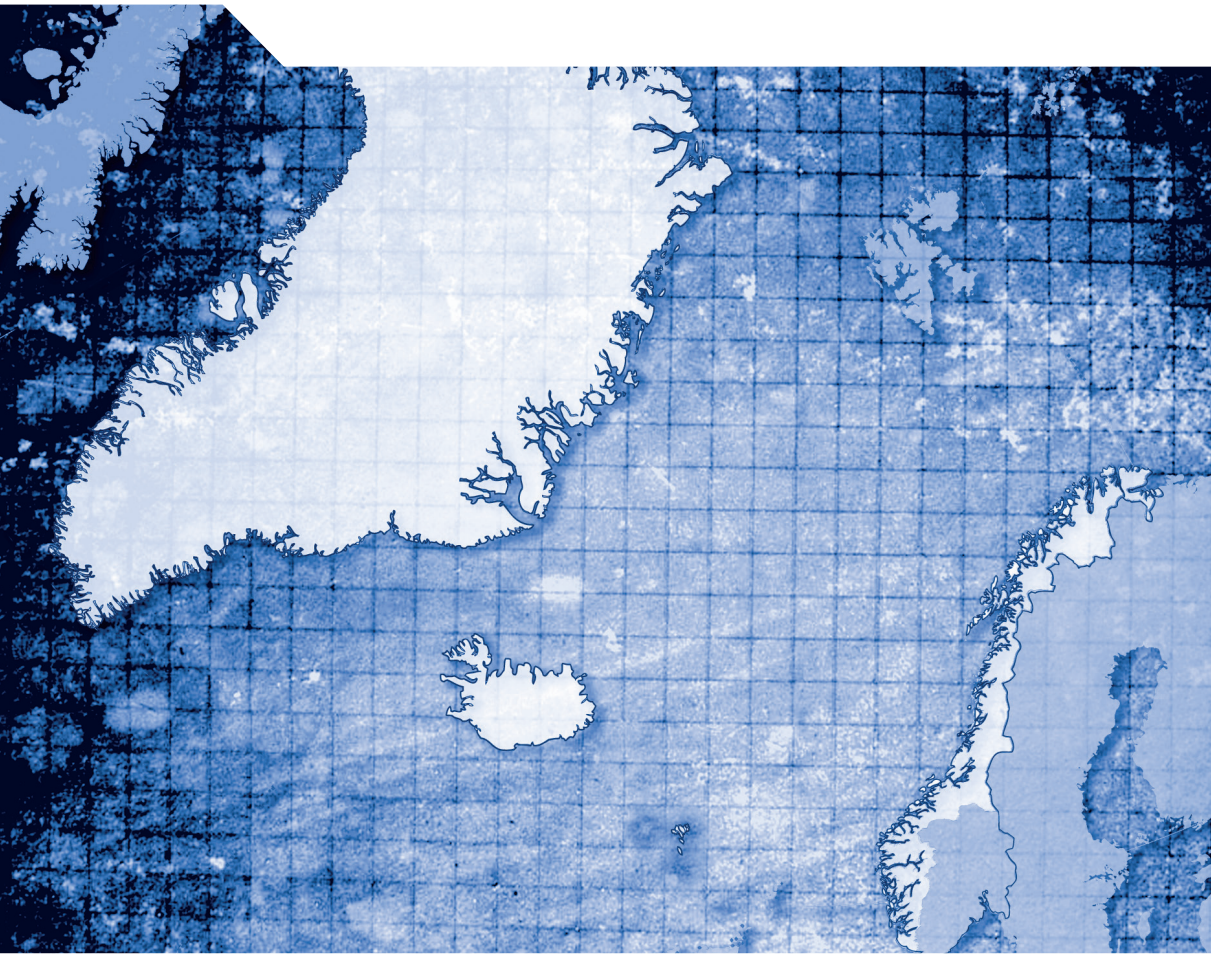
OECD Territorial Reviews

NORA REGION

THE FAROE ISLANDS, GREENLAND, ICELAND AND COASTAL NORWAY



OECD

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2011

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Please cite this publication as:
OECD (2011), *OECD Territorial Reviews: NORA Region 2011: The Faroe Islands, Greenland, Iceland and Coastal Norway*, OECD Publishing.
http://dx.doi.org/10.1787/9789264097629-en

ISBN 978-92-64-09761-2 (print)
ISBN 978-92-64-09762-9 (PDF)

Series: OECD Territorial Reviews
ISSN 1990-0767 (print)
ISSN 1990-0759 (online)

Foreword

At the beginning of this new millennium, regional economies are confronting momentous changes. The globalisation of trade and economic activity is increasingly testing their ability to adapt and maintain their competitive edge. Market integration and cross-border agreements play a prominent role in the development of many regions. Rapid technological change and greater use of knowledge are offering new opportunities for local and regional development but demand further investment from enterprises, reorganisation of labour and production, more advanced skills and environmental improvements.

Amid this change and turbulence, regions continue to follow very different paths. Some regions are doing relatively well in the current phase of the growth cycle and are helping to drive the recovery. Others are less successful at capturing trade and additional economic activities. Many territories with poor links to the sources of prosperity, afflicted by migration, and lagging behind with respect to infrastructure and private investment, are finding it difficult to keep up with the general trend.

At the same time, central governments are no longer the sole provider of territorial policy. The vertical distribution of power between the different tiers of government needs to be reassessed, as well as the decentralisation of fiscal resources, in order to better respond to the expectations of citizens and improve policy efficiency. Public authorities need to weigh up current challenges, evaluate the strategies pursued in recent years, and define new options.

Responding to a need to study and spread innovative territorial development strategies and governance in a more systematic way, in 1999 the OECD created the Territorial Development Policy Committee (TDPC) as a unique forum for international exchange and debate. The TDPC has developed a number of activities, including a series of Territorial Reviews. These studies follow a standard methodology and a common conceptual framework, allowing countries and territories to share their experiences and disseminate information on good practices. This series is intended to produce a synthesis that will formulate and diffuse horizontal policy recommendations.

Acknowledgements

The OECD would like to thank the authorities of Nordic Atlantic Cooperation (NORA), the Faroe Islands, Greenland, Iceland and Norway for their co-operation and support during the review process. Special thanks are given to Mr. Lars Thostrup, Director of NORA, Ms. Inga Ósk Jónsdóttir, Chairman of NORA, Mr. Jørn Hansen, Board Member of NORA, Mr. Jákup Mørkøre, Board Member of NORA, Mr. Nils R. Sandal, Board Member of NORA, all the NORA Committee and NORA staff at the secretariats, that collaborated in the review process, including Mr. Jákup Sørensen, Project Coordinator, Ms. Sigríður K. Þorgrímsdóttir, NORA Contact Point in Iceland, Mrs. Manumina Lund Jensen, NORA Contact Point in Greenland, Mr. Trond-Erlend Willassen and Mr. Trond Ueland, NORA Contact Points in Norway. The OECD would also like to thank to the different authorities and actors from the public and private sectors, international organisations, civil society and academia of the NORA regions who participated in the meetings conducted during missions to these territories. The participation in these meetings of Mr. Kaj Leo Johannesen, Prime Minister of the Faroe Islands, Mr. Kuupik Kleist, Prime Minister of Greenland, Mr. Jóannes Eidesgaard, Minister of Finance of the Faroe Islands, Mr. Palle Christiansen, Minister of Finance of Greenland, Ms. Agathe Fontain, Minister of Health of Greenland, Ms. Ane Hansen, Minister of Fisheries and Hunting of Greenland, Ms. Katrin Juliusdottir Minister of Industry of Iceland, and Ms. Torill Selvold Nyborg, Chairman of the Hordaland County Council, is gratefully recognised. The Nordic Centre for Spatial Development (Nordregio), and Dr. Rasmus Ole Rasmussen, Senior Research Fellow of Nordregio, actively participated in the process, supplying background reports and statistical information. Special thanks are due to the members of the NORA Review Reference Group – Mr. Gilli Wardum and Ms. Ina Hammershaimb from the Faroe Islands, Mr. Snorri Björn Sigurðsson from Iceland, Mr. Martin Christiansen from Greenland and Mr. Aalbu Hallgeir from Norway. We would also like to thank the staff from Statistics Faroe Islands and Statistics Greenland, for the provision of detailed statistical information.

The peer reviewers were Mr. David Collins, Director General of Policy and Coordination of the Atlantic Canada Opportunities Agency (ACOA), and Mr. David Gass, former Regional Director of Scottish Enterprise. They provided substantial support and collaboration in all phases of the review process, and the OECD is grateful to them and to the governments of Canada and Scotland for their involvement. Special thanks are given also to Ms. Liette Lavallée, Mr. Richard Cormier and Mr. Paul Parsons from ACOA, and to Mr. Julian Pace, Director Responsible for Rural Operations of Scottish Enterprise, for their collaboration in the review process.

The review benefited from reports conducted by Ms. Sofie Skjeflo and Mr. Asbjørn Aaheim, from the Centre for International Climate Change and Environmental Research in Oslo (CICERO) and from Ms. Anne-Sofie Christensen, from the Innovative Fisheries Management Research Centre (IFM) at the Aalborg University Copenhagen.

This review was co-ordinated and drafted by Mr. Carlos Icaza Lara under the direction of Mr. Joaquim Oliveira, Mr. William Tompson and Mr. Andrew Davies of the Public Governance and Territorial Development Directorate, of the OECD. Substantial contributions were provided by Dr. Irene McMaster, Senior Research Fellow at the University of Strathclyde, Scotland, UK; Professor David Freshwater of the University of Kentucky, United States; and Ms. Claire Nauwelaers of the Public Governance and Territorial Development Directorate, of the OECD. Mr. Carl-Christian Schmidt, Head of the Fisheries Policies Division of the OECD's Trade and Agriculture Directorate, and Mr. Gerard Bonnis, Principal Administrator of the Environmental Performance and Information Division of the Environment Directorate, contributed to the review process and supervised the preparation of the sections on fisheries and climate change, respectively. Econometric and statistical analysis was provided by Ms. Monica Brezzi, Mr. Vicente Ruíz and Mr. Daniel Sánchez Serra, from the OECD secretariat.

Ms. Doranne Lecercle edited the final manuscript and Ms. Erin Byrne and Ms. Jeanette Duboys prepared the review for publication.

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The NORA region is one of the world's most peripheral areas, but one with considerable opportunities and economic potential.

The NORA region comprises the Faroe Islands, Greenland, Iceland, and the coastal counties of Norway, a group of North Atlantic territories linked by shared characteristics and challenges, as well as by historical, institutional and cultural links. Remoteness, sparse settlement patterns, physical barriers between communities and extreme climatic conditions create significant difficulties in terms of communications and accessibility. These factors complicate the region's trade, economic diversification and provision of public services. However, these territories have managed to cope with their extreme conditions. The region's rich, relatively unspoiled and unique environment offers a range of opportunities linked not only to fisheries, but to energy and mineral production, eco-tourism, and research on the Arctic environment and climate change. The importance of the Arctic is increasing, and the NORA region occupies a strategic position between Europe and North America, as an entryway to the Arctic.

The population is unevenly distributed and increasingly concentrated.

The region's inhabitants are predominantly based in small dispersed coastal settlements and a few larger towns. The average population density of the region is 3.6 inhabitants per square kilometre, a figure that contrasts with an average density of 33 per km^2 in the OECD area. However, population has been declining in most of the smaller settlements, owing to the increasing concentration of the population – particularly the working-age population – in larger settlements and towns. Internal migration is linked to economic opportunities and the dynamics of agglomeration. The settlement pattern of the NORA region was largely shaped by the fishery industry: communities were established to exploit site-specific resources. More

recently, technological improvements in fishing and in fish processing have reduced the number of vessels and the number of people involved in both activities. In addition, climate change has hurt traditional hunting, fishing and herding, the economic base of traditional indigenous groups (Inuit and Sami) and many smaller localities. As a result of all this, the economic and social structures of smaller settlements have become increasingly fragile and the provision of basic services more challenging, not least owing to the high share of elderly people in small communities.

The region as a whole suffers from outmigration and brain drain.

International migration patterns in the NORA region are closely linked to the situation of the local economies in relation to those of other Nordic countries, particularly Denmark in the case of the Faroe Islands and Greenland. International emigration is especially frequent among the highly educated, young adults and women. Many of those who leave remain abroad. Job opportunities are often better, particularly for those working in fields unrelated to fisheries. As a result, the communities of origin lose some of their more qualified people. Moreover, this situation creates disincentives for economic diversification.

Measures to encourage the return of migrants need to be accompanied by a broadening of economic opportunities.

When a vacancy in Greenland or the Faroes is to be filled by a non-Nordic citizen, strict immigration regulations apply, especially if local unemployment rates are high. However, the local unemployed are mostly unskilled or low-skilled workers, while the rules chiefly affect companies seeking to hire highly skilled international workers. Non-Scandinavian immigration would probably be limited in any case, given climatic conditions and relatively small labour markets. Nevertheless, even small fluctuations in immigration can have an important impact on the demographic situation and on the labour markets of small economies. Immigration regulations in the Faroe Islands and Greenland should be relaxed to facilitate immigration.

Those who previously lived in the region are those most likely to be attracted to it, so it may make sense to target some efforts aimed at attracting highly qualified migrants in the first instance. Programmes to encourage emigrants to return can focus on those who have children and seek a good

environment in which to raise them and a better quality of life, as well as on recent graduates with degrees relating to the needs and potentialities of the NORA region. However, even if there is a case for targeted programmes to facilitate the return of migrants, the rate of return and the attraction of immigrants will ultimately depend on the presence or absence of competitive job opportunities: broadening economic opportunities will remain crucial to offering clear incentives to return. To the extent that such programmes involve financial or other support for returnees, they will need to be assessed quite carefully, to ensure that their economic returns exceed the costs.

It is important to find new place-based opportunities.

For some peripheral settlements, the twin pressures of consolidation of both traditional businesses and public services, as governments struggle to reduce unit service costs, mean that their survival hinges upon the identification of new and viable economic activities. Aquaculture is a significant and growing activity in the region, especially in the small coastal communities of Norway and the Faroe Islands. In Greenland, reduced sea-ice coverage owing to climate change may also provide new opportunities. Mining currently accounts for a minor share of the NORA territories' GDP and employment, but increased exploitation of mineral resources in Greenland and northern Norway offers significant opportunities. Tourism also represents a valuable alternative for some locations with good natural amenities, but it requires good facilities and infrastructure and good connections to the outside world. If smaller settlements are to become tourist destinations, they will have to improve transport connections and infrastructures (services and amenities), probably in co-operation with one another; co-ordination will be necessary if such investments are to be profitable. Certain emerging sectors, such as renewable energy, could offer some opportunities in rural regions. However, the development of new activities in the region will require a training and education effort to adapt to the new labour requirements.

ICTs can improve the framework for business development and increase the efficiency of public service delivery.

The availability of extensive and efficient information and communication technologies, accompanied by well-developed ICT utilisation skills, is essential to enhance the development of remote areas.

Internet coverage is generally good across the region, but there is a need for better and more efficient coverage in rural areas and peripheral localities, particularly in Greenland. ICTs can play an important role in improving the efficiency of public service delivery (*e.g.* through e-health and distance learning) in sparsely populated and remote areas. The Internet can also promote better business opportunities and help rural firms to penetrate distant markets. However, for ICTs to be an effective tool for businesses there must also be good physical connections so that goods can be shipped and parties can engage in face-to-face contact.

Improving accessibility is crucial for the development of the region.

The NORA region suffers from a series of disadvantages related to its remoteness from major markets and trade routes. Even direct transport connections linking the four NORA members are limited. External connections to Greenland and the Faroes are extremely limited and mostly pass through Denmark. There is untapped potential for stronger links between the western parts of NORA and Atlantic Canada and the eastern parts of NORA and the United Kingdom. This would facilitate access to larger markets. The lack of critical mass makes it hard to develop and diversify the transport network, especially in Greenland and the Faroes, but an improved and more diversified transport infrastructure is crucial to overcome the problem of remoteness and improve the region's competitiveness.

Better connectivity, co-operation and regional development are mutually reinforcing processes.

The strengthening of external and regional transport networks will require co-operation and joint action by the NORA territories. Regional co-operation could lead to denser regional transport networks and facilitate a more rational use of regional air hubs (for instance Reykjavik airport) to improve the region's links with nearby countries. Clearly, improvement of the transport infrastructure system would be aided by a parallel process of enhancing the competitiveness and economic activity of the region by promoting innovation and further economic diversification, upgrading the institutional framework for business and investing in education and skills. However, stronger transport links could in themselves result in further economic, academic and institutional exchanges in the region. This would in

turn support efforts to stimulate innovation, diversification, entrepreneurship and the growth of human capital.

Sustainable development of fisheries will be essential for the region's long-term competitiveness.

Although the economic importance of fisheries has declined in recent decades, the sector is expected to remain one of the most important in the region. It accounts for almost 80% of exports from Greenland and the Faroe Islands, and it remains an important source of employment in Iceland and Norway. However, over-exploitation of fish stocks has increased rapidly, putting the biological sustainability and the economic viability of commercial fisheries under serious pressure. Efficient and sustainable management systems are as important as international agreements for avoiding a continuous "race to the fish" that would seriously threaten the industry's survival. Effective and efficient co-ordination of resources and know-how will be crucial to ensure the sustainable development of North Atlantic fisheries. The region's long tradition in fishing has been complemented in recent years by a strong export-oriented aquaculture industry. Aquaculture is a significant and growing part of fish production, especially in Norway and the Faroes. The volume of fish farming has more than doubled in both territories over the period 1998-2008. However, securing its future, too, will depend on steps to address environmental externalities and other risks associated with fish farming.

Research and innovation are crucial for improving the efficiency and sustainability of the fishery sector.

The NORA region's fishing industry is one of the most efficient in the world. Nevertheless, continued productivity improvements in fishing, fish processing and fish farming will be required to maintain this leading edge. Innovation and technological change will play an important role in meeting current and future challenges: improving energy efficiency (in light of increasing fuel costs), ensuring sustainability and adapting to climate change. Innovation and developing better methods and technology will also be required to cope with changing demand, global competition and environmental protection in aquaculture.

Regional co-operation is required to ensure sustainable management of the sector and can be the basis of exchange of know-how, research and expertise.

The NORA territories compete among themselves directly for both fisheries resources and markets. However, co-operation is crucial for ensuring sustainable and efficient management of the marine environment and avoiding depletion of shared fish resources. Much of this co-operation takes place either within wider international arenas or on a bilateral basis, but the scope for NORA-based co-operation on a range of issues is clear, particularly in view of the territories' distinctive, and sometimes complementary, expertise and experience, and could offer opportunities for productive exchanges of technical know-how, data on stocks in NORA waters, research and expertise. Norwegians, for example, have expertise in aquaculture and vessel design, Icelanders in processing and traceability, and the Faroese in the application of traceability solutions and development of fishing gear.

NORA territories generally have limited resources for research, and these might be leveraged via increased collaboration, knowledge sharing and joint support of fisheries-related research and innovation, including co-operation by the region's institutions in the provision of education and training. The uncertainties surrounding the effect of climate change on fish migration and fish productivity also underscore the importance of regional co-operation. Research into the impact on the sector and potential adaptation measures is clearly required.

Further development of the mining and oil sectors would benefit from stabilisation measures…

NORA's exports consist mainly of primary commodities, especially fish, minerals, oil and gas. This makes these economies vulnerable to changes in international commodity prices and sudden shifts in demand, or in the case of fish, in the availability of stocks. Income levels can be exceptionally variable and unstable. In addition, since hard minerals and hydrocarbons are depletable, their exploitation is necessarily finite. Further development of the mining industry in Greenland or potential future oil production in Greenland or the Faroes would benefit from macroeconomic measures to minimise the risks associated with commodity price cycles. Management of mining and oil rents through institutions such as Norway's Government Pension Fund and Chile's Copper Stabilisation Fund should be

considered. Even if the scale of production does not initially warrant such elaborate solutions, it will be important to manage hydrocarbon and mineral revenues in such a way as to insulate the domestic economy to some extent from the effects of commodity price fluctuations.

…but would have to be carried out under the strictest environmental regulations.

The NORA region's unique ecosystems constitute an asset as well as a challenge. These rich ecosystems offer significant economic opportunities but are extremely sensitive to environmental degradation. Strong dependence on activities such as trade, transport, mining and oil extraction leave the region highly exposed to such degradation. Climate change is making it easier to tap some mineral resources, such as the expected substantial reserves of petroleum off the coast of Greenland. However, the Arctic presents many of the high-profile challenges associated with deepwater operations: remoteness, an extreme climate, safety of personnel and large environmental footprint. The recent Deepwater Horizon oil spill in the Gulf of Mexico and its devastating effects on the regional ecosystem in general and the fishery sector in particular demonstrate the importance of very strict environmental regulations and controls in the NORA region's current and future oil extraction activities.

NORA territories could gain from diversifying their productive base.

Alongside the further development of traditional raw-material-based sectors, the creation of new niches or entirely new sectors is a complementary development path for the NORA territories. Economic diversification would help reduce the risks attendant on NORA's current high dependence on natural resources. It could also help reduce the outmigration of qualified people by offering new and more attractive jobs. The development of new activities is particularly important for economies heavily dependent on fisheries, as structural adjustment in fishing fleets has led to a reduction in employment. A number of niches that might be associated with "green" branding could take advantage of the rich and diverse environment of the region: ecological tourism, research related to climate change, ice, water and Arctic and sub-Arctic products, further development of renewable energy sources.

Higher value added and niche products from the marine sector could be further developed.

NORA regions could capitalise on the strong knowledge base acquired through traditional fishing and fish-processing activities by further developing value-added food and non-food products from the marine sector: *e.g.* new nutrients, bio-medicines and pharmaceutical products, among others. The blue biotechnology area is a growing sector worldwide. The NORA territories could exploit many opportunities linked to better use of by-products and marine resources. For example, they could combine forces to screen material obtained from the oceans and to develop by-products from the seafood processing industry.

Some Icelandic and Norwegian companies have already become some of the world's leading producers of ready-to-eat meals, fine seafood and premium Nordic food products. Further expansion of secondary fish processing in other NORA territories, especially Greenland, is constrained by long distances. However, there have recently been efforts to develop Greenlandic Arctic water and ice industries. Greenland plans to market its high-quality mineral water as a luxury product "from an untouched natural landscape". The potential for establishing viable commercial production of berries in the Faroes, Greenland and Iceland, or of eiderdown in Greenland and the Faroe Islands, is currently being explored with the support of Nordic Atlantic Cooperation (NORA organisation). One key to unlocking these and other opportunities in Arctic and North Atlantic products lies in developing strong marketing, exploiting the clean and natural image of the NORA environment, and building the infrastructure and capacity to respond to international demand.

The rich ecosystems of the NORA region present opportunities for expanding high value-added natural tourism and cruise tourism.

There is scope to develop tourism further, based largely on local resources. NORA territories have tourist attractions found in very few places, such as fjords and icebergs, the northern lights, the ice cap and active volcanoes. Tourists can enjoy direct contact with nature in unique and unspoiled environments. Norway and especially Iceland have developed their tourism industries for some time. However, tourism in the NORA region has generally been constrained by the region's remoteness and lack of connectivity, high costs and lack of brand recognition. High prices and a limited supply of tourist amenities prevent the development of a tourist offer

based on quantity, but high-end tourism with limited numbers could make a significant economic contribution to the region. Ecological tourism, adventure tourism and prestige events, both for businesses and individual tourists, are interesting niches that could be further developed. Efforts to improve co-operation among local entrepreneurs are needed, however, as a lack of co-ordination is likely to hinder the development of such activities. Better organisation and training of local operators could also help ensure that these activities have a small environmental impact and are respectful of the region's environmental and socio-cultural sustainability.

Cruise ships are especially attractive in the NORA context, because they offer the visitor the opportunity to experience large parts of the North Atlantic on the same journey, and because they avoid the expense of constructing large accommodations to meet seasonal demand. Currently, the region's cruise-ship-based tourism is modest but expanding, and climate change is making some sea routes and locations, especially in Greenland, more accessible. However, cruise tourism, even more than other forms of tourist activity, may suffer from failures of co-ordination if operators fail to co-operate: for example, multi-stop itineraries for cruises would improve the experience for visitors and increase the economic return to the individual firms involved.

Joint regional efforts to promote regional tourism could have a greater impact.

Competition among the NORA territories could limit the effectiveness of co-operation. However, with sufficient backing, regional co-operation could strengthen efforts to "brand" the region, to offer joint products for tourism and to undertake co-ordinated marketing activities. Travel packages branding the North Atlantic as a "last frontier" destination and covering several parts of NORA could be developed jointly and marketed towards specialised agencies (in particular adventure, sport- and eco-tourism). Development of joint training packages and methods for small tourism entrepreneurs is another potential area for co-operation. A common strategy on how best to manage, develop and exploit the growing potential associated with cruise tourism could also facilitate interaction and co-ordination among local entrepreneurs in providing profitable products and services. At the same time, co-operation among destinations for rescue and security services would be crucial. Big cruise ships travelling in a remote and geographically challenging region where response resources are scarce present a number of challenges in terms of safety, rescue equipment and environmental impact that could be better addressed at a regional scale.

The NORA region could become a knowledge hub in niche areas.

Given the natural and climate-specific conditions of the NORA region and its long-standing expertise in traditional resource-based sectors, the region could become an active participant on the applied and experimental side of the R&D spectrum, in a number of areas:

- **Climate change research** relies heavily on new data, and the Arctic environment provides a unique setting to collect data and conduct experiments. Physical and biological processes in the Arctic will play a key role in understanding global climate dynamics. Climate change is expected to be more significant and rapid there than in many other parts of the world. This offers opportunities for positioning the region as a key location for climate change research. The challenge is to ensure that the NORA region contributes to R&D activities and is not confined to a role of supplier of experimental locations and basic services. In this respect, the University Centre in Svalbard (UNIS) is a good example of research facilities combined with applied research and high-quality teaching.
- **Research in fishing and fish-farming** would build on the obvious traditional specialisations of the NORA research communities. The Marine Research Institute in Iceland, the Faroese Marine Research Institute and the Norwegian Institute of Fisheries and Aquaculture Research are important research hubs in this field and are well networked with Nordic and other institutes.
- **Research in building technologies** can benefit from the specific climatic conditions of the North Atlantic area in order to develop applied research activities targeted at such environments. The Icelandic Innovation Centre and its Building Research Division, Narvik University College in Norway, and Artek, the Arctic Technology Centre in Greenland, are three examples of institutes conducting applied research in this field.
- **Small-scale renewable energy exploitation** systems especially adapted to remote and rural areas are a specific area in which new research and applications are needed and seem particularly well suited to the conditions prevailing in the NORA territories.

Regional co-operation can facilitate a greater international role for NORA in R&D.

The small scale of many research systems in the NORA region provides an opportunity for sharing resources, exchanging know-how and information, and exploiting complementarities. Remote and peripheral areas have limited resources and are thus unable to take full advantage of some of their potential. By pooling their strengths, they can overcome these limits and achieve otherwise unattainable results. Co-operation opportunities could include the development of joint transnational services and initiatives, participation in jointly funded projects, exchanges of experience, co-operation between universities and researchers, and sharing of facilities and equipment in both traditional and emerging sectors. In-depth research into the R&D projects, initiatives, strengths and potentialities of each of the NORA territories could reveal the comparative advantages present in the region and its untapped potential. Since it would be a waste of resources for each region to try to become a self-sufficient knowledge hub in each research area, a distributed regional model of knowledge creation could be established.

Further regional exchanges could help upgrade education and training in the region.

In order for new jobs in emerging sectors such as mining, green tourism or R&D to benefit local inhabitants, it is crucial to improve the workforce's education and skills. Otherwise, local populations could miss out on new job opportunities. The provision of specialist training and tertiary education in the Faroe Islands and Greenland, in particular, is limited by their small populations and lack of demand. However, a range of universities in Norway and Iceland offer programmes in English that focus on the needs and problems of the North, including research programmes on climate change, the exploitation of Arctic resources, renewable energy or Earth sciences. There are also several joint Nordic master's programmes. However, few of the Greenlandic and Faroese students abroad choose to join other NORA universities and programmes. There is scope to further develop exchanges not only of students but also of teachers in colleges, universities and training institutes across the region and beyond, *e.g.* through well-functioning Nordic programmes on education, such as the Nordplus framework programme. There are also opportunities for regional exchanges to provide specialist training in key sectors (*e.g.* tourism entrepreneurs). The experience of institutions such as the University of the Arctic should be

evaluated as a basis for developing international agreements with the best institutions in the Nordic countries and beyond. Finally, distance learning systems and teacher education are areas in which the NORA territories face many of the same challenges and provide a good breeding ground for joint initiatives.

Climate change will have adverse consequences but may also create economic opportunities for some.

The impact of climate change is already increasingly apparent in NORA territories and has implications for the region's main economic activities. Some of the effects of change are negative and create considerable uncertainties and problems, but others can be viewed as potential economic opportunities. A rise in sea temperatures will affect the migratory patterns and stocks of fisheries and probably mean a loss of habitat for key species, as well as more difficult conditions for fish farming. However, climate change is expected to facilitate the extraction and transport of mineral resources, and it is already allowing longer crop seasons and the harvesting of new vegetables. Yet, agriculture may also face an increased risk of diseases, fungus and insect attacks. The length of the navigation season in the Arctic will increase, opening up Arctic shipping lanes, but the risk of flooding, landslides or avalanches is likely to rise. Finally, changes in the distribution of Arctic mammals and fish stocks and negative impacts on reindeer herding will adversely affect smaller settlements and indigenous populations. The severity of these impacts will depend on the extent to which comprehensive adaptation plans to reduce vulnerability can be adopted early. At the same time, the scope of the benefits will also depend on how the different territories and communities, and the region as a whole, adapt to the potential changes. Short-term economic benefits should be set against long-term sustainable development patterns by integrating environmental factors in sectoral and economic development policies.

Regional co-operation can enable a better understanding of climate change and better tools for adaptation.

It is not easy to project the precise effects of climate change, and this makes shaping responses particularly difficult. Regional co-operation can provide the different territories and institutions with a better understanding of both region-specific and wider trends and with better tools to adapt to climate change. It can be an important vehicle for addressing climate

change, especially in respect of: *i)* research and exchange of information and know-how relevant to risk, vulnerability, adaptive capacity, monitoring and evaluation; *ii)* marketing and applying new technology; *iii)* supporting adaptation at the local level; and *iv)* joining forces to take a similar position on climate change in international forums. Developing a common strategy for adapting to extreme events could also be beneficial. Additionally, smaller scale project-based co-operation could be a useful way to address specific issues shared by the different territories, *e.g.* the impacts of climate change on fisheries, small communities and local transport.

Preparation of a regional development strategy would help to focus territorial co-operation efforts.

Strengthening links and interactions in the NORA region requires developing a strong basis and rationale for co-operation: it is not possible to co-operate with everyone on everything. Some areas would be better addressed at sub-national, national or international (beyond NORA) levels. Identifying and agreeing on a focus for co-operation is crucial to its success. It is important to consider where international initiatives could add value to domestic interventions or to existing co-operation networks by addressing gaps or complementing existing programmes. Defining a participative long-term development strategy for the NORA region would help to focus, streamline and rationalise co-operative efforts and resources. The development of such a strategy would need the support and involvement of the NORA region's main economic, political and social stakeholders. The process would be a valuable means of reaching a shared vision of what the focus of NORA-based co-operation is and what it is for. It can also be seen as an opportunity to gain "buy-in" and agreement from key stakeholders, to increase their interest and involvement, raise awareness and build momentum behind the ideas.

Co-operation in the region confronts barriers that underscore the need for a regional institution.

Territorial co-operation in the NORA region is not easy: it involves working with different institutional settings, in territories that compete in many sectors, are separated by large distances, and have strong institutional and economic links with other regions. Moreover, tangible benefits from co-operation are sometimes elusive in the short term. In this regard, there is a need for an institution or institutions in a position to facilitate the process

by playing a "brokerage" role, pulling key actors together and facilitating co-operation. In order to take on this strategic role, an organisation must have sufficient resources and the profile necessary to manage the task. It must be well connected to the governments of the NORA territories and other stakeholders and well known in the region. To an extent, such a framework is already in place through the activities of the NORA organisation.

The role of Nordic Atlantic Cooperation (NORA) as an institutional facilitator of co-operation could be further refined…

The Nordic Atlantic Cooperation – the NORA organisation operating under the aegis of the Nordic Council of Ministers – has long been engaged in generating and supporting co-operation projects, particularly those concerned with knowledge exchange in the region. Its role as an institutional facilitator of co-operation could be further developed and embedded:

- The NORA organisation could play a key role in driving and facilitating the process of developing a long-term development strategy in the NORA region.
- NORA can help co-ordinate links with other territories, particularly neighbouring states that share common interests and problems with the NORA region. The NORA organisation already has good working links with many of these.
- NORA's international conferences have already proved an excellent way to initiate and expand contacts between stakeholders from different NORA territories. More active follow-up to these conferences could ensure that their outcomes receive greater visibility and lead to more concrete action.
- NORA offers a flexible source of funding for small projects that is perceived as less bureaucratic and more in line with the specific needs of the region than other co-operation programmes. To minimise overlap with other co-operation arrangements and programmes, the NORA organisation could focus its efforts on supporting those who normally have greater difficulty securing other sources of funding (*e.g.* SMEs, traditional communities). It can also help these groups prepare to participate in larger projects, such as EU programmes.

- Some tools, such as shared Internet platforms, could be further promoted, as they offer a useful way to share experiences with partners from different territories.

…and its profile could be raised.

To play a more strategic role, the NORA organisation would probably require an enlarged mandate. The organisation has limited financial and human resources to devote to the quite ambitious role of strengthening regional co-operation. It would also need more institutionalised and smoother co-ordination with the different programmes and institutions engaged in co-operation in the NORA region. Special care should be taken to clarify the roles and interaction mechanisms of the different institutions. Vaguely defined or overlapping mandates can compromise co-operation efforts. Finally, for the co-operation process to be successful there has to be clear support from the different territories and from the region's main stakeholders. Increased interaction with its key political and economic actors (especially in Iceland and Norway where the organisation is still relatively unknown) will be essential for achieving greater support for the NORA co-operation project.

A "variable geometry" approach to regional co-operation is likely to be desirable.

Long distances, lack of connectivity, the low intensity of present intra-NORA economic linkages and the natural linkages of NORA territories to other regions outside NORA all point to a "variable geometry" approach to international co-operation. Partnerships and co-operation need not cover all, or only, the NORA territories; participation should be evaluated on the basis of the policy domains and activities in question. Distances imply that certain co-operative arrangements will evolve more easily with just two or three of the NORA members, while others can be enriched with the presence of partners from neighbouring territories with many commonalities with the NORA region (*e.g.* North Atlantic Canada, Scotland, Russia) and beyond.

In the context of the new environmental, economic and social challenges facing North Atlantic coastal communities as a result of globalisation and climate change, increasing exchanges with neighbouring territories could result in common benefits. North-west passage trade opportunities are being enabled by climate change. Increasing trade and transport in the area will amplify the rationale and potential benefits of extended regional co-operation. At the same time, the commonalities across the territories of

the North Atlantic Rim have generated increased interest in finding ways to learn more from one another and to explore opportunities for greater co-operation. The NORA territories already have working links and are involved in different co-operative initiatives with neighbouring regions. These links have expanded and a growing part of NORA's projects and conferences currently involve partners from adjacent territories, mainly with the Atlantic provinces of Canada and Scotland. The NORA organisation can provide a gateway for co-ordinating and improving the effectiveness of relations with neighbouring regions.

In order to sustain broad support for co-operation across the NORA region, it is crucial to evaluate and demonstrate its benefits.

The benefits of co-operation are sometimes difficult to perceive, particularly in the near term. Communicating the positive outcomes of territorial co-operation – with special emphasis on the search for efficiency – to key actors in the different territories can motivate them to support enhanced co-operation in the region. Demonstrating the benefits of co-operation in a convincing way, moreover, will require rigorous, consistent attention to evaluating the costs and benefits of different initiatives. Greater attention to the evaluation of outcomes, in turn, should help to ensure that initiatives that are bearing fruit are allowed to develop, while others, whose costs may exceed their benefits, can be wound up and the available resources, which are limited, can be directed elsewhere. This Review has highlighted a wide range of possible areas and mechanisms for co-operation within and beyond the NORA region, but it is unlikely that all of them will prove their worth in practice. A broad-based experimental approach is needed, in which many initiatives are explored and tested but none are exempt from careful scrutiny of outcomes. Some will succeed, some may need refinement and some may be shelved altogether. They key to success lies not in identifying *ex ante* the perfect initiatives or ideal modalities but in knowing how to progress through a cumulative process of policy learning.

Chapter 1

Major trends, challenges and strengths of the NORA region

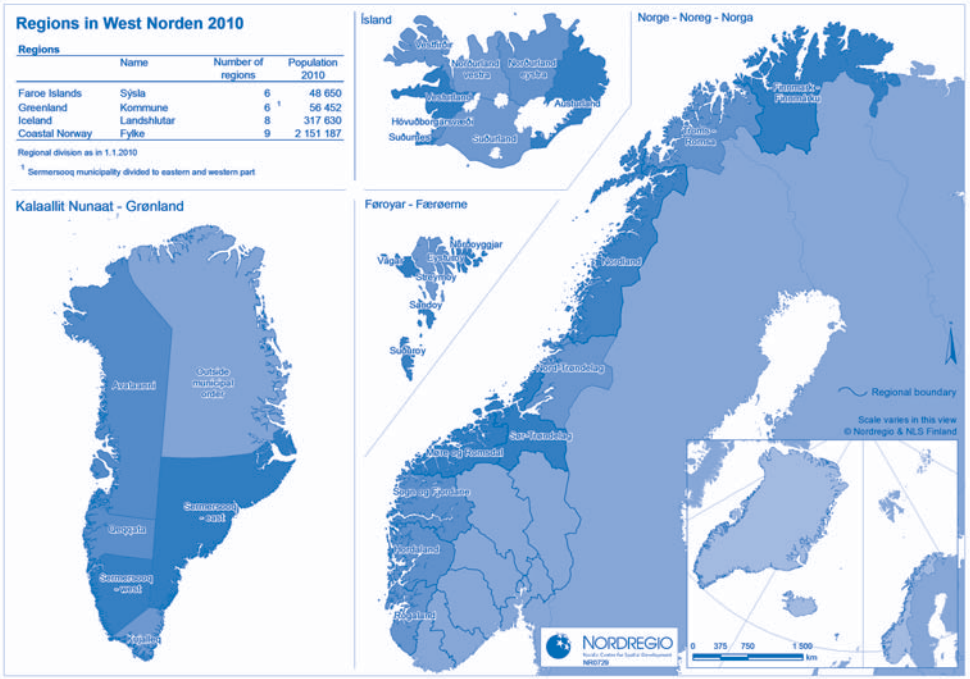
The NORA territories have a relatively high GDP per capita (only Greenland falls well below the OECD average) and economic performance before the crisis was solid. Yet these territories are highly dependent on a reduced number of primary commodities, mainly fisheries, but also oil and gas. The public sector is relatively large and a major employer in the region. At the same time, this region is characterised by its extreme peripherality, by the sparse settlement pattern and by significant difficulties in terms of communications and accessibility. These factors complicate the region's trade, economic diversification and provision of public services. This chapter starts with a definition of the unit of analysis of this review: the NORA region. It then assesses the major socio-economic and demographic trends in the region. Finally it underlines four main challenges for the region: geographic peripherality; ensuring sustainable development of the fisheries sector; economic diversification; and adaptation to climate change.

Introduction: defining the unit of analysis

This review examines the policy challenges and prospects of the North Atlantic region (NORA), which includes the Faroe Islands, Greenland, Iceland and the coastal counties of Norway. NORA was first defined as a distinct entity in 1996, when the Nordic Council of Ministers established a specific body to deal with the particular challenges facing this group of territories. This group is perceived as strongly linked by their shared characteristics, extreme peripherality, and historical, institutional and cultural links. The review looks at NORA not as an institution but as a trans-national region. At the same time, the review does not focus on individual national or territorial particularities (though they are mentioned, where relevant, in the analysis). The objective of this review will rather be to explore the region's shared challenges and strengths, and the opportunities that institutionalised co-operation offer to better address them.

The four territories are situated between the northern periphery of Europe and the northern periphery of North America, between the Arctic and the North Atlantic oceans. Overall, the NORA region covers an area of land and sea that is bigger than the continent of Europe, but it has a population of just under 2.5 million. It is far from the main world centres of trade and business, and much of the population lives in small and remote settlements where population ageing and outmigration of young adults are a common problem. Long distances, sparse populations and physical barriers between communities pose considerable challenges for developing and maintaining communication infrastructures and result in reduced accessibility and high transport costs. The provision of basic public services such as education, health care or long-term care for the elderly is a shared challenge for the remote locations of the four territories. The region's national economies are very dependent on fisheries and raw materials. Finally, these territories' environments are extreme and fragile and they are especially vulnerable and exposed to the effects of global warming.

Figure 1.1. **Map of the NORA region**



Source: Nordregio - Nordic Centre for Spatial Development, *www.nordregio.se*, (c) Nordregio, 2010.

The territories of the NORA region also have similar economic potential and one of the world's richest areas of marine resources. At the same time, its well-preserved and unique environment offers a range of opportunities linked not only to fisheries, but also to eco-tourism, energy and mineral production, as well as research on the Arctic environment and climate change. While climate change represents a major challenge for the region, it is also a gateway to new opportunities. For instance, a reduction in the ice cap opens up easier access to new sea routes, new resources (mineral extraction), and new economic opportunities, *e.g.* expansion of tourism and agriculture. The importance of the Arctic (shipping routes, potential energy reserves) is increasing, and the NORA region occupies a strategic position between Europe and North America, as an entry point to the Arctic.

As in other transnational regions, beyond the common characteristics, challenges and potential, the different territories also have particularities. Iceland and especially coastal Norway are much less dependent on fisheries and have more diversified economies than the Faroe Islands and Greenland.

Unlike the other three territories Greenland faces significant social and educational challenges, but it also has great potential in view of its key position as the entrance to the Arctic. In institutional terms, Greenland and the Faroe Islands are autonomous territories (self-governing under Danish sovereignty), coastal Norway consists of nine regions or counties belonging to a unitary state, and Iceland is an independent country.

Regional co-operation can engender direct and indirect benefits. The region's shared demographic, economic, and environmental characteristics raise questions that could be better addressed through regional co-operation. At the same time, the particularities of the different territories can be a source of mutual learning. The kinds of benefits that can be realised via greater interaction and co-operation range from: *i)* gaining an international profile and voice for the NORA territories (*e.g.* acting jointly gives the opportunity to better expose shared challenges, opportunities and interests of the region in international forums); *ii)* achieving critical mass and greater impact through joint actions (*e.g.* trade and tourism promotion, research, innovation and technology development); *iii)* creating synergies in fields of common activity (*e.g.* NORA territories have distinctive and complementary expertise in fisheries which could be a basis for productive exchanges); *iv)* generating mutual learning and better understanding of common challenges and opportunities *(e.g.* demographic challenges, economic development and climate change); *v)* contributing to sustainable and safe management of the regional resources and the environment (*e.g.* fisheries management, maritime safety and environmental control).

There is already high-level institutional co-operation in the NORA region and a strong tradition and basis for co-operation among territories which are strongly integrated into a wide Nordic network of intergovernmental co-operation on a broad range of issues. The Nordic Council and the Nordic Council of Ministers (NCM), the parent of the NORA institution, are well-established, wide-ranging regional partnerships.[1] In addition the Faroe Islands, Greenland and Iceland have formed a joint parliamentary organisation, the West Nordic Council, to promote west Nordic interests and institutional co-operation. NORA territories also participate in the Arctic Council. Finally, NORA territories participate in wider co-operation programmes, most notably the EU's Northern Periphery Programme and the Seventh Framework Programme for Research and Development. However, looking to the future, a number of issues could be better addressed through more effective and efficient regional co-operation.

This volume has three chapters. This chapter analyses the NORA region's main shared characteristics, trends and challenges. Chapter 2 focuses on policies to better address common challenges and to take advantage of the region's potential in four main areas: accessibility,

fisheries, innovation and the effects of climate change. Chapter 3 focuses on the institutional framework, the rationale for, and scope of, regional co-operation, and ways to maximise the impact of regional co-operation. The analysis and examples are mainly at the level of the four NORA territories,[2] although figures and information at a lower scale (regional and local) are presented whenever the availability of statistical data and their pertinence (within the trans-national approach of this review) make them relevant.

The current chapter is divided in two main sections. Section 1.1 describes the major socio-economic trends in the NORA region: demographics, economic structure and performance, and education. Section 1.2 identifies the main regional challenges which constitute the agenda for the rest of the review: geographic peripherality and the problems that stem from it; ensuring sustainable development and improved productivity in the fishing sector; broadening economic opportunities by consolidating emerging sectors (mining) and exploring new economic activities; and the challenge of climate change.

1.1. Major socio-economic trends

Demography and settlement patterns

The NORA region covers an enormous but very thinly populated area. The region's inhabitants are predominantly based in small coastal settlements and a few larger towns. There is a trend towards concentration of population in the larger towns. But even these sometimes lack the critical mass necessary for developing local economic and business potential.

A small number of bigger cities (mainly capitals) have a dominant position…

Population is unevenly distributed in the NORA region. The average population density is 3.6 inhabitants per square kilometre (km^2), a figure that contrasts with an average density of 33 per km^2 in the OECD area. A small number of larger towns have a dominant presence. The larger towns are the capital cities of the Faroe Islands (Tórshavn), Greenland (Nuuk) and Iceland (Reykjavik), and a small number of cities in coastal Norway. They differ markedly in size. There are only four cities of more than 100 000 people in the region: Reykjavik and the Norwegian cities of Bergen, Trondheim and Stavanger. In the Faroe Islands and Greenland, the capital cities are small (close to 18 000 for Tórshavn[3] and 15 000 for Nuuk),

but they dominate in economic and administrative terms. Private services, state service jobs and industry are normally over-represented in capitals and larger cities. In contrast, close to 90% of the settlements of the NORA region have fewer than 10 000 inhabitants, and close to 80% have fewer than 5 000. Two levels of settlements are generally identified:[4] towns, often settlements with a population of 1 000 to 10 000 inhabitants, often acting as hubs connecting a number of villages; and villages, typically smaller settlements of up to 1 000 inhabitants, which were generally established in connection with the development of fisheries, hunting or agriculture. The primary sector (mainly fishing and hunting), and to a certain degree manufacturing industry and municipal services, are significantly over-represented in towns and localities. Public transfers are very important for the smaller settlements. Finally, the subsistence sector has been crucial for the resilience and continuous existence of many small settlements.

Table 1.1. **Basic demographic figures for the NORA region**

	Population			Population change (%)		Area		Population density	Main city
	1990	2000	2010	1990-2000	2000-2010	Total	Ice free	Ice free area	(Inhabitants 2010)
Faroe Islands	47 770	45 353	48 650	-5.1	7.3	1 399	-	34.8	Thorshavn[1] (17 966)
Greenland	55 558	56 124	56 452	1.0	0.6	2 166 086	410 449	0.1	Nuuk (15 469)
Iceland	253 482	279 049	317 630	10.1	13.8	102 806	91 406	3.5	Greater Reykjavik[2] (200 907)
Coastal Norway	1 927 239	2 013 464	2 151 187	4.5	6.8	201 400	-	10.7	Bergen (256 600)
Total NORA	**2 284 049**	**2 393 990**	**2 573 919**	**4.8**	**6.5**	**2 471 691**	**704 654**	**3.6**	

1. Including the population of: Tórshavn/Hoyvík/Argir.

2. Including the municipalities of Reykjavík, Álftanes, Garðabær, Hafnarfjörður, Kópavogur, Mosfellsbær.

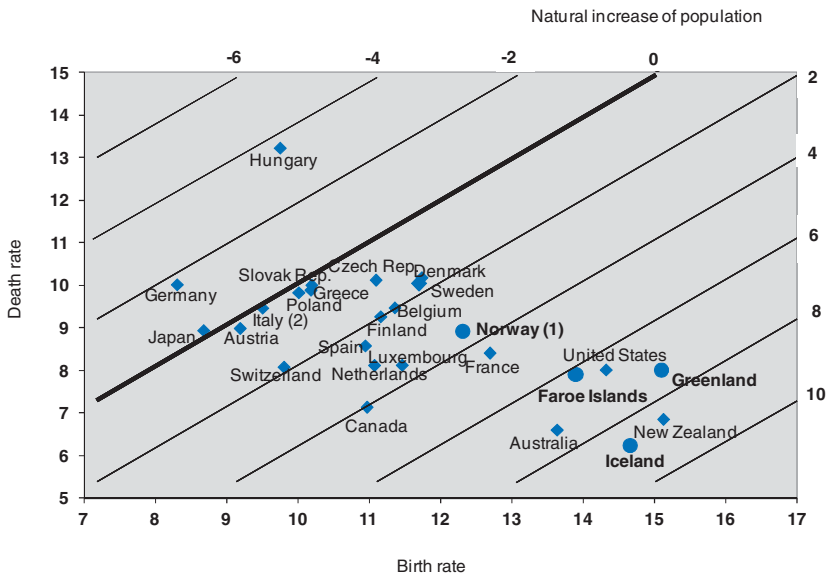
Source: National statistics offices.

The population of the NORA region has been growing as a result of population increases in Iceland and Norway. While the populations of the Faroe Islands and Greenland have remained roughly constant during the last 20 years, those of coastal Norway and especially Iceland have increased (see Table 1.1). In Greenland, the stagnation is due to negative net immigration. Greenland's high birth rate, one of the highest rates of natural increase when compared to the OECD area (see Figure 1.2), is offset by large-scale

emigration (see Table 1.2). The situation is similar in the Faroe Islands, but slightly positive migration flows, together with high birth rates and low death rates, have produced slight increases in the population during the last ten years. Nonetheless, from 2004 to 2007 net migration flows were negative. The case of Iceland is different: both natural increase and positive net immigration rates produced constant increases in population during 1998-2008. In this period Iceland had one of the highest average annual population increases among OECD countries. The increase in the population of coastal Norway reflects growth in the southern counties of Rogaland, Hordaland and Sør Trondelag, with a combination of natural growth and both internal and external migration. The other counties have had either limited growth in population, or, in the case of some northern counties (Finnmark, Nordland), a decrease due to outmigration to other regions.

Figure 1.2. **Birth rate, death rate and natural population increase, 2007**

NORA territories and OECD countries



1. Figures for total Norway.
2. Figures for Italy are for 2006.

Sources: OECD Population and Vital Statistics and Nordic Statistics.

Table 1.2. **Determinants of national population dynamics**

1998-2008[1]

	Increase in population	Average annual growth rate	Natural balance	Net international migration
Faroe Islands	4 543	0.9%	3 156	1 387
Greenland	386	0.1%	4 593	-4 207
Iceland	46 987	1.5%	26 784	20 203

1. Population figures are from 1 January 1998 to 1 January 2009, except Greenland to 1 January 2008.

2. Including corrections.

Source: OECD calculations based on data from national statistical institutes and Nordic Statistics.

The growth of population has been concentrated in few larger settlements, particularly in the capitals. There has been a trend towards geographical concentration, with an increase in the share of the population living in and around the capitals (Nuuk, Reykjavik, Tórshavn) and in and around the most populated cities of coastal Norway (Bergen, Trondheim, Stavanger, Tromsø). Meanwhile, population has declined in most of the smaller settlements, especially in those with fewer than 5 000 inhabitants, and in the sparsely populated areas of Norway (see Table 1.3).[5] Some medium-sized regional centres have been an exception, with population increases during the last years linked to the development of service-sector activities such as tourism and sometimes (as in Iceland) to policies to improve living and businesses conditions. This is the case for both Akureyri in Iceland and Sisimiut in Greenland (the second largest cities of these territories). Besides coastal Norway, the capital cities of NORA territories are still the major magnets for attracting and concentrating jobs, industries, houses, services and population.

In the case of coastal Norway, geographical concentration has occurred in three directions: from rural to urban areas, from the north to the south, and from inland to the coast. At the regional scale, weak growth or decrease in population in the northern counties have been mainly caused by internal north-south migration. The negative population trends are not limited to the northern periphery, however, but affect many rural or remote localities throughout coastal Norway. In this regard, at local scale, around half of Norwegian municipalities experienced population decline in the decades following the mid-1980s, with population centralisation a significant trend at all territorial levels, mostly concentrated around the largest towns: Bergen, Trondheim, Stavanger and Tromsø (OECD, 2007).

Table 1.3. **Concentration of population in the NORA region**

	Faroe			Greenland			Iceland		
	Inhabitants		% change	Inhabitants		% change	Inhabitants		% change
	1990	2009		1991	2009		1990	2009	
Localities 10 000 and over	17 700	19 619	10.8	12 217	15 105	23.6	173 362	230 418	32.9
Localities 5 000-9 999	5 122	4 927	-3.8	0	0	0.0	5 239	13 183	151.6
Localities 1 000-5 000	18 817	18 745	-0.4	2 9661	29 240	-1.4	41 609	37 312	-10.3
Localities below 1 000	6 131	5 457	-11.0	12 187	10 572	-13.3	39 367	28 584	-27.4

	Coastal Norway		
	Inhabitants		% change
	1990	2009	
Urban settlement	1 262 961	1 572 942	24.5
Sparsely populated area	625 493	546 988	-12.6

1. Faroe Islands: data segregated by municipalities (2009); Greenland and Iceland: data segregated by locality.

Source: Nordregio and national statistics offices.

…and a self-reinforcing depopulation trend characterises much of the region

An important but decreasing share of the population lives in very small and often isolated settlements. Population decline in smaller settlements during the last 20 years (see Table 1.3) has increased the demographic challenge. Localities of fewer than 5 000 inhabitants, and especially those with fewer than 1 000 have suffered from both severe population declines and population ageing (people of working age are moving to larger places), so that settlement structures have become extremely fragile.

The trend towards concentration of population and workers in a few big towns can bring advantages to the larger cities but creates problems for small towns and settlements. It offers opportunities for higher per capita income levels, capacity to absorb a larger share of labour into the workforce, and greater diversification of economic activity. Agglomeration also facilitates the flow of workers' knowledge among organisations, and allows for better and cheaper provision of public services (health, education). The benefits however are neither linear[6] nor boundless.[7] At the same time, this imposes costs on sparsely populated regions where the loss of highly skilled labour aggravates the problem of an ageing population.

Internal migration is linked to economic opportunities and the dynamics of agglomeration…

Greater concentration of the population has been significantly influenced by increased international competition in product, capital and labour markets. Employment and population have developed in parallel: job seekers have migrated to areas in which jobs were available, and new job creation has been encouraged by population growth. Larger towns offer economies of scale, including better services and better infrastructure and connections, thicker labour markets, larger populations of firms and more investment opportunities in a self-reinforcing process. In smaller communities, the limited availability of services (*e.g.* access to education opportunities), the lack of jobs outside traditional activities, difficult living conditions, and limited accessibility create the preconditions for outmigration to larger towns.

International migration is linked to the cycles of the fishing industry…

Beyond migration from smaller to larger settlements, there is significant outmigration in the region. International migration patterns in the NORA region are closely linked to the situation of the local economy in relation to that of the other Nordic countries (mainly Denmark). Owing to the region's high economic dependence on fisheries, international migration has been closely related to the economic cycles of the fishing industry: resource scarcity due to overfishing or to natural changes in the environment, or to drops in fish prices, have often resulted in increased international migration. This was the case in the Faroe Islands during the crises of the late 1980s and early 1990s and of Iceland in the 1960s and early 1970s (Box 1.1). In times of low growth, the Faroese labour force usually migrates in search of work and returns to the islands in times of high growth.

Box 1.1. Migration and the fishing industry in the Faroe Islands and Iceland

Faroe Islands

During the 1970s successful skippers in the Faroe Islands managed to accumulate capital and invested in new filleting plants, and a very successful fisheries and fishing industry was established. Major investments in new trawlers and processing facilities resulted in a high level of efficiency and a boom in the economy. However, a combination of overfishing and environmental variation led to a drastic decline in fisheries during the late 1980s and early 1990s. One of the main results was that the sector was no longer able to support the same number of workers. Without alternatives, many saw outmigration as the only option. Attempts to find alternatives, for instance alternative fisheries or diversification to other species, did not succeed. The large fishery sector (fish account for around 85% of exports) collapsed, major Faroese banks went bankrupt, and foreign debt skyrocketed. During these years, the Faroese population declined from some 48 000 to some 42 000 because of net outmigration, mostly to Denmark, largely because they had relatives there or saw an opportunity to find similar jobs. The Faroe Islands meanwhile began to rebuild the fisheries. Several fishing plants were merged, several closed, and United Seafood became the principal Faroese company. As a part of the reconstruction process many trawlers were sold, some of them to private owners. A very slow recovery in parts of the fishing industry has resulted in the return of some emigrants. However, while in Denmark many young Faroese created new ties; it was predominantly the older age groups that returned. Consequently the long-term result has been a further contribution to the ageing of the population and further net outmigration of young people and especially women.

Iceland

The story is similar in Iceland. When herring fishing recovered as a result of warming conditions during the early part of the 20th century, the country experienced a remarkable climb from poverty to affluence. Larger vessels using the new purse-seine technology explored offshore feeding grounds and brought back unprecedented catches. Total catches reached peaks of above 200 000 tonnes several times in the 1930s and 1940s, and these good herring seasons are often mentioned as important contributions to Iceland's achievement of economic, then political independence in the 1940s. Total catches exceeded 1 million tonnes a year during the 1950s, but then collapsed to less than 100 000 tonnes in 1969 and 10 000 tonnes in 1973. The initially labour-intensive fishery industry made substantial cash wages available to many people for the first time, and resulted in a marked population increase. Young male workers from the farms went to the towns to become fishermen, and young Icelandic women, the herring girls, moved there as well. Some of the towns' year-round

Box 1.1. **Migration and the fishing industry in the Faroe Islands and Iceland** (*cont.*)

population increased as much as tenfold, and a seasonal workforce, arriving with the herring from May through October, doubled or even trebled it. With the collapse in stocks, however, most jobs were lost, and during a relatively short time massive migration, primarily to Reykjavik and other larger settlements, created the current situation in which more than 60% of the population is concentrated in the capital region. In addition there was substantial outmigration.

A new chapter of the outmigration story is being written today in the wake of the financial crisis. During the last years two trends have been apparent. First, younger people who have chosen to look for jobs outside Iceland seem to have been quite successful in doing so. Second, many immigrants (especially Polish workers) who had worked on contracts based on Icelandic salaries, for instance with Alcoa on the alumina smelter in east Iceland, have chosen to return to their home countries.

Sources: Baerenholdt, J.O. and N. Aarsaether (1999), "Wise Coastal Practices for Sustainable Human Development Forum, Local Coping Strategies/Faroe Islands-Denmark", *www.csiwisepractices.org/?read=20*, accessed 23 March 2010; Hamilton, L., O. Otterstad, and H. Ögmundardóttir (2006), "Rise and Fall of the Herring Towns: Impacts of Climate and Human Teleconnections", in *Climate Change and the Economic of the World Fisheries*, R. Hannesson, M. Barange and S.Herrick (eds.), Globec IPO, Edward Elgar Publishing, Northampton.

International mobility is facilitated by historical, institutional and cultural links with Denmark. The Faroe Islands and Greenland are autonomous territories of Denmark,[8] while Iceland maintains strong historical and cultural links with it. In the Faroe Islands Faroese is the dominant language, while Danish –the other official language – is also spoken and understood by everybody. Greenlandic is the official language of Greenland, and Danish is spoken and widely used in business and the public administration. Danish is also widely understood in Iceland, and is the second foreign language. Faroese and Greenlanders have the same education and health facilities in Denmark as any Danish-born citizen. Finally, there has been a traditional influx of Danish workers to the Faroe Islands and Greenland. As a consequence of all these factors, most people leaving the Faroe Islands, Greenland and Iceland choose Denmark as their destination (see Table 1.4), as networks and facilities make it easier to look for a job. For example, the fisheries town of Esbjerg, in Southwest Jutland, has become, especially during economic crises, a place for immigration of Faroese and to some extent Greenlanders, while non-crisis immigration is more evenly distributed, with Copenhagen, Aarhus and Aalborg as major choices.

Table 1.4. **Total number and main destination of emigration**

2008

From/to	Total	Denmark	Faroe Islands	Greenland	Iceland	Norway	Sweden
Faroe Islands	1 477	77.9%		2.0%	3.6%	3.2%	0.8%
Greenland	3 174	89.6%	1.6%		0.9%	0.9%	1.0%
Iceland	9 144	18.6%	0.7%	0.0%		3.5%	6.3%
Norway[1]	23 615	12.2%	0.3%	0.0%	1.0%		21.1%
Denmark	43 469		2.5%	4.8%	3.5%	6.5%	12.6%

1. Information for total Norway.

Source: National statistics offices.

…but the lack of educational opportunities produces brain drain

Migration is especially strong among highly educated and younger people. The narrow offer of programmes in local universities as a result of small demand and facilities for studying in Denmark (public support, historical links, Danish language) produces an important exodus of students every year (Table 1.5) shows the loss of population in the student age range in the Faroe Islands and Greenland). A share of those who leave (especially among Greenlanders and Faroese) remain abroad after their studies: job opportunities are often better, especially for those working in fields unrelated to fisheries. There are no official figures about students' rate of return after completing their studies, but the impression of public officials (interviews conducted during missions to Greenland) is that at least one-third of the Greenlandic students going to Denmark remain there, thus representing a major brain drain. In the Faroe Islands, there is some evidence that brain drain is also a considerable challenge: a Nordic survey conducted in 2007 revealed that 56% of the students who graduated abroad between 2004 and 2006 were still living abroad in April 2007. However, the proportion was higher among graduates from 2006 than from 2004, suggesting that in a longer time frame, some graduates may still move back to the Faroe Islands (Saarikallio-Torp and Wiers-Jenssen, 2010).[9] The proportion seems to be higher for women since the conditions for educated women are more difficult in a local economy dominated by the fishery sector. As a result, the communities of origin lose some of their more qualified people. Moreover, this situation creates disincentives for economic diversification. Offering special support programmes to encourage the return of those who temporarily leave for study/work abroad would be as important as broadening economic opportunities so as to offer emigrants a clear incentive to return (see Chapter 2.1).

Table 1.5. **Changes in population in the typical student age range**

NORA territories + Denmark

	Year/age range	10-14 years	20-24 years	% change 1999-2009
Denmark	1999	289 167		
	2009		315 695	9.2
Faroe Islands	1999	3 472		
	2009		2 984	-14.1
Greenland	1999	4 779		
	2009		4 238	-11.3
Iceland	1999	20 447		
	2009		23 347	14.2
Norway	1999	273 555		
	2009		294 736	7.7

1. The percentage of change is an estimate: factors and variables other than emigration may intervene.

Source: Nordic Statistics.

Women are over-represented among migrants, and high female migration from rural areas creates demographic, social and economic challenges. Women are more likely to migrate permanently away from their home communities, looking for job opportunities outside traditional activities. Many women also leave the country for tertiary education or, if they study in their home country, to pursue a career in which they can take advantage of their acquired skills. The absence of women in smaller towns and rural areas can affect birth rates. At the same time it creates social challenges, since women are the main providers of primary care for children and other dependent people. Finally, it affects the economic diversification of rural areas, since women often initiate the diversification of the rural economy by creating businesses, especially in the service sector (Rasmussen, 2010).[10] However, recent surveys in Norway show that male mobility in peripheral municipalities has increased relative to female mobility, resulting in only minor differences for males and females born between 1965 and 1970 (Ministry of Local Government and Regional Development, Norway).

High youth and old-age dependency ratios coexist

Youth dependency ratios are high, but have tended to decrease, especially in smaller areas. Figure 1.3 shows youth dependency ratios well above 30% in 1998, a share higher than the OECD mean and that of other Nordic countries. This reflects the high birth rates of the different territories of the region. The large young population could be an important asset for

economic development. However, as discussed above, the constant depopulation of smaller settlements is a common trend, with an important segment of those of working age migrating to larger towns. Moreover the youth dependency ratio fell significantly during the decade to 2009 (Figure 1.3). One of the most important factors has been the fall in birth rates as result of a shift towards family structures similar to those in the other Nordic countries, with one or two children instead of three or more. Finally, high youth and old-age dependency ratios also coexist in many places, especially in smaller settlements. This is normally the case in stagnating or declining localities, where high birth rates go along with high outmigration of younger persons seeking job or education opportunities.

Figure 1.3. **Youth and old-age dependency ratios, NORA territories, OECD and Nordic countries**

1999-2009

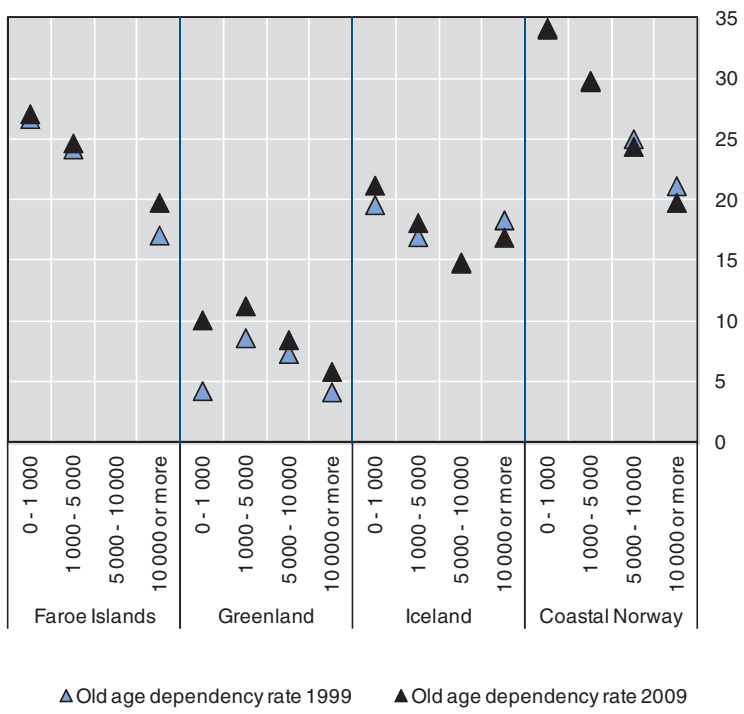
Sources: National statistics offices and OECD.

The concentration of elderly population represents a challenge for smaller settlements

The elderly population is increasingly concentrated in smaller settlements. NORA territories show different old-age dependency ratios (see Figure 1.4). The Faroe Islands and coastal Norway have figures similar to the OECD mean. Iceland, with the highest birth rate among OECD countries, has lower elderly figures, especially compared to other Nordic countries. Finally, Greenland has particularly low old-age dependency ratios. The reasons are at least threefold: *i)* high birth rates; *ii)* hard living conditions for older persons (life expectancy in Greenland is 71 years for women and 66 for men); and *iii)* the fact that many retiring Greenlanders move to Denmark.[11] However, an analysis at local level shows important differences within the territories, with much higher figures in smaller towns. Over time, the gap has tended to increase, showing a marked ageing trend in smaller settlements (Figure 1.4).

Figure 1.4. **Old-age dependency rate by size of settlement in NORA territories**

1999-2009



Source: National statistics offices.

Economic structure: main economic sectors

NORA territories are resource-based economies

The economies of the NORA region are very reliant on natural resources. The fishing industry is the most important sector in the Faroe Islands and Greenland, with important knock-on effects on the rest of the economy: trade and manufacturing are both extremely dependent on fisheries. Beyond fisheries, Greenland currently focuses on expanding the mining sector. Iceland and coastal Norway have more diversified economies, but both are largely resource-based. The development of the Norwegian economy as a whole, and especially that of its coastal counties, has been shaped by the exploitation of natural resources. Fish, wood and energy play key roles in the local economy: a long tradition in fishing has been complemented by a strong export-oriented aquaculture industry. Yet, the discovery and extraction of oil and gas has been the key factor in the economy of coastal Norway: mining, oil and gas accounted for 11.9% of the national gross value added (GVA) in 1998, rising to 29.5% in 2008 (Table 1.6). The importance of fisheries in the Icelandic economy has declined considerably, though it remains a key economic sector.

Table 1.6. **GVA by economic sector, NORA territories**[1]

1998-2008, %

	Faroe Islands		Iceland		Total Norway	
	1998	2008	1998	2008	1998	2008
Agriculture	0.3	0.2	1.9	1.4	1.7	0.6
Fishing	21.3	11.7	8.2	5.0	1.0	0.4
Mining, oil and gas	0.1	0.2	0.2	0.1	11.9	29.5
Manufacturing of food products[2]	8.2	6.2	7.0	4.4	1.8	1.4
Industry/manufacturing[3]	4.0	4.4	9.1	8.1	11.1	7.7
Electricity	2.4	0.9	3.4	4.8	2.7	2.7
Construction	4.7	8.5	8.4	9.5	5.1	4.8
Trade	10.5	10.0	11.7	10.8	11.0	8.0
Hotels and restaurants	0.9	1.1	1.6	1.7	1.7	1.4
Transport and communications	8.0	9.9	8.8	6.7	10.0	6.3
Financial	3.4	3.8	3.9	7.0	3.8	3.7
Business services	13.4	15.5	12.7	18.0	14.4	13.9
Public administration	4.9	6.1	5.6	5.4	5.9	4.3
Education	5.4	6.3	4.5	4.3	5.1	4.0
Health	9.7	12.3	9.3	9.0	9.2	8.5
Other	2.7	2.9	3.7	3.7	3.5	2.7
Total	100	100	100	100	100	100

1. There are no segregated GVA figures for Greenland.

2. Including fish processing.

3. Excluding manufacture of food products.

Source: National statistics offices.

The public sector is a major employer, especially in peripheral municipalities

A striking feature of the economy of the Faroe Islands and Greenland is the presence of a large public sector, alongside an underdeveloped private sector that is heavily reliant on fisheries. The public sector is responsible for 35% of employment in the Faroes and 44% in Greenland (Annex 1.A1). It owns major companies in both territories (Box 1.2) but also plays a key role in maintaining the welfare system and providing other important services for remote locations (*e.g.* aviation, telecommunications). The annual block grant that Greenland and the Faroe Islands receive from Denmark enables them to maintain rather large non-tradable sectors and, in particular, large public administrations. The grant accounts for 57% of government revenue in Greenland (2009) and 12% of public revenue in the Faroe Islands. Norway also has one of the highest proportions of public-sector employment in the OECD. Peripheral municipalities of both coastal Norway and Iceland are heavily dependent on public-sector jobs (local government and municipal services). Moreover, in remote areas, the public sector provides employment opportunities for higher-skilled workers, who have few alternative local employment opportunities.

Box 1.2. **Public sector companies in the Faroe Islands and Greenland**

The public sector plays a central role in the economies of the Faroe Islands and Greenland. Many of the most important companies of Greenland are publicly owned by the self-rule government, such as Royal Greenland (fisheries and fish processing), Royal Arctic Line (freight company) or Air Greenland (of which the government owns 37%). The public sector also owns a large part of the housing stock (80% of the real estate market belongs to the government). In the Faroe Islands, the public sector also runs some public institutions and takes care of production and sales functions. (*e.g.* the Alcohol Monopoly of the Faroe Islands, the National Pharmacy Service, Faroese Energy and the Highway Authority) and also completely or jointly owns some limited companies (*e.g.* Faroese Telecom and Vágar Airport, Atlantic Airways, which is the Faroe Islands' airline, Faroese Telecom, the Post Office Authority).

There have been increases in employment in sectors such as construction, trade and business services (Annex 1.A1). In Greenland, the largest growth in employment outside fisheries since 2000 has been in wholesale and retail trade and construction, all non-tradable sectors. Most job creation outside the capital Nuuk and the larger towns has relied heavily

on the public sector. The mining sector employs only a small share of the workforce, but the increase in the number of licences issued and public support for the expansion of this sector suggest that it may play an important role in generating employment growth in the near future, not least via the impact of growth in mining – and recent indications of hydrocarbon findings – on non-tradable sectors. In the Faroe Islands, falling employment in fisheries and fish processing contrasts with the expansion of construction, real estate and businesses services, as well as trade and catering. Iceland's financial and banking sector grew dramatically during the past decade, but the collapse of the main Icelandic banks in the global financial crisis will reduce the size of the sector in the economy. Other activities that expanded were construction and business services linked to tourism. Finally, in coastal Norway the main increases in employment have been in the oil and gas sector and in business activities.

Fisheries remain a key sector and employer in the region…

The economy of the NORA region is closely linked to fisheries, though the sector's contribution to the economy has declined. In terms of employment, exports and value creation, fisheries play a vital role in NORA territories. In Greenland and the Faroes, fish processing accounts for most of the jobs in manufacturing (fish processing, shipyards), while fish exports account for around 72% of total exports in Greenland and 85% in the Faroe Islands. In the latter, the relative weight of fisheries and fish processing in the economy has decreased, as sectors such as construction have grown in importance. Employment in fisheries and fish processing has also fallen, but 15.4% of total employment is still directly linked to either fish or fish processing (Table 1.7, Figure 1.5), and the economy is still exceptionally dependent on fish exports. In Iceland, the importance of fisheries has declined considerably, though it remains a key economic activity: the share of fisheries in total employment (2.5%, plus 1.6% in fish processing) is the highest in the OECD, and the marine fishery landings are the fourth highest in the OECD (after the United States, Japan and Norway) accounting for around 5% of the value of OECD catches in 2007. In Norway as well, the role of fish and fish processing in the economy has declined. Yet Norway is the biggest fishing nation in Europe, and the third among OECD countries. Catches account for close to 8% of the OECD total and nearly 3% of the world total. Moreover, as sea fishing has declined, fish farming (aquaculture) has grown in importance.

Table 1.7. **Key fishery figures, 2008**

Key figures	Faroe Islands	Greenland	Iceland	Norway
Sea fishing (1 000 tonnes)[1]	521	109	1 283	2 437
Growth in sea fishing 1998-2008 (change in volume)	38%	63%	-24%	-15%
Aquaculture (1 000 tonnes)[2]	37	0	5	839
Growth in aquaculture 1997-2007 (change in volume)[3]	114%	-	29%	128%
Fishing + fish processing as a share of total employment	15.4%	-	4.1%	2.0% (coastal Norway)

1. Values are in live weight.

2. Figures for aquaculture in Iceland and Norway are for 2007.

3. For the Faroe Islands growth of aquaculture for 1998-2008.

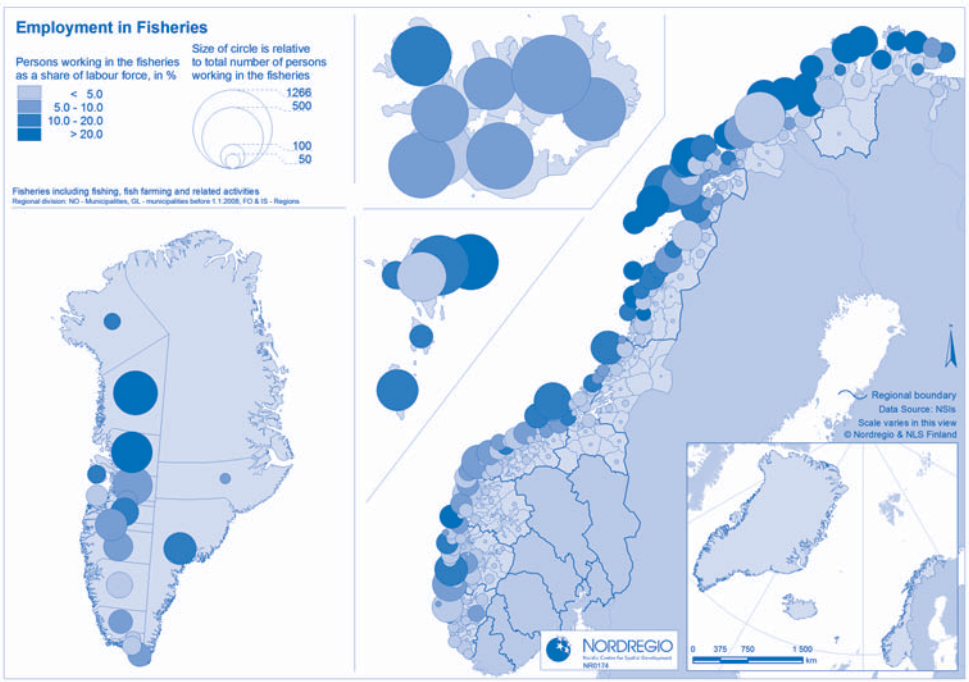
Source: National statistics offices.

The evolution of catches in the NORA territories in the last ten years has followed a dual pattern: between 1998 and 2008, marine landings increased substantially in volume terms in the Faroes and Greenland and decreased in Norway and Iceland. However, the total catch of the Norwegian and Icelandic fishing industries, measured by weight, remains relatively large by historical standards: the total decreased over the decade to 2008, but from exceptionally high levels (Figure 1.6); the profitability of the fishing fleet improved while the number of fishers and the economic weight of fisheries in the total economy declined.[12]

…but global competition, declining fish stocks and climate change raise serious challenges

The historical position of the NORA region has been severely affected by global competition from other parts of the world. This has occurred in a context of declining fish stocks and problems related to climate change. Total marine catches of NORA territories represented 13.1% of world catches in 1951. Since then, NORA catches have increased but the positions of competitors such as China, Indonesia, Peru, India and Chile have strengthened, and the relative weight of NORA catches fell in 2008 to 6.2% of total marine catches.[13]

Figure 1.5. **Employment in fisheries, NORA region, 2005**

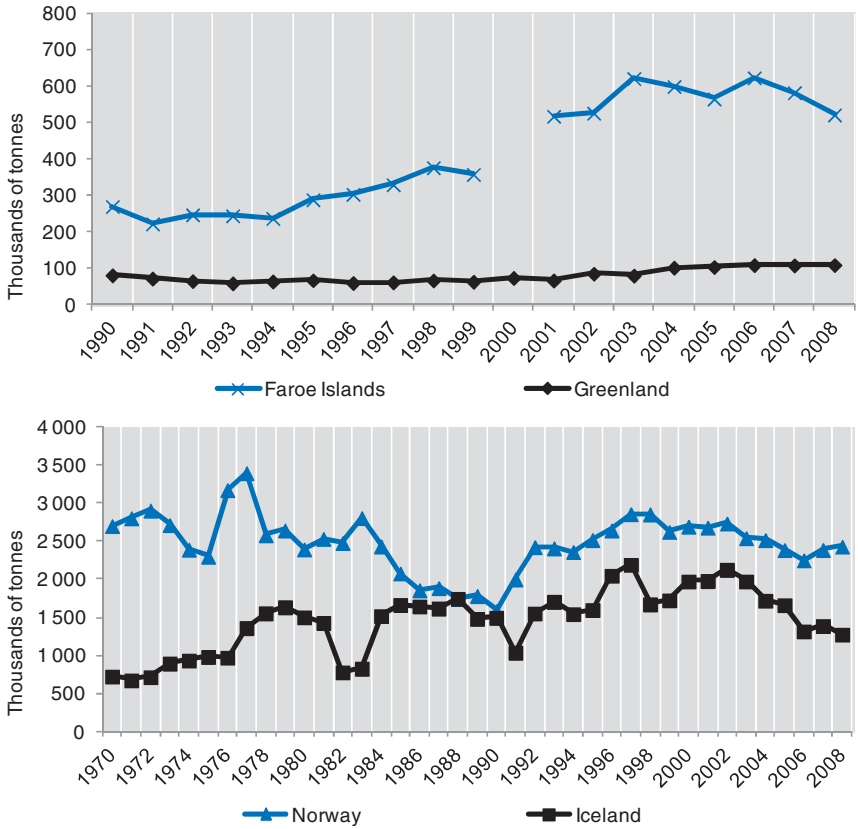


Source: Nordregio – Nordic Centre for Spatial Development, *www.nordregio.se*, (c) Nordregio, 2010.

Fish farming appeared as an important alternative

With the decline in marine fish stocks, fish farming was viewed as an important complement to traditional fishing in the NORA region. Large scale-production of fish in open-water cages led to global trade in high-quality, high-value species such as salmon. Norway and the Faroe Islands were early adopters of marine aquaculture and during the last ten years have more than doubled their fish farm production (Table 1.7). Environmental control and improvements in technology are central to the ongoing development of this sector (see Chapter 2.2). NORA producers also face growing competition. Although Norway has dominated global production of farmed salmon since the 1980s, it has faced competition over the last decade from an array of new entrants, most notably Chile, which have the same favourable natural conditions as Norway and where production costs are substantially lower.[14]

Figure 1.6. **Historical sea-fish landings in NORA territories**



1. Values are in live weight.

Source: National statistics offices.

Mining is an emerging sector, and oil exploration is being carried out in Greenland and the Faroes

Efforts to diversify in order to reduce dependence on fisheries have mainly focused on developing industries based on raw materials. Greenland has sought to expand the mining sector and create an aluminium industry. A nascent mining sector (gold, olivine and rubies) accounted for just over 10% of total exports in 2007. It is expected that new mines (*e.g.* lead, zinc, molybdenum, iron ore, diamonds, eudialyte, platinum) will open in the next years, offering new jobs on the local market. At the same time, there are

plans for developing an aluminium smelter, for which Greenland is well suited, given its hydroelectric potential. In addition, there has been a good deal of oil exploration in both Greenland and the Faroes. To date, there have been no major commercial finds, but the announcement of a potentially significant find in late August 2010 has refocused attention on Greenland's hydrocarbon potential. The UK-based Cairn Energy announced that it had found thermogenic gas, indicating the presence of oil, in one of four wells in the Baffin Bay Basin, off Greenland's west coast. Data from the US Geological Survey suggest the seabed between Greenland and Canada could hold 17 billion barrels. Blocs off Greenland's eastern coast, which also appear promising, will be opened for exploration in 2012.

In Iceland, the authorities have actively promoted development of an aluminium industry as a way to reduce the country's reliance on fisheries (Box 1.3). Norway's emergence as a major oil and gas producer in the mid-1970s also transformed the economy: in 1970, agriculture and fishing represented about 6% of total value added; in 2008 they accounted for only 1.1% (GVA figures are for total Norway). Meanwhile, the share of oil and gas extraction rose from 0% to 29.5%.

Box 1.3. **The aluminium industry in Greenland and Iceland**

Attempts to further diversify the economy in Greenland and Iceland reflect the authorities' wish to diminish dependence on fisheries and also to take advantage of the territories' wealth of renewable energy resources. Given its tremendous hydroelectric potential and the availability of cheap electricity, both territories are well suited to exploit this sector.

In Iceland, large-scale aluminium-related investment projects have expanded from cycle to cycle. The main arguments for developing an aluminium industry have focused on taking advantage of the enormous amount of untapped renewable energy available and diversifying the economic structure away from fisheries. However, as pointed out by the *OECD Economic Review of Iceland 2006*, regional policy considerations should also be considered. The development of power-intensive industries has involved foreign companies which build and operate aluminium plants, with public utilities providing the necessary electricity under bilateral long-term contracts, and the effect on domestic employment has been limited. Foreigners have accounted for three-quarters of the work force involved in the construction of the current projects. In the operational phase, the power stations have a limited number of employees, but the aluminium plants are more labour-intensive, with each employing directly up to 500 persons. Moreover, it is unclear whether the public utilities earn appropriate returns for the use of natural resources, the environmental costs

Box 1.3. **The aluminium industry in Greenland and Iceland** (*cont.*)

and the risks they assume. In this regard, the authorities should set reserve prices for the use of natural resources and negative environmental externalities. If well managed, the development of the aluminium industry can be an important source of national income, but economic success and a continuously rising standard of living ultimately depend on the country's skills base and the ability of its workforce to respond to changing market needs.

In Greenland, one of the main economic initiatives currently being considered by the government is an aluminium industry (aluminium smelter) in the city of Maniitsoq. The final decision on the project (including its ownership) will be made in 2011 or 2012. If the project goes ahead, it is calculated that it could involve an investment of DKK 15- 20 billion, the equivalent of between one and a half and twice Greenland's gross national product (GNP). When operational, this project will result in close to 500 permanent jobs at the melting plant and in the hydroelectric plants. To this should be added the expected derived permanent employment of 400-600 persons (servicing of the melting plant and increased public and private services in Maniitsoq). The project would require upgrading the skills of the existing labour force and attracting labour from other locations. The construction of the plant would require a major labour demand, but it would be probably met by foreigners. Experience with large-scale aluminium and power sector investments in Iceland shows the need to evaluate these projects on the basis of a broad, transparent cost-benefit framework, taking into consideration factors such as the appropriate rent for the use of natural resources, the environmental impact, the allocation of risks and the implications for macroeconomic performance.

Sources: OECD (2006), *OECD Economic Surveys: Iceland*, OECD Publishing, Paris; Ministry of Finance and Foreign Affairs of Greenland (2009), *Political Economic Report 2009*, Nuuk; Bank of Greenland (2009), *The Bank of Greenland Annual Report 2009*; ADE (*Aide à la Decision économique*) (2008), "Macro Economy, Public Finances and Regulatory Aspects; Greenland – Public Financial Management Assessment", study co-ordinated by ADE for the European Commission, 8 June; Greenland Development A/S (2007), Økonomiske konsekvenser af etablering af aluminiumsindustri i Grønland – Analyser af kapaciteten, NIRAS Greenland A/S, November.

The production of hydrocarbons and metals has been important for economic growth, especially in Norway and Iceland, and it is expected to have an important role in the development and diversification of Greenland's economy. The economic risks associated with reliance on primary commodities are discussed below. Managing those risks is only one of the challenges facing the NORA economies. Ensuring that such developments are economically and environmentally sustainable is another. Since hydrocarbons and minerals are depletable, their exploitation may be only a temporary phenomenon requiring judicious macroeconomic policies to ensure the sector's future economic sustainability (see Chapter 2.3).

NORA territories are highly sensitive to environmental degradation

Ensuring that the development of resource sectors does not damage the fragile ecosystems of the NORA region constitutes another challenge. The NORA region's unique ecosystems constitute an asset as well as a challenge. The region's rich ecosystems are the source for important parts of its economies, rendering the region highly sensitive to environmental degradation. At the same time, the high dependence on activities such as trade, transport, mining and oil extraction render the region highly exposed to environmental degradation. Coherent strategies will be needed to address the growing environmental pressures. For the NORA region, the recent tragedy of the Deepwater Horizon oil spill in the Gulf of Mexico and its devastating effects on the regional ecosystem in general and the fishery sector in particular demonstrate the importance of strict environmental regulation and control in current and future oil extraction activities. The challenging geographical, weather and accessibility conditions of the region render such precautions all the more important.

There is potential to expand tourism linked to the region's unique environment

An exceptional natural environment is an important asset for the tourism sector. NORA territories have tourist attractions found in very few places, such as fjords and icebergs, the northern lights and the midnight sun, the opportunity to visit the ice cap, active volcanoes, dog sledges and marine mammals, among others. Tourists can enjoy direct contact with nature or with the last indigenous population of Europe (the Sami in Norway) or Greenland (the Inuit) in unique and unspoiled environments. In 2007, the *National Geographic* declared the Faroe Islands the most appealing and unspoiled islands in the world. Given the region's fragile environment, tourism development must be carried out under sustainable conditions.

Greenland and the Faroe Islands have made efforts to develop the tourism industry, as a way to diversify the economy, but it still represents a small share of economic activity. There is scope to develop tourism further, based largely on local resources, and to create new job opportunities and supplement tourism-related activities. Norway and Iceland have promoted tourism for some time. In coastal Norway, tourism has become an important contributor to local economies, but offers further potential. Norway ranks third among the Nordic countries in terms of foreign tourism flows (measured in foreign overnights at accommodation facilities), behind Denmark and Sweden but ahead of Finland (Finnish Tourist Board, 2006). The distribution of overnight stays in the different counties of Norway shows potential for further exploitation of the sector, especially in the north

(OECD, 2007). Iceland is far more reliant on tourism than the other NORA territories; tourism represented 5.1% of GDP in 2006, the highest share among the Nordic countries. The number of visitors and the contribution of tourism to the economy have increased considerably during the last years: the number of visitors from overseas grew by 37.2% over 2004–09, and the number of bed-nights of overseas guests grew to over 2 million or by 39.7% (Iceland Tourist Board and Statistics Iceland).[15]

The development of tourism is constrained by factors linked to the NORA region's peripheral location (especially Greenland and the Faroe Islands):

- **Cost.** Long distances to destination and high fuel prices make international flights expensive. Tourist facilities – hotels, restaurants or specialised tours – are also expensive compared with other destinations and are not yet sufficiently developed in many parts.
- **Lack of connectivity.** Most international flights connecting the Faroes and Greenland leave from Denmark, with few connections to the other NORA territories or neighbouring countries (Canada, the United Kingdom), especially in winter. At the same time, the lack of critical mass makes it difficult to extend the number of destinations or increase the frequency of flights.
- **Lack of interaction and co-operation by local entrepreneurs.** Sales and marketing are often ensured by small units with limited resources. At the same time, entrepreneurs providing similar services in the same area appear unwilling to co-operate with each other and with other service providers in neighbouring countries. The result is poor and inefficient national and international tourism networks.
- **Short seasons.** Tourist flows are concentrated in a few weeks in summer and winter, which creates a challenge for service provision.
- **Lack of brand recognition.** Greenland and the Faroes are not well-known destinations on the international tourism market and are promoted relatively little abroad.
- **Little refinement of the offer.** All the above factors result in a narrow offer of tourist products and services.

However, efforts are being made to expand the sector. In recent years cruise tourism has increased significantly, in terms both of the number of ships and the number of passengers visiting the region. This is the only way for a single visitor to experience large parts or all of the North Atlantic on the same journey (see Box 1.4). In addition climate change is making some

sea routes and locations, especially in Greenland, more accessible. In the Faroe Islands, efforts to develop the tourism sector include the provision of structures and incentives for education and training; developing new infrastructure and facilities (such as information offices, restaurants and improved internal transport). From 2005 to 2006, the number of overnight visitors from foreign countries increased by about 19% (Faroese Governmental Bank, 2009a, 2009b). In Greenland the government launched in 2008 a three-year national tourism strategy to support the development of the tourism sector. The focus areas of this strategy include infrastructure, competency development and labour market considerations, product development, marketing, among others (Ministry of Finance and Foreign Affairs of Greenland, 2009). Norway is developing a national strategy for tourism (to be launched in 2011) with the aim of promoting a competitive and sustainable tourism industry. Finally, there has been an increase in eco-tourism and adventure tourism offers and options, linked to the region's rich and unusual ecosystems.

But higher tourist inflows will pose environmental and infrastructure challenges

The rich biological diversity and the unique natural and cultural environments of the NORA region form the basis for expanding tourism and recreational services but also raise the challenge of sustainability. Therefore, it is crucial to preserve landscape values and to provide high-quality tourist services appropriate to the carrying capacity of the environment. As the tourist sector develops, the challenges for preserving the biological diversity and valuable landscapes will also increase. The seasonal aspect of tourism, coupled with the concentration of tourists in certain locations, adds environmental and infrastructure challenges related to energy and water supply, safety measures, waste generation and treatment, and air emissions. Similarities in exposure and effects, the particularities of trans-border tourism (*e.g.* cruise tourism) and the international effects of environmental degradation make this a particularly interesting area for co-operation (Northern Periphery Programme, 2007a, 2007b).

Box 1.4. **Cruise tourism in the NORA region**

Accessibility to the NORA region from the sea creates a clear opportunity for cruise tourism. Cruise tourism in the Arctic has been limited owing to problems of accessibility for some sea routes. Climate change and the consequent reduction of sea ice, however, have opened up new possibilities. While other regions in the North, such as Alaska, have known cruise tourism for decades, the NORA region has been rather slow to promote this sector. The reasons are mainly related to the high cost of transport and maintaining an infrastructure, combined with a short tourist season that is dependent on favourable weather conditions. Cruise tourism in the North Atlantic is also vulnerable to the harsh local climate conditions, as sea ice can affect sea routes.

The situation has been changing. In 2009 a total of 20 new cruise ships were added to the North Atlantic routes and 8 expedition cruise companies are planning to expand offerings in the North Atlantic. The region has 68 ports in total: Norway 37, Greenland 16, Iceland 12, and the Faroe Islands 3. The most popular cruise ship harbour in Iceland is Reykjavik. The number of calls usually ranges between 50 and 100, with more than 50 000 guests and thousands of crew members. Many cruise tourists take part in shore excursions in a bus with a tour guide. Additionally, during the last ten years Akureyri, the capital of the north, has seen increases of more than 160% in the number of cruise ship guests: on average between 50 and 60 cruise ships a year bring 45 000 to 50 000 guests. Other destinations in Iceland are Grundarfjørður in the west and Isafjørður in the north-west. Cruise tourism is a relatively recent activity in Greenland. But the situation is changing, and the frequency of cruise tourism visits is increasing, raising some challenges for managing this expanding activity. The American cruise ship Crown Princess with almost 3 000 passengers and a crew of around 1 500 visited Nuuk in 2009. This is the largest ship ever to come to the town, and a stopover in a town of around 15 000 inhabitants is a major event requiring infrastructure and organisation. Many of the tourists coming to Greenland, however, aim to visit the smaller places of the territory. As an example, a 2009 visit to the town of Ittoqqortoormiit in east Greenland (around 500 inhabitants) by the German MS Europa with 408 passengers and a staff of 280 was extremely demanding. For a single day the town was occupied by a number of tourists that exceeded the total population. Many smaller settlements have limited human and infrastructure resources to meet these challenges, and it is difficult to cover the costs of maintaining services and amenities for these rather infrequent visits.

When a big cruise ship arrives in one of the small North Atlantic ports, the call can – if carefully planned for – provide new revenue opportunities for the local community. However, the arrival of such a cruise ship also raises a number of issues in terms of infrastructure, safety and rescue equipment, as well as the impact on the environment. Co-operative efforts by these destinations to address these challenges would be beneficial.

Source: NORA (2009), *Climate Change and the North Atlantic*, L. Thostrup and R.O. Rasmussen (eds.), Tórshavn, November.

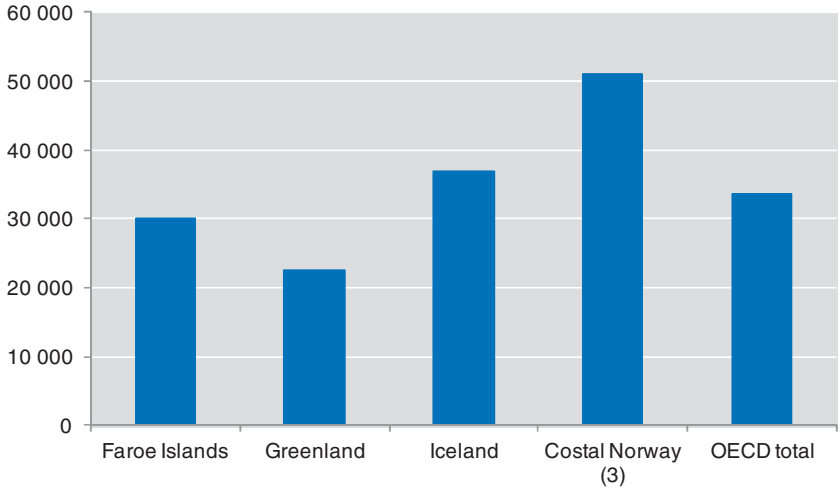
Economic performance

While the territories of the NORA region share economic characteristics and challenges, their economic performance varies considerably. Iceland and coastal Norway have GDP figures well above the OECD average. Norway has enjoyed steady growth since the beginning of the 1990s, and in terms of GDP per capita (converted to purchasing power parity, PPP), it ranks second in the OECD behind Luxembourg. Yet Norway's economy and its GDP per capita are more regionally concentrated than the OECD average, with an index of geographic concentration among TL3 regions about 30% above the OECD average (OECD, 2009a). GDP is especially concentrated in the most populous regions (primarily Oslo, followed by Rogaland and Hordaland counties in coastal Norway).[16] Until the financial crisis, Iceland had been among the top performers in GDP terms during the last years. Following significant structural reforms and foreign direct investment, the Icelandic economy enjoyed a long period of comparatively rapid expansion, which led to the build-up of major internal and external imbalances. In 2008, Iceland was struck by a banking crisis of unprecedented proportions and the economy plunged into a deep recession (OECD, 2009b). The Faroe Islands have a GDP per capita close to the OECD average, but with considerable fluctuations in performance over time. They had high GDP growth rates in 2000 and 2001 and in 2005-06. Growth rates declined during 2002-05, and, as a consequence of the financial crisis, in 2008. Finally, Greenland has lower GDP per capita figures than the rest of NORA territories. Per capita GDP in 2006 was close to the levels of OECD countries such as the Czech Republic. The gap has increased since 2002 owing to slower growth (see Figures 1.7 and 1.8).

Strong GDP fluctuations in the Faroe Islands and Greenland are linked to fluctuations in the fish industry. Fishery and related industries, such as fish processing, are important in all NORA territories; in the Faroe Islands and Greenland fish products account for about 85% of the exports of the Faroe Islands and above 70% for Greenland and thus determine the overall performance of the economy. Export income can fluctuate notably from year to year, and these variations spread throughout the economy. An economy that is highly dependent on fish products is bound to be vulnerable to changes in fish stocks, fish prices, oil prices and exchange rates, all of which are often cyclical and unforeseen. Fish cycles have left their mark on the economic history of these territories.

Figure 1.7. **GDP per capita at current prices in PPP**[1]

2008 or latest available data[2]



1. PPP figures for the Faroe Islands and Greenland are estimated using the PPP deflator for Denmark. In addition, both receive a block grant from Denmark which accounts for 57% of government revenue in Greenland (2009) and 12% of public revenue in the Faroe Islands. Information on national accounts data should consequently be interpreted with care.

2. Data for Greenland and coastal Norway for 2007.

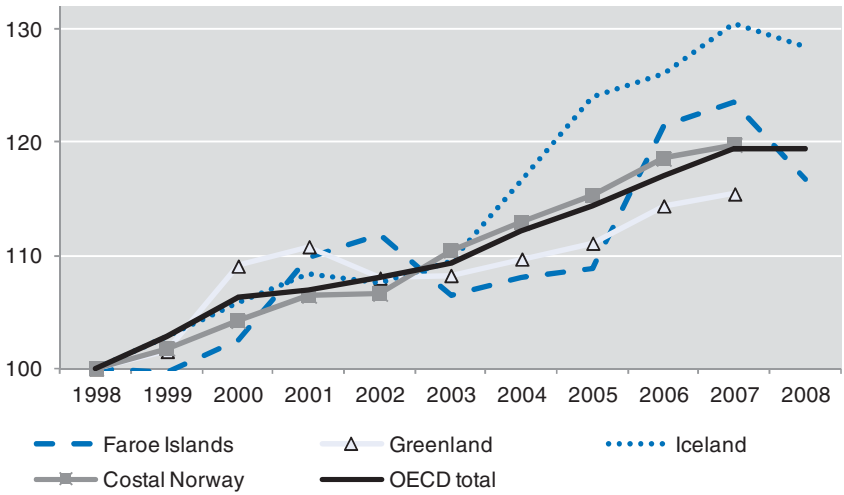
3. Figures for coastal Norway are based on GDP figures of the nine counties of coastal Norway using information from the *OECD Regional Database* (Based on Eurostat).

Sources: Faroe Islands and Greenland: Nordregio based on figures of the national statistics offices; Iceland: OECD STAT National Accounts; coastal Norway: *OECD Regional Database*.

Trade

The NORA economies are very dependent on exports of a narrow range of products. As measured by the Herfindahl-Hirschman index (HHI) based on three-digit classifications, they all record levels of export concentration far above the OECD average: Iceland and Norway have the highest concentrations of any OECD members, at around 0.37 and 0.40 in 2007, as compared with an OECD average of 0.14. The corresponding figure for the Faroe Islands was higher still, at around 0.61. A look at the revealed

Figure 1.8. **Real GDP per capita growth in the NORA territories**[1]



1. In constant PPP prices of 2000. PPP figures for the Faroe Islands and Greenland are estimated using the PPP deflator for Denmark. In addition, both territories receive a block grant from Denmark which accounts for an important share of public income. Information on national accounts data should consequently be interpreted with care.

Sources: Faroe Islands and Greenland: Nordregio based on figures of national statistics offices; Iceland: OECD STAT National Accounts; coastal Norway: *OECD Regional Database*.

comparative advantages (RCAs) of these three territories over the period 1990-2007 highlights elements of continuity and change: the Faroe Islands' very high dependency on fisheries remains unchanged throughout the period, but there is clear evidence of diversification in Iceland and Norway.

The most dramatic development in Iceland has been the rise of aluminium exports. Iceland has in recent decades developed a substantial aluminium ferro-silicon sector using its abundant hydroelectric and geothermal electric capacity to process imported alumina. In 2008, non-ferrous metals overtook fisheries as the number one item in the export bill; the former accounted for 39% of exports and the latter for 32.5%, down from over 90% in the mid-20th century. Exports of aircraft and associated equipment have also taken off, though these were hit hard by the global recession – in 2009 they fell to roughly half the levels of 2007.

In Norway, the major change has been the diversification of hydrocarbon output: the rapid growth of gas exports has brought about a

significant decline in the three-digit HHI index for exports since 2000. While this leaves the country reliant on hydrocarbons for roughly 64-65% of exports, the change is not insignificant, especially in view of ongoing rapid changes in international gas markets and the different outlooks for oil and gas from a climate-change perspective.

Greenland presents something of a puzzle: export concentration appears to have fallen sharply since the mid-2000s, from around 0.53 at the start of the decade to just 0.37 in 2007. The share of fisheries in total exports fell from 95% to just about 72% over the period. This change primarily reflects a sharp rise in scrap metal exports (10% of exports in 2006) and a rather large share of net exports under the heading "special transactions not classified". It is unclear what lies behind this category.

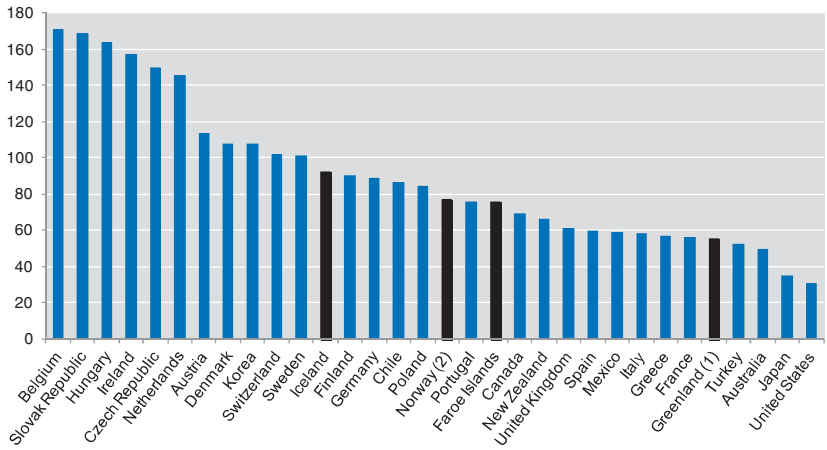
Despite their small size and export concentration, the NORA territories exhibit surprisingly low ratios of trade turnover to GDP. The ratio of exports plus imports to GDP amounts to roughly 80% in the four territories (Figure 1.9). This is close to the OECD median, in a situation in which one would expect it to be relatively high, especially since the NORA territories must import practically all household consumer and investment goods. Partly for this reason, all NORA territories except Norway have negative trade balances (Table 1.8). To a great extent, the relatively low trade-to-GDP ratios reflect the relative weight of the public sector in these economies, especially in the Faroe Islands and Greenland, where close to 40% of employment is in the public sector and the large non-tradable sector is substantially supported by annual block grants from Denmark. Other factors limiting the degree of trade openness include geographical peripherality and the underdevelopment of the secondary tradable sector (manufacturing); there is thus not as much intra-industry trade as in a small open economy that is deeply integrated in global production chains (*e.g.* the Czech Republic).

Their high levels of export concentration make the NORA economies very vulnerable to external shocks, especially since their exports consist overwhelmingly of primary commodities; this vulnerability is all the greater in view of their reliance on energy imports: petroleum and petroleum products typically constitute the largest item on the import bills of Greenland and the Faroes; in Iceland, they are second only to metalliferous ores and scrap (the raw material imports for the smelters that generate Iceland's non-ferrous metals exports). The volatility of international commodity prices means that trade balances can vary greatly from year to year. It is somewhat surprising, therefore, to observe that the NORA economies have not, with the exception of Greenland, suffered particularly sharp terms-of-trade declines over the last decade (Figure 1.10). Norway's terms of trade rose dramatically as oil and gas prices surged from 2003,

while Greenland's fell steadily, but Iceland and the Faroes saw theirs hovering around the levels of 2000. The dramatic rise in oil prices was offset by increases in other commodity prices. These increases were less dramatic than the oil-price surge but the commodities in question loomed far larger than oil in the trade bills of Iceland and the Faroe Islands.

Figure 1.9. **Trade turnover to GDP ratios, OECD and the NORA region**

2008[1]



1. 2007 for Greenland.

2. Figure for all Norway.

Sources: OECD Macro Trade Indicators; Faroe Islands and Greenland: national statistics offices.

Table 1.8. **Trade balance, NORA territories**

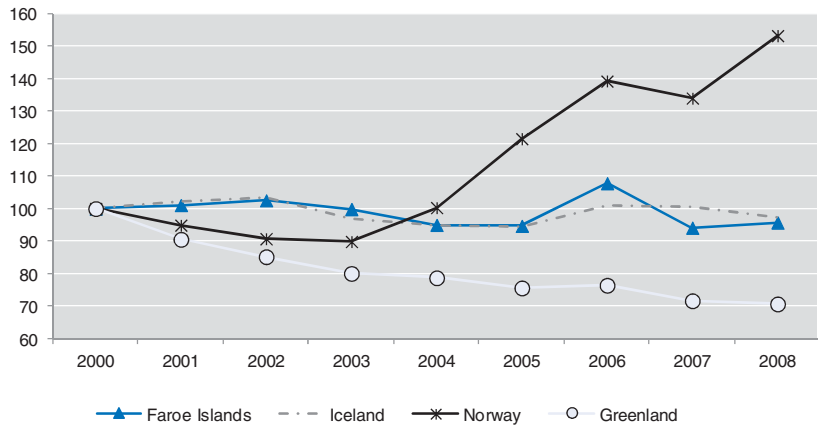
Millions of EUR

1998	Faroe Islands	Greenland	Iceland	Norway
Exports	388.9	226.5	1 709.8	36 053.6
Imports	342.7	364.7	2 203.9	33 448.3
Net balance	46.2	-138.2	-494.2	2 605.2
2008				
Exports	578.3	332.6	3 662.9	113 570.8
Imports	668.9	593.0	4 038.6	60 446.5
Net balance	-90.6	-260.3	-375.7	53 124.2

Source: Nordic Statistics.

Figure 1.10. **Terms of trade**

2000 = 100



Source: UNCTAD Handbook of Statistics 2009.

Intraregional trade in goods is limited. Given the similarities in the NORA territories' productive profiles and factor endowments, this is hardly surprising. To be sure, many countries with similar endowments trade with each other. Such two-way or intra-industry trade is typically much higher for manufactured goods than non-manufactures, and is highest for more sophisticated products, such as chemicals, machinery and transport equipment, electrical equipment and electronics, where product differentiation is considerable. Transport costs or seasonal effects may also contribute to such trade. However, the NORA territories are specialised in primary products, they share common seasons[17] and they are physically distant from one another. Intra-industry trade between the NORA economies would nonetheless become more attractive as they produce more differentiated, high-value-added goods. The availability of skilled human capital, innovation and research will be crucial to facilitate the production of highly specialised products in the NORA region.

Box 1.5. **Command GDP**

In order to appreciate fully the impact of terms-of-trade shifts on purchasing power, it is helpful to look beyond the conventional measure of real GDP. Volume GDP underestimates the increase in real incomes and purchasing power that may be induced, for example, by a fall in import prices (Kohli, 2003). One way to correct this potential bias is provided by the so-called command GDP (GDP) indicator. CGDP is defined as follows:

$$CGDP = GDP + (TT-1)*XGSV$$

where TT is the terms of trade and XGSV is export volumes. Since the terms of trade are defined as the price of a country's exports divided by the price of its imports, this adjustment to GDP is equivalent to deflating both exports and imports by the *import* price deflator, rather than using different deflators for imports and exports, as is done when computing conventional measures of GDP. This yields a summary measure of the impact of terms-of-trade shifts on an economy's purchasing power – *i.e.* on its ability to *command* goods and services. If the terms of trade improve, CGDP will be higher than GDP; if they deteriorate, TT-1 will be negative and CGDP will be lower.

Calculation of CGDP for Iceland, Norway and the Faroes over the period 2000-08 reveals the extent to which Norway benefited from rising terms of trade: CGDP in Norway over the period was roughly two percentage points higher than GDP on average, and in some years it was as much as 7.9% higher than conventional GDP. By contrast, CGDP and GDP were almost exactly equal on average over the period in question in the Faroes. Although CGDP deviated from conventional GDP by as much as 4.5 percentage points in some years, the lack of a sustained trend in the terms of trade meant that the good and bad years more or less cancelled each other out. For Iceland, a slight decline in the average terms of trade over the period meant that CGDP was marginally (0.5% on average) lower than GDP, but the differential never exceeded 2%.

Most NORA trade is with EU members (Table 1.9). The NORA territories are not EU members but maintain special trade agreements with it. Owing to their links with Denmark, the Faroe Islands and Greenland concentrate a high share of their trade with this country. Almost 90% of Greenland's exports go to Denmark. There is limited trade with neighbouring countries such as Canada or the United States. The shorter distances to these countries and the size of the North American market suggest that it would be desirable to strengthen these trade links. This will likely require further development of transport links with North America (see Chapter 2.1). The Faroe Islands' exports are geographically more diversified, but more than 30% of imports come from Denmark, raising the question of whether and to what extent the development of new transport links would help to diversify their imports.

Table 1.9. **Share of exports and imports by country of origin/destination**

NORA and selected OECD countries, 2008[1]

	Exports				Imports			
	Faroe Islands	Greenland	Iceland	Norway	Faroe Islands	Greenland	Iceland	Norway
Faroe Islands		0.1	0.7	0.1		0.0	0.4	0.1
Greenland	0.8		0.2	0.0	0.0		0.1	0.0
Iceland	2.4	1.6		0.4	3.1	0.3		0.3
Norway	15.6	0.3	4.4		20.8	1.6	11.2	
European Union	65.8	96.7	76.2	83.4	63.1	84.0	53.6	68.2
Denmark	12.1	86.5	3.1	3.4	31.9	52.7	7.3	6.9
Sweden	0.6	0.0	0.8	6.5	5.2	21.5	9.0	14.3
Finland	0.8	0.0	0.2	1.5	1.2	0.4	1.1	3.4
United Kingdom	20.3	1.9	11.6	27.0	4.0	0.6	4.4	5.9
France	8.0	0.0	3.1	9.4	2.2	0.8	2.4	3.7
Germany	6.2	1.0	11.3	12.8	7.7	3.0	10.3	13.4
Netherlands	1.0	0.1	34.4	10.3	1.6	0.9	6.1	4.1
Spain	7.5	7.1	3.8	1.8	0.8	0.4	1.2	2.0
United States of America	1.5	0.3	5.6	4.4	1.3	1.5	8.0	5.4
Canada	0.7	0.0	0.5	2.3	0.2	0.4	1.0	2.9
China	0.0	0.5	2.2	1.1	3.9	1.6	6.6	6.4
Russia	2.5	0.0	1.3	0.6	0.2	0.1	0.6	2.2
Others	10.7	0.6	9.7	7.8	7.3	10.5	18.8	14.6

1. 2006 for Greenland.

Source: Nordic Statistics.

Employment

Unemployment is relatively low, but concentrated in sparsely populated areas

Overall, the NORA territories are characterised by high employment rates and low unemployment (Table 1.10). A very large proportion of the adult population is economically active, and employment rates are substantially higher than the OECD average of 67% in 2007. Unemployment has generally been significantly lower than the OECD average (5.6% in 2007) in all NORA territories except Greenland (6.8% in 2007). Unemployment in Greenland is concentrated among unskilled workers, who accounted for 84% of registered unemployment in 2007 (Ministry of Finance and Foreign Affairs of Greenland, 2009).Yet unemployment in Greenland fell steadily in the years leading up to the crisis.

In principle the contraction of job opportunities in traditional sectors such as fishing should have led to high levels of unemployment, as it did in OECD regions such as Newfoundland in Canada. Yet, several factors contribute to relatively low unemployment in the NORA region. The first is rapid growth of the public sector which has mopped up labour, especially in urban areas. A second is demographic decline. The ageing of the work force means that the number of new retirees exceeds the number of new labour-market entrants. Finally, higher rates of youth outmigration, either for further education or jobs in other countries, also reduce the number of people seeking jobs.

Not surprisingly, there were marked increases in unemployment from the latter half of 2008 as a result of the global downturn. The consequences of the crisis and of the collapse of the banking system were especially severe in Iceland, where unemployment rose from 3% in 2008 to 7.2% in 2009. In the Faroe Islands, the average annual unemployment rate jumped from 1.2% in 2008 to 3.8% in 2009 and rose further in early 2010 before beginning to fall. In Greenland, the recession contributed to an increase in unemployment from 5.5% in 2007 to 7.1% in 2009. In Norway, the effects of the crisis seem to have been less severe and were expressed chiefly in terms of labour-force withdrawal rather than unemployment. The unemployment rate rose only slightly, remaining below 4%, but the drop in employment was far larger, as the proportion of the inactive rose. The seasonally adjusted unemployment rate was 3.3% of the labour force in January 2010 (Statistics Norway).

Unemployment and the scarcity of highly skilled workers is an important challenge for the peripheral areas of the NORA region

Unemployment is far higher in sparsely populated areas. In Greenland, unemployment is highly biased geographically; large towns have lower average unemployment than smaller towns and outlying districts.[18] Moreover, unemployment varies considerably throughout the year, with lower figures in the summer season and a peak in January. This is mainly due to the construction sector, but it is also influenced by the fishing industry (Ministry of Finance and Foreign Affairs of Greenland, 2009). In the Faroe Islands, the unemployment rate is higher in the peripheral islands, where the job market is particularly concentrated on the fish industry. Falling employment in fish and fish processing and the effects of infectious salmon anaemia (ISA) on local fish farming led to considerably higher unemployment rates. Finally, compared to other OECD countries, Norway shows the lowest regional disparities in unemployment; however registered unemployment is higher in the counties of the north, especially in Finnmark.

Table 1.10. **Socio-economic indicators, NORA region**

2009 or latest available data

		Faroe Islands	Greenland	Iceland	Coastal Norway	Total OECD
Economic (1)	GDP per capita PPP	29 997	22 612	38 772	49 968	34 332
	GDP per worker PPP	56 784	42 307	69 329	98 014	
Population (2)	Population	48 650	56 452	317 630	2 151 187	
Life Expectancy (3)	Men	77	66.6	79.7	78.6	76.4
	Women	82	71.6	83.3	83	81.9
Labour market	Employment/population ratio (4)	55.4	64.3	52.5	52.3	
	Employment rate (5)	86.1	92.9	77.8	79.5	66.7
	Unemployment rate (%) (6)	3.8	7.1	7.2	2.5	8.3
Employment by sector (7)	Agriculture, fishing	9.9	4.9	4.0	4.3	6.1
	Mining	0.3	0.6	0.1	3.0	0.4
	Manufacturing (including fish processing)	12.1	3.1	9.8	11.9	17.4
	Construction	8.2	9.9	10.0	7.6	8.1
	Wholesale trade	12.8	17.0	13.3	13.5	16.5
	Public administration, education and health	34.6	46.5	27.1	33.8	20.0
	Others	22.1	18.1	35.7	25.9	51.5

1. Data expressed in current prices, USD, constant PPP. Faroe Islands, Iceland and total OECD, value for 2008. Greenland and coastal Norway, data for 2007. GDP per worker in Greenland, data for 2006. PPP figures for Faroe Islands and Greenland are estimated based on the PPP deflator for Denmark. In addition, Faroe Islands and Greenland receive a block grant from Denmark which accounts for 57% of government revenue in Greenland (2009) and 12% of public revenue in the Faroe Islands. Information on national accounts data should consequently be interpreted with care. Faroe Islands' workers include all persons aged 16-74 with at least 7 hours of paid work a month. Greenland, employment includes all persons aged 15-62 living in towns; it excludes population living in settlements. Figures for coastal Norway are based on GDP figures of the nine counties of Coastal Norway using information from *OECD Regional Database* (Based on Eurostat).

2. Data for 1 January 2010.

3. Faroe Islands and Greenland, data for 2008. Data for total Norway. OECD, estimated value for 2007.

4. Greenland: as a share of population living in towns.

5. Iceland and coastal Norway expressed as share of persons of working age (15 to 64 years) in employment. Faroe Islands based on estimated labour force surveys for population 16-66 years old. Greenland, persons aged 15-62 living in towns in 2006. OECD, data for 2008.

6. Faroe Islands based on estimated labour force surveys for population 16-66 years old. Greenland, figures only measure unemployment in towns.

7. Data for 2008. Greenland, employment figures exclude population living in settlements.

Sources: Faroe Islands and Greenland: national statistics offices; Statistics Greenland (2010), *Greenland in Figures 2010*; Iceland: OECD STAT National Accounts and national statistics office; coastal Norway: *OECD Regional Database*.

The scarcity of highly skilled workers is a general problem in peripheral areas of the NORA region. The self-reinforcing concentration of population, economic and job opportunities in a few larger towns, a common phenomenon throughout the region, makes it more and more difficult to find highly skilled labour in medium and small towns. Their peripherality and lack of connections make movement of internal workers or attraction of immigrants even more difficult. At the same time, because of the lack of education and job opportunities, many of the most qualified people leave to look for opportunities abroad. In Greenland, the presence of a large proportion of Danish workers underscores the fact that there are not enough local qualified workers to meet the demand of enterprises and government services. The available workforce reserve is mainly unskilled workers (Ministry of Industry, Labour, and Mineral Resources of Greenland, 2010). Newly created jobs (especially in mining) generally require skills and thus attract workers who are already employed. Efforts to upgrade education and skills and to generate new opportunities for low-skilled workers are thus particularly important. In the Faroe Islands as well it is still a major issue to find ways to recruit young Faroese with good education or to persuade those who left to study abroad to return. Paradoxically, Greenland and the Faroe Islands have stiff regulations on migration. In Greenland, to fill a vacancy with a non-Nordic citizen, the employer must ask for special permission which will only be given if no Greenlander with the required skills is available. Similarly, in the Faroe Islands, whenever the unemployment rate is above 3.5% the authorities block the concession of work permits to foreigners. As unemployment mostly involves unskilled workers, most of whom are from the fish industry, a company looking to hire skilled workers is unlikely to find a candidate domestically but is blocked, or at least faces administrative disincentives, from hiring a foreigner.

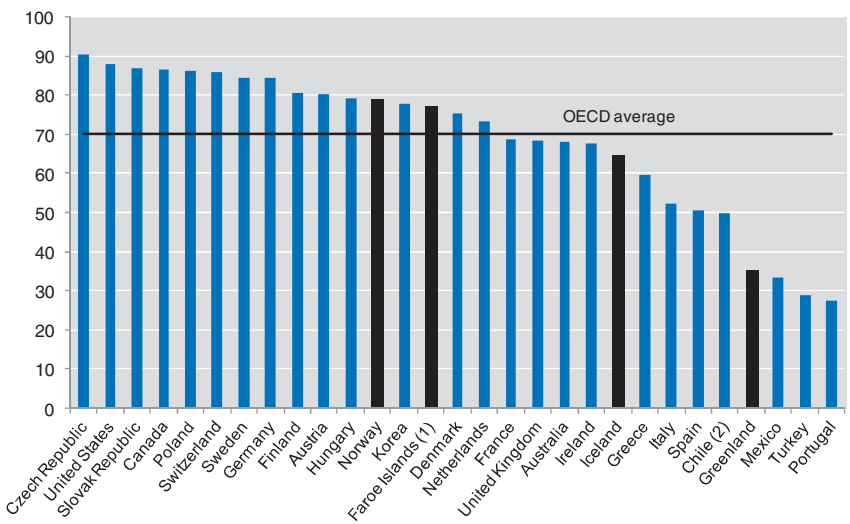
Education

Educational attainments are relatively high on average, except in Greenland (Figure 1.11), but there are questions about the quality of provision in many places. Both Norway and the Faroe Islands are above the OECD average in terms of upper secondary education attainment and Iceland ranks only slightly below. The Faroe Islands have a few higher education and research institutions and a number of institutions offering vocational training, in fields such as fisheries and the maritime professions. Many students migrate to Denmark where education opportunities are broader (see below). In Iceland, upper secondary education rates have risen in the last ten years (due to an increase in tertiary education attainments), but the country still ranks below the OECD average. Moreover, educational performance (as measured by PISA scores) has generally deteriorated

relative to the OECD average since 2000. Norway's PISA scores are close to the OECD average; however expenditure per student at primary and secondary levels is about 40% higher than the OECD average (OECD, 2010c). In the Faroe Islands two PISA studies have been conducted; in 2006 the score was significantly below OECD average, while figures from 2009 are not yet available.[19] In Greenland, improving education and vocational training is high on the political agenda, and the average educational level has increased in the last ten years. However, the figures are still very low relative to OECD countries: only 35% of the population has at least upper secondary education. In addition, the general level of education among people born in Greenland is on average lower than that of people born in Denmark. Finally, a lack of foreign language skills is a substantial barrier in Greenland, both for young people in the educational system and for the workforce's in-service training opportunities. Its situation differs from that of the other NORA territories where knowledge of English is widespread.

Figure 1.11. **Population aged 25-64 with at least upper secondary education attainment**

NORA territories and OECD countries, 2007



Note: OECD figures exclude ISCED 3C short programmes.

1. Year of reference 2006.

2. Year of reference 2004.

Sources: OECD Education Database; Faroe Islands Statistics; Greenland Statistics.

A general challenge for the region is to improve primary and secondary education in rural areas and small settlements. The high cost of schooling in rural areas and recruitment problems have prompted most of the NORA territories to expand the use of information and communication technology (ICT) for tele-education schemes, but the challenge of providing quality basic education in smaller locations remains. Iceland needs to improve outcomes in rural areas, where the proportion of licensed teachers is sometimes exceptionally low and where children (especially boys) have performed poorly on PISA tests. Smaller settlements in Greenland lack skilled teachers, and better prepared people tend to migrate to larger towns. Norway is the exception: it has had for decades a strongly redistributive regional policy which has made it possible not only to make primary and secondary but also tertiary education widely accessible. However, challenges remain. On the one hand, as mentioned, above-average expenditure has not yet led to above-average performance. On the other hand, small and sparsely populated localities still suffer from brain drain[20] and school closures due to declining population (OECD, 2007).

Education interchange within the NORA region is underutilised

In the Faroe Islands and Greenland, low demand makes it difficult to broaden tertiary education options even in the capitals, so that many students look for opportunities abroad, mainly in Denmark. Around 130 students are enrolled in the University of the Faroe Islands, and close to 150 in the University of Greenland. In Greenland around one-third of the school leavers who enter higher education remain at the local university, while two-thirds go to Denmark. Numbers in vocational training schools are also low. However, few students from Greenland and the Faroe Islands enter non-Danish universities and programmes abroad. [21]

Universities in Iceland and coastal Norway offer a full range of high-quality tertiary education programmes, some of them in English and with a special focus on the economic potential and challenges of the North. The University of Iceland, for example, offers programmes in English on the environment and natural resources, renewable energy or Earth sciences, among others. The University of Bergen offers excellent research in marine science and fisheries biology. The University of Tromsø – the world's northernmost university – has a special focus on the needs and problems of the North, including research programmes on climate change, exploitation of Arctic resources and environmental challenges (Box 1.6). These universities are open to all Nordic students. However, in spring 2010, there were only two students from the Faroe Islands and two from Greenland registered at the University of Tromsø, which was then host to almost 700 foreign students, mostly from Russia. In the same period, the University

of Bergen had only two students from the Faroe Islands, and none from Greenland, among more than 1 300 foreign students. There are also a number of joint Nordic master's programmes sponsored by the Nordic Council of Ministers, with programmes jointly offered by several higher education institutions from Nordic countries (*e.g.* Nordic Master in Marine Ecosystems and Climate; Nordic Master in Innovative Sustainable Energy Engineering). The programmes include a mobility component: students must study in at least two of the participating institutions. Yet, the participation of Faroese and particularly Greenlandic students in these programmes is also limited.

Box 1.6. **The University of Tromsø**

The University of Tromsø plays a leading development role as a provider of higher education services for the whole of northern Norway. The creation of the university in 1968 was a policy step designed to train young people so as to retain them more easily in the area. Lines of study include medicine, pharmacy, psychology, law, social sciences, humanities, science and mathematics as well as fisheries. The creation of the faculty of medicine in particular aimed to deal with the shortage of practitioners in that part of the country. The university succeeded quite well in this respect as a high proportion of the medical students studying in Tromsø remain in the area. The university has around 9 000 students (close to 70% are from the region) and 2 400 staff. Foreign students, attracted by teaching standards equivalent to those in other parts of Norway and the many master's programmes taught in English, represent nearly 10% of enrolment. The university engages in basic and applied research with a special commitment to interdisciplinary research on the needs and problems of the north. Climate change, the exploitation of Arctic resources and environmental threats are topics of great concern in the university, which gives priority to research in the fields of biomarine studies, biomedicine and biotechnology; health and telemedicine; indigenous studies (Sami language and identity).

As a higher education institution, the university contributes to regional development through knowledge dissemination in the region and promotion of partnerships with the private sector. It set up in 1992 the Norut Group of which it is the main owner, jointly with the Ministry of Fisheries and Coastal Affairs, to promote R&D and develop networking with firms and other educational and research institutions such as university colleges and technical institutes located in other parts of the region, such as Bodø and Kirkenes. Finally, the university is a founding member of the University of the Arctic, an international network of study and research institutions of the circumpolar region.

Sources: OECD (2007), *OECD Territorial Reviews: Norway*, OECD Publishing, Paris; University of Tromsø official webpage, *www2.uit.no/www/inenglish*.

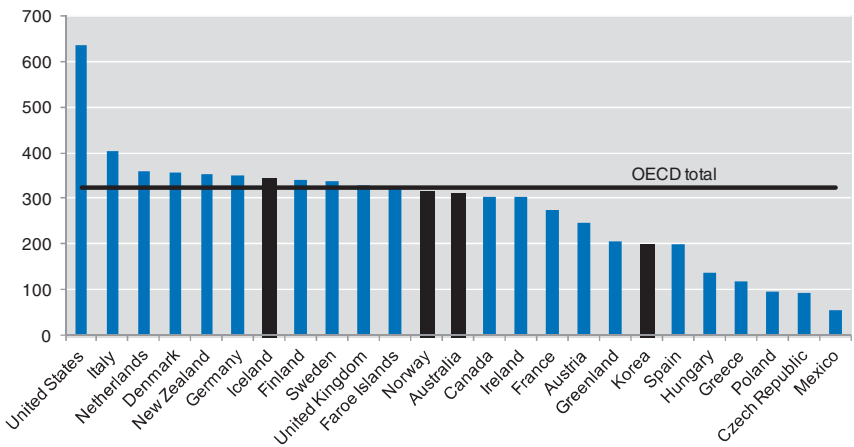
Internet

Internet coverage becomes crucial for public service delivery

ICT may help to overcome certain disadvantages springing from long distances and peripherality and to improve the delivery of key public services such as education and health. In general the NORA region has good Internet connections, but there is room for improvement in peripheral areas. In 2007, 87% of households in Iceland and 84% in Norway had Internet access, most of them by broadband. However, full broadband access encounters limits in remote areas. Further, elderly people, who are over-represented in remote areas, have the lowest access rate. As Internet connection is especially important for the connectivity of remote and peripheral areas, and among the elderly for e-health services, there is room for improvement. In the Faroe Islands the telecommunication infrastructure has improved markedly during the last years. Currently the number of subscribers is similar to the OECD average, and 99% of the connections are broadband. In contrast, Greenland has significant room for improvement. The number of subscribers per 1 000 inhabitants is below the OECD average and similar to those of Spain or Korea (Figure 1.12). However, with Greenland's degree of peripherality and its sparse settlement pattern, excellent Internet coverage is crucial. Moreover, high prices for use of the Internet and low connection speeds show the need for improvements.

Figure 1.12. **Internet subscribers in the NORA region and selected OECD countries**

Number of subscribers per 1 000 inhabitants, 2007[1]



1. 2009 data for the Faroe Islands; 2008 for Greenland.

Sources: OECD Dataset Telecom; Faroe Islands and Greenland: national statistics offices.

1.2. Main challenges for the region

Geographic peripherality

The remoteness of the NORA region creates bottlenecks for expanding its economic potential. The NORA region covers a large area and faces various challenges relating to its internal and international connectivity and the provision of basic public services. Beyond the particularities of each territory, common challenges arising from its peripheral location include:

- Geographical challenges: Long distances, both internally, between towns and settlements, and internationally, from neighbouring countries. "Scrappy" geography (sea ice, fjords, islands) and harsh weather also make connections more difficult.
- Demographic challenges: The dispersed settlement pattern described above, low population density, increasing outmigration and ageing of the population.
- Economic isolation: Peripheral locations lack visibility as potential areas for businesses development owing to long distances to major markets and small potential demand. The lack of critical mass creates additional challenges for economic development and diversification.
- Weaknesses in the transport infrastructure: As a result of the factors noted above and the reduced size of the population, diversified and reliable year-round internal and external connections are lacking.
- Difficulties with the provision of services: These include public services (education, health) and business services (training, banking and insurance, among others).

Addressing these challenges is crucial for increasing the region's economic and social potential.

The territory of the NORA region is large and geographically challenging

Large distances are a key issue in the NORA region: distances between population centres internally; between the territories in the region; and between the NORA territories and the main international markets. The most extreme example is Greenland. Its capital, Nuuk, is located 3 250 km from London and 2 700 km from New York. The northernmost location, Cape Morris Jesup, is the world's northernmost land area, just 740 km from the North Pole, while Cape Farewell, Greenland's southernmost point, is

situated some 2 670 km to the south. Measured west-east, Greenland is 1 050 km wide at its broadest point (Statistics Greenland, 2010). In Norway, the North Cape (in the Far North) is located more than 2 000 km from Stavanger (in the south of coastal Norway). In addition, the Faroe Islands, Greenland and Iceland face the specific challenges of island economies, with long sea distances separating them from their neighbouring countries.

Long distances and settlement patterns affect the functioning of internal markets. In the NORA region, the problems are compounded by various challenges related to the settlement patterns and to the transport infrastructure (Box 1.7). In Greenland, each of the towns and settlements is itself like an island; since most of the land is covered by the ice cap, there are no internal roads linking them. Very small settlements are spread along the coast, especially the west coast, separated by extremely long distances. Passenger traffic is only by air, and freight travels by air and boat. This naturally limits, and makes very expensive, movement of people and trade in goods. Such remoteness also affects the southern Faroese islands and the rural settlements of Iceland, especially the western fjords, the northeast and southeast: a combination of infrastructure and distances make mobility difficult in some locations, limiting options for commuting and creating relatively separate labour and housing markets. Such settlements are to a certain degree dependent on their own economic potential. Coastal Norway's rural areas, especially in the three northernmost counties,[22] also feel the effects of their peripherality. Great efforts have been made to improve the networks of roads, including secondary roads connecting the rural areas, and modern subsea tunnels and bridges connecting the islands with the mainland. Yet, the mountainous and broken (fjords, islands, scattered settlement pattern), landscape renders communication problematic and reduces accessibility to services, economic activities and jobs in some parts of the territory. In this regard, 40% of labour-market regions in Norway consist of only one municipality (OECD, 2007).

Box 1.7. **Transport infrastructure in NORA territories**

Faroe Islands

The Faroe Islands consist of 18 mountainous islands, 17 of which are inhabited, and internal connections are difficult. However, in recent decades efforts have been made to build a dense modern network of roads, bridges and subsea tunnels. Ferry and road are the two main means of internal connection and a helicopter service links the more remote smaller islands. The four largest islands of the north (Vágar, Streymoy, Eysturoy and Borðoy) are linked by a bridge and two subsea tunnels; more than 85% of the population of the territory

Box 1.7. **Transport infrastructure in NORA territories** (*cont.*)

is connected by roads. Kunoy and Viðoy in the far north are also connected with Borðoy, while other minor islands of the north and the south are connected by ferry. The trip from Tórshavn to the southernmost island, Suðuroy (close to 5 000 inhabitants) takes two hours. International connections are somewhat more limited. The air carrier Atlantic Airways is the only provider of transport for passenger and goods, with several daily connections to Copenhagen, but only weekly or seasonal connections with Iceland, Norway and the United Kingdom (Table 1.11). The harsh and variable weather conditions in the Faroe Islands cause frequent flight delays and cancellations. By boat Smyril Line maintains ferry connections between Denmark and the Faroe Islands and also has connections to Iceland in summer. The large ferries transport goods, cars and passengers. Three companies serve the Faroe Islands for the transport of goods. The Icelandic Samskip, Faroe Ship (owned by the Icelandic company Eimskip) and the Faroese company Freshlink (which only serves the Faroes-Scotland route). Between them they operate several vessels on routes between Iceland, the Faroe Islands, the United Kingdom, the European mainland and Scandinavia. Nevertheless, the bulk of passengers and freight go through Denmark.

Greenland

The territory's geography means that air transport is the main, and almost only, means of passenger transport. Neither roads nor railways link the different cities. There is no regular international transport by boat, and most regional ferries have been replaced by air connections. Larger planes connect the major hubs, while helicopters connect smaller municipalities and villages. Efforts have been made to build runways in all major towns in Greenland. Currently there are 13 airports, 6 heliports and 40 helistops. However, the limited availability of plains and the harsh weather conditions create frequent delays. Air connections are served by Air Greenland, which essentially has a monopoly on air transport. Most flights from/to Copenhagen (the only year-round international connection) arrive at the international airport of Kangerlussuaq (a former American military base), and from there connect to further destinations, including the capital, Nuuk. The capital's runway is not big enough to receive large planes arriving from Copenhagen, but the surrounding craggy coastal geography makes it difficult to build a larger one. However, smaller planes arriving from Reykjavik land – for the moment only in summer – in the capital Nuuk, Narsarsuaq and Ilulissat, and serve Kulusuk on the east coast year-round. Transport of goods is handled by the Royal Arctic Line, a publicly owned freight company, with Aalborg in Denmark as the corresponding harbour outside Greenland. The company has a monopoly on transport of goods.

Iceland

There is an efficient ship transport system between Iceland and neighbouring countries. More than 99% of all imports and exports of goods and materials to and from Iceland are carried by ship. Iceland has efficient transport systems with

Box 1.7. **Transport infrastructure in NORA territories** (*cont.*)

forwarding networks overseas. It has 57 ports, the majority built for fishing vessels, with around 15 with appreciable cargo activity. The Port of Reykjavik is the principal port and receives more than 70% of all imports. Direct scheduled sailings to Europe also operate from three main ports in the western, northern and eastern regions. Average sailing times from Reykjavik to major ports are 4-5 days to Europe and 8-10 to North America. There is no domestic shipping transport system or direct scheduled sailings from areas outside the capital. As a result, industries located far from Reykjavik have to transport all goods by truck to or from Reykjavík. A well-developed network of roads for transport of both people and goods covers the island. However, conditions are difficult, especially in the mountainous areas where the roads lack an asphalt surface; the roads are often narrow and make access to remote areas problematic. From time to time, volcanic activity also damages the road network, especially on the southern coast; expensive reparations are necessary to re-establish the road connection to all settlements. Finally, Iceland has four airports of international standard, two in the southwest, one in the east and one in the north, with Keflavik international airport (50 km west of the capital, Reykjavik) the main one, offering daily connections to the main capitals of Europe and North America. Iceland is strategically located for air communications with both sides of the Atlantic. Flight times are 2-3 hours to major gateways in Europe and 5-6 hours to the east coast of North America. The strategic location and the good network of international connections make Iceland a potential international hub for the NORA region. However, at present there are only limited connections with Greenland and the Faroe Islands, and with Trondheim, Bergen and Stavanger in coastal Norway.

Coastal Norway

Coastal Norway has a well developed air, maritime and road transport network. Norway has a coastline of around 2 700 km and close to 300 communities settled along the coast. Consequently sea transport has traditionally been of great importance for a country which currently has around 60 public ports. Yet, the significance of sea transport has been declining over the last decades. This is mostly due to the extensive use of road transport. In this regard, one of the main objectives of the government (developed through the National Transport Plan) has been to improve traffic flows within and between regions, including secondary state roads, so as to promote the development of viable rural areas and growth-oriented housing and labour markets while meeting the transport needs of business and industry. This involves improving the road system, facilitating the provision of ferry services, building new bridges and tunnels, removing infrastructure bottlenecks and ensuring the operation of the system of 28 regional airports (over half in the north and the remainder mainly along the western coast).

Sources: Nordregio; OECD (2007), *OECD Territorial Reviews: Norway*, OECD Publishing, Paris; Norwegian Ports official webpage, *www.havn.no/englishpage.asp*; *www.samskip.com*.

The demographic and geographic characteristics of the NORA region affect the provision of public services

Low population density, long distances and the ageing of the population make it difficult to provide basic services in the smaller settlements of the NORA region. Finding qualified teachers to provide basic education services in the most remote locations is not an easy task. At the same time providing health services to small settlements with increasingly elderly populations is both challenging and expensive. Some education and health services are only offered in the larger towns, thus requiring remote patients to travel. Finally, Faroese and Greenlandic hospitals do not provide some specialised health-care services; patients are currently sent to Denmark. The Faroe Islands and Iceland have signed an agreement so that Faroese patients can go to Iceland rather than Denmark. For some time a limited number of patients from eastern Greenland have been transported by air to Iceland for acute treatment, and Greenlandic and Icelandic authorities are currently discussing an agreement for using Icelandic hospitals for certain treatments. The use of Icelandic rather than Danish hospitals would mean shorter transport time and cheaper treatment costs and would demonstrate the potential of regional co-operation (see Chapter 3).

The provision of business services is also problematic in peripheral and sparsely populated locations. Business services (such as banking and insurance, training, or research and development) are important for the development of firms, especially small and medium-sized enterprises (SMEs). These services are made available when the combination of price, volume of business and cost of provision allows the service provider to operate at a profit. This means that demand must be sufficient to cover the cost of providing the service. In peripheral areas and small countries where demand is small, the private sector is less able to provide these services. The resulting costs have to be borne either by customers, which reduces demand, or by the firm, which reduces profits.

Lack of connectivity reduces market access

Long internal and external distances and lack of competition in the provision of transport services lead to high transport costs for people, goods and services and reduce market access for local businesses. In addition, in the Faroe Islands and Greenland, external transport connections are extremely limited. International connections are mostly to Denmark, with some irregular or seasonal connections, mainly to Iceland (Table 1.11), while the lack of critical mass hinders transport diversification. This clearly affects the traffic of passengers and the development of businesses between the Faroes and Greenland and its North Atlantic neighbours.

Table 1.11. **International air connections in the Faroe Islands and Greenland**

From/to		Denmark			Iceland	Norway	Other countries
		Copenhagen	Billund	Aalborg	Reykjavik/ Keflavík	Stavanger[1]	
Faroe Islands		Up to 4 flights per day to Copenhagen.	Up to 2 flights per week	3 per week (only summer)	Up to 4 flights per week	2 per week (only summer)	Up to 2 flights per week to London (only summer and special vacations)
Greenland	Kangerlussuaq	Up to 1 per day (summer) and 4 per week (winter).				No	Only special charters in summer season
	Nuuk				Up to 2 per week		
	Narsarsuaq	1 per week (only summer)			Up to 2 per week (only summer)		
	Kulusuk				Up to 3 per day (summer); and up to 2 per week (winter)		
	Constable Point				Up to 2 per week		
	Ilulisiat				Up to 3 per week (only summer)		

1. From 2011 Atlantic Airways will fly to Bergen instead of Stavanger.

Source: Nordregio; official airlines' webpages.

Ensuring sustainable development of the fisheries sector

As noted above, the fishing industry remains a core sector in the economies of the NORA territories in terms of employment, exports and value creation. In many municipalities and local communities of the region, fisheries still account for more than 20% of total employment (Figure 1.5). The long-term sustainability and prosperity of the fishing industry and, more generally, the marine sector are thus a key concern for the overall evolution of the NORA economies. In this respect, a number of issues have emerged during the last years:

- Overfishing: the overfishing of stocks worldwide has had significant consequences for both the biological sustainability and the economic viability of commercial fisheries. It has led to falling

productivity and stagnant incomes for fishers worldwide (OECD, 2009c).

- Collapse of some high-value species: in a context of constant pressure on the resource base, high-value fish stocks (especially cod) have collapsed, with strong impacts on the sector.
- Increasing global competition: as mentioned, the historical position of NORA in the fishing industry has been severely affected by international competition.
- Falling employment: the above-mentioned factors have had significant consequences in terms of reductions in the size of fishing fleets and some catches and consequently of employment. Modernisation in the processing sector to improve efficiency has also contributed to a fall in employment.
- Climate change: although there is still some uncertainty about the precise effects of climate change on the sector, international research indicates that global warming will affect primary production, fish growth and fish migration, with potential impacts on fish stocks in the North Atlantic.
- Price volatility: the fishing industry is extremely dependent on international market prices of fish and oil. For this reason, income levels in the fish industry are exceptionally variable. Owing to stagnating market prices and escalating oil prices during the last years, the revenue base of the fish industry has decreased markedly.

The growing fish farming sector faces its own challenges. The production of farmed fish has risen sharply since the industry was established at the beginning of the 1970s. It has represented a crucial addition to traditional fishing in places such as Norway or the Faroe Islands (see above). However, the industry is very vulnerable to sudden collapse because of fish diseases. It would appear that fish density, in terms both of fish in cages and high concentration of fish farms, makes stocks particularly susceptible to infectious diseases. Related issues include the prevalence of salmon lice and the genetic contamination of wild salmon. These environmental challenges can all lead to important losses of farm output. In addition, development of the sector requires firm environmental control in order to reduce environmental impacts.

Innovation, sustainability and co-operation are crucial for the future of the sector

Sustainable management of the fishing sector requires co-operation. Internationally co-ordinated management of fish stocks is essential to avoid overexploitation. At the same time, shared fish stocks, increasingly uncertain and changing fish migration patterns, and other issues related to climate change call for regional co-operation and the establishment of bilateral and multilateral agreements. But co-operation on fishery management is not easy, as the NORA territories, like other territories that share fish stocks, compete directly with each other for resources and markets (see Chapter 2.1).

Innovation in fisheries has become crucial. Fisheries are expected to continue to be a key economic sector in the region. NORA territories are therefore concerned with the sector's continued development and innovation. Innovation and the application and marketing of new technology (*e.g.* in the management of fish stocks, aquaculture, maritime safety and research) are essential, and co-ordination and co-operation play a crucial part in the sector's evolution and development. Effective and efficient co-operation and co-ordination of resources, know-how, techniques and technology will be a key to the long-term future of the sector in the NORA region. Beyond this, encouraging alternative economic sectors helps the region to become less dependent on external factors such as international prices or availability of fish stocks.

Economic diversification and specialisation through innovation

NORA's export base mainly specialises in commodities, especially fish, minerals, oil and gas. This renders the economy vulnerable to changes in international commodity prices and sudden shifts in the demand for commodities or in the availability of stocks (in the case of fish).[23] In addition, natural resources are depletable. Therefore, income levels can be exceptionally variable and unstable. OECD countries are generally less dependent than NORA territories on natural resources.

Innovation could support the development of added value products in traditional sectors

The potential of traditional sectors could be further expanded. Raw material sectors such as fishing and mining are key sectors for the region. However, NORA territories could take better advantage of their sectors of specialisation by producing goods with higher value added. Adding value to existing sectors calls for higher skills, education and innovative activity.

Science, technology and innovation play a key role, first by exploring new products in emerging sectors (for instance bio-medicine or pharmaceuticals) and second by making existing ones more productive and efficient (see Chapter 2.3). In the case of fisheries, the role of research and innovation is all the more important in light of pressures linked to increased fuel costs, pressures on fish stocks and the marine environment, and the potential impacts of climate change. Finally, as NORA territories develop higher skills and technology in resource-based sectors they can transfer the knowledge and productivity gains to other sectors.

A number of sectors could be developed to promote further diversification…

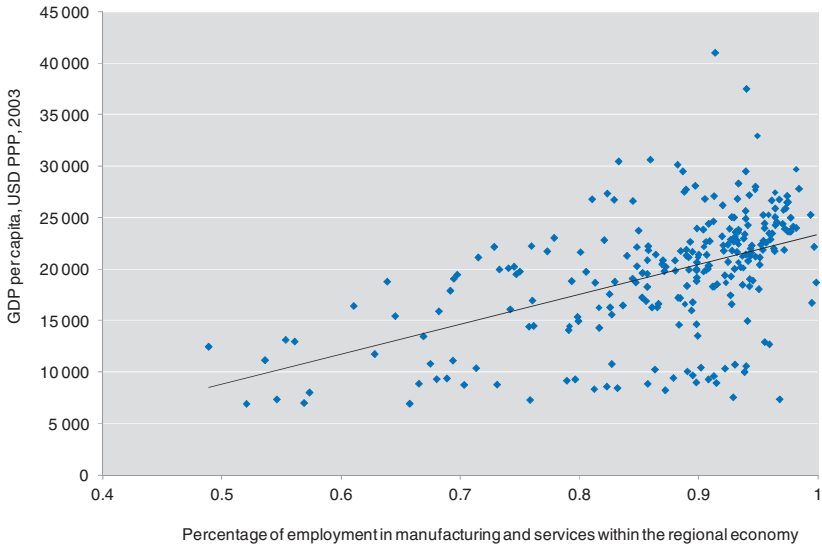
Alongside the further development of traditional areas, a number of sectors could be developed to further diversify the region's economic base. This would help to alleviate risks due to strong dependency on a few commodity-based businesses. It is also a way, albeit in the long term, to address the outmigration of qualified and young people from the NORA territories. The development of new products and new activities is particularly important for economies such as the Faroe Islands and Greenland which are heavily dependent on fisheries and where structural adjustments in fishing fleets (concentration of vessels, increased efficiency of fishing techniques) imply a continuous reduction of jobs. New occupations need to be found for workers released from the fishing industry. A number of niches that might be associated with the branding of "Green" could take advantage of the rich and diverse environment of the NORA region: ecological tourism, research related to climate change, and ice and water resources (see Chapter 2.3).

The lack of critical mass and long distances to the main centres of economic activity render diversification and the attraction of foreign investment or service sector activities difficult. However, in rural areas of OECD countries that face similar challenges, economic diversification is an ongoing reality. Far from being viewed as a threat to the traditional primary activities carried out for centuries, economic diversification is increasingly seen as an opportunity to complement and provide value added to primary activities and become new sources of employment and income for rural residents. Diversification offers an alternative to migration to urban areas. For instance, rural OECD regions with a higher share of employment in manufacturing and service activities have higher GDP per capita (see Figure 1.13) and higher employment growth. The objective seems to be to maintain and broaden the economic base of rural areas through the preservation of competitive and multifunctional primary activities and to

diversify the economy through the incorporation of new activities compatible with a sustainable development (OECD, 2009d).

Figure 1.13. **Diversification of rural economies and GDP per capita**

OECD predominantly rural regions, TL3[1] 2003



1. Predominantly rural regions in selected OECD countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Greece, Hungary, Ireland, Italy, Japan, Korea, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden and United Kingdom.

Source: OECD Regional Database.

Specialisation and diversification are not mutually exclusive. Regions can specialise in economic activities for which they enjoy comparative advantages, as determined by the complex interaction of natural endowments (*e.g.* oil, mining, etc.) and endogenous assets (*e.g.* infrastructure, technology, skills). But regions may also gain from diversifying their productive base. Specialisation favours knowledge spillovers and forward and backward linkages between firms from the same industry and therefore leads to efficiency gains. Yet, these benefits also

occur when firms from different industries locate in a common space (diversification), as this facilitates the transfer of ideas among sectors through formal and informal interaction. This also leads to efficiency gains and to a larger portfolio of goods and services.

…but will require a highly educated workforce

As the economy of the NORA territories become less dependent on fisheries, demand for a highly educated workforce will increase. If well managed, strategies for diversification beyond fisheries of the economy of NORA territories like the Faroe Islands and Greenland will make the economy less vulnerable. However, the capacity to develop new sectors or to add value to existing ones will depend on the economy's skills base and on the ability of its workforce to respond to changing market needs. Investment in, and improvement of, human capital is crucial to develop fast-growing activities, such as technology and knowledge-intensive industries. At the same time, the development of sectors like mining or tourism will require training and an upgrading of the skills of the local population. In tourism, linguistic and specialised training will be needed. Increasing employment in the construction sector will also require an intensified training effort.

Adaptation to climate change

NORA territories, and the Arctic regions in particular, are expected to see their climate change more and earlier than in most other parts of the world. Projections of the increases in temperature differ according to the emissions scenario applied. At the same time, the impacts of climate change will be felt very differently across the region (given that it covers a large and diverse geographical area). However, on average, temperature increases along the North Atlantic are expected to be greater than the global mean (especially in the Arctic regions), with the largest temperature increases in winter (see Chapter 2.4). Higher temperatures are expected to have various derived effects: increased precipitation levels, increased melt rates of Greenland's ice sheet, reduced sea ice and glacier coverage, changes in sea temperatures and rise in sea levels, and potentially an increase in regional storm events, among others. Some of the impacts of change are negative and create considerable uncertainties and challenges. Yet, there are developments that can be viewed as opportunities and areas in which the NORA territories can benefit. All of this points to the need for substantial adaptation efforts.

The main economic sectors of the region will be affected, in different ways

An increase in sea temperatures will imply a change in the migratory trends and stocks of fisheries and probably the loss of habitats for key fish species, and more difficult conditions for fish farming. On the other hand, climate change is expected to generate new opportunities by facilitating the extraction and transport of mineral and land resources as a result of shrinking ice sheets (especially in Greenland). But, it will also amplify and extend pressures on the environment and natural resources. Climate change will probably allow longer crop seasons and the harvesting of new vegetables. But agriculture may also face an increase in the risk of diseases, fungus and insect attacks, which may cause much damage. Transport and infrastructure will be other key activities for the region that will be affected either positively (increasing the length of the navigation season in the Arctic; opening up Arctic shipping lanes) or negatively (increasing the risk of flooding, landslides or avalanches). Finally, inhabitants of smaller settlements and indigenous populations (Inuits in Greenland and the Sami in Norway) may be particular affected, owing to their dependence on traditional hunting and fishing and reindeer herding.

Climate change will affect a broad range of human activities and welfare in different ways and to different extents. Some of the most direct impacts on the NORA economies will be felt in sectors based on natural resources, such as fisheries, aquaculture, agriculture, traditional hunting and herding activities, and energy production. Climate change also affects opportunities and resources for tourism, most notably tourism based on winter activities. There is also a wide range of associated impacts, for example on accessibility and infrastructure provision. These issues, and potential responses, are considered in more detail in Chapter 2.4.

Adaptation is crucial to deal with the effects of climate change

The severity of the impacts will depend on the extent to which mankind is able to adopt, in advance, comprehensive adaptation plans to reduce vulnerability to climate change. At the same time, the scope of the benefits in some sectors (*e.g.* transport, mining, agriculture) will also depend on how the different territories and the region as a whole adapt to the potential changes (*e.g.* by developing skills to work in emerging sectors). However, the vulnerability of regional ecosystems, and the strong links between the local economy and the environment, point to the need to follow sustainable development strategies that do not compromise the region's future development.

Conclusions

Chapter 1 has focused on presenting the NORA region's major socio-economic trends and on identifying its shared characteristics and challenges. The NORA region covers a vast but scarcely populated area. The territory is characterised by remoteness, a dispersed settlement pattern, dependence on the sea, and rich natural resources and unique landscapes that are highly sensitive to climate alterations. This chapter recognises four main challenges for the region:

i. Improving accessibility: the remote location of the NORA region and its settlement pattern create diverse challenges for the sustainability of smaller settlements and the region's overall economic development. Improving accessibility is crucial. But better connectivity requires a parallel process of enhancing the region's economic potential.

ii. Ensuring sustainable development of the fisheries sector: the economy of the NORA region is closely linked to fisheries, although its size in the economy has shrunk and it faces a number of challenges. Sustainable development of the sector and effective co-operation on shared resources, know-how and technology will be essential for the region's long-term competitiveness.

iii. Economic diversification and specialisation through innovation: NORA's lack of economic diversification and high dependence on natural resources entails risks. Innovation could support the development of added value products in traditional sectors while developing new products to promote further diversification of the economy.

iv. Meeting the climate change challenge: the effects of global warming will be especially felt in the NORA region, especially in the Arctic. The main economic sectors will be affected, either positively or negatively, by climate change. Adaptation will be crucial to control the effects and to ensure the region's future development.

The public policy implications of these four challenges are the subject of Chapter 2.

Notes

1. Also involved are Denmark, Finland, Sweden and Åland.
2. Because of the size of the population of the NORA territories (especially in the case of Faroe Islands and Greenland) and the lack of statistical information, analysis at a lower administrative scale is generally not feasible.
3. The municipality of Tórshavn consists of the main area/city of Tórshavn (Tórshavn with 12 375 inhabitants), two bigger suburbs (Hoyvík with 3 613 and Argir with 1 978 inhabitants) which have merged with Tórshavn and 14 other villages/islands (1 907 inhabitants) which are not in close contact with Tórshavn/Hoyvík/Argir.
4. There are of course some differences both between and within territories.
5. The comparable available statistical information for coastal Norway is expressed in terms of urban settlements and sparsely populated areas.
6. Simple concentration of resources and investment in a place does not necessarily translate into economies of agglomeration and new growth. The key appears to be how assets are used, how different stakeholders interact and how synergies are exploited in different types of regions. The market does not always appear to maximise this potential alone and thus public policy has a role to play (see OECD, 2009a).
7. Associated costs include higher housing and land costs, greater contamination and an impact on global warming (OECD, 2010a). Other kinds of "congestion costs" or diseconomies of scale are unlikely to occur in the NORA region: all cities are far below the population threshold level at which metro-regions suffer from congestion costs.
8. Both territories have their own government and parliament with competences transferred in almost all domestic areas.
9. Asked about their plans for the future 58% of those who graduated abroad between 2004 and 2006 expected to live on the Faroe Islands in 2012 (Saarikallio-Torp and Wiers-Jenssen, 2010).
10. Women tend to be socialised into situations that require adjustment and change. This enables them to move to new job categories and job options and to adjust better to change through the educational system (Rasmussen, 2010).
11. In Greenland it is possible to retire at the age of 60, and special arrangements for women make it possible to retire at 55.

12. The number of fishing vessels has fallen, while the average size of vessels has increased and changes in technology mean that fewer people are required for any given size of vessel.

13. FAO Global Capture Production Statistics, considering only marine fishes and crustaceans.

14. The Faroese salmon industry has recently experienced a considerable rise in sales value, mainly due to disease problems in Chilean aquaculture.

15. The tourism industry has recently grown considerably in terms of foreign currency revenues and is estimated to have represented ISK 155 billion in 2009. Taking into account exchange rate and pricing effects, an approximately 21% real increase in foreign currency revenue for 2008-09 may be assumed (Tourism Satellite Account, Iceland Tourist Board and Statistics Iceland).

16. To a significant extent, this concentration reflects the regional distribution of population, but GDP appears to be much more concentrated than population, meaning that densely populated regions tend to have higher GDP per capita than scarcely populated ones. The GDP per capita of Oslo was 86% higher than the national average. Meanwhile, Rogaland and Hordaland recorded respectively the second and third highest GDP per capita in Norway, 6% and 3% higher than the national average. Nord-Trøndelag is at the bottom of the list (followed in coastal Norway by Finmark) with GDP per capita well below the national average (OECD, 2007; OECD Regional Statistics).

17. In contrast to countries in different hemispheres, such as the United States and Chile, which may have seasonal flows of fruits and vegetables first in one direction and then in the other.

18. In the third quarter of 2008, the lowest unemployment figures were in the biggest cities, Nuuk, Ilulissat and Sisimiut, where unemployment averaged approximately 2% of the potential workforce. Instead, the average unemployment rate in Tasiilaq, Nanortalik and Kangaatsiq was 9.1%, 8.2% and 7.9%, respectively.

19. The Faroe Islands are not an assigned region in the PISA survey. Figures should therefore be interpreted with care.

20. Young people move from mostly rural areas to regional hubs and then often to bigger cities in other counties, particularly the Oslo area, the adjacent Akershus region and Trondheim, where job creation is strongest (OECD, 2007).

21. Figures from the Faroese Grant Fund on the number of students receiving a scholarship show that the number of Faroese students at international universities (mainly England and Scotland) has more than doubled

since 2003 as a result of an effort to increase the international presence of Faroese students. However, the distribution of tertiary education is still very tied to Denmark: close to 50% of tertiary education students go to Denmark, 40% remain in universities in the Faroe Islands, and only 10% go to international universities.

22. In these areas, the average population density is just 4.1 per km^2 (against 10.6 in coastal Norway overall).

23. Moreover, since natural resources are typically bulk commodities that are sold to oligopolistic multi-national firms, producers in normal times have less pricing power than processors, so profits are squeezed at the level of the resource producer (Clark and Munro, 1980; Love and Burton, 1999; Young and Hobbs, 2010). Occasionally, when there are supply shortfalls, producers can extract large economic rents, but over the long run the profitability of natural resource producers has been limited (Fattouh, 2007; Gelb and Grassman, 2009; Gunton, 2010).

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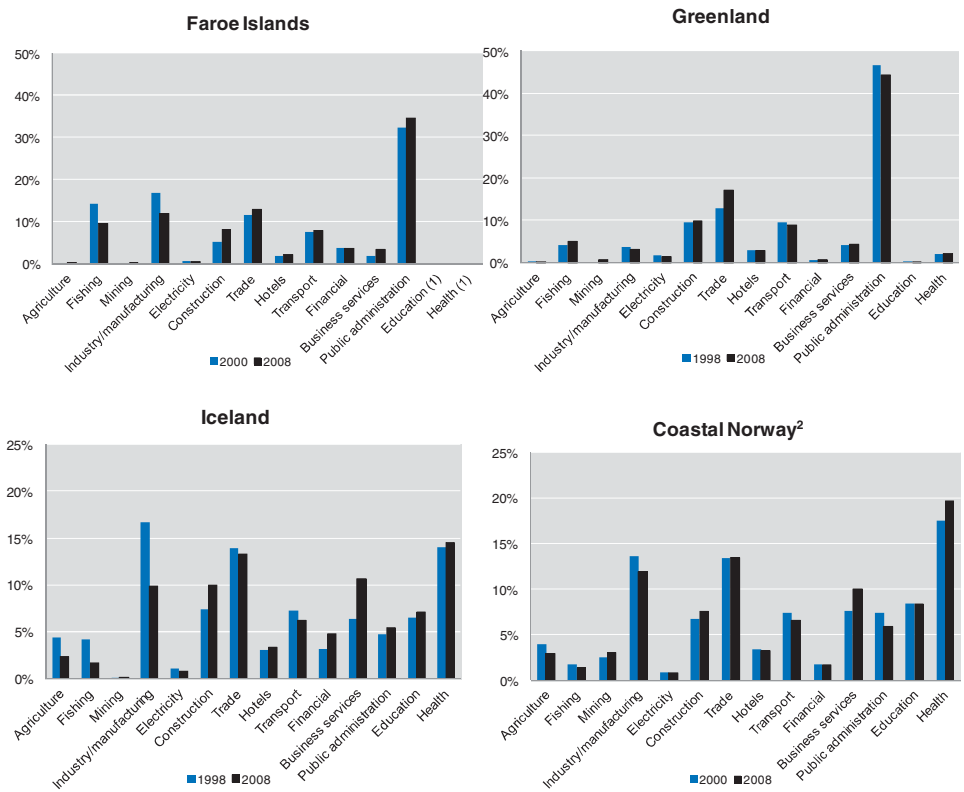
Annex 1.A1

Figure 1.A1. **Employment by major industries in the NORA territories**



1. In the Faroe Islands "education" and "health" are integrated in public administration figures.

2. Based on employment figures of the nine counties of coastal Norway. Information for 2000 and 2008.

Source: Faroe Islands, Greenland and coastal Norway: National statistics offices; Iceland: OECD employment statistics.

Chapter 2

Policies supporting a sustainable, competitive economy in the NORA region

Reinforcing economic competitiveness and a sustainable development process in the NORA region will largely depend on its capacity to overcome different challenges related to the remote location of the region, its vulnerability to climate change, and its narrow productive base. The chapter is divided into four sections. Section 1 provides recommendations for improving accessibility and for coping with the peripherality and demographic challenges of the region. Section 2 focuses on the future productivity and sustainability of the fishing industry, as one of NORA's main economic sectors. The third section identifies the opportunities for diversifying the economic base, and the crucial role that innovation plays in the region. The fourth section considers the challenges of climate change for the main economic activities of the region and the crucial role of adaptation measures to confront the effects of climate change.

Introduction

As observed in Chapter 1, the NORA territories are small and peripheral economies, heavily reliant on a narrow range of primary products (fisheries, mining, oil). The NORA territories are currently focused, to varying degrees, on expanding their economies. Chapter 1 identified four main challenges or bottlenecks to the development of the NORA region. This chapter seek to emphasise a number of actions that can contribute to better understanding these challenges, and to responding and adapting to them, so as to strengthen the international competitiveness and sustainability of the NORA region. The chapter has four main sections.

i. Section 2.1 examines the challenge of improving accessibility. The peripherality of the NORA region remains an obstacle to its economic development. The focus is on four crucial areas: demographic challenges; improving the delivery of public services; coping with economic vulnerability; and restructuring transport networks.

ii. Section 2.2 looks at the future of the fishing industry. Its fortunes in the NORA region have fluctuated over time, but it remains an important part of the NORA economies and its development is therefore a key concern. Bigger and more modern and efficient fishing vessels are faced with shrinking and highly variable fish stocks. In the future, combining enhanced productivity with the sustainability of the fishing will be a crucial issue. It will require combining the resources and approaches of the different territories and reaching agreements regarding the management of marine resources.

iii. Section 2.3 studies the opportunities for enlarging the economic base, as well as the important role of innovation in the NORA region. New developments, research and the implementation of new techniques can support the future competitiveness and sustainability of traditional natural-resource-based industries. At the same time, in the context of increasing efforts to sustain and diversify regional economies, innovation could help to support the development of emerging or new niches and sectors. However, this will require improving education and training and encouraging entrepreneurship and competition.

iv. Section 2.4 considers the challenges of climate change. Its effects will be larger and more rapid in the North Atlantic, and NORA's natural-resource-based economies will be particularly vulnerable. However the economic effects of climate change are expected to be

mixed: climate change will create certain challenges but it will also create some new economic opportunities.

2.1. Addressing the peripherality challenge

The NORA region suffers from a series of disadvantages related to its remoteness from Europe and from the major international trade routes, its higher infrastructure costs and its harsh climatic conditions. In addition, the region is characterised by a dispersed settlement pattern, migration from smaller to bigger locations and population ageing. This represents a challenge for the provision of public services and for the sustainability of smaller settlements (see section 1.2). Finally, each of the four NORA territories is small in terms of population and GDP and lacks the critical mass to achieve scale economies in most economic sectors. Weaknesses in the transport infrastructure amplify these challenges, but lack of critical mass makes it difficult to develop the transport network. Challenges of peripherality are common in predominantly rural OECD regions (Box 2.1), but the example of NORA is certainly one of the most extreme cases of geographic peripherality.

Box 2.1. **Development challenges in predominantly rural OECD regions**

A consistent theme in the various OECD reviews of rural policy has been the challenge of development in territories characterised by long distances, low densities and small numbers (of people, firms, organisations). The magnitude of this problem, of course, differs from country to country. For example, it is a greater issue in Finland than in the Netherlands, and a bigger challenge for Scotland than England, even though they are both part of the United Kingdom. But within every OECD country it is possible to see that development is more difficult in more remote areas. The crucial problems are:

- higher transport costs, both to and from and within the region, which make both local goods and imports from outside the region more expensive and increase the cost of exports;
- an inability to take advantage of the scale economies associated with Marshallian agglomeration effects, which can enhance opportunities for innovation and reduce unit production costs; and
- small truncated economies, because there are few people and firms to act as a home market and participate in the local labour market, which can in turn result in missed development opportunities, either because of missing skills or labour shortages on the one hand, or high unemployment due to small numbers of firms on the other.

Demographic adjustment

Outmigration overwhelms the natural increase in population of the NORA region

Chapter 1 shows that unlike much of the OECD, where fertility rates have fallen below natural replacement rates, birth rates in three of the four NORA territories (the Faroes, Greenland and Iceland) still allow relatively rapid natural population growth. In addition, death rates continue to decline in all NORA regions, as the average lifespan of citizens increases over time. However, because the population of the NORA territories is very small (especially the Faroes and Greenland), even small changes in net migration rates can overwhelm the natural increase in population. For example, between 1998 and 2008, net international migration in Greenland almost completely offset the high natural increase in population; total population was almost constant.

In general, the region has stable and relatively high population outflows, as young people leave to continue their education or to obtain better employment. This outflow has two consequences. First, an offsetting influx of people would be required to prevent population decline, and second, there are potential longer-term implications for future birth rates if, as is currently the case in the NORA region, the outflow includes a disproportionately large number of young women and the inflow a smaller proportion of females.[1] International immigration is largely driven by current employment opportunities. When the NORA region has better employment opportunities than immigrants' home countries, flows are higher. Conversely, periods of slow growth and weak job creation reduce the incentive to move to the NORA region. In addition, while the NORA members allow citizens of any Nordic country full freedom of entry, some have tended to restrict immigration during periods of high unemployment (see Chapter 1).

Restrictions on immigration should be released

When restrictions on immigration during periods of weak job creation are coupled with higher rates of emigration, the likely outcome is a period of net outflow of people. Given the small absolute numbers associated with the natural increase in population, it is easy to have intervals where population declines significantly even if fertility remains high. Conversely, when economic conditions are good, a strong inflow of foreigners can add considerably to population growth. For example, during 1998-2008 the population of Iceland grew by 1.5% a year. Roughly half of this was due to

natural increase and the other half to net immigration. Some OECD countries facing similar demographic challenges, such as Canada, have adopted policies to attract immigrants (Box 2.2). As pointed out in Chapter 1, there are strict regulations on immigration in the Faroe Islands and Greenland when a vacancy is to be filled by a non-Nordic citizen. As the unemployed are mostly unskilled workers, this creates serious difficulties for companies seeking to hire highly skilled international workers. Non-Scandinavian immigration would probably be limited in any case, given climatic conditions that are not especially attractive to migrants who lack a Scandinavian heritage, relatively small labour markets and the high cost of travel to the NORA region. Nevertheless, even small fluctuations in immigration can have important impacts on the demographic situation and on labour markets.

Box 2.2. **Atlantic Population Table**

Atlantic Canada is affected by an ageing population, outmigration and relatively low immigration. This undermines the region's capacity to support economic growth, innovation and productivity. The 2001 Census showed that three of the four provinces in Atlantic Canada had lost population since 1996, while most of Canada was still expanding. In addition, Atlantic Canada attracted only 1.2% of the total permanent immigrants coming to Canada in 2002, far short of the region's share of the national population. Addressing these demographic challenges became even more urgent as a resources boom in western Canada siphoned off workers, mostly young people, from Atlantic Canada. The Atlantic Population Table (APT) was set up in 2005, when senior federal and provincial officials began discussions to identify themes and issues for which common, collaborative, region-wide approaches could be considered.

At its early meetings, the APT realized that there were four areas in which joint action was needed: attracting and promoting Atlantic Canada as a destination; raising the awareness of Atlantic Canadians of the benefits that immigrants bring when they settle in the region; promoting smoother integration of immigrants into labour markets; and sponsoring research into population-related matters. The four Atlantic provinces joined the Atlantic Canada Opportunities Agency (ACOA) and the Department of Citizenship and Immigration Canada (CIC) in developing an Atlantic Population Initiative that embraced these four streams. The Department of Human Resources and Skills Development Canada (HRSDC) was also an active participant in discussions at the APT. The Memorandum of Understanding (MOU) that provides the framework was signed by ministers at the end of 2008. Under the guidance of the APT, several initiatives have been identified and are being implemented on an Atlantic-wide basis. The APT meets quarterly, and at these meetings directly pursues consultation and co-ordination activities with a range of stakeholders.

Box 2.2. **Atlantic Population Table** (*cont.*)

There has been progress as the decade has advanced. The Atlantic Canada region now attracts close to 3% of all permanent immigrants coming to Canada, as the four provinces have aggressively used their Provincial Nominee Programmes (special programmes that allow provinces to nominate individuals who wish to immigrate to Canada and who are interested in settling in a particular province) to recruit skilled workers. Retention rates have improved. Research has shown that labour market outcomes for immigrants in Atlantic Canada are rather better than for Canada as a whole.

Much remains to be done. Although the region's population decline has been arrested and reversed since 2001, rates of increase are still low. Projections suggest that by 2012 100% of net growth in the Canadian workforce will be due to immigration. Immigrants as a proportion of the Canadian labour force stand at 21%, while in Atlantic Canada they are less than 5%. Increasing immigration alone will not bring the population and workforce into balance. Increasing the productivity of Atlantic Canada firms and improving the employment outcomes for youth and under-represented pools of labour are also important.

Source: Atlantic Canada Opportunities Agency.

It will also be important to encourage the return of migrants

A striking feature of the migration pattern is the phenomenon of return flows. If there are employment opportunities, individuals who have left their home country for education or employment when they were younger often return. Typically, this happens after they have children. The demographic impact of this return flow can be considerable, particularly when migrants return with spouses from elsewhere. Moreover, the migrants return with skills and resources acquired elsewhere which add to the territory's human capital. The important implications for policy are:[2]

- Those who previously lived in the region are those most likely to be attracted to it.
- It is not necessary to encourage all previous emigrants to return; the focus can be on those who have children and are looking for a better quality of life and environment in which to raise them or on recent graduates in degrees close to the needs and potentialities of the NORA region.
- Individuals who return come back with potentially important skills.

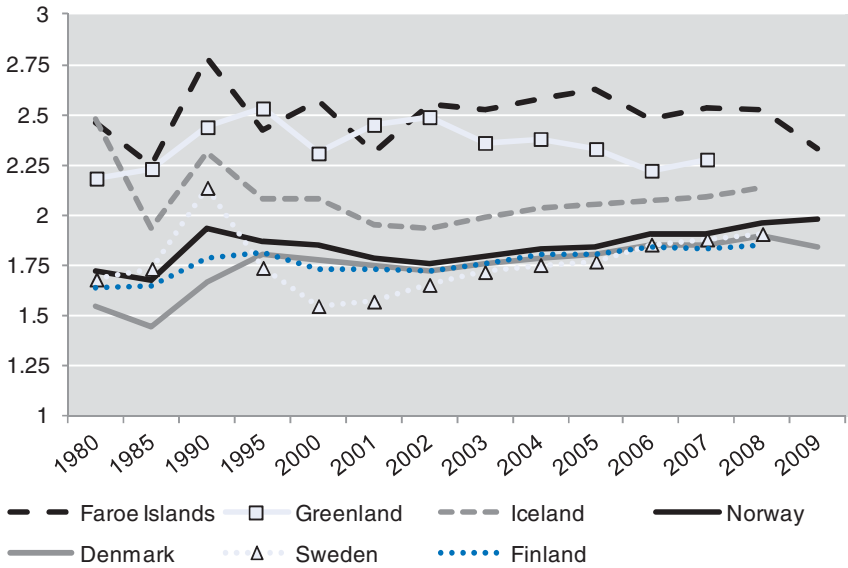
- It is important to manage the economy so that there are visible opportunities for potential returning families.
- It is also important to ensure that the existence of these economic opportunities is widely disseminated in expatriate communities and to create facilities for the immigrants wishing to return.

Current high fertility rates cannot be counted on in the future.

Fertility rates are currently high enough in parts of the NORA region to result in a slowly growing population, assuming no external migration effects. Fertility is highest in the Faroe Islands and Greenland and somewhat lower in Iceland and Norway, which are near, or below, levels that would result in zero natural population growth (Figure 2.1). Even so, the rates in all four territories are higher than those of Denmark, Sweden or Finland. Yet during the last ten years, fertility rates in the Faroe Islands and Greenland have tended to fall, while they have increased regularly in the rest of the Nordic countries. If the Faroes and Greenland evolve along the same path, a significant drop in fertility rates will lead to further population challenges. The main exception to this phenomenon could be the Inuit population of Greenland, which maintains a birth rate in excess of that required to maintain a stable population, but, even among the Inuit, birth rates have fallen in recent decades after peaking in the 1950s–1970s (Marquardt, 2002). Canada and the United States, OECD countries with significant indigenous populations, are seeing important demographic shifts in some regions in which the indigenous population is a major share of the total population and there are different fertility rates among various ethnic groups.

Low fertility rates become a more important issue when viewed alongside high rates of female outmigration, especially among younger women who do well in school. Many OECD regions are experiencing high rates of female outmigration as young women leave rural areas for better opportunities in cities. As the ratio of females to males declines, higher fertility rates are required to maintain the population. Should domestic fertility rates drop to a level associated with zero population increase, the role of international migration becomes even more crucial. Net immigration is usually strongly associated with a growing economy and ample job creation. For the NORA region to maintain current population levels, or increase them, there will have to be strong economic growth.

Figure 2.1. **Fertility rates in the NORA region and Nordic countries**



Sources: Nordic Statistics and *OECD Regional Database*.

A deteriorating demographic structure and increasing ageing of the population will place heavy demands on public budgets

Another consequence of falling birth rates and considerable youth outmigration is an increasingly unbalanced population structure. Initially, the effect of low fertility on the demographic structure is masked because the younger cohort is a small share of the population. Over time, however, as these smaller cohorts of females reach reproductive age, their low share of the population results in further population decline, because fewer women give birth. The process leads to an accelerating drop in population, as each generation produces a smaller number of replacements for those who die.

As shown in Chapter 1, NORA territories, like most OECD countries, will experience significant ageing in the next decades, especially in smaller settlements, which tend to have a higher share of elderly people. As the population ages, the share of people in the workforce declines and the growing burden of supporting old age pensions and public services falls upon a smaller number of workers. In addition, there is increased demand for social services for the elderly, and this often requires significant new investments in health care, senior housing and public transport. This is an

important challenge, not only with social impacts but also with a bearing on the future functioning of municipalities, which deliver a considerable share of public services in the NORA territories.

The dispersed settlement pattern of the NORA region presents several challenges

The settlement pattern of the NORA region was largely shaped by the historic role of communities in the fishery industry. Communities were established to exploit site-specific natural resources. Traditional fishery was highly localised: each community fished a specific territory and fish processing took place in small plants that relied on local labour. These small communities had limited public services and obtained most of their goods and services from nearby trade centres. More recently, the technology employed in fishing and in fish processing has reduced the number of boats and the number of people involved in both fishing and in fish processing. As a result many of the smallest communities in the NORA region no longer have an obvious economic function. Small rural communities specialised in the production of a limited number of goods require sufficient export revenue from sales outside the community to survive (Box 2.3).

Box 2.3. **Export base models**

While export base or economic base models are often criticised, they remain an important tool for regional economics. In particular, they can play an important role when thinking about the nature of local economies in rural areas and identifying strategies for economic development. The fundamental assumption of export base models is that there are two types of economic activity in a community. Some part of the local economy is oriented to creating goods or services that are sold to other regions, while other parts of the local economy are oriented to providing goods and services to be consumed within the region. While both types of activity are important, the distinction is central to the logic of the model.

Few economies are able to produce locally all the goods and services that residents want or firms need as inputs. These have to be purchased from external sources. The basic sector of the local economy is the part that sells its output externally and generates the revenue for the community to buy imports. The idea is particularly powerful in rural communities because they tend to be small and specialised in the production of a limited number of goods and services, so that much of what resident firms and families consume has to be imported. Unless the community receives ongoing income transfers, it has to generate enough "export" revenue (from sales outside the community – not necessarily from sales

Box 2.3. **Export base models** (*cont.*)

abroad) to pay for its imports. In urban areas, by contrast, a far higher share of final demand can be met from local sources, so the internal dynamics of the economy are more complex and more dominant.

The second part of export base theory deals with the role of the non-basic, or local, component. Production sold for local demand is important because it may be an intermediate input in the production of an export good, or because it is consumed by workers in an export activity. Thus, a firm producing lumber that is sold to another firm that produces chairs for sale overseas is a key part of the production process. It is important to emphasise that export base theory differentiates the two functions – a distinction that goes beyond the usual categorisation of 'tradable' and 'non-tradable' activities. Wood and chairs are both tradable goods, but their functions in the local economy differ. If there was no demand for chairs there would be no demand for lumber. Conversely, it may be possible for the chair manufacturer to import wood. Most importantly, if chair sales increase or decrease, there is a direct effect on the sales of the lumber firm. If the chair manufacturer fails, the lumber producer may be able to export its output, perhaps quite profitably, to furniture makers elsewhere, but the impact on the local economy as a whole may nevertheless be negative.

The share of basic and non-basic activity can be determined in a number of ways. Some sectors such as tourism are inherently basic, because tourism by definition involves customers from somewhere else who buy a tourism experience locally. Some services are effectively non-tradables and are thus by definition non-basic. Other sectors may be harder to classify. Retail establishments may sell some of their goods locally while some are exported. By segmenting economic activity on the basis of sales or employment into these two categories, it is possible to determine the share of non-basic and basic activities. The ratio of non-basic to basic activity provides a simple multiplier. If exports increase by some amount then total economic activity will increase by the multiplier times the increase in exports. A simple development strategy for a rural community consists in the first place in increasing exports and in the second place in ensuring that there is adequate capacity in the non-basic sector to support the economic base. The logic of the model suggests that some sectors/firms are more important than others, because they are, in a sense, the locomotives that power the local economy.

Consolidation of the fishing industry has allowed a small number of places in each territory to expand the number of jobs in fishing and fish processing, even though total employment in the sector has declined, but the number of settlements that have benefitted from consolidation is far smaller than the number that have seen reductions in employment. In addition, there has been a trend in public service delivery to offer services in larger-scale facilities that serve bigger populations. This has led to regional centres

which take the place of a more spatially dispersed service delivery system. The result has been pressure for settlement consolidation that has been enhanced by population ageing and migration from smaller settlements to bigger towns. A similar pattern exists in regions that historically relied upon agriculture. In the OECD, many rural communities dependent upon farming are confronting economic decline and loss of population. New production and transport technologies have resulted in fewer, but larger, farms and these larger farms no longer rely on local merchants for inputs or to purchase their crops. As a result, a few communities grow and they become the new regional service centres, while other nearby communities see firms close and people leave.

The concentration of population in fewer viable settlements may offer some benefits…

There is an open debate in some NORA territories, especially in Greenland[3] over the potential for encouraging the further concentration of population in a smaller number of more viable settlements. Demographic trends, combined with the existing sparse settlement patterns, are raising questions about the benefits of settlement consolidation. As the resource sector moves towards more capital-intensive methods and larger-scale production, the economic rationale for many smaller settlements is disappearing. In Greenland, some argue for concentrating population and workers where emerging activities linked to the mining industry and the new aluminium smelter plants are located. Concentration of population and workers is expected to have at least four effects in the long term:

- It will allow for a supply of labour in the places where new job opportunities are appearing and can thus enable diversification from traditional activities (mainly fishing and hunting) to new emerging activities.
- It will make it easier, and cheaper, to provide key public services such as education or health, because economies of scale can be achieved.
- It will reduce the pressure on public expenditures and allow a greater concentration of public investment on infrastructure, because less transport and electricity will be needed in small remote places.
- It will give the population the possibility of receiving better public services.

To help overcome the distance barrier, the government of Greenland has introduced a mobility act which allows municipalities to apply for relocation support for workers and their families wishing to take advantage of job

opportunities. If granted, recipients' transport and relocation costs are covered by the government.

…but forced consolidation has social as well as economic costs, and the benefits are not always clear

For settlement consolidation to result in significant savings in service delivery, resettlement on a significant scale is needed and some places have to be abandoned. This usually involves a greater degree of compulsion than most democratically elected governments choose to impose, especially since older residents of small villages often maintain strong attachments to their communities and resist relocation efforts. Typically, governments are unable to deny services to people who refuse to leave a community. Compensation can motivate some people to move, but this may have the effect of raising the unit cost of providing services to those who remain.

In Greenland's experience the long-term social consequences of relocating rural populations to larger settlements are often not good for the older generation and unskilled workers. If people have artisanal skills that are useful in their original community, they may be able to be reasonably self-sustaining with limited transfer payments. If they are relocated to an urban context and lack the skills needed for wage employment, or if employment opportunities are limited, they typically become completely dependent upon transfer payments and further interventions may be needed to deal with health problems or problems of social maladjustment arising from the relocation, such as alcoholism, drug abuse and violence. Another problem is the housing costs connected with relocation, not only for the individuals moving to more expensive dwellings in the larger towns but also for the public economy. In Greenland the government ensures public housing and has responsibility for the housing infrastructure and housing facilities. In cases of relocation this means increased public costs and greater pressure (and longer waiting lists) on the public housing facilities. At the same time, most isolated or sparsely populated villages now have an older work force that is rapidly approaching retirement age. As older unskilled workers have few prospects for employment in new activities, relocation schemes would effectively put part of the current workforce into a dependency situation. This means that savings in public service delivery associated with community consolidation may be offset to a greater or lesser extent by higher outlays on income maintenance. In this regard, any resettlement measure should be clearly planned from a social and labour-market perspective. Moreover, the experience of Newfoundland and Labrador in Canada (Box 2.4) suggests that it may be better to allow people to remain in their traditional environment where only supplemental support is needed.

Box 2.4. **Resettlement in Newfoundland and Labrador (Canada)**

From 1954 to 1965 the government of Newfoundland and Labrador tried to resettle residents of the smallest fishing communities in the province in larger centres. Many of the fishing ports had fewer than 300 residents and lacked a local government or any public services, such as education or medical care. Most were inaccessible except by boat and were facing economic decline as the fishery modernised. Financial aid was provided to each family, but only if the entire population agreed to move. In 1965 a joint federal-provincial programme was introduced that provided more money per family and reduced the share of the population that had to agree to move from 100% to 90%. This share was further reduced to 80% by 1972 when the programme was ended.

Although over 300 communities and 30 000 people were resettled, the programme was highly controversial. Families felt pressured to move in order to allow their neighbours to move. More importantly the promise of a better life did not always materialise. Traditional family and community relationships were destroyed and while those who relocated had access to public services they often found it difficult to find jobs and become part of their new community.

While there is no formal resettlement programme in Newfoundland and Labrador today, the same issues remain. The closure of the cod fishery in 1992 eliminated most of the inshore fishery the small communities depended on. While new fish species, particularly shrimp and crab, have replaced the cod revenue, the new fishery relies upon a small number of boats that operate far away from their home port and land their catch at central processing facilities. Newfoundland and Labrador still faces the problem of delivering expensive public services to small remote places where the population is ageing and shrinking. Now however there is a growing sense that the best solution is managed decline.

Source: Heritage Newfoundland and Labrador, *www.heritage.nf.ca/law/resprogram.html*.

As governments struggle to reduce unit service costs, the twin pressures of consolidation of traditional businesses and consolidation of public services in most peripheral communities mean that their survival hinges upon identifying a new economic function (Box 2.5). Certain emerging sectors, such as renewable energy, which is for the most part rural, could offer rural regions some opportunities. Tourism represents a significant alternative for some locations (see section 2.3). Some places with good natural amenities are able to attract tourists who become part of a new export base activity. But tourism hinges upon good natural amenities and good connections to the outside world. This suggests that if governments want to revitalise rural areas as tourist destinations, they will have to

improve the transport infrastructure. Improved transport is a two-edged sword. It lets people out as well as in. Many places have found that with better roads or other means of transport more firms and residents leave, because the cost of exit has been lowered. In this regard, co-ordination between transport infrastructure and other economic development policies will be crucial to improve the conditions, capacities and competitiveness of peripheral locations.[4] The potential prosperity of a location will therefore be determined by drivers such as human capital, entrepreneurship, access to innovation and technology, good infrastructure, and access to business and financial services.

Box 2.5. **Rural communities, youth migration and economic decline**

Outmigration has been a common phenomenon in small rural communities of OECD countries for a long time. In fact, much of the growth of cities in OECD countries in the 19th and early 20th centuries came from rural migrants. Ambitious rural youth left for better jobs in urban areas. However, at that time the population of rural communities remained constant or grew slightly, because families had many children and only some left. Enough children stayed to allow outmigration but also maintain community size. What changed in the latter part of the 20th century was a decline in rural birth rates and reduced demand for labour in traditional rural industries, such as agriculture, fishing and forestry. The combination of small families and fewer local employment opportunities has made it difficult to maintain community viability. While the number of children leaving has not changed very much, they now account for a larger share of all children. Although many rural communities are actively discussing how to attract new migrants, there will be little chance of increasing the local population without an increase in the demand for labour. In the NORA region, where there has been growth in some localities, either because of mine openings, oil and gas production, new aluminium smelters or the harvest of a new fish stock, settlements have seen population growth. Settlement viability is mainly driven by having an economic function.

Challenges for public service delivery

All OECD countries face the challenge of providing basic public services in small settlements. Over time, the public's expectations about the level of services that should be made available to all citizens have increased, and changes in technology have led to larger minimum scales for delivering specific services. For example, a one-room school is no longer seen as a viable approach to education. Additionally, a community must now have a

broad set of high-quality public services if it is to attract new migrants and new firms.

In the NORA region the issue of public service delivery is particularly challenging for three reasons.

- The NORA economies are individually so small that, especially in the most peripheral locations like the Faroe Islands and Greenland, it is difficult to provide some public services (*e.g.* higher education or specialised health services).
- The region relies on air and sea links for a much greater share of transport than the OECD average, and this increases the difficulty of service delivery to small or isolated locations. Air travel is quick but very expensive and the volume and weight of goods that can be shipped are limited. Sea transport is slow and expensive for small quantities. Moreover, both airports and ports are expensive to build and require specific geographic conditions.
- A considerable, albeit declining, share of the population is located in very small isolated communities. This makes it hard to provide services jointly to these places and raises the unit cost of service delivery. Yet because much of the population is older there is high demand for public services.

In many remote rural OECD areas there have been significant advances in delivering public services. The crucial step has been to focus on service outcomes, rather than on the specific means of delivery, and to engage the local population in identifying which services are most important and the ways to provide them in a cost-effective manner that meets local needs (OECD, 2010a). Many of these approaches rely on the mobility of the service provider or the service user to achieve minimum efficient scale. In much of the NORA region these approaches are less likely to be useful because of the high cost of moving people between isolated communities. The situation is particularly difficult for Greenland owing to the reliance on air travel and the problem of weather-imposed breaks in air service. In the Faroe Islands the completion of the system of tunnels and bridges that links most of the larger islands has created road connections which have greatly increased opportunities for the mobility both of service providers and service users.

Information and communication technologies (ICTs) can play an important role in service delivery

ICTs are both a service that has great value of itself and a vehicle for delivering other services. The Internet offers a means of delivering public services such as health care and education in remote areas. E-health is being used in OECD countries as a way to provide better and more cost-efficient health services in sparsely populated and remote areas. Rural hospitals are using the Internet to allow specialists in large hospitals in urban centres to provide diagnoses and advice on treatment. The result is greatly improved medical outcomes (Box 2.6). Similarly, distance learning and e-books provide small rural schools with classes and resources that cannot be provided locally. The Internet also allows firms in small and remote places to tap national and global markets for both sales and inputs. This makes the presence of high-speed broadband an important public service in communities of all sizes. As shown in Chapter 1, Internet coverage in the NORA region is good, but better and more efficient coverage in rural areas and peripheral localities is needed. Greenland needs to broaden the coverage, and the price of Internet services is high in the Faroe Islands.[5] OECD countries implement different measures to ensure Internet availability in remote areas. The EU's Northern Periphery programme has also developed specific programmes to reduce the digital divide in remote and rural areas (Box 2.7).

The Internet can also promote good business opportunities

The Internet has also become an effective tool for rural firms seeking to penetrate distant markets in urban areas. The availability of extensive and efficient ICT connections, accompanied by well-developed ICT utilisation skills among the general and business population, is a necessary condition for the development of new activities. Internet technologies are a relatively cheap way to market a firm and a way for firms from remote locations to acquire information about new techniques and new suppliers. Prior to the general availability of the Internet, firms in remote areas were largely restricted to local markets which may have been too small to allow them to grow or even to be viable in the longer run. Now a firm in a remote place can potentially produce a specialised product that can be sold around the world. At the same time, however, such firms may face tougher competition at home, since the Internet also provides rural households and firms with the opportunity to source many more things from remote providers.

Box 2.6. **E-health in Norrbotten county, Sweden**

Norrbotten county in Sweden offers a practical example of how e-health can provide more efficient and less costly health services. Access to health services in remote, large and sparsely populated regions like Norrbotten creates challenges for the patients and the county: long distances to get medical attention and high costs per patient, as well as a large share of elderly in the population, which means both low per capita tax revenue and high spending needs. In this regard, Norrbotten has been a pioneer in implementing and getting results from e-health services. Videoconferencing is used in several services: neonatal care, psychiatry, pathology, haematology, physiotherapy and transmission of real-time ultrasonograph examinations. This allows, *inter alia*, daily videoconferences between hospital and local psychiatric units, planning of care activities and exchange of information on patients needing specialist in-patient treatment. Nurses taking care of the elderly can perform basic exams, send the results via the Internet and discuss them with a doctor who is far away. In this way, the care provided by nurses is much more efficient and the patient is moved to a hospital only when there is a true need. In addition a remote-controlled "robot" has been developed for examining patients suffering from a heart condition. This robot makes it possible to examine at a distance, through the use of video, ultrasound images or a remote-controlled stethoscope. Doctors 200 km away can partly monitor patients. Finally e-health services have led to trans-border co-operation between peripheral counties and municipalities. For example, health care providers of Norrbotten and North Finland co-operate to bring health services to the Torne Valley. All have reported several benefits for the county: better access to health services; fewer visits to the doctor and fewer stays in hospital (providing more at-home attention) with a consequent saving of time, private and public resources; access to specialists beyond county borders and throughout the county; and reduction of pollution due to less travelling.

Source: OECD (2010), *OECD Territorial Reviews: Sweden*, OECD Publishing, Paris.

Box 2.7. **Spreading the use of ICTs in rural areas**

OECD countries have introduced different strategies to ensure increased use of technology for learning and delivering care in rural areas. In Spain, the strategic project on the Information Society of Extremadura, based on the fundamental principles of connectivity and technological literacy, led to the development of a powerful communications network and to the provision of broadband access to Extremadura's 383 municipalities. Finland's Kainuu Broadband Strategy is a regional approach taken by the Ministry of Transport and Communications. It aims for full wireless coverage in the region through Wimax (Worldwide Interoperability for Microwave Access) technology, the most cost-effective alternative for the region. The pricing for services in rural

Box 2.7. **Spreading the use of ICTs in rural areas** (*cont.*)

areas is comparable to that for urban customers. The strategy is part of a broader Information Society Strategy for the Kainuu Region which involves not just improving the technological infrastructure but also training and support programmes, a multi-channel communication network and decentralised content production.

In Germany the government launched a pilot programme, Practical Solutions to Close Broadband Supply Gaps, in six "problem municipalities" to address the problem of broadband accessibility. A working group on nationwide broadband supply was formed under the direction of the Federal Ministry of Economics. Participants included representatives from central and local governments as well as private actors. The objective was to achieve the widest broadband coverage possible (*i.e.* coverage of more than 99% of households) through market solutions, thus limiting the use of subsidies. A broadband atlas developed by the Federal Ministry of Economics helped to identify market opportunities for enterprises and areas in need of government action. Preliminary findings revealed that: *i)* market solutions are feasible in many areas, even sparsely populated ones; *ii)* 20 to 30 local customers are enough to realise economically viable (wireless) solutions; *iii)* there are opportunities for small and medium-sized enterprises (SMEs) owing to the dearth of major suppliers in rural areas.

The objective of the DARRA project, supported under the European Union's Northern Periphery programme, is to decrease the digital divide in remote and rural areas among the partner regions (Finland, Ireland, Norway and Sweden) by boosting the use of ICT by SMEs and the public sector, and to improve the region's overall competitiveness. The digital divide is an inter- and intra-regional handicap and one indicator of a region's peripherality. Stronger regional ICT applications are intended to lead to *i)* reinforcement of exchanges with more central and developed regions; *ii)* more complete regional ICT-related applications; and *iii)* jointly developed approaches. The aim is to reduce effectively and sustainably the peripheral character of the partner regions. Levels of ICT maturity have been indicated with an e-ladder (a measurement tool developed under the auspices of the DARRA project) to identify the development needs of each participating company. Development activities are ongoing and SMEs' ICT maturity levels will be measured to assess the progress they have made.

Sources: *www.northernperiphery.eu*; Knaut, Peter (2008), Session IV, OECD Rural Development Conference, Innovative Service Delivery, Meeting the Challenges of Rural Regions, Cologne, Germany, 3-4 April, *www.oecd.org/gov/regionaldevelopment/cologne*; Karjalainen, S. (2007), "Bridging the Broadband Gap in Rural Areas", presentation to the OECD mission, Ministry of Agriculture and Forestry, including also slides from Karppinen, V. (2007), "Access to Broadband in Remote Rural Areas: Developing Information Society in Kainuu Region", Kainuun Nuotta Association, Kainuu, 4 May.

The inherent potential of ICTs must be exploited to the full if the NORA region is to achieve higher levels of economic activity and prosperity. E-health or e-education can support a more efficient and cheaper provision of services in remote locations. E-commerce can promote business opportunities, exchange of services and job creation in the more remote communities (Northern Periphery, 2006). Enhancing the take-up and effective use of ICTs by SMEs, learning institutions and communities will be central to future success.

The Internet is not a panacea for rural areas. To be an effective tool for business, there must also be good physical connections that allow goods to be shipped and customers to travel. To provide other services via the Internet requires a significant investment in training and in modifying practices so that the new delivery mechanism actually delivers useful services. In small and remote places, it is also important to consider private firms and local non-profit and community organisations as providers of services that might be provided by government in larger locations. Non-traditional providers can often integrate the service into their primary activity and achieve an acceptable outcome in a different way at significantly less cost. For example, in England the government has used village pubs as local post offices. This gives the pub a secondary source of income and provides postal services in places that cannot support an autonomous post office. In Canada, local pharmacies play a similar role in housing post office facilities. In Scotland retail or central eating establishments in an area often fulfil a tourist information function.

Economic vulnerability

Economic dependency exists when the local economy is highly reliant upon external support for its well-being. An economy can be both dependent and prosperous, and the NORA region largely fits this description, given its heavy reliance on transfer payments and relatively high standard of living, but this situation leaves it vulnerable to exogenous changes in political or other circumstances. The Faroe Islands and Greenland receive annual block grants from Denmark, a considerably smaller amount in the former than in the latter,[6] while coastal Norway benefits from large fund transfers from the Norwegian government. Only Iceland, an autonomous country, does not receive transfer payments. These transfers fund a significant share of the public sector in the recipient regions, thus allowing a high level of public services and reduced need to fund these services out of local taxes. They also underlie the surprisingly low openness to trade of these economies: normally, very small economies have extremely high trade turnover-to-GDP ratios, but transfers mean that these economies are much more oriented to non-tradables than they would otherwise be.

A second source of external vulnerability is more indirect and stems from very heavy reliance on an extremely narrow range of commodity exports. Glomsrod and Aslaksen (2009) show that, compared to OECD countries, the NORA economies have an unusually high share of GDP from raw materials production and the public sector. The problem with dependency is that external political authorities often shape local economic conditions. This makes it more difficult to identify effective, locally based economic development strategies. Increased resource scarcity should increase the interest of the external world in the NORA region, and while higher rates of extraction may increase income, the volume of resources removed and the net return to the region will largely be determined by outsiders.

Distance and low density of population create barriers to economic growth…

As mentioned in Chapter 1, there are only four cities with a population of more than 100 000: three in coastal Norway – Bergen (256 000), Stavanger (121 000) and Trondheim (168 000) – and one in Iceland, Greater Reykjavik (201 000). The remaining cities are all quite small by OECD standards, especially when one considers that they play the role of either national capitals or regional centres. Typically, size is highly correlated with the range of goods and services available, with larger cities having more complex economies which offer a broader range of goods and services. In the NORA region the small size of urban places and the small populations in rural hinterlands lead to local economies that rely heavily upon imported goods and services. Thus, the development context of the NORA region closely resembles the situation in most rural regions of the OECD, where the penalties of distance, low density and lack of critical mass are significant barriers to economic growth.

Regions that have large internal populations, are well connected to other regions, and have high per capita incomes tend to have more complex economies than those that are small, remote and poorer. A large internal population allows a region to take advantage of scale economies that create a "home market" effect, which is seen as increasingly important in explaining economic growth (Krugman, 1991). A large domestic market also tends to reduce transport costs, since a large customer base is geographically close to producers. Similarly, regions that are close to other regions also have low inter-regional transport costs; this favours specialisation and increased trade. Finally, regions with high per capita incomes have greater opportunities for a broad range of goods and services and a greater ability for niche producers to survive on small sales volumes.

…but peripherality also creates some opportunities for local production

The case of NORA is different. While per capita incomes in the NORA region are high by world standards, the individual economies are small in terms of population and distance from each other as well as from global markets. Small scale leads to high unit production costs in most industries and distance means high transport costs for intra-regional and external trade. However, the NORA members' also isolated nature conveys certain advantages. Because external firms do not see the markets in the NORA region as either big enough or close enough to offer adequate returns, there is often more opportunity for local firms to prosper. High transport costs combined with high per capita incomes create a larger internal market than might be expected in places with small populations. For example, Torshavn, the capital of the Faroe Islands, has a population of 18 000, yet it is able to support a relatively sophisticated retail and restaurant sector that offers items far superior to what would be found in a city of similar size in Europe or North America. Similarly, Iceland, with a population of 300 000, has an international airline that is able to compete with airlines in much larger countries. Of course, this comes at a relatively high unit cost, but in essence local producers offer high unit production costs with low transport and distribution costs, while foreign producers offer low unit production costs with high transport and distribution costs. For consumers prices are high in either case. Because local firms often predominate, it would seem that they are in fact the low-cost providers of goods and services. Prices in the NORA region will inevitably be high relative to larger places, no matter whether the goods are produced locally or imported. However, in the first case there is an opportunity for a more complex economy which may be able to export certain high value, niche items, while in the second the economy will be weakly integrated into global supply chains, but restricted to producing a narrow set of primary products.

Shared peripherality points to the benefits of stronger links among the NORA economies

For remote territories, a crucial factor for improving economic growth is the development of synergies with neighbours. It is only by pooling limited resources that demand becomes large enough to achieve the gains from specialisation. In this regard, regional co-operation can be thought of as an effort to take advantage of a larger market, just as international trade agreements are driven by the search for increased efficiency in global production. An advantage of adopting a strategy whereby NORA members strengthen internal linkages is the possibility of creating a more diversified

and more highly skilled labour force. With a focus on a narrow comparative advantage, the NORA region will remain dependent on external markets for primary and semi-finished products, with prices set in international markets. These markets are largely driven by cost efficiencies and lead to lower wages, simplification of workforce tasks and the substitution of capital for labour. This is an economic structure that will encourage continued outmigration of skilled workers who face limited local opportunities.

Currently in the NORA region, there is only limited competition among producers of any particular good or service, because the local economy is too small to support more than one or two firms. As most firms are small, they tend to have limited employment opportunities and limited export potential. While it is unlikely that most firms in the NORA region will ever become large exporters, even modest export sales would contribute to firms' viability and perhaps increase employment. In a small community, and in a small region, modest increases in employment can have large impacts.

The crucial question is where the most promising export opportunities for small businesses beyond the traditional raw materials sectors are most likely to be found, and it may be *within* the NORA region. Another key question is how great the potential for stimulating further intra-NORA trade might be, given the distances involved. It is likely that for some products and services, trade would simply add high transport costs to the high unit costs already characteristic of the region. In other sectors, it is possible that sufficient scale economies could be realised to offset the transport costs. Trade theory now recognises that the bulk of OECD countries' trade is with other OECD countries. Traditional trade models are based upon simple comparative advantage arguments that suggest national specialisation, but modern trade theory recognises that varieties of broad product categories create opportunities for trade. Thus, countries that produce automobiles also trade automobiles with each other. However, as noted in Chapter 1, such intra-industry trade tends to increase with product sophistication and differentiation and is very limited in the case of primary products, except when seasonal or other factors make it attractive. Greater intra-industry trade among the NORA economies, which rely mainly on exports of primary products, will therefore depend to a great extent on how successfully secondary manufacturing develops.

Restructuring transport networks

For the western part of the NORA region, ship and air are the only external means of transport. At present, transport patterns are strongly oriented to Denmark. This is particularly true for air travel. As shown in Chapter 1, on most days of the year the only way to travel from one NORA

member to another (or, in the case of the Faroe Islands and Greenland, to other potential markets like Canada or the United Kingdom) is via Copenhagen.[7] In Greenland, several attempts during the last 30 years to open up alternatives to Copenhagen (Iceland, the United States and Canada) have only lasted for short periods, simply because the volume of traffic was insufficient to maintain an economically viable connection. However, a year-round route has been established between Reykjavík and Nuuk and seasonal routes have been established between East Greenland and, and Reykjavik. In the Faroe Islands, historical, institutional and economic links with Denmark and low passenger flows result in an international transport system anchored in Denmark, with few connections with much closer neighbours, such as Scotland or Iceland (Table 1.11). The exchange of goods and services exhibits a similar pattern with respect to shipping: while there is some intra-member maritime connectivity, it is limited and a large share does not involve several NORA members. This type of transport network establishes a core-periphery relationship between parts of the NORA region and Denmark and restricts internal trade or the development of regional businesses. Not only Iceland, but a full range of cities in the North American Atlantic coast are closer to Greenland than Copenhagen, which is 3 600 km from Nuuk.

Improved transport infrastructure is crucial to overcoming the challenge of remoteness

Better and geographically more diversified transport infrastructure is needed to ensure the sustainability of communities and to improve the region's competitiveness. An efficient transport network is essential to business development, as it reduces transport costs and improves market accessibility. In addition, transport infrastructure enhances labour mobility, firm relocation, and access to public and businesses services. Finally, efficient connections between the NORA territories are crucial to enhancing their social, educational and economic interactions. A key area of importance in this context is the need to improve air and sea links between the different NORA territories and the international hubs. Some studies have been made to identify improvements to existing and potential strategic transport links in the NORA region (NORA, 2010). These and further feasibility studies are necessary to obtain qualitative evidence to support and promote the strengthening of the regional transport networks.

Transport improvement is challenged by the lack of critical mass

The lack of critical mass makes it difficult to further develop and diversify the transport network, especially in territories such as Greenland

and the Faroe Islands. There are few direct transport connections among the NORA members, largely because the expected volumes are too small to justify them. This results in a typical catch-22 situation, since the absence of connections can be a major impediment to the development of trade and business. Moreover, because transport is now via Copenhagen, an effort is required to identify market opportunities in the NORA region, while it is relatively easier to identify opportunities in Denmark.

A reconfiguration of transport networks could help

Before business or trade takes place there has to be contact. While the Internet now provides an effective initial way to explore opportunities, there is still a need for face-to-face contact. If this contact is hard to manage, there is less chance that market opportunities will be acted upon. The impression of public officials in Iceland[8] is that firms in both Iceland and Nova Scotia showed considerable interest in exploring trade opportunities during the brief period when Icelandair operated direct flights between them. When the flights were suspended, the interest evaporated.

Reorganising transport routes in the NORA region may be somewhat easier than in other places. Where transport is land-based, existing road and rail networks largely dictate transport corridors. The cost of creating a new route is high, because constructing the road or rail line requires large investments. By contrast, in the NORA region, where planes and ships provide transport, no investment in spatially fixed transport infrastructure is needed when routes change. Existing ports and airports can be used for any destination.

However, if the transport network is to be reoriented it will only happen if NORA members choose to act together. Improved integration is largely a public good and private transport operators have little incentive to invest in costly route changes that primarily benefit others. Indeed, because the popular perception is that the four territories are largely competitors, public efforts may be needed to stimulate the shift in behaviour necessary to make a new route structure viable. The experience of Scotland's Route Development Fund points to the potential positive impacts of public incentives to expand and diversify international air-traffic routes to help develop a region's economy (Box 2.8).

Box 2.8. **Scotland's Route Development Fund**

The Scottish Air Route Development Fund (RDF) was established in November 2002 as a partnership involving the Scottish Government, Scottish Enterprise, Highlands and Islands Enterprise, and Visit Scotland. The objective was to improve business connectivity and inbound tourist access through the provision of incentives and public funding to initiate new direct overseas air links to Scotland. Prior to the RDF, most international traffic to Scotland was routed through hub airports such as Heathrow. The RDF contributed to a dramatic improvement in Scotland's direct international air network by concentrating on routes that helped business and in-bound tourism. A recent evaluation of the RDF carried out by Scottish Enterprise found that over its period of operation, there was a steep rise in both domestic and international air passengers. A wide range of Scottish and non-Scottish users benefited from the RDF services, and migrant workers, in particular, depended heavily upon RDF-supported flights to access jobs in Scotland. The review showed that nearly all RDF services return a positive net present value and benefit-to-cost ratio greater than 1, which suggests overall good rates of return, with some instances of very high rates of return. The RDF appears to have had an overall positive impact on business perceptions of Scotland and airline industry risk aversion. As of January 2010, 31 routes continue to operate as result of investment from the Fund. The RDF ceased in its current form at the end of May 2007. However, routes started by that date remain eligible for funding. The Scottish Government has been exploring how route development could progress further.

Source: Scottish Enterprise.

Better transport infrastructure would be facilitated by a parallel process of economic development

Improvement of the transport infrastructure system would be facilitated by a parallel enhancement of the region's competitiveness and economic activity. Promoting innovation, further economic diversification, upgrading the institutional framework for business development, education and working skills appear to be crucial (see section 2.3). Strengthened regional co-operation could result in further economic, academic and institutional interchanges. This, in turn, would contribute to economic development, more regional businesses, trade and human flows, and with this a better framework for developing and diversifying the transport infrastructure network. At the same time, joint public support for improving and diversifying air-traffic routes in the NORA region would help establish a better framework for developing businesses and improving the region's economic potential.

Beyond the opportunities for strengthened economic interactions, the similarities in framework conditions and challenges shared by the NORA regions, the small size of markets and the limited resources and capacity within each of the NORA territories argue for collaborative efforts, exchange of know-how and best practices, and co-operation to confront some of these regional challenges (see Chapter 3).

2.2. The future of the fishing industry

The Faroe Islands, Greenland, Iceland and Norway have strong maritime traditions. All of the NORA territories have long coastlines and, in comparison to their land areas, extensive ocean territories. As underlined in Chapter 1, the marine sector, and especially the fishing industry, continues to dominate the national economies of the Faroe Islands and Greenland, and it remains a key sector in Iceland and Norway. The fishing industry is also an important employer in the NORA economies, including wider employment in fish processing and products. However, the conditions of the fishing industry fluctuate, owing, in particular, to declining fish stocks, increased global competition and varying market prices. Over-exploitation of fish stocks has increased rapidly, putting the biological sustainability and the economic viability of commercial fisheries under serious pressure. The sector also faces the challenges and effects of climate change. Management of the fishing industry is further complicated by the often conflicting approaches and interests at stake. Strong national and regional interests are involved, but international, co-ordinated management of shared fish stocks is essential. Sustainable development of the sector relies on local responses, such as adaptation within fishing communities. At the same time, international action is required on issues such as over-fishing, management of fish stocks and climate change. Obviously, strong economic interests are at stake, but political, environmental and cultural concerns, such as the sustainability of traditional fishing communities, are as well.

Fisheries and the marine sector in the NORA region: major trends[9]

The economic cycles of the NORA territories have traditionally been linked to the cycles of the fishing industry. Good catches and high export prices resulted in economic growth, while poor catches and adverse fishing and market conditions have led to economic slowdown and even depression (ACIA, 2005). However, the NORA territories face different challenges related to declining fish stocks, increasing global competition and varying market prices, as well as the common challenge of climate change. A more recent challenge is the impact of the global economic crisis. Although some

areas of the industry have not been affected, there have been three main impacts on the fishing industry in the NORA territories.

- The prices of some fish species have decreased. Crucially, cod prices have been falling in Greenland, Norway and the Faroe Islands. Shrimp prices have also fallen, which poses a particular challenge for Greenland, where shrimp is the most important species. It has also affected Iceland, where the shrimp quota was not fished in 2008 owing to the low prices.[10]
- Fewer investments are made in the fishing industry because the banks are very cautious about lending money. This is the case in all four territories, but it has been especially keenly felt in Iceland. Companies, including fishing companies with loans or investments in foreign currencies, have been also negatively affected by the devaluation of the Icelandic kroná.
- High fuel prices are having a serious impact on the fishing industry, making it more expensive to run vessels and much more difficult for some vessels to remain profitable.

In general, while fishing fleets have shrunk, individual vessels have grown larger and more efficient

The commercial fishing fleets in the NORA territories vary in size, type of vessel and forms of ownership. However, there are a number of common trends in the current structure and scale of the fleets. Fishing fleets are extensive and comprise a range of vessels, long-liners, gill-netters, single and pair-trawlers, purse seiners, some ocean-going factory ships, and a large number of smaller coastal vessels. The trend for a long time now has generally been from a small-scale, labour-intensive industry to a professionalised industry based on modern vessels and gear. Vessels have increased in size and in efficiency and need fewer crew members, and the area of operation has expanded from coastal areas to the high seas. However, small-scale fisheries and small processing plants with very simple technology still exist alongside a modern, highly efficient fleet and modern processing plants.

Overall, the NORA fleets are large relative to population, but the number of vessels has been decreasing in the last ten years except in Greenland.[11] Cuts in vessel numbers are linked to a range of factors, including the increasing efficiency of modern vessels, the collapse of some key fish stocks, especially cod, fluctuations in the value of catches and the cost of running vessels. Reductions and restrictions have also been placed on the numbers of licensed vessels. For example, in Norway, an industry-

funded decommissioning scheme was launched as part of a package of capacity-management measures introduced in 2004. Several OECD countries have implemented plans for structural adjustment of fishing fleets (see Box 2.9). Another important reason for a reduction in the number of vessels is the quota management system. One purpose of individualised and transferable quotas is to explore efficiencies through concentration on more efficient vessels.

Within the fleets, a small number of vessels account for a large proportion of the catch. In Norway, pelagic trawlers and purse seiners account for approximately 40% of total landings, although they represent only 2% of vessels (FAO, 2010). In 2007, about 41% of the total catch value in Iceland was landed by trawlers, just over 1% by small undecked boats and 58% by other vessels of varying sizes and capacities (Icelandic Ministry of Fisheries and Agriculture, 2010). In Greenland, too, fisheries remain very concentrated. The trawl fleet consists of a relatively small number of shrimp vessels. Nevertheless, many small villages and settlements depend on small artisanal fisheries: small boats either have to land to central fish collection systems or the activity is for local consumption.

Employment in fisheries has been falling but remains important

There has been an important drop in employment both in fishing and fish processing in recent years. However, as shown in Chapter 1, the sector still plays a vital role in terms of employment and value creation (Table 2.1). Moreover, aggregate fishing statistics may understate the contribution of the fishing industry and ancillary activities to the economies of the NORA territories: backward linkages to activities such as shipbuilding and maintenance, fishing gear production, or fisheries research and education, and forward linkages, including the transport of fish products, fish processing or the production of animal feed, play an important role and create many jobs in the economies of these territories.

The processing sector is a key source of jobs in the NORA territories, although its size has tended to decrease over the last ten years. Processors constituted 42.5% of workers in the fishing sector in Iceland, 37.5% in Faroe Islands (both in 2008), and 34.4% in Coastal Norway (2006). In Greenland (where employment data on fish processing are not available) fish processing (mainly shrimp and Greenland halibut) is the major manufacturing industry. Advances in the sector have led to reduced running costs, less waste and the use of fish waste for processing into marketable products, such as feeds and fish oils, but it has also contributed to a reduction of employment in order to maintain competitiveness. Iceland has been at the forefront of modernisation of the fish processing industry.

Box 2.9. **Examples of structural adjustments of fishing fleets in OECD countries**

Many OECD countries are taking steps to bring production in line with resource availability. This is being achieved through a mixture of resource recovery plans, vessel decommissioning programmes, improved management measures, and the strengthening of fisheries monitoring and surveillance activities. Many OECD countries have been actively reducing the size their fleets through decommissioning programmes in order to better match fleet capacity with available resources.

- Within the European Union, strict capacity management has been established since the new Common Fisheries Policy came into force in 2002, resulting in a 10% decrease in the number of vessels and a 7% decrease in total gross registered tonnage (GRT) up to 2005. Such measures are implemented through two key requirements: any entry of capacity has to be compensated by the exit of at least an equivalent capacity, measured both in terms of tonnage and power; and capacity withdrawn (or scrapped) with public aid cannot be replaced.

- In France measures have been taken to reorganise the industry so as to enable better resource management and promotion. Until 2002, financial measures to reduce fishing had been used in order to reduce the capacity of the French fishing fleet by 3%. As from 2003, the Common Fisheries Policy imposed an additional 3% reduction of the fleet compared to the reference levels at the end of 2002. In order to achieve these objectives, a decommissioning plan was implemented over the period 2003-04 with a budget of EUR 400 million. Furthermore, fleet renewal subsidies were discontinued as of the end of 2004. In 2006, a EUR 26 million decommissioning plan was introduced. It should affect 80 vessels and result in a reduction of 23 300 kW. A plan to protect and restructure enterprises was added to the decommissioning plan for the year 2006 with a budget of EUR 26 million, to make it possible for the fleet format to adapt to the resources available and to improve, in the medium and long term, the viability of fishing enterprises. Under this protection and restructuring plan, consolidation loans are available as well as structural subsidies for replacing engines, upgrading fishing gear, etc.

- In Finland two separate decommissioning schemes (vessel scrapping with community aid) of the Finnish fleet were carried out during 1997-99 and 2004-06. The total capacity reduction with public aid in 1997-99 was 827 gross tonnes (GT) and 4 158 kW. The equivalent reduction in 2004-06 was 1 378 GT and 6 025 kW.

Source: OECD (2008), *Review of Fisheries in OECD Countries: Policies and Summary Statistics*, OECD Publishing, Paris.

Icelandic companies have contributed to increasing quality and yield by improving technology. For instance, Iceland was among the first countries to develop on-board processing equipment that could operate in extremely rough conditions. In Greenland, close to 75% of shrimp catches are processed on board the trawlers, and the remaining catch volumes are processed in factories managed by Royal Greenland in towns and settlements. Some of the plants are not profitable but have been maintained, as they play a pivotal role in the economic life of smaller towns and settlements (OECD, 2005b). How to maximise value added through better, more efficient processing and product development are key issues for the future of the sector in the NORA Region.

Table 2.1. **Share of fisheries and fish processing in total employment**[1]

Percentages

		2000	2002	2004	2006	2008
Faroe Islands	Fishing	13.34	13.49	12.38	11.23	9.6
	Processing	10.05	9.93	8.13	7.48	5.8
Greenland[2]	Fishing	4.65	5.22	4.56	4.89	
	Processing	NA	NA	NA	NA	NA
Iceland	Fishing	3.90	3.38	2.95	2.71	2.35
	Processing	4.28	4.08	3.46	2.24	1.74
Coastal Norway	Fishing	1.75	1.66	1.56	1.44	1.34
	Processing	1.17	1.13	0.94	0.75	0.70

1. Employment in fishing includes fish farming.

2. Employment only includes persons living in towns; it excludes population living in settlements.

Source: National statistical offices.

Measures to promote the long-term sustainability and prosperity of the fishing industry are as important as measures to support the communities most affected by restructuring and to promote alternative occupations. These measures will be especially relevant for smaller towns and settlements in which fishery is still the main – and, in some cases, almost the only – activity. OECD countries facing similar challenges have adopted measures ranging from financial packages to help individual fishing businesses to exit the sector to programmes aimed at training and capacity building in targeted communities (see Box 2.10)

Box 2.10. **Supporting the rationalisation of the fishing sector**

Australia's Securing our Fishing Future package, released in 2005, was designed to create a sustainable and profitable operating environment in Commonwealth-managed fisheries. The package includes an AUD 220 million structural adjustment package, a range of new fisheries management measures in Commonwealth fisheries and the declaration of Marine Protected Areas (MPAs) in the south-east marine region. The financial package included an AUD 150 million one-off, voluntary tender process to allow individual fishing businesses to rationalise or exit the industry, AUD 20 million for community assistance, AUD 30 million for onshore and related business assistance and AUD 21 million for a levy subsidy.

In Canada, the Aboriginal Fisheries Strategy (AFS) includes co-management approaches aimed at building fishing capacity, and incentives to support aboriginal communities' participation in fisheries management. The Allocation Transfer Programme is an integral component of the AFS, which facilitates the voluntary retirement of commercial licences and the issuance of licences to eligible aboriginal groups in a manner that does not add to the existing fishing effort, thereby providing communities with much needed employment and income. Other programmes and initiatives have been implemented to provide aboriginal fisheries with the capacity to manage their commercial fishing operations. Those programmes also aim at improving their participation in decision-making processes for aquatic resources and oceans management, diversification of the catch in the inshore fishery, improving overall fishing skills, as well as improving safety and vessel maintenance.

Source: OECD (2008), *Review of Fisheries in OECD Countries: Policies and Summary Statistics*, OECD Publishing, Paris.

Catches remain high by historical standards but their composition is changing

The evolution of catches in the NORA territories reveals no long-term pattern of decline. Catches in Norway and Iceland have decreased over the last ten years but remain high by historical standards, and landings continue to grow in the Faroes and Greenland (see Chapter 1). Within these broad trends, the type and volume of catches of specific species vary considerably between the NORA territories (see Table 2.2). Within a large variety of fish stocks the most important are cod, haddock, saithe, Greenland halibut, and pelagic fisheries for herring, blue-whiting and mackerel.

Table 2.2. **Key species 2008 or latest available figures (thousand tonnes)**

Species	Faroe Islands	Greenland	Iceland	Norway[1]
Flat fish	4.8	19.5	24.2	14
Codfish	361.9	12.9	507.6	1 100
Other marine fish	142.3	7.9	738.7	1 176
Crustaceans and molluscs	12.3	69.3	12.4	86
Freshwater fish	-	0.02	-	0.6
Total Fish	521.3	109.6	1 283	2 393.3
Aquaculture	38	-	5.1	846.3

1. Figures for Norway are for 2007.

Sources: National statistical offices; Norden Statistics Databank.

In terms of catches, the collapse of high-value fish stocks, especially cod, has had a dramatic impact on the sector, as cod is a high-value catch and a large part of the fishing fleets focused on this species. Greenland and Iceland experienced a peak in cod catches during the late 1980s, followed by a dramatic decline. In Iceland in 2006, cod landings were at their lowest level since 1984. In Norway, catches of cod peaked in 1997, followed by significant fall in subsequent years. This happened in a context where the resource base, not only in the NORA region but worldwide, remains under pressure. Recent data from the FAO indicate that worldwide, 25% of global fish stocks are overexploited or depleted, while 52% are fully exploited (FAO, 2007).

Yet, for some species (*e.g.* prawns, shrimp, halibut, pelagic fish), landings have generally been stable or have increased since the start of the millennium. Thus, the industry has demonstrated some areas of adaptability. For instance, in the Faroe Islands, landings of pelagic fish, which make up the majority of the overall catch, increased after 2000 and peaked in 2006, while other catches remained relatively stable. In Norway over the last ten years, catches of pelagic/industrial species have been relatively stable. In 2008, Greenland's fishery for deepwater prawns was at its highest level for almost 20 years. In Iceland herring catches have also gradually increased since 2000. Similarly, offshore shrimp catches reached their highest level since the mid-1980s in 2007/08. How to continue to respond to changes in the available fish stocks, and how to combine efficiency with sustainability, remain the sector's central concern. As will be discussed below, effective management of fish stocks is closely linked to increased co-operation and to innovation in the region.

Aquaculture is emerging as an alternative to traditional fisheries

In all NORA territories except Greenland, farming of species such as Atlantic salmon and rainbow trout is a significant and growing part of fish production. It is especially important in small coastal communities. The development of the sector is strongest in Norway and the Faroe Islands, where the geography of the coastlines' deep fjords, the clean, temperate waters and strong currents provide ideal conditions for fish farming. The volume of fish farming has more than doubled in both territories over 1998-2008 (Table 1.7). Norway in particular, is a world leader in aquaculture. In 2008, Norwegian seafood exports amounted to NOK 39.1 billion (EUR 4.8 billion), 51.7% of which consisted of farmed seafood; for the first time, exports of farmed fish exceeded those of wild capture fish (NORA/Norden, 2009). Salmon makes up close to 90% of total sales of Norwegian fish farming; preliminary figures for 2009 and early 2010 show considerable growth of farmed salmon, both in volume and value, following the collapse of the competing Chilean industry due to infectious salmon anaemia (ISA). Farming of other species, including cod (11 104 tonnes in 2007), has expanded. In the Faroe Islands, too, aquaculture represents an increasing proportion of production, though fish farming in 2008 still amounted to not much more than 9% of sea catches in live weight.

Fish farming is very vulnerable to sudden collapses because of fish diseases (see Chapter 1.2). The development of fish farming requires strict environmental controls, in order to minimise the risk of pollution, diseases and other damage to the surrounding ecosystem: sea lice, mass escapes and infectious diseases from fish farms can seriously affect surrounding wild fish; escapes can also produce interbreeding (genetic pollution). At the same time, medication, pesticides and fish-farm feed, if not controlled, can also have severe environmental effects. The recent launching of the "Strategy for an Environmentally Sustainable Norwegian Aquaculture Industry" by the Ministry of Fisheries and Coastal Affairs seems to go in the right direction. It identifies the main environmental challenges for the industry, sets goals and explains what needs to be done to achieve them. It does not include specific effect-indicators for acceptable influence (Norwegian Ministry of Fisheries and Coastal Affaires, 2009). Further work is therefore necessary on implementing the concept of sustainability in an appropriate manner. This will require further research and investment in technology (*e.g.* to develop containment systems that protect wild fish from sea lice, mass escapes and infectious diseases).

Fisheries management in the NORA region

The continued development of fisheries relies on effective and sustainable management of the resource. Fisheries management systems are crucial for protecting stocks from over-fishing and for improving the economic performance of commercial fishing industries (Pearse, 2002). Because fish stocks do not follow administrative borders, and because marine environmental challenges have a clear international component, regional co-operation is needed to promote more efficient and sustainable fisheries and aquaculture.

NORA territories apply different approaches to the management of fisheries

Fisheries management systems and approaches are the subject of considerable debate. The NORA regions apply their own, distinct approaches to the management and development of the fisheries sector over their own extensive aqua-territories. In this regard, they have retained a high degree of independence in the management of their fisheries, in comparison, for example, with EU member states. The approaches used for NORA fisheries management vary in detail, but can be divided into two main categories: output-controlled systems, based on shares of allowable catches, and effort-based fisheries management systems, based on fishing days (see Box 2.11). This diversity can be a source of strength, as it provides administrations with the opportunity to learn from each other's innovations (Norden, 2010). Yet differing approaches make greater co-ordination within the NORA region complex, especially as access to fisheries is a politically contentious issue, involving lengthy and complex negotiations and a wide range of interests. Co-operation is a key element of the response, especially for mobile fish stocks. Thus, there is a range of international agreements and arrangements covering the NORA region, *e.g.* the North-East Atlantic Fisheries Commission (NEAFC), as well as collaboration with international institutions (*e.g.* the EU and the International Council for Exploration of the Sea).

Box 2.11. **Output- and effort-based fisheries management systems**

Output-controlled systems are applied in Iceland, Greenland and Norway. They focus on how much fish can be landed. Fisheries rights are distributed in quotas, *i.e.* shares of total allowable catches (TACs). Decisions on quotas generally involve consultation with key stakeholders.

- Iceland was one of the world's first fisheries management systems to base the distribution of quotas between vessels on a system of individual transferable quota shares (ITQ system). Within Iceland's exclusive economic zone TACs for individual fisheries are set by the Ministry of Fisheries and the Parliament, based on advice from the Icelandic Marine Research Institute (Christensen *et al.*, 2009a, 2009b).[1] In particular, a harvest control rule (HCR) for the most valuable catch, cod, was introduced in 1996, which means that this TAC is a direct calculation based on advice from the Marine Research Institute.

- Fisheries management in Greenland is based on a system of licences. Different types of licences are issued, based on time and catch limitations. Each licence states where a vessel owner is allowed to fish, for which species and with what kind of vessel. The quota attached to the licence is expressed in terms of quota shares, and the owner of the licence receives an annual quota. The Greenlandic government (*Naalakkersuisut*) establishes rules on access to fisheries, sets TACs, and determines the conditions under which the fishery should be carried out. TACs are generally based on advice from the Greenland Institute of Natural Resources. The *Naalakkersuisut* also consults with the Fisheries Council, which includes representatives from the fishing industry, mainly from the bigger vessel companies.[2] Finally, regulation of shrimp fishery is based on quotas – ITQs – and licence regulations, while the TAC is based on the biological advice of the North Atlantic Fishing Organisation in order to ensure sustainable use of the resource.

- Norwegian fisheries management is based on quotas and licensing requirements. Three main types of quotas are allocated to different groups of vessels. Individual quotas are then allocated to each vessel, either through individual vessel quotas (IVQs) or through maximum quotas. In the case of IVQs, the group quota is shared among the participating vessels with a fixed portion for each vessel. The system of maximum quota sets an upper limit to the annual catch. Vessel quotas and maximum quotas allocate a fixed maximum quantity of a certain species. The authority to manage Norwegian stocks lies with the Norwegian central government and the Ministry of Fisheries. However, there is consultation with key stakeholders. For instance, the Institute of Marine Research and the International Council for Exploration of the Sea (ICES) give advice for setting TACs for specific species. TACs for Norwegian stocks are then established in consultation with experts, industry representatives and government officials, following hearings held by the Fisheries Directorate and the Management Council.

Box 2.11. **Output- and effort-based fisheries management systems** (*cont.*)

In contrast to the output-controlled approaches use in Iceland, Greenland and Norway, an effort-based system, which replaced an ITQ system in 1996, is applied in the Faroe Islands. The system is complemented by technical measures and area closures (Løkkegaard *et al*., 2004). The Faroe Island's effort-based system is based on the number of days that individual fishermen have the right to fish. The system is structured around a segmentation of the fleet, based on the size of vessel and gear type. Each year the relevant fleet groups are allocated a number of fishing days per year. These days are allocated to the individual vessel, but fishing days are tradable with certain restrictions. The idea behind the fishing-days system is that fishing capacity and the numbers of fishing days are fixed and allow fishermen to absorb and respond to fluctuations. The effort-based system was designed to take account of the fact that fishing for demersal ground fish species in Faroese waters often results in a mixed catch. Basing the management system on a multi-species approach and the ecosystem in which the fishing takes place means that the entire catch is legitimate and has an economic value, thus reducing discard of unwanted fish. TACs for the stocks of the exclusive economic zone (EEZ) are set domestically. Advisory boards consisting of key stakeholders, biologists and active fishermen advise the relevant minister and parliament (*Løgtingið*) in setting the TACs. However, for shared fish stocks, which are mainly pelagic species (herring, blue-whiting and mackerel) the TACs are set in international agreements.

1. Stakeholders play no formal role in the decision-making process. However, representatives of the fishing industry are involved in discussions on the advice of the Marine Research Institute (Christensen *et al*., 2009a, 2009b).

2. The Greenlandic government (*Naalakkersuisut*) is developing a new system. However, at the time of writing the details of this system are not publicly known, although indications are that it will be more formalised and transparent.

Management systems are complemented by a range of additional regulations. For instance, all the systems have restrictions and allowances for different gear types, minimum mesh sizes on nets to prevent catches of immature or young fish, and sorting grids to minimise unwanted by-catch. Closed areas are also used. Some areas are closed during the spawning season. Temporary closures are applied in areas in which there have been high catches of juvenile fish. In the Faroe Islands long liners are not allowed to fish within six miles of the coast. Other areas are closed for trawlers. For instance, in Greenland, trawling is banned within three nautical miles of the skerries; in these areas only passive gear types are allowed. Norway has a number of trawler-free zones, which are permanently closed.

Transferability of fishing rights could help improve the robustness of the sector

Transferability of fishing rights allows for an important element of flexibility and adaptability. The introduction of transferable rights tends to lead to greater concentration of fishing rights in fewer hands. This can increase economic efficiency. Experience in fisheries which have introduced transferable rights has shown that transferability also tends to limit overcapacity, as some commercial fishers sell their rights (CEC, 2007). This can improve the balance between fishing capacity and stocks. Transferability can also be an important platform for co-operation. Once individuals are members of a group that collectively holds exclusive rights to fish, and each has a specified share of the harvest, "the stage is set for co-operation" (Pearse, 2002). Moreover, if individual quotas are secure, long-term and transferable, they are valuable assets and their holders may develop a keen interest in protecting and enhancing them, *i.e*. in developing conservation measures.

Nevertheless, experience has demonstrated that transferability is not a panacea for problems of overfishing or activities such as high-grading (selectively harvesting fish so that only the best-quality fish are brought ashore). Additionally, transferability and potentially excessive concentration can make it more difficult for new entrants, particularly for young people who have to acquire their first fishing rights. It may also have consequences for small-scale fleets, as structural adjustment can lead to higher economic and social costs (CEC, 2007).[12] The extent to which rights can be transferred varies between the NORA territories (see Box 2.12)

Box 2.12. **Transferability of fishing rights in NORA territories**

The fishing-days system operated in the Faroe Islands allows for the transfer of fishing rights. Throughout the year, Faroese fishing vessels can trade their fishing days within a section of the fleet. Fishing days may be leased for one year or sold. In the last three months of the fishing year (from June to August), all commercial fishers can trade fishing days, but only for the remaining part of the current year. However, transferring fishing days between different kinds of vessels is more complex than transferring ITQs (individual transferable quota shares) between similar vessels. Therefore a key for transforming fishing days from one kind of vessel to another has been developed to ensure that as many of the fishing days as possible are used. Trading of fishing days is monitored by the fisheries inspection.

Box 2.12. **Transferability of fishing rights in NORA territories** (*cont.*)

Quota shares in Greenland are partially transferable. The only clear kind of transferability is that quota shares are hereditary. The rules for fishing companies owned by the government are more flexible. Licences or quota shares can be sold if, for example, a vessel is out of order for an extended period, or if ice or similar circumstances prevent the fishing company from using its quotas. However, there are still restrictions. The Greenlandic government (*Naalakkersuisut*) can reduce the quota shares that are transferred and added together. The Fisheries Act sets the maximum quota-share percentage (between 10% and 33.3%) for various fisheries in order to ensure that none of the fishing companies becomes too big. The Act stresses that transfer can only take place within the same fleet component; this means that a vessel can only fish what it is licensed to fish. Additionally, as a general rule, rented quota shares should only be fished by the company that owns the quota.

The core of the Icelandic system is the transferability of quota. All commercial fish species in Icelandic waters are subject to the ITQ system. Quotas can easily be transferred (either on a yearly rental basis or by selling them) between vessels. This is carried out via an online system, which is regularly updated and provides the fishers (and fisheries inspection) with a real-time picture of who over-fished his quota and who still has quota left. As part of this system, a vessel can transfer some of its quota between fishing years, but the quota is lost if the vessel catches less than 50% of its total quota in two subsequent years. There is also a requirement that, within the year, the net transfer of quota from any vessel must not exceed 50%. The quotas are based on so-called cod equivalents, whereby cod is assigned a value of 1 and cod equivalents are calculated as the proportion of the value of individual species compared to the value of gutted cod. The Directorate of Fisheries publishes cod equivalent tables annually. The cod equivalents fluctuate considerably from year to year, mostly owing to changes in market prices. This system was tailored to ensure maximum economic gain from fisheries. The system of cod equivalence also contributes to biological robustness for cod because fishers can catch all other species without owning the quota or having to lease it as the catches are deducted from their cod quota. The aim is to make the system flexible and help to prevent discard.

In Norway, quotas are not directly transferable. Some vessels have a common pool quota; this group of vessels can fish as long as quota is left in the common pool. Other vessels are under a system of individual vessel quotas (IVQs). This is a management mechanism to distribute the Norwegian TAC among different segments of the fishing fleet. The fleet is divided into several groups according to size and fishing technique (trawlers, purse seine, etc.). Each vessel group is then allocated a group quota which is shared among the participating vessels in fixed and (more or less) guaranteed portions. Trade in quota is not allowed, although an informal market has existed. In addition, different quota-transfer systems have been developed to meet the challenge of increasing overcapacity due to technical development in vessels, gear and equipment (OECD, 2008b).

The extensive debates that have taken place over the relative merits of these management systems are beyond the scope of this study. However, when addressing the common challenges and opportunities for co-operation in the NORA region, it is important to recognise the potential contribution of three main features to sustaining the sector:

- In light of climate change, ocean pollution, overfishing and technological advances, there is a need to maintain a flexible and responsive approach to the design, implementation and application of management systems in order to reflect changing social and biological conditions in particular fisheries. At the same time, for the industry to develop, there needs to be some stability in the overall approach to allow forward, strategic planning.

- As mentioned, the ability to transfer rights to others in the sector can help improve the sector's adaptability and robustness. The introduction of transferable rights can lead to increased economic efficiency, help limit overcapacity and provide an important platform for co-operation. Yet safeguards are normally adopted to limit negative economic and social consequences. Most countries that have introduced transferable rights schemes have safeguards, *e.g.* to limit transfers of rights to geographically defined communities or to reserve a share of rights for young people (CEC, 2007).

- Stakeholder consultation in the decision making process is key to securing success in implementing management approaches (OECD, 2008a). Such involvement helps to ensure that the best information is used in the decision-making process and stakeholder buy-in for changes. Any uncertainty in scientific assessments should be clearly expressed to stakeholders, given that many decisions will be made based on less than perfect information (OECD, 2008a). Additionally, in the face of increasing uncertainties about the long-term future of stocks, obtaining agreements on a set of pre-established harvest control rules as the status of the stock changes is of particular importance. This can serve to limit calls for rapidly increasing quotas or for removing restrictions when there are signs of improvement.

Co-operation in the management of fish stocks

The management of fish stocks requires co-operation

Fish stocks migrate and in many cases are shared between two or more countries. For example, in Norway, 90% of the catch comes from stocks that are shared, including with the Russian Federation, the European Union, Iceland, the Faroe Islands and Greenland (OECD, 2008b). This makes co-operation among states on fisheries management and conservation especially crucial. At the same time, there is a need to address imbalances between fish resources and harvesting capacity, as it is widely acknowledged that overcapacity in the world's fishing fleet is the primary cause of over-fishing and depleted fish stocks. This has led to a range of international agreements, such as the UN Fish Stocks Agreement, which establish a precautionary approach in fisheries, strengthen the basis for regional co-operation, provide for more effective enforcement of rules and introduce mandatory dispute resolution for straddling and highly migratory fish stocks (FAO, 2002).

Management systems for shared fish stocks are based on total allowable catches set by international agreements. Regional fisheries management organizations (RFMOs) have a key role, both in promoting regional co-operation and in setting TACs for shared fish stocks. Setting of TACs for shared stocks normally takes place in collaboration with RFMOs such as the North East Atlantic Fisheries Commission (NEAFC) (for pelagic and deepwater stocks in the North Atlantic), the Northwest Atlantic Fisheries Organisation (NAFO) and the North Atlantic Salmon Conservation Organisation (NASCO) (see Box 2.13). The proportion of shares allocated are based on a range of factors including fishing history, the extent to which stocks exist and can be fished commercially in national waters, the level of dependency on fisheries, as well as the contribution to scientific research on the stock. RFMOs are generally established under a convention on multilateral co-operation, which aims to promote the conservation and optimal utilisation of fishery resources and encourage international co-operation and consultation with respect to these resources. RFMOs have been under increasing pressure to better manage the fisheries resources under their control. Some changes to strengthen these international organisations have been under way with varying degrees of success (and some significant success stories) in terms of ensuring stable co-operative agreements and improved management of the fisheries resources under their control (OECD, 2009a).

Box 2.13. **Key regional fisheries management organisations in the NORA region**

The North East Atlantic Fisheries Commission is a regional fisheries management organisation for pelagic and deep sea fish stocks in the Northeast Atlantic. NEAFC aims to "promote the conservation and optimum utilisation of the fishery resources of the North-East Atlantic area and aims to encourage international co-operation and consultation with respect to resources" (*www.neafc.org*).

The Northwest Atlantic Fisheries Organisation is a regional fisheries management organisation on fisheries for fish and shrimp stocks in the North West Atlantic. NAFO's general objective is to contribute through consultation and co-operation to optimal utilisation, rational management and conservation of the fishery resources of the Convention Area (*www.nafo.int*).

The North Atlantic Salmon Conservation Organisation focuses on international co-operation for the conservation, restoration, enhancement and rational management of migratory salmon stocks in the North Atlantic.

Bilateral and multilateral agreements are also important. In the NORA region, there is extensive co-operation regarding shared fish stocks, not only among the four NORA territories, but also with neighbouring states, as many of the most important fish stocks migrate between domestic and foreign waters or into the high seas. For instance, the Faroe Islands has reciprocal fisheries agreements with neighbouring economies in the North Atlantic region, including Iceland, Norway and Greenland. These involve the exchange of fishing opportunities, which give foreign vessels quotas and access to the Faroese zone in exchange for equal fishing opportunities for the Faroese fleet in their zones. These agreements provide Faroese fishing vessels with the scope and flexibility to pursue a variety of fisheries in the best seasons (Ministry of Fisheries and Natural Resources, 2008). Similarly, in Norway, bilateral negotiations take place on shared stocks. Russia and Norway have established the so-called Mixed Norwegian–Russian Fisheries Commission for shared stocks in the Barents Sea. Norway and the EU negotiate on North Sea stocks. Many Norwegian TACs are set in these negotiations. Iceland as well has bilateral fisheries agreements with the EU, Greenland and the Russian Federation (in addition to those mentioned with Norway and the Faroe Islands).

Another important actor is the EU. None of the NORA regions is an EU member (although Iceland applied for membership in July 2009). A desire to retain independence in fisheries and opposition to the EU's Common Fisheries Policy (CFP) are widely recognised as key reasons why the other

NORA territories have not sought to join the EU. The self-governing status of the Faroe Islands and Greenland allows them to legislate regarding fisheries independently. Nevertheless, the EU's CFP, which sets overall standards for fisheries management (such as TACs, minimum landing sizes, number of days at sea, etc.) in the member states, has an impact on the management of international fish stocks. For instance, Norway holds two annual meetings with the EU every autumn – one in Bergen and one in Brussels – to set TACs and other regulations and management plans concerning the shared stocks. Norway and the EU have developed management strategies for several joint stocks (*e.g.* long-term management plans for cod, haddock, saithe and herring). The Fisheries Partnership Agreement (FPA) between Greenland and the EU, for a duration of six years from 1 January 2007, allows Community vessels mainly from Germany, Denmark, the United Kingdom, Spain and Portugal to fish in Greenland waters. In exchange, the Community pays an annual financial contribution to the Greenland authorities to be used for research undertaken by the Greenland Institute of Natural Resources and for training of fisheries officials, as well as for cod management plan studies (EU, 2006).

Co-operation on shared fish stocks is complex but pays off

Co-operation on management of shared fish stocks is crucial, though complex and sometimes contentious. There are many examples of successful co-operation and co-ordination in the management of shared fish stocks, though securing and applying these agreements are the result of lengthy, complex and, at times, challenging negotiations (see Box 2.14). Negotiations regularly break down (*e.g.* between Scotland and Norway on shared stocks and quotas in 2010) and in some cases agreements are simply not reached (*e.g.* NEAFC countries have sometimes been unable to agree a quota regime for blue whiting on the high seas).

Co-operation is also crucial for maintaining and sustaining the maritime environment

Environmental protection is a crucial element of the management of fish stocks and it, too, requires co-operation. Through their legislative arrangements and participation in international fisheries management organisations, the NORA territories actively engage in co-ordination on a range of marine conservation measures. More generally, marine environmental protection in the region is regulated by international conventions, such as the MARPOL Convention for the Prevention of Pollution from Ships and the OSPAR Convention for the Protection of the Marine Environment in the North Atlantic, which is concerned with the

Box 2.14. **Co-operation on shared stocks**

In some cases co-operation agreements have been critical for sustainably managing stocks and sharing resources. An interesting example of direct co-operation in the management of a fish stock is the management of Norwegian spring spawning herring. Herring stocks were seriously depleted in the late 1960s. Subsequent rebuilding of stocks over more than two decades led to substantial growth in stocks by the early 1990s. The migratory range of the herring then expanded beyond the Norway's territorial waters, which changed the stock's status from an exclusive to a shared (straddling) fish stock. In the absence of an international management regime for this new stock in international waters, in theory it could be fished by vessels from other countries. In 1996, talks among the coastal economies in the region resulted in an agreement whereby Norway, Russia, the Faroe Islands and Iceland agreed to a TAC for the fishery and its distribution (Churchill, 2001). A small share of the TAC was defined as the high seas component of the stock and it was left to NEAFC to decide on its distribution. The following year the European Union was included in the agreement. The allocation arrangement for herring took a scientific report on its distribution as its point of departure (Norwegian Ministry of Fisheries, Department of Marine Resources and Research, 1995). The scientific assessment concluded that in terms of its distribution the "zonal attachment" of the stock was overwhelmingly Norwegian (89.2%). Yet, the quotas awarded did not reflect this and were also driven by power relationships between the territories involved. Historic fishing patterns, as well as dependency upon fishing were brought forward as arguments in the talks. While it is not possible to quantify relative influence, power relationships played a major role in the quota agreed (Ramstad, 2001). Norway is the major coastal state involved, but had accepted a much smaller share of the allowable catch, while Iceland and the EU obtained sizeable quotas. With the larger share of the stock in its waters, Norway stood to lose most in the case of non-agreement, as anyone could have fished herring in international waters. However, multilateral agreements are not easy to reach and owing to disagreement over the relative shares in the quota arrangement, the parties were unable to reach an agreement on TAC and quota shares in 2004 and 2005, with the result that each party set unilateral quotas.

Source: Hoel, A. H., and I. Kvalvik (2006), "The Allocation of Scarce Natural Resources: The Case of Fisheries", *Marine Policy*, Vol. 30, pp. 347-356.

prevention and elimination of pollution from land-based and off-shore sources and assessment of the quality of the marine environment. Such co-operation is vital to maintaining and sustaining wild fisheries. OECD countries participate in different regional co-operative efforts for sustainable management of marine resources. For example, Korea organised the first APEC Ocean-related Ministerial Meeting in April 2002. At the meeting, the

APEC countries adopted the "Seoul Ocean Declaration", a milestone for co-operation in the region on the sustainable management of marine and coastal resources. Following this conference, the second APEC Ocean-related Ministerial Meeting was held in Bali, Indonesia, in September 2005. At that meeting, member countries, including Korea, adopted the "Bali Plan of Action" aimed at healthy oceans and coasts for the sustainable growth and prosperity of the Asia-Pacific community (OECD, 2008a).

Co-operation also plays an important role in fish farming. For example, veterinary regulations are based on an agreement with the EU. The health of stocks is monitored at various stages of production from broodstock, egg, fry, smolt and ready-to-harvest fish. Farming areas are inspected regularly. At the same time, the Faroe Islands has adopted an inspection system based on those operated in Norway and Scotland, which monitor the seabed in farming areas. Systems of licences are used to regulate the industry. Additionally, facilities are developed to minimise the risk of introducing or spreading disease to native stocks.

In relation to the marine environment, another area of co-operation by the NORA territories, and a notable difference between the NORA region and many neighbouring states, is their stance on managing marine mammals. The Faroe Islands, Greenland, Iceland and Norway are all members of the North Atlantic Marine Mammal Commission (NAMMCO). NAMMCO focuses on conservation, management and study of marine mammals in the North Atlantic. The NAMMCO Council meets annually to review advice from its Scientific Committee, to co-ordinate recommendations for further scientific research and to review hunting methods for marine mammals in member countries. In terms of co-operation within the region, common ground on issues such as hunting marine mammals is a regional link and a source of exchange, although there is also opposition to the stance taken on hunting some species from some interest groups in the NORA territories. More generally, the formal position taken by the national authorities on issues such as whaling has been a source of some tension.

Exchange of technical information and data is essential

A key to managing sustainable international stocks is exchange and collaboration on developing and utilising high-quality data and research. The success of fisheries management systems and management of the marine environment relies heavily on the quality of the scientific assessments and advice on the status and management of stocks and marine eco-systems. The NORA territories all have institutions to inform their decisions on fisheries management. National stock assessment is based on a

range of investigations such as bottom trawl, surveys carried out by research vessels, commercial catch and effort-data from log-books, and the sampling of commercial catches for age and length. National organisations are also involved in the International Council for the Exploration of the Sea (ICES)[13] which provides scientific advice on the marine ecosystem to governments and international regulatory bodies that manage the North Atlantic Ocean and adjacent seas. Finally, the NORA territories also maintain their own links and systems of co-operation. For instance, the Nordic Fisheries Co-operation (AG-Fish) has a long tradition, though a limited budget.[14]

Climate change introduces challenges and uncertainties

Among the most important concerns for the future are the productivity and changing patterns of fish stocks as a consequence of climate change. The impacts of climate change on marine ecosystems and fisheries are not yet fully understood (see section 2.4). However, research indicates a close relationship between changing weather patterns and the productivity of marine ecosystems. The Fourth Assessment Report of the International Panel on Climate Change (IPCC) notes that changes in salinity, circulation and ice coverage, which have already happened and may be expected to continue, are affecting primary production, fish growth and fish migration. Climate change is likely to contribute to a change in the composition of species (due to migration). While in some cases the resulting direction of the growth and migrations of certain stocks seems relatively clear, the speed and magnitude of these changes and how they may affect particular regions are much less clear. Finally, a parallel challenge for the fish industry is related to the increase in alternative activities (*e.g.* transport, access to mineral resources or offshore oil extraction) which compete with and have an impact on the fish industry (including increased pollution) (Molenaar, 2009).

Policy makers and key stakeholders have to be aware of the need to respond to and anticipate and incorporate climate-related changes (OECD, 2008a). Changes in productivity and the availability and migration of key fish stocks as a result of climate change suggest the importance of: *i)* research into ways to mitigate and adapt to climate change and its specific impacts on the marine environment and industries; *ii)* adaptation in fleet types and technologies; and *iii)* responsive fisheries management and governance systems. In addition, given uncertainty about the precise effect of global warming on fisheries, regional co-operation and co-ordination are needed to further improve the basis for adaptation strategies (see section 2.4).

Innovation is crucial for the long-term competitiveness of the marine sector

Innovation is crucial for sustaining and improving the competitiveness of the sector, for improving methods and for improving safety and sustainability. The role of research and innovation is all the more important in light of cost pressures linked to increased fuel costs, pressures on fish stocks and the marine environment, and the potential impacts of climate change. All these challenges call for new and innovative solutions. Advances in the technologies and techniques applied in the fishing industry are responsible for considerable improvements in the efficiency, effectiveness and sustainability of open sea fisheries: improvements in gears, more energy-efficient vessels, traceability and eco-labelling, among others. For aquaculture, innovation is also viewed as essential to cope with the challenges of changing demand or global competition (for example research and development for farming new species), environmental sustainability (*e.g.* developing better barriers to prevent the spread of diseases and escapes) or adaptation to climate change (see section 2.3).

The NORA territories engage in co-operation and pooling of resources to support R&D and innovation in the fishing industry. NORA partners have been involved in a number of EU-funded projects on research and innovation in the fisheries and marine sector, *e.g.* through the 2007-13 Northern Periphery Programme, Norwegian partners are working with partners in Scotland and Ireland on a project to develop the methods and technology required to rear cleaner fish for use by the cod and salmon farming industry (*www.eco-fish.org*).

Accumulated expertise on fisheries is a source of competitive advantage

The long-term sustainability of the sector also depends on a sufficient base of expertise. This can be ensured through training and educational opportunities. The NORA territories have gained an excellent international reputation in the fisheries and marine sectors, through their long experience in fisheries and as mariners and engineers in the international merchant-shipping sector. A number of institutions offer professional studies in the field of fisheries and maritime occupations.[15] This internationally recognised expertise is a source of competitive advantage over other maritime economies and potentially a source of revenue. Support for these activities is important to ensure the long-term sustainability of the sector and to continue to develop the expertise and know-how that are essential to ensure the sector's continued competitiveness and adaptability, especially during a

period of change and uncertainty. Opportunities to maintain and build on this expertise in the region are therefore crucial.

2.3. Economic diversification and innovation in the NORA region

In all OECD countries, innovation has been recognised as a key aspect of competitiveness and growth. Innovation is the creation of economic value through the exploitation of new ideas: it takes the form of new products, processes, organisational forms, marketing practices, etc. It goes far beyond R&D and development of high technology and can take place in all sectors, industries and services. Enhancing innovation is both an economic imperative and a political priority for the NORA territories as for others. Indeed, in some respects, their need for innovation is unusually great. The NORA territories all adhere to the Nordic welfare model, with its high living standards and a premium placed on balanced socio-economic development. This model, combined with the region's acute development challenges, puts huge pressure on public budgets and translates into high salary costs. This prevents an economic development strategy based purely on price competition. Hence, sustaining high levels of productivity and strong productivity growth is a necessity and a challenge for all parts of NORA.

The NORA regions have two options when trying to ensure strong productivity growth: more intensive use of natural resources or an emphasis on innovation and new business development aimed at increasing productivity and value added in all economic activities. These options are complementary, but the second is more promising, particularly because the NORA region has largely achieved high levels of efficiency in the exploitation of primary resources. Opportunities for further intensive development in this field are limited, at least in the absence of further technical innovation. To be sure, quantitative increases in sales and exports of primary resources may result from "extensive" growth: the catch of new marine fish species and the extension of fisheries to the deep sea, the opening of new fish farming sites, or the exploration and development of new hydrocarbon and mineral deposits. But the potential of these approaches is limited. Innovation in primary resources exploitation is needed to ensure these industries' competitiveness in the face of intense international competition. Innovation in resource-based economies differs from the usual pattern of innovation based on the development of high-technology industries. It is based on knowledge absorption capacity, at least as much as on knowledge creation capacity: innovation in resource-based economies is thus poorly measured by traditional R&D investment indicators. This is notably the case for the "Norwegian paradox": a wealthy

and innovative economy with strong technology adaptation capacity and relatively low private R&D investment (Fagerberg *et al*., 2009).

As noted in Chapter 1, a development strategy based mainly on exploitation of natural resources is fragile, particularly for such small economies. Worldwide fluctuations in demand and commodity prices, environmental pressures or the emergence of substitute energy sources, may have dramatic effects on the demand for the specific primary resources in which the NORA territories are specialised. This points to the need to create new niches or even new activities in non-traditional sectors.

Innovation to improve the performance of the primary sector

Natural resource-based sectors, and in particular the fishing industry, are and will remain central sources of economic activity in the NORA regions. New developments and the implementation of new techniques or new organisational methods are needed to support the future competitiveness and sustainability of the natural resources-based industries.

Innovation could improve the efficiency, safety and sustainability of the fishing sector

The NORA region's fishing industry is one of the most efficient in the world. Nevertheless, continued improvements in productivity in fishing, fish processing, and fish farming and management are still required to maintain a leading edge. Innovation is also needed to address problems related to overexploitation of marine resources and climate change. Domestic development of new techniques and implementation of further organisational changes as well as access to worldwide knowledge and technologies can help. Technological change and innovation have in the past been geared towards improving productivity. Today, they are increasingly oriented towards addressing environmental challenges, improving energy efficiency and ensuring the sustainability of the fishing industry (Boxes 2.15 and 2.16).The development of user-driven initiatives, such as eco-labelling and product traceability, has also accelerated. Finally, better technology and research will be crucial to adapt to climate change (see section 2.4).

Box 2.15. **Energy management solutions: Marorka**

Reykjavik-based Marorka is a leading provider of energy management solutions for the international shipping industry. Marorka's products and services enable vessel operators to optimise fuel consumption by maximising the energy efficiency of their vessel or fleet. This reduces both emissions and costs. Marorka started out as a NORA project. In 2002, NORA supported a collaborative project which led to the development of an IT solution for the optimisation of ships' energy requirements. This solution – Maren – is a comprehensive system developed for onboard energy management equipped with operational optimisation, simulation-based decision support and extensive energy-analysis tools.

Sources: NORA and *www.marorka.com.*

Innovation will also be needed to cope with challenges of changing demand, global competition and environmental protection in aquaculture. The rapid growth of Norwegian aquaculture is largely due to scientific and technological advances, such as vaccines, improved cages and developments in feed (NORA/Norden, 2009). Measures to minimise the impact of rearing and production methods on local coastal environments and stringent regimes for veterinary monitoring have been major factors in the success of the industry in the region. Other developments could focus on the management of effluent from the industry, disease control and feeding efficiency. For the environment, closed recirculation systems technology is especially important to reduce water use, to separate farmed fish from wild fish and thus to prevent the spread of diseases and parasites and eliminate escapes and discharges of waste into the ocean. The possible farming of new fish species is also being explored (Box 2.17). In this regard, the example of Arctic charr shows how exchange of know-how and information can be a source of regional co-operation.

The energy sector also needs technological advances to ensure its sustainability

The most prominent example within NORA is Norway's oil and gas industry. It is a very competitive industry, responsible for a high share of Norwegian gross value added (mining, oil and gas together accounted for 30% of Norwegian value added in 2008; see Chapter 1), and the country leads the world in technologies and systems for oil and gas exploration and exploitation (see Box 2.18). To maintain its leading edge, it should continue to innovate in these technologies, including in technologies to prevent environmental damage and disasters. In addition, the development of

Box 2.16. **Development of new technologies with applications in the fishing industry**

Advances in technologies and techniques applied in the fishing industry are responsible for considerable improvements in the efficiency, effectiveness and sustainability of open sea fisheries:

- Lighter and more selective fishing gear has helped to reduce the impact of fishing on the marine environment, *e.g.* trawl undersides with rollers to minimise the damage to the seabed.
- New sorting grids and other technical adaptations have been developed, such as the flexi-grid for use in pelagic trawling, such as blue-whiting fishery, and have been shown to significantly reduce by-catch of cod. Technical advances have also helped to evolve towards the capture of non-traditional species.
- New developments have produced more energy-efficient vessels and fishing practices. This is of particular relevance as it cuts greenhouse emissions and reduces fuel costs.
- Improvements in fish processing have led to a more cost-efficient industry, with less waste, higher-quality products, and greater use of waste products.

Traceability and eco-labelling are among the key recent innovations in the sector. Eco-labelling of fish is increasingly used and can increase the price of catches. Pressure for the eco-labelling of fish has been driven by processors and especially supermarkets which demand labelling of fish in line with other products. The most widely used form of eco-labelling is that of the Marine Stewardship Council (MSC). In Norway different fisheries have recently obtained the MSC certification (*e.g.* Norway's offshore Northeast Arctic [NEA] cod and haddock fisheries). The Faroese Pelagic Organisation (FPO) Atlanto-Scandic Herring, obtained the MSC environmental standard for sustainable and well-managed fisheries in March 2010.

Source: Adapted from NORA/Norden (2009), *Innovation in the Nordic Marine Sector*, S. Margeírsson and T. Edvardsen (eds.), Nordic Council of Ministers and NORA, June.

technologies linked to off-shore drilling can be exploited in other energy sectors. Drilling and technology developed in the context of oil and gas industries should for example provide the foundation for knowledge needed for future research into renewable sources such as geothermal energy.

Box 2.17. **Opportunities for farming new fish species**

The possibility of farming cod, in particular, is being explored in the Faroe Islands. Cod found in the Faroese bank have especially rapid growth rates, and natural conditions in the Faroese fjords are considered to be well suited for farming. In Greenland the focus has been on the potential for wolffish farming and seaweed harvesting. In Norway, efforts are under way to farm new species, such as cod, halibut, wolffish and shellfish. Cod production from aquaculture in Norway exceeded 11 000 tonnes in 2007 (up from 300 tonnes in 1997), which demonstrates the potential for farming high-value species.

The project Sustainable Aquaculture of Arctic Charr is a collaboration between partners in Norway, Iceland and Sweden funded by NORA and the EU's 2007-13 Northern Periphery Programme which aims to develop commercial farming of Arctic Charr. The partners aim to increase the production of farmed Arctic Charr in the northern periphery by identifying production potential and bottlenecks in different regions and with different technologies. The project also aims to develop and implement solutions to problems in farming and to initiate triple-helix structures in order to provide stakeholders with tools and a contact network that will facilitate development.

Sources: National Statistical Office of Norway, *www.ssb.no/en*; *www.northcharr.eu.*

Box 2.18. **Competences in energy research in coastal Norway**

The development of the Ormen Lange field in the Norwegian Sea is one of the largest and most demanding industrial projects ever carried out in Norway. Hydro, a Norwegian petroleum company, is the operator. The field is situated in an area of the Norwegian Sea with climatic and oceanographic conditions that make this one of the world's most challenging development projects. Norwegian research and industrial centres of expertise have been engaged to find solutions to a set of challenges that had not previously arisen for oil and gas development on the Norwegian continental shelf. Together with several partners in the Ormen Lange field, Hydro is implementing a major pilot programme to test the viability of a sub-sea compressor off the Norwegian coast. This highly innovative project would eliminate the need for a conventional platform, saving billions of NOK and halving operating costs.

Several Norwegian universities are also conducting advanced energy-related research. The Norwegian University of Science and Technology (NTNU), in Trondheim, is Norway's primary institution for educating the nation's future engineers and scientists. Energy is one of six thematic strategic areas established by NTNU in 2000. The objective is to organise multidisciplinary research and education to handle complex social problems and challenges that can only be solved by multidisciplinary teamwork.

Box 2.18. **Competences in energy research in coastal Norway** (*cont.*)

The SINTEF Group, located in Norway, is the largest independent research organisation in Scandinavia. Every year, SINTEF supports the development of some 2 000 Norwegian and other companies via its research and development activity. The "Petroleum and Energy" area of expertise at SINTEF offers R&D and advanced technical services to improve the development of Norwegian and international petroleum resources by means of safe, environmentally friendly techniques. It focuses on: exploration technology for petroleum resources; reservoir and well technology, well-stream technology, energy systems, thermal energy processes and electric power. By the application of the "teamwork strategy" NTNU and SINTEF have been able to increase energy-related research activity substantially since its start-up in 2000. Today more than 1 200 people in NTNU-SINTEF are working to bring new knowledge, new technology and new solutions to in the energy sector.

Finally, the Northern Research Institute (Norut) is a national research group located in Tromsø, Narvik and Alta in northern Norway. Norut has research activities in technology, innovation, natural and environmental science, and social science, with a special focus on the High North. Norut Narvik has a special research group on renewable energy and especially solar electricity. The main work of the group concerns development of silicon-based solar cells. The research is performed in co-operation with national and international companies, and a centre of competence has been built in Narvik for the development of new methods of production of solar cells and PVPT (photovoltaic production technology). The institute is majority-owned by the University of Tromsø.

Sources: OECD (2008), *OECD Reviews of Innovation Policy: Norway*, OECD Publishing, Paris; *www.ntnu.edu*; *www.sintef.no*.

Hydroelectric power (in the Faroe Islands, Greenland, Iceland and Norway) and geothermal energy (in Iceland) are two resource-based sectors in which NORA territories have developed leading positions. Using its cheap energy sources (geothermal and hydropower) to produce electricity, Iceland has set itself the goal to become the first country to break its dependency on fossil fuel: it built the world's first commercial hydrogen refuelling station in 2003 and the first hydrogen-powered rental cars in 2007. The country conducts research and experimentation on hydrogen-powered vehicles and aims to convert all its transport fleet to hydrogen by 2050. The NORA project EL-mobility seeks to broaden awareness of electric cars in the Faroes, Greenland and Iceland. The project aims to test and evaluate battery-powered cars in different landscapes of the North Atlantic (including measuring potential complications due to the harsh climatic conditions). The project seeks to assess the potential for

increasing the use of renewable energy sources in future transport systems. These developments contribute to the goal of ensuring greater sustainability and energy efficiency.

The future of energy in NORA territories is dependent not only on the presence of abundant resources, but also on a continually improving capacity to exploit them. Despite the diversity of energy sources throughout the NORA territories, opportunities for co-operation in energy research exist. However, the NORA regions also compete in a number of respects, most crucially for the location of aluminium companies attracted by cheap hydro-electricity: this creates a barrier for co-operative research that is close to exploitation of such energy resources. Other renewable energy sources, such as wind, tidal and wave energy, are also potential sources of environmentally friendly energy, thanks to the NORA territories' favourable natural conditions. However, given the region's limited research and technological development capacities, co-operation and exchange of ideas on these new energy sources could be particularly fruitful, and should extend beyond NORA to countries with acknowledged expertise.

Small-scale renewable energy may offer opportunities for remote locations

The development of renewable energy in small settlements is an emerging opportunity that would be valuable for the NORA region. Small settlements in the NORA region are largely dependent on oil and gas. Some small-scale renewable energy facilities exist, but developing renewable solutions for peripheral communities will require addressing problems related to the small size and isolation of these locations and to their harsh weather and geographic conditions. Renewable energy production in peripheral areas can have a triple benefit: it increases the amount of clean energy, it can contribute to cost savings in places that currently use generators powered by imported diesel, and it may create employment opportunities in regions with high unemployment. However, large-scale solutions and mainstream technologies are often not appropriate for remote locations, because the production facilities required are not cost-effective and create overcapacity, because local connections to common backbone systems are limited, or because these places present weather-related limitations (lack of sun, very strong wind, ice conditions).

The crucial issues for developing renewable energies in remote locations are: identifying the source of energy best adapted to local assets and local restrictions and reliability in terms of availability and of resilience to harsh environmental conditions. With small-scale power systems there are few standard technologies, but the experience of early adopters can be very

useful for subsequent initiatives. Communities are likely to face similar challenges for designing and installing power systems. Shared study of strategies that have succeeded and failed in the NORA regions could thus facilitate the development of renewable energy systems in other places. Efforts are being made by NORA governments to research and invest in renewable energies. Since 2006, the government of Greenland has earmarked funds for research and development of renewable energy. As a result, the first hydrogen plant for renewable energy storage was inaugurated in Nuuk in March 2010 (Box 2.19). In addition, educational institutions and innovation centres have over the last decade become increasingly open to participating in research and development and providing training facilities for more diverse technologies. A Centre for Energy Technologies has been created in Sisimiut, Greenland, and an Institute of Energy Research at the University of Akureyri in Iceland. At the same time, the Nordic Task Force for Renewable Energy in Sparsely Populated Areas[16] has as its main focus finding suitable common solutions for a decentralised energy supply that could contribute to a reduction in fossil fuel usage.

Box 2.19. **Hydrogen plant for storage of renewable energy in Greenland**

The hydrogen plant for renewable energy storage is a test system to provide suggestions for how hydrogen can be used for future renewable energy storage in Greenland. The hydrogen plant is owned and operated by the national energy company Nukissiorfiit. Its purpose is to gain experience with production, distribution and use of hydrogen as an energy carrier and thus investigate opportunities for increasing the share of renewable energy in energy production. Currently close to 60% of the energy produced in Greenland comes from hydropower. The rest is produced by the use of expensive and polluting diesel, especially in small settlements. The plant includes a compression and distribution system that enables storing of hydrogen under pressure in distributable bulk containers. The hydrogen can then be distributed to other cities and settlements in Greenland and used for local energy production. The plant is also prepared for a future upgrade with a hydrogen refuelling station to enable the use of hydrogen as fuel for transport. The next phases of the project are being planned. One idea is to distribute hydrogen from the plant to a nearby settlement or to move the entire plant, as it has been designed to be moveable.

Source: *www.h2logic.com.*

Developing the mining sector will require advanced technologies and judicious macroeconomic policies

Mining today accounts for a minor share of the NORA territories' GDP and employment, but significant opportunities exist for increased exploitation of mineral resources in Greenland and northern Norway. In these territories, the exploitation of minerals is seen as an activity that can make an important contribution to regional development and provide jobs in areas lacking other location-specific advantages. New mining developments are at the core of Greenland's development strategy. Given worldwide competition for the production of these raw materials, it is obvious that the latest technologies should be used and further developed if mining is to be economically and environmentally sustainable. In addition, since hard minerals and hydrocarbons are depletable, their exploitation may be temporary. The policy challenge is thus to stabilise growth via judicious macroeconomic policies, as well as to maintain competitiveness in non-mineral sectors through fiscal discipline and assertive structural policy reforms (OECD, 2005a). The Government Pension Fund in Norway and the stabilisation funds of Chile are good examples of how some OECD countries combine the development of raw material sectors with stabilisation measures to ensure balanced development through benefits derived from the oil and copper sectors, respectively (Box 2.20). These funds could serve as a reference for the development of the mining industry in Greenland, and for both Greenland and the Faroe Islands if oil production takes off in the future.

Box 2.20. **Stabilisation funds in Chile and Norway**

Chile

Chile's fiscal finances are heavily dependent on the volatile price of copper, Chile's leading export. In the past, the volatility of the price of copper had a very negative impact on fiscal finances. In 1987, the Copper Stabilisation Fund was established. It was designed to partially isolate the available fiscal revenues from cyclical fluctuations in the price of copper. When the price of copper goes above a certain target, the extra revenue is deposited in the Fund and is not available to the budget. Similarly, when the price of copper falls below a certain target, the revenue shortfall in the budget is compensated for through withdrawals from the Fund. Since 2006, surplus earnings are assigned to the Economic and Social Stabilisation Fund, and the Pensions Reserve Fund, which replace the previous Copper Stabilisation Fund. At the end of 2008, the two funds had savings amounting to USD 21.5 billion (12% of GDP) thanks to the rise in copper prices

Box 2.20. **Stabilisation funds in Chile and Norway** (*cont.*)

between 2006 and 2008. Sound macroeconomic management has enabled the Chilean government to run counter-cyclical fiscal policies. It adopted in 2001 a structural fiscal rule which forces the government to maintain a structural surplus equivalent to 1% of GDP (relaxed in 2008 to a structural surplus of 0.5% of GDP). As in other countries, the overall Chilean economic outlook shifted drastically with the world economic crisis during the last quarter of 2008. Nevertheless, the structural surplus and the stabilisation funds accumulated during the "prosperous" years were used to launch a fiscal stimulus package in January 2009 which boosted public investment programmes and transfers. This stimulus package included, among others, investments in infrastructure, small enterprise development, and subsidies to low income households.

Norway

The Government Petroleum Fund was established in Norway in 1990 to build up financial reserves in order to preserve an equitable share of present petroleum revenues for future generations and decades, and to prevent short-term fluctuations in the oil price from influencing spending in the current and following year's budget. The Fund is fully integrated into the state budget and net allocations reflect the total budget surplus (including petroleum revenues). It remained empty until 1996, as a result of the recession of the early 1990s, but has seen a rapid build-up in assets in recent years. The government decided in 2005 to establish the Government Pension Fund, which encompasses the former Petroleum Fund (renamed the Government Pension Fund – Global) and the National Insurance Scheme Fund (renamed the Government Pension Fund – Norway). Its real return can be seen to provide a partial pre-funding of future pension liabilities. This fund mainly transforms depleting oil and gas resources into financial assets. As this wealth belongs in theory to present and future Norwegian generations, the capital stock should be preserved, and only the returns consumed, to allow future generations to make their own choices in allocating these earnings. For 1997-2006, the average annual real return was 4.6% after deducting management costs. In 2004, new ethical guidelines were adopted for the allocation of the fund's international investments. In April 2007, the government announced plans to increase the equity allocation to 60%.

Sources: OECD (2004), "Budgeting in Chile", *OECD Journal on Budgeting*, Vol. 4, No. 2, OECD Publishing, Paris; OECD (2005), *OECD Economic Surveys: Norway*, OECD Publishing, Paris; IEA (International Energy Agency) (2009), *Energy Policy Review Chile 2009*, International Energy Agency, OECD/IEA, OECD Publishing, Paris.

Innovation in emerging sectors and further economic diversification

Developing new activities will offer further opportunities for economic development

Alongside the further development of traditional raw-material-based sectors, the creation of new niches or entirely new sectors is a complementary development path for the NORA territories. Further economic diversification would help to reduce the risks attendant on NORA's current high dependence on natural resources (Chapter 1). It could also help address the problem of outmigration of qualified and young people by offering new and more attractive jobs to highly skilled workers. The development of new products and new activities is particularly important for economies heavily dependent on fisheries – especially the Faroe Islands and Greenland – where structural adjustment in fishing fleets (concentration of vessels, increased efficiency of fishing techniques) implies a continuous reduction in fisheries employment (see section 2.2).

Acquired knowledge in fisheries could provide a good basis for the creation of new niches

The NORA region could capitalise on the strong knowledge base acquired through traditional fishing and fish-processing activities by developing value-added food and non-food products from the marine sector: *e.g.* new nutrients, bio-medicines and pharmaceutical products, among others (Box 2.21). Many opportunities linked to the better use of by-products, biotechnology and marine resources have not yet been seized and could be an opportunity for NORA territories. The blue biotechnology[17] area is a growing sector worldwide with the search for new biological principles and organisms that have not been exploited so far. Nordic collaboration could result in a combined effort to screen material obtained in the oceans and in by-products from the seafood processing industry (NORA/Norden, 2009).

Box 2.21. **Innovative use of marine products: Acadian Seaplants Limited**

There is a growing demand for marine-based biochemical products to meet new and growing customer demand. Marine-based biochemicals, such as omega-3 fatty acids, have expanded their market share. Traditional compounds such as proteins, oils, fatty acids, sugars and polysaccharides also present good market opportunities. Novel compounds, *e.g.* secondary metabolites and compounds processed from traditional compounds, are under development by innovators active in health-related products. Health benefits of long-chain omega-3 fatty acids are well documented and there is growing evidence of the multiple benefits of fish-based peptides. In terms of fish raw materials used to process food, less than 50% is utilised directly as food in some cases. The rest contains components that are in great international demand (*e.g.* for supplements, pharmaceuticals, cosmetics and energy sources). Seaweeds are another source of important biochemicals: they are an economically feasible source of special polysaccharides for industrial applications. Macro-algae also contain a great variety of other complex and "unusual" polysaccharides of great potential for diverse non-food applications. Algal polysaccharides and derived bio-compounds have, for example, emerged as an important class of bioactive natural products with interesting medicinal properties: blood anticoagulant, anti-tumour, anti-mutagenic and anti-inflammatory.

The case of Acadian Seaplants Limited (ASL) in Atlantic Canada is a good example. Headquartered in Dartmouth, Nova Scotia, in Atlantic Canada, with five manufacturing plants in three of the four Atlantic provinces, ASL has elevated the harvesting and cultivation of select wild seaweeds into a thriving business which markets its high-quality specialty products and ingredients to more than 70 countries around the world. The once rural company has grown. It now has more than 500 employees and has become the largest independent manufacturer of seaweed specialty products in the world, exporting close to 95% of its annual production. Its success is closely aligned to its on-going commitment to research and development. ASL has its own R&D Centre for Innovation, with eight PhD-level researchers on staff. After close to 30 years of operation, the company continues to take a common, often ignored natural resource and turn it into a wide variety of products. Its competitive advantage relies on innovation and being first to market with new, difficult-to-duplicate products. As a result ASL is now a highly diversified technology-based manufacturer of natural specialty fertilisers, feed, food ingredients, health and beauty ingredients and brewery supplies. With funding from the Canadian government through the Atlantic Canada Opportunities Agency (ACOA), ASL – in collaboration with the National Research Council and the Nova Scotia Agricultural College – has begun to develop and eventually expects to market two new seaweed food products "with functional properties", that is, food with health-promoting or disease-preventing properties. These new products will be targeted to the Asian market, especially Japan.

Source: Atlantic Canada Opportunities Agency.

Specialisation in maritime activities also offers favourable conditions for the emergence of world leaders in niche products and in equipment linked to the food processing industry. Iceland's Marel, for example, is a leading global provider of advanced equipment and systems for the food processing industry. Innovation started in Marel in the 1980s, when the company harnessed computer technology to develop intelligent graders and scales specially adapted to the fish processing industry. Since then it has grown into an industry leader by developing an extensive mix of high-technology processing equipment to fit current, emerging and projected needs of the broader food industry. Finally, given the small size of each of the NORA territories, research linked to the fishing industry is a potential area for co-operation to achieve critical mass and exploit complementarities in research resources.

Exploitation of natural Arctic products could be further developed

Arctic food is another niche in which NORA regions may develop competitive advantages. Some Icelandic and Norwegian companies have already become leading producers and suppliers of ready-to-eat meals, fine seafood and premium Nordic food products. Further expansion of secondary fish processing to other NORA territories, especially Greenland, is constrained by long distances; production/packaging facilities for secondary processing normally need to be close to the market. There have been recent efforts to develop Greenlandic Arctic water and ice industries. High transport costs for a relatively low–value product could be a problem. Yet Greenland water will be targeted as a luxury value-added product for which limited volumes could offer significant profit (Box 2.22). One key to unlocking new opportunities in this sector lies in the development of strong marketing efforts, exploiting the clean and natural image of the NORA environment, and building the infrastructure and capacity to respond to international demand.[18] Opportunities for co-operation within the NORA territories would more easily be developed at a pre-competitive stage, such as shared branding of green/pure products and research into wider consumer trends for North Atlantic products. Opportunities for joint ventures in innovative businesses could be explored and facilitated by intermediaries diffusing information on technology transfer opportunities.

Box 2.22. **Spring water from Greenland**

In 2009 Greenland Springwater ApS, received the green light from the government of Greenland for processing and bottling mineral water from the island of Disko. Greenland Springwater ApS's production and storage facilities (including PET production and filling systems) are located in Qeqertarsuaq, in the south of the Disko island. Greenland Springwater plans to market the high-quality mineral water as a luxury product "from an untouched natural landscape" to countries such as Korea, the United Arab Emirates, Germany, Switzerland, France, Belgium and Israel. The bottled water is called 938, named for the water's pH level of 9.38 which is considered an ideal level of alkalinity for mineral water. Initially, the company will target upscale hotels, high-end boutique shops and restaurants. The second phase of marketing will target the fitness and beauty industry in participating countries.

Source: www.938.ch; *www.icenews.is*.

The rich ecosystems of NORA present opportunities for expanding tourism

As pointed out in Chapter 1, there is a lot of potential still to be developed in the tourism sector. In order for this activity to be economically and environmentally sustainable, tourist products with high value added should be promoted. The type of tourism that can be developed in the region would need to differentiate itself from mass and low-cost tourism: the high-quality, high-price segment of the industry remains the most promising for the NORA region. High prices and the limited supply of tourist amenities prevent the development of a tourist offer based on quantity. But high-quality tourism with limited numbers can make a significant economic contribution. Moreover, value-added ecological tourism is "environmentally friendly", an important factor in an environmentally fragile region. Ecological tourism, adventure tourism, high-class events for both businesses and individual tourists are interesting niches that could be further developed. For instance, Norway (through Innovation Norway) has been involved in developing value-added tourism. There are also untapped opportunities for involving the local population in the development of innovative tourist products, based on local culture and traditions, which can constitute good sources of ideas and a supply of differentiated tourist products. Efforts should be directed to improve co-ordination and co-operation between local entrepreneurs, and to offer consistent, high-quality services. This would require better organisation and training of local operators. The Gros Morne Institute for Sustainable Tourism in Atlantic Canada offers training programmes to help local entrepreneurs to learn ways to market and develop

the expanding adventure/ecological tourism sector (Box 2.23). The goal is to enhance the quality of services and to develop a low-impact economic activity, respectful of both environmental and socio-cultural sustainability.

Box 2.23. **Gros Morne Institute for Sustainable Tourism**

There is a shift in how visitors want to experience their tourist destinations. They want to understand and experience the local culture and traditions in low-impact and sustainable ways. The challenge that operators and service providers face is to create visitor experiences that allow for an intimate connection without harming what people want to see and experience. The Gros Morne Institute for Sustainable Tourism (GMIST) seeks to enhance the quality and sustainability of operators' and service providers' outdoor/nature-based offers throughout the four Atlantic Canada provinces. The Institute, founded in 2003 as a not-for-profit organisation, develops and provides training programmes that respect sustainable tourism practices, experiential tourism services and eco-adventure tourism. GMIST is funded by the Canadian government through the Atlantic Canada Opportunities Agency (ACOA), Parks Canada, the Canadian Tourism Commission, and by the four Atlantic provinces (New Brunswick, Newfoundland and Labrador, Nova Scotia and Prince Edward Island).

The Institute's Edge of the Wedge Experiential Travel programme offers full immersion and hands-on experience to help participants develop new skills in sustainable experiential product development, cutting-edge marketing techniques and partnership development. The two-day Beacons of Effective Sustainable Tourism programme guides tourism business owners and managers through a series of checklists and resources as they build their own "sustainability action plan". Participants consider and examine the three pillars of sustainability – economic, environmental and socio-cultural – to provide a balanced and holistic approach to achieving and improving sustainability. Throughout the programme, participants learn from local operators how sustainable practices have changed their businesses for the better – higher margins, lower costs, and new markets – while caring for tourism resources. They also learn how to calculate and measure the impact of changes on both the world around them and their bottom line, explore a wealth of resources to implement the sustainability action plan customised by them for their operation, and get exclusive access to post-course materials and support.

Source: Atlantic Canada Opportunities Agency.

There are opportunities for regional co-operation in tourism. NORA territories are competing among themselves and selling similar destinations. However joint efforts, such as common branding of the North Atlantic as a "last frontier" destination, could help address the challenge of lack of brand

recognition noted in Chapter 1. Joint training initiatives for tourist entrepreneurs may also be an opportunity for collaboration. Beyond that, the expansion of the cruise ship industry is a prime example of a tourism sector that would benefit from co-operative efforts.

Further development of the cruise industry could be promoted

Cruise ships are especially attractive in the NORA context because they avoid the expense of constructing large accommodations for seasonal demand. Currently the region's cruise-ship-based tourism is modest but expanding (see Chapter 1). Ships do not stay long and the local tourism sector is often not organised to take advantage of the visitors. If cruise ship passengers could be retained in port for several days, they would provide a captive audience for a range of off-ship activities. However, this implies a wide range of activities that are easily accessible from the dock and attractive to ship clientele. It suggests the need for further research on the types of activities that would be most attractive to cruise ship patrons and identification of ways to structure local tourism resources to provide these or similar services. While all the NORA members offer the same basic tourism opportunities, there are important differences among the various locales that would allow synergies to be exploited. It should therefore be possible to put together multi-stop itineraries that would offer passengers a richer and fuller experience. It would also increase the economic return to the various firms involved. However, putting together this type of package would require collaboration among NORA members and close work with cruise ship firms. At the same time, it should be kept in mind that the presence of cruise ships in small or remote localities also involves a number of challenges in terms of infrastructure, safety and rescue equipment, as well as impact on the environment.

There is potential for developing ICT applications and creative industries

The NORA territories have some specific potential for developing innovative ICT applications, such as Internet-based customised services or "cloud computing" applications (see Boxes 2.24 and 2.25). In general, knowledge-based activities are still a small part of economic activities in the NORA territories. Iceland demonstrates, however, that knowledge-based companies (*e.g.* in medical equipment or ICT applications) can be developed, despite a small economic base and a traditional orientation towards exploitation of natural resources. Long distances to the main world centres of trade and business have been an incentive to develop a good ICT infrastructure (except in Greenland) and early ICT applications, with a

population that is generally more receptive than in more densely populated areas. Their geographical and cultural context generally favours openness to innovative ICT applications, and their small size and isolation can be an advantage for the development and testing of demonstration projects.

Box 2.24. **ICT applications can take advantage of the climate of the Far North**

A new Icelandic start-up, Greenqloud, will open the world's first environmentally friendly public compute cloud later this year. It will only use renewable energy sources. Greenqloud offers hardware stored in data centres and leased to clients on a self-serve basis. The client pays only for the time of use. The company's hardware and software will only be run in data centres with guaranteed access to renewable energy sources. In addition, Greenqloud takes advantage of Iceland's cold climate, which reduces the need for energy to cool the equipment.

Source: www.greenqloud.com.

Box 2.25. **The Bitland initiative in the Faroe Islands**

Private businesses in the Faroe Islands have launched the Bitland initiative which aims to detect and support innovative projects based on ICT exploitation in the islands, and stimulate the interest of large multinational companies in adopting the area as a test bed for new ICT developments. Bitland offers office facilities to entrepreneurs and companies; project management and co-ordination; advice on development and processes in relation to innovation; advice on innovative projects for investors and financial providers. Examples of the projects in which Bitland has been involved are: development of a nation-wide plan to enable digital transfer of all traceability data in the Faroese fishing industry between various links in the value chain; development of a conceptual scheme for personal safety at sea in relation to new telecommunication opportunities. Bitland participates in an EU FP7 project, with a focus on the potential for using location and identification technologies such as RFID, barcodes, mobile data capture and natural feature identification to optimise the use of feed and other resources and to improve yield factors, animal health and welfare. However, it has proven difficult to run the company profitably, and the question of the minimum critical size for conducting such an activity efficiently has been raised.

Source: www.thebitland.com.

Finally, creative industries are less dependent on scale than many others. Design activities and artistic creation may thrive if supported by appropriate marketing efforts and some public support for internationalisation at an early stage of development. A recent Green Paper on the creative economy for the Nordic region highlights the many assets of Nordic countries in this area (Norden, 2007). It advocates the development of a pan-Nordic strategy for the creative sector, arguing that this would increase the potential for sharing resources and exploiting complementarities and enlarge the market. The lack of entrepreneurship has been identified as an important barrier for the development of this sector: creative ideas and projects are often not transformed into commercial ventures. The development of a creative sector in the NORA territories and in a Nordic context could engage with a segment of the tourism sector oriented towards the discovery of the specific culture and heritage of the Arctic and northernmost regions.

The NORA region could become a knowledge hub in niche areas

Each NORA territory is a small entity with limited critical mass in research, but it is also part of a larger network of countries and regions, with the potential to play a specific role in research networks in areas of specific interest. In research and technology development activities, the question of critical mass is important and it is important to take an international perspective. While it would be unrealistic to view each of the NORA territories as a self-sufficient knowledge hub, each has assets that could be exploited in a more distributed model of knowledge creation. Many examples encountered during this review point to the potential role of NORA territories on the applied and experimental R&D spectrum through exploitation of their specific conditions and their long-standing expertise in traditional resource-based sectors. Areas in which the NORA region can provide expertise either as experimental fields for research or as contributors to new applied or fundamental knowledge include:

- Climate change research relies heavily on new data (see section 2.4), and the Arctic area provides a unique environment to collect these data and conduct experiments. Physical and biological processes in the Arctic play a key role in understanding global climate dynamics. Climate change is expected to be more significant and to take place more rapidly there than in many other parts of the world. This offers opportunities for positioning the region as a key location for climate change research, with opportunities for further strengthening local institutions, promoting local research and further developing local facilities for climate and environmental research, among others. The Kangerlussuaq International Science

Support (KISS) and the Arctic Station in Greenland are examples of facilities which provide the opportunity for scientists from all over the world to develop research projects in the Arctic environment. The challenge is to ensure that the NORA region contributes to R&D activities and is not confined to a role of supplier of experimental fields and basic services. In this respect, the University Centre in Svalbard (UNIS) is a good example of research facilities combined with applied research and high-quality teaching (Box 2.26).

Box 2.26. **The University Centre in Svalbard (UNIS)**

The University Centre in Svalbard (UNIS) was established in 1993 to provide university education in Arctic studies, to carry out high-quality research and to contribute to the development of Svalbard as an international research platform. UNIS' geographical position gives it a unique advantage by enabling students and faculty to use nature as a laboratory and arena for observation and for data collection. UNIS is a share-holding company, owned by the Norwegian Ministry of Education and Research. The four traditional Norwegian universities – Oslo, Bergen, Trondheim and Tromsø – are represented on the Board of Directors. The centre offers courses in Arctic Biology, Arctic Geology, Arctic Geophysics and Arctic Technology Science, including high-quality research on climate change. About 350 students from all over the world take one or more courses every year at UNIS. The student body is 50% Norwegian and 50% international students and English is the official language (*www.unis.no*).

Source: www.unis.no.

- Research in fishing and fish-farming would build on traditional specialisations of the NORA research communities, which have recently turned to blue biotechnology as a new area for which the NORA territories have important assets, thanks to their knowledge of the marine environment. The Marine Research Institute in Iceland, the Faroese Marine Research Institute and the Norwegian Institute of Fisheries and Aquaculture Research are important research hubs in this field, which are well linked to Nordic and other institutes.
- Research on building technologies can benefit from studying the specific climatic conditions in the North Atlantic area, in order to develop applied research activities targeted at such environments. The Icelandic Innovation Centre and its Building Research Division,

Narvik University College in Norway, and Artek, the Arctic Technology Centre in Greenland, are three examples of institutes conducting applied research in this field.

- Small-scale (renewable) energy exploitation systems especially adapted to remote and rural areas have been mentioned as a specific area in which new research and applications are needed and seem particularly well suited to conditions prevailing in the NORA territories.

Exploiting the potential of the region would require overcoming certain barriers

NORA territories can develop comparative advantages linked to their location in the clean Arctic environment and exploit traditional or more recent knowledge linked to this environment. This could lead either to the development of new niches in sectors already present in some NORA territories, or to the development of new sectors. However, exploiting this potential will require overcoming certain barriers:

- **Distance.** An important condition for the development of new activities in the NORA region and for overcoming the challenge of distance is the availability of extensive and efficient ICT connections, accompanied by well-developed ICT skills. In this regard, the potential of ICT must be exploited to the full (by improving coverage in rural areas and in Greenland) if the area is to achieve further economic development (see section 2.1).
- **Size.** As observed, the lack of economies of scale makes developing new niches and activities more difficult. For potentially small organisations in remote regions, regional co-operation would offer opportunities to undertake activities, develop ideas or initiate processes jointly (see Chapter 3).
- **Education and skills.** Developing new sectors will require specific education and skills. Addressing the brain drain and attracting qualified workers will therefore be crucial priorities.
- **Entrepreneurship.** Conditions for entrepreneurship and start-ups need to be improved, especially in the Faroe Islands and Greenland.
- **Natural resource dependency.** Traditional resource-based activities might tend to crowd out the development of new activities. The orientation of education and research systems, the availability of funding sources, and the priorities of public support systems tend

to favour existing branches of activity, leaving little room for new activities. Innovation and economic development policies to support the development of new niches and new sectors will be required.

The last three points will be addressed below.

Improving the conditions for innovation and diversification

A more diversified economy will require more diversified skills

Until recently, the evolution of the NORA economies has been mainly influenced by the economic value of natural resources, mainly fish, but also oil and gas in Norway. These industries formerly required large numbers of relatively low-skilled workers. As they evolved, they required more and more skilled technicians, engineers and other specialists, such as biologists. The educational systems in the NORA territories have been shaped by the changing needs of these industries. Given the region's peripherality and the small number of students, a large part of the higher education supply is outside the NORA region, mainly Denmark for the Faroe Islands and Greenland and other countries for Iceland (see Chapter 1). In Norway, there is less outwards mobility, since students from coastal Norway have access to the well-developed and diversified domestic Norwegian education system.

Further economic diversification and the development of new economic activities or sectors generate the need for an even larger and more diversified supply of higher education. This is unlikely to be met within the NORA higher education systems, which are specialised in the disciplines most relevant to the existing economic specialisations of the NORA economies. In particular, the breeding of creativity is becoming a crucial component of higher education in all disciplines. It is very difficult to "teach" creativity, but mobility and exposure to different environments is a good way for students to develop new and more innovative skills. The small scale of education systems in the NORA territories and the resulting need for outwards mobility can be turned to advantage if further developed into an internationally open system, and if brain drain can be turned into brain gain by attracting the return of internationally qualified students.

There is a need to address brain drain

A crucial issue for the NORA territories is to attract new university graduates to the region to improve the skill base of the workforce. Limited opportunities to improve skills and limited current employment opportunities for those with more formal education contribute to youth

outmigration. Strengthening local universities is one option and has already proved successful in larger locations like Tromsø, Bergen or Reykjavik (see Chapter 1). Yet, even in these places, it will not be possible to develop a fully fledged offer for higher education. In smaller locations, local universities will never be able to provide the range or depth of education available in larger places. Student mobility can constitute a "brain gain" if enough of those who leave for study abroad return home with higher education and international experience.

Increasing the number of students who return after completing their studies abroad could be a key to the diversification and strengthening of the economies of Faroe Islands and Greenland in particular. Such students bring international experience and an international outlook. Higher education in Iceland, for example, has always had a strong international dimension, encouraged by the government, which sees this as an opportunity for brain gain more than brain drain. Prior to the crisis, at least, the impression of public officials (there are no statistics) was that most students who studied abroad returned home. Twice a year, the government and enterprises from Greenland organise a mission to Denmark to persuade students to return home. A comparable biannual event is organised by the Municipality of Tórshavn in combination with public and private institutions. Yet it is still a challenge to persuade young, highly skilled Greenlanders (and to a certain degree also Faroese) to move back home, especially to highly isolated and remote areas. Norway also makes efforts, such as tax reductions and reduced payments on student loans, to get students and workers to return to – or move to – remote or very remote areas such as North Troms and Finnmark. A recent Australian study suggests that it is possible to attract university graduates to remote and very remote locations but that this requires a premium of some kind (see Box 2.27). However, ultimately, the rate of return of students finalising studies abroad will be closely related to the offer of competitive job opportunities in the home country. Even if there is a case for targeted subsidies to encourage return, these cannot compensate for a lack of economic development opportunities.

Box 2.27. **Return of students to remote areas in Australia**

Australia has both a highly urbanised population which is concentrated in a small portion of its territory in large core cities and a vast area with small and dispersed population centres remote from the core. "Australia's sparsely populated regions have the lowest levels of accessibility to urban amenities and services in the OECD." (Corcoran, Faggian and McCann, 2010) A crucial feature of rural and remote Australia is a high rate of youth outmigration for higher education. Return flows after completion of higher education are limited. This brain drain is seen as limiting future economic growth and weakening human capital. Stemming the loss of more highly motivated youth is seen as a necessary condition for any rural development strategy, but little is known about the specific motivation of those who leave and then return to rural Australia. Survey data of recent university graduates from 2006 have been used to provide important information on individual motivations. The data show that of the 54 698 students surveyed, among those coming from a university located in a major city, some 7 665 relocated outside a major city and of these 1 010 relocated to a remote or very remote region. The latter number represents only 1.9% of all graduates from major city universities, but it is a number that is equal to 72% of all graduates from universities located in a remote or very remote area. The high percentage mainly reflects limited opportunities to attend universities outside major cities in Australia. But it also points out the importance of even modest return flows from city universities. Those who moved to remote or very remote regions can be characterised in the following ways:

- graduates from programmes where there is a government incentive to stimulate employment in rural areas (*e.g.* education, health care) are more likely to relocate;
- native-born are more likely to relocate than foreign-born;
- full-time work opportunity increases the odds of relocation over part-time employment;
- higher wages increase the odds of relocation.

The Australian data suggest that it is possible to attract university graduates to remote and very remote locations but a premium of some kind is required. This is not surprising because simple inertia suggests that relocation only takes place if the move significantly increases a person's well-being.

Source: Corcoran, J., A. Faggian and P. McCann (2010), "Human Capital in Remote and Rural Australia: The Role of Graduate Migration", *Growth and Change*, Vol. 41, No. 2, pp. 192-220.

Nationals living abroad could be also a source of know-how

Diaspora populations abroad could also be a particularly important source of know-how and international links. A number of countries with large numbers of highly skilled people living and working abroad view this expatriate population as an important development resource and a source of valuable linkages and know-how to be accessed, *e.g.* through initiatives such as GlobalScot (Box 2.28).

Box 2.28. **The Globalscot Network**

The GlobalScot network is a fully funded service, designed and provided by Scottish Enterprise, the Scottish Government Economic Development Agency for Lowland Scotland. Working in partnership with Scottish Development International, the Scottish government and other agencies both in Scotland and around the world, GlobalScot aims to expand and diversify Scotland's business culture by: developing new markets overseas; attracting new businesses to Scotland; and mentoring Scottish businesses at home and abroad. More specifically, GlobalScot seeks to develop and expand Scotland's standing in the global business community by utilising the talents of leading Scots around the world, and of people with an affinity for Scotland, to establish a worldwide network of individuals who are outstanding in their field. Scottish companies are able to draw on this network for brokering deals, leveraging finance, receiving advice, and developing contacts, assistance and support.

Sources: Scottish Enterprise; *www.globalscot.com.*

Interchange programmes could be further promoted

Encouraging interchange programmes and joint Nordic degrees would also help, particularly in conjunction with steps to attract more graduates to return home. As noted in Chapter 1, the participation of Faroese and particularly Greenlandic students in these programmes is currently very limited. An increased presence of Greenlandic and Faroese students in regional universities would represent an opportunity to acquire education and research in areas of special relevance for the far North (environment and natural resources, marine science, renewable energy or earth sciences, etc.). Beyond that, sharing resources and developing joint academic programmes, training and research activities on the basis of excellence and relevance of education and research, is a must for the small NORA higher education sector.

Changes in primary and secondary education are also needed

While tertiary education needs priority attention, there is also a need to improve primary and secondary education in rural areas in general and in Greenland in particular. It is in primary and secondary schools that the creative skills needed for an innovative economy can be fostered. In addition, development of the spirit of entrepreneurship can be bred at secondary level through specific schemes such as "student enterprises", as developed in various OECD countries. Improving language skills (especially English) is a particular priority for Greenland. The government is aware of this need and since 2006 has been implementing the Greenland Education Programme (Box 2.29). Given the small basis for recruiting teachers, international exchange programmes for teachers would need further support.

Box 2.29. **The Greenland Education Programme**

Parliament adopted the Greenland Education Programme (GEP) in 2005 in recognition of the territory's low educational level, which is viewed as an impediment to economic development and improvement of living conditions. GEP's overall purpose is to ensure that two-thirds of the work force has an education providing them with academic qualifications or vocational skills in 2020. In its first phase (2006-12) the GEP focuses on lower secondary school leavers who drop out of the education system after graduation and on unskilled workers under 50 who are unemployed, in threatened trades and/or breadwinners for a family. In the second phase (2013-20) the focus will be on higher education. Implementation of the GEP is supervised by the Executive Steering Committee, which has members from several ministries and from the Association of the Municipalities in Greenland.

Source: Government of Greenland.

Openness of the labour market should be further promoted

The lack of critical mass for further developing business is critical in the Faroe Islands and Greenland, and it also affects the sparsely populated areas outside the capital in Iceland, and outside the main cities in coastal Norway (see Chapter 1 and section 2.1). NORA territories can mobilise their work forces through various initiatives: *i)* promoting better accessibility to the markets (see section 2.1); *ii)* aiding the transition of youth into the workforce through training programmes and adequate links between the private sector and educational institutions; *iii)* reducing school dropout rates; and *iv)* promoting adult training programmes and entry into the workforce.

Improving and broadening the offer of vocational training programmes would help diversify local economies. Diversification in vocational education is also required to meet the changing needs of the economy: the development of sectors such as mining or tourism will require training and an upgrading of the skills of the local population. Increasing employment in the construction sector will also require an intensified training effort. A better-educated work force can augment productivity and reduce mismatch problems in the labour market. To overcome the limitations of small critical mass, international mobility and distance learning can help establish a good-quality supply and encourage interactions among students from different origins and locations. Promoting better connections between vocational training schools and the private sector is one way to enhance the availability of a workforce for existing and new activities. At the same time, a stronger focus on technical education can help counteract the outmigration of youth to the cities or to foreign countries. Vocational programmes at upper secondary level, professional degrees at university level, in-company and labour market training and adult education are all options that might reduce incentives to leave.

The development of flexible lifelong learning opportunities, including distance learning components, is another need, especially for Greenland. Further education and training initiatives could be extended to other partners from the NORA region and beyond, either in the form of networked institutes, or through the establishment of joint bodies. The further education sector is particularly well suited to the development of distance learning systems, since its student population is composed of adults with professional and family responsibilities and thus faces higher barriers to mobility than younger students.

Entrepreneurship should be encouraged

Impediments to expanded entrepreneurial activity in the NORA area are significant. They include: the remoteness of the NORA region as a business location; a limited local market that is unable to support additional producers of many goods and services; little entrepreneurial tradition in local societies; and strong traditions of working in traditional resource industries or for government. However, the various NORA territories differ quite a lot with respect to entrepreneurship. Iceland has a strong inclination and good environment for individual entrepreneurs (and the crisis further exacerbated this potential); the Faroe Islands, and especially Greenland, at the other extreme, face strong barriers to entrepreneurship, owing in large part to the dominance of public-sector employment and traditional industries linked to natural resources, the lack of entrepreneurial tradition in traditional communities, and a weak skills base. The small size of local markets is a

problem throughout NORA, especially in the most remote settlements. However, high living standards offer opportunities to develop new businesses to capture expressed or latent demand on local markets, and a strong outward orientation is favourable for the creation of new innovative ventures.

An important factor for the development of new products or new activities is the presence of favourable conditions for entrepreneurship. In most OECD countries entrepreneurs are recognised as key drivers of economic growth. This is especially true in rural and remote areas where opportunities for large-scale manufacturing are unlikely. The sharing of experience between business support agencies which support start-ups and new entrepreneurs could help increase the efficiency of their services (see Box 2.30). In Greenland, new regional innovation centres have recently been established in the four newly merged municipalities, and these would benefit from the experience of other intermediaries within NORA or in other sparsely populated environments. Finally, encouragement of women entrepreneurs should receive particular attention, given the specific problem of gender-biased emigration (see Chapter 1). Scotland's "Women into Business" initiative provides a range of targeted services to encourage and enable more women to start a business (Box 2.31).

Box 2.30. **Supporting entrepreneurship: IMPRA**

IMPRA at Innovation Centre Iceland assists entrepreneurs with the start-up, growth and management of SMEs. IMPRA operates an Incubator Centre which offers support and facilities to start-up companies working on innovative business ideas. IMPRA offers extensive Internet information services, workshops and courses for SMEs and the general public and publishes books and manuals on management, marketing and more. IMPRA also runs an Enterprise Europe Network office (EEN) to encourage co-operation between Icelandic and European companies. IMPRA has also set up a network of delegates in small knowledge hubs disseminated throughout the country, to help support existing and potential entrepreneurs in remote rural areas.

Source: www.nmi.is.

Box 2.31. **Women into Business Scotland**

In Scotland, research commissioned by Scottish Enterprise and Highlands and Islands Enterprise in 2003 indicated that 67 000 women run businesses, of which 26% is self-employment, up from 20% in 1984. However, women account for only 10% of high-growth businesses in Scotland. Despite women's entrepreneurial interest a relatively low level of women-owned businesses pursue growth strategies. In terms of new starts, women are now thought to constitute around one-third of the total. Over the last few years Scottish Enterprise (SE) has increased its effort to encourage more new business creation and development by women. The programme "Business Gateway" has targeted services and initiatives to encourage and enable more women to start a business:

- Women into Business Networking: a sustained programme of business seminars and networking opportunities for pre-start customers that provides links to advisers, business people and informal mentors offering information, advice and firsthand experience on setting up a business.
- Mentoring Support for Female Entrepreneurs: the Business Mentoring service is a partnership between Scottish Enterprise and the Scottish Chambers of Commerce. Businesses are carefully matched with experienced business mentors, all of whom have a track record of success in business.
- *scottishbusinesswomen.com*: this website was created to communicate and promote the range of targeted initiatives available from Business Gateway to encourage more women in Scotland to start a business. It is a key communication channel to reach and inform women and to promote the range of activities and services. The website provides customers with access to information, advice and online registration to targeted programmes, training and services. It highlights other partners' events and services and provides a wide range of case studies on women in business.
- Women into Business Conference: these events, organised by Business Gateway, aim to inspire, encourage and enable more women to start a business. The events provide a series of workshops on personal and business development subjects. The speakers are women who have an excellent track record in business and who can share with attendees their formula for success, demonstrate how they have developed their business and also highlight how they have found their way through adversity in business.

Source: Scottish Enterprise.

There is a need to develop an efficient public sector that does not crowd out private sector activities.

As mentioned earlier and illustrated in Chapter 1, the public sector plays a key role in the NORA economies, especially in Greenland and the Faroe Islands, where it is very involved in business activities through ownership of key companies and enterprises. This is due to the specific accessibility and scale challenges of these regions, which create a situation in which certain economic activities (such as air transport) are not profitable for private firms. However, in such economies a big public sector represents a challenge for private-sector competitiveness (especially for SMEs) including a risk of crowding out private activities (see Box 2.32). These challenges should however be set against the role the public sector plays in maintaining the welfare system of these economies. Although the fundamentals of the situation cannot be changed, there are opportunities to open the economy further to foreign investors, improve the housing market situation in Greenland (see OECD, 1999) and, as mentioned above, promote entrepreneurship.

Box 2.32. **The dominant role of the public sector and private sector challenges in the Faroe Islands and Greenland**

The size of the public sector in the NORA economies, particularly Greenland and the Faroe Islands, reflects in part the requirements of the Scandinavian welfare model. It is reinforced by the peripherality of these territories, their dispersed settlement patterns and their harsh climatic and geographic conditions. Basic services for communication with the outside world such as aviation, shipping or telecommunications are publicly assured by the government for the different settlements. It would be extremely difficult to create well-functioning competitive markets in many activities, but there are opportunities to improve the conditions for expansion of the private sector.

A big public sector and a lack of entrepreneurial culture imply a risk of crowding out private activities, including enterprise start-ups, and a great risk of unfair competition, as publicly owned enterprises may face softer budget constraints. Weak competitive pressures may also result in the inefficient use of resources. When national economies are small, the dominance of the public sector reinforces the diseconomies of scale in the private sector. The role of the private sector becomes limited and may become too small to reach the "critical mass" necessary for longer-term expansion. A further problem is the lack of a support network for SMEs, which face particular challenges in an environment dominated by the public sector and by a small number of large companies in fisheries and other resource sectors. The formation of clusters is challenged by

Box 2.32. **The dominant role of the public sector and private sector challenges in the Faroe Islands and Greenland** (*cont.*)

the island structure of the settlements and their small size. In addition, an important challenge in the Faroe Islands and especially Greenland is the lack of a local entrepreneurial culture and traditions for establishing new enterprises. In Greenland, new industrial enterprises have been established for decades either by Danish residents in Greenland or by the government, and only to a limited extent by Greenlanders. This pattern is changing, but it will be some time before a business culture emphasising local entrepreneurship emerges.

In order to trade and conduct business in Greenland, a trading licence must be obtained from the public administration. The Greenland Trade Act (2001) states that a person wishing to obtain a trading licence must possess Danish citizenship or have a work permit for Greenland and be a resident of Greenland, unless an international agreement valid for Greenland states otherwise or the government grants a waiver. Citizens of Nordic countries do not need work permits or residence permits. Companies and branch offices can obtain trading licences if they are registered in Greenland and if the management resides in Greenland. For public and private limited companies, half of the company's actual management must reside in Greenland. These requirements could be substantially relaxed, as such overt protectionism represents an impediment to business formation (OECD, 1999).

Public finances both in Greenland and in the Faroe Islands are under pressure, and this pressure will increase in the coming years, owing to population ageing and the need for substantial investments in education and infrastructure. In addition, the block grant from Denmark is calculated in fixed (nominal) prices: in order to avoid structural imbalances and to ensure sound public finances, there will be a need for lower public expenditure and/or more private commercial activity to create higher tax revenues.

Sources: OECD (1999), "Greenland's Economy: Building a Strategy for the Future", OECD, Paris; Faroese Governmental Bank (2009), *Economic Assessment, Economic Outlook 2009 and 2010*, Landsbanki Føroya, 30 October; Bank of Greenland (2009), *The Bank of Greenland Annual Report 2009*; Ministry of Industry, Labour and Mineral Resources of Greenland (2010), *Setting-up a Business in Greenland: Guide for Investors*, NIRAS Greenland A/S, Nuuk.

Innovation and economic development policies could support further expansion of the economy

It would be important for innovation policy and economic development policies to support potential new developments, notably by giving a voice to entrepreneurs and the private sector in policy design. A number of policy instruments are available to support innovation in NORA territories. They

are either developed and managed at national level, such as national funds for research or technology and technology centres, or owned by the national government and implemented in partnership with the regions, such as Innovation Norway or IMPRA in Iceland. The Icelandic Regional Development Institute (*Byggdastofnun*) supports eight industrial regional development agencies formed by municipalities, federations of municipalities, trade unions or private institutions. Byggdastofnun provides added financial support to projects concerned with regional development and innovation conducted under the auspices of these agencies. A few genuinely regional instruments exist as well, such as Greenland Venture or the Faroese Research Council. The orientation and intensity of these policies influence the NORA innovation potential and provide a pool of experiences for sharing knowledge and practice in support of innovation, adapted to the region's specific situation.

The most relevant policy instruments for the NORA region will be those that tackle the key bottlenecks for economic development and diversification: internationalisation, entrepreneurship, new firm creation and venture capital provision. One key policy instrument that is present or under development in the NORA territories is the establishment of local or regional innovation agencies and of intermediaries to support innovation in existing or new businesses. Such intermediaries are found in many OECD regions. A recent OECD study has identified success factors for these agencies (Table 2.3). These conclusions, coming from a comparative survey of several models of OECD regional innovation agencies, could be taken on board in exchanges of experiences between NORA actors involved in this type of support.

Given the small size and limited market in the sparsely populated areas of NORA, a promising co-operation activity would be exchanges between regional offices of Innovation Norway, IMPRA and regional knowledge centres in rural Iceland, Danish Regional Growth Forums, Greenland Venture and the regional agencies recently established in the newly merged municipalities in Greenland. Those exchanges, focusing on innovation promotion in remote and sparsely populated peripheral areas, would bring food for thought throughout the NORA region. Policy learning from other regions facing similar development challenges should also be taken into consideration (*e.g.* rural Scotland, Box 2.33).

Table 2.3. **Strengths, weaknesses, threats, opportunities, and success factors for regional innovation agencies (RIAs)**

Category	Key issues
Strengths	• Knowledge of specific situation of local companies • Proximity with local public and private actors in charge of innovation promotion • Central position to enhance regional partnerships and social capital, facilitator role • Well placed to achieve horizontal co-ordination of portfolio of services
Weaknesses	• Unclear mandate • Lack of impact evaluation of activities • Difficulty to find and retain qualified staff (owing to unstable funding) • Inward-looking perspective constrained by administrative boundaries – lack of vertical co-ordination
Threats	• Unfair competition with private services • Unfocused activities owing to a shortage of financial resources • Public status and absence of competition induce lack of performance incentives • Inward-looking strategies – unnecessary competition with other regions
Opportunities	• Co-ordination and synergy of regional innovation support (to avoid fragmentation) • Acquiring legitimacy through the demonstration of goals achieved – need for strategic evaluations • Development of tools and professional support for own governance and to fuel strategic policy intelligence • RIAs as agents of change in the regional innovation system, "one step ahead"" • Overcome administrative boundaries to obtain effective innovation promotion
Success criteria	• Institutional recognition as a legitimate regional policy instrument • Complementarity of services, either internally or externally, in either one or another of two models: integrated or networked • Flexibility in the definition of the services portfolio (adaptability to new needs) • Strategic management capacities • Goal-oriented approach and (partly) performance-based funding • Quality of human resources (professionalism, specialisation) • Suitability of structural funding sources (not too high, not too low)

Source: OECD (2011 forthcoming), *Regions and Innovation Policy*, OECD Publishing, Paris.

Box 2.33. The South of Scotland Innovation System Initiative

In September 2008, Scottish Enterprise launched a three-year project, the South of Scotland Innovation System Initiative, to address some weaknesses in the rural south of Scotland: a high proportion of small businesses and self-employment; industries with low levels of knowledge-intensive employment; dispersion of businesses; limited size of local markets and competition; few regionally produced research and graduates. Ultimately, such a situation results in lower levels of innovation within the region and a relatively weak innovation infrastructure. The project has two major components:

- Linking Entrepreneurs programme to facilitate business-to-business exchanges of ideas and experience and to support businesses to innovate through peer networking and collaboration; and

- Knowledge Links programme to facilitate business-to-academia linkages and support businesses to access relevant research academics and students.

This initiative has helped to fill gaps and create linkages in the region's innovation system. Where the project has provided direct support to businesses, there have been clear, measurable benefits. The project has also seen some success in connecting extra-regional innovation support to businesses within the region. This has largely been achieved by encouraging innovation support providers to host events and promote services in the region and by raising awareness of support available through regional businesses development intermediaries.

Source: Scottish Enterprise.

2.4. Meeting the climate change challenge

For the NORA territories, climate change will raise challenges, but opportunities to expand some economic sectors are also envisaged. The main economic sectors and activities of the region (fisheries, mining, energy, transport) will be affected, either positively or negatively, by climate change. Adaptation measures will be required to address the forthcoming challenges and to take advantage of the economic opportunities in a sustainable manner.

Climate change in the NORA region

Today's climate varies considerably across the territories in the NORA region, from Arctic regions in parts of Norway and Iceland and the great ice sheet in Greenland to the oceanic climate of the Faroe Islands. Yet, projections of climate change suggest that by the end of this century, temperatures will increase in the NORA territories, and in the Arctic regions in particular, more strongly and earlier than in the rest of the world. However, before examining the possible impact of climate change, it is important to note that there is much uncertainty surrounding the issue.

There are different assumptions about climate change. Some studies refer to specific emissions scenarios, with detailed information about changes in several climatic parameters. Some take potential adaptation measures, such as reduced CO_2 emissions, into account, while others do not. Potential impacts are analysed in different social and economic contexts. Some analyses limit themselves to considering the impacts of an increase in global mean temperature. Others focus on the specific effects of climatic changes in single areas. It is also important to note that, as well as climate change linked to increased greenhouse gas emissions, other processes can also affect climate patterns, introducing additional uncertainties into the projections. For instance, the North Atlantic Oscillation (NAO) is a climatic phenomenon in the North Atlantic Ocean, which involves fluctuations in atmospheric pressure at sea level between the Icelandic low and the Azores high. The NAO is linked to marked shifts in weather conditions: fluctuations in ocean and land temperatures, rainfall and surface pressure, and impacts on the marine and terrestrial ecosystems (Hurrell, 1995; Visbeck *et al*., 2000; Thostrup and Rasmussen, 2009). At the same time, the thermo-haline conveyor belt is part of the large-scale ocean circulation and changes in the conveyor patterns and the circulation of cold and warm waters in the ocean have had dramatic impacts on climate, *e.g*. severe winters in the north and drought in other areas (Gagoslan, 2003; Thostrup and Rasmussen, 2009). These phenomena mean uncertainties about attributing specific changes to a single cause.

While taking into account the different scenarios and uncertainties about the precise effects of climate change for the purposes of short-, medium- and long-term planning in the region, it is still important to consider key projections and the likely indicators of change.

Temperatures are expected to rise by more than the global mean

Projections on the exact extent and rate of change differ. Crucially, estimates vary according to the emissions scenarios applied (Hanssen-Bauer, 2009). Some of the most widely used projections are set

out in the IPCC Special Report on Emissions Scenarios (Table 2.4). Geographic differences and specificities must also be taken into account.

Table 2.4. **IPCC emissions scenarios**

Scenario	Characteristics	Global average surface warming (by 2090-99 relative to 1980-99)
A1B	Rapid economic growth based on technological change and balanced use of fossil and non-fossil energy sources, and a world population that peaks in 2050.	↑2.8°C
A2	A more heterogeneous world with slower economic growth and technological development and a continuously growing world population.	↑3.4 °C
B2	Slower population growth than A2 and focus on environmental protection at the local and regional level.	↑2.4 °C
B1	Population peaks mid-century and CO_2 emissions are reduced through the introduction of new technologies and global solutions.	↑1.8 °C

Source: IPCC (2007), *Climate Change 2007: Synthesis Report: An Assessment of the Intergovernmental Panel on Climate Change*, AR4, IPCC.

Projections based on the disaggregation of global climate models suggest that the North Atlantic region will experience a more humid climate and warmer temperatures by the end of the century. Developing accurate projections for the NORA territories is difficult because of the influence of ocean currents on local climates, especially in Iceland and the Faroe Islands (Heide-Jørgensen and Johnsen, 1998; NVF, 2006). Nevertheless, specific projections have been attempted for the region and for the NORA territories individually, the results of which are summarised in Table 2.5.

Table 2.5. **Summary of the projected temperature increases in NORA territories 2071-2100 relative to 1961-90**

Indicator	Norway	Iceland	Faroe Islands	Greenland
Mean winter temperature change	4.3-6°C	2-3°C	Mean change up to 3°C	Uncertain: About 2° C in the south and 6-10° C in the north in winter (with only small increases in summer)
Mean summer temperature change	2.4-3.5°C	2.5-3.5°C		

Source: Various, see text.

Temperature increases are expected to be greater than the global mean in this region, with the largest increases in winter, yet because the NORA region covers a large and diverse area, territories will face different challenges, and even internally, especially in Greenland and Norway, potential impacts will vary over the territory:

- In the Faroe Islands, global climate models (May, 1999; Stendel *et al*., 2000) project an increase in the mean annual temperature of approximately 3°C for 2071-2100 compared to 1961-90, with only small differences in temperature rise between winter and summer (Cappelen and Hesselbjerg Christensen, 2005). Heide-Jørgensen and Johnsen (1998) project an increase of up to 1-2°C warming up to 2100 with a slightly greater increase in winter.

- For Greenland, projections vary in their estimates of the extent of change. Estimates of global and regional climate models (May, 1999; Stendel *et al*., 2000; Kiilsholm *et al*., 2003) show a general trend of an increase of around 2°C (a little more in winter than in summer). In northern Greenland there would be temperature increases of 6-10°C in winter, and minor increases in the summer (B2 emission scenario). The Danish Meteorological Institute projects a 7-8°C increase by 2080, under a scenario of rapid economic growth (A1B emission scenario) (Danish Meteorological Institute, 2009). The Arctic Climate Impact Assessment projects a 3°C mean warming of eastern Greenland by 2070-90 (ACIA, 2004). Heide-Jørgensen and Johnson (1998) suggest that projections for southern Greenland are more uncertain as the area has experienced a period of cooling that may counteract the effect of global warming in the medium term.

- In Iceland, a temperature increase of 2-3°C is projected, slightly smaller than the projected increase in Scandinavia (NVF, 2006).

- In Norway the mean temperature is expected to increase by 2.3-4.6°C by 2071-2100 relative to 1961-90, with the largest temperature increase taking place in winter in the north and the smallest increase taking place in the west. Changes for Svalbard are expected to be similar to those in mainland Norway, but with an even larger temperature increase during winter and an overall increase in precipitation across seasons (Hanssen-Bauer, 2009).

Projections point to increased precipitation, less snow and reduced icebergs

Precipitation levels in the region are generally expected to increase. For example, for the Faroe Islands a small increase in precipitation of around 4% is projected (Heide-Jørgensen and Johnsen, 1998). In Greenland, an overall increase in precipitation is expected. In the medium term, the combination of increased precipitation and temperature could result in increased melt rates at the margins of Greenland's ice sheet, but increased accumulation rates in the interior due to greater snowfalls. In the longer term, the increased melt rate is expected to be the dominant trend (Heide-Jørgensen and Johnson, 1998; Anisimov *et al*., 2007). The projected scenarios for Iceland vary. Based on an assumption of slower economic and population growth (A2 and B2 emissions scenarios), increased precipitation is projected for northeast Iceland, especially in winter. For the southwest, precipitation may decrease during winter, spring and summer, but increase by as much as 30% during autumn (NVF, 2006). Additionally, the size and quantity of Icelandic glaciers are expected to decrease drastically over the century. Finally, a general increase in precipitation is expected in Norway, with an expected 18.3% increase in annual mean precipitation. The largest increase in precipitation is expected in the regions of the west coast where autumn, winter and spring precipitation changes are expected to be largest.

In all of the NORA territories, as a result of temperature changes, snow seasons are likely to become shorter, especially at low altitudes. For instance, by the end of the century in Norway, the snow season is expected to be reduced by as much as 2-3 months at low altitudes; this could lead to winters without snow in some areas. Snow depth is also expected to decrease across the country by the end of the century, but may increase in the northernmost areas and at high altitudes in the medium term owing to increased precipitation (Hanssen-Bauer, 2009). In Norway, as in Iceland and Greenland, the size and quantity of glaciers are expected to decrease drastically over the century. For instance, Nesje *et al*. (2006) project that 98% of the Norwegian glaciers may disappear, and the area covered by glaciers could be reduced by 30-40% by 2100.

Upper layer sea temperatures are likely to increase…

As with land temperature changes, projections for changes in sea temperatures vary, owing to uncertainties about changes in sea-ice coverage. However, a number of estimates have been put forward. Sea temperatures will remain unchanged in areas covered by ice. However, ACIA (2005) suggest that upper layer sea temperatures are likely to increase by the same amount as air temperatures in areas without sea-ice coverage. Such changes

would mean increased variability in surface water temperatures, increased exposure to wind and, related to this, changes in water circulation with implications for ocean temperatures.

…while sea-ice coverage will contract

A greater area of sea is expected to be without ice coverage. The extent of sea-ice cover in the Arctic during the summer has already decreased by 15-20% over the past 30 years and is expected to further decrease by over 50% by the end of the century (ACIA, 2004). Hanssen-Bauer (2009) suggests that summer sea ice could disappear by the middle of the century, the mean surface temperature of the North Sea could increase by 1.4°C over the century, and a 1°C increase in the temperature of the Barents Sea could occur in the period 1995-2059.

Changes in sea levels are also highly uncertain, owing to questions about the melt rates of the Greenland ice sheet and Antarctic land ice, for example.[19] ACIA (2005) project a 5 cm increase in sea level by 2020, 15 cm by 2050 and a 25 cm rise in sea level by the end of the century, but with a range of 10-90 cm due to uncertainties about the rate and extent of change. Land geography also affects patterns of sea level rise. For instance, for Norway, the projected rise in sea level by 2100 are a 70 cm increase along the coast of southern and western Norway, 60 cm along the northern coast and 40 cm in the largest fjords. However, it is also suggested that the exact level of change may be up to 35 cm higher or 20 cm lower (Hanssen-Bauer, 2009).

Change in wind climate is also an important indicator of climate change. Few clear conclusions can be drawn concerning changes in wind patterns in the North Atlantic (Hanssen-Bauer, 2009). However, climate change has been linked to a possible increase in regional storm intensity and a probable northward shift in storm tracks (ACIA, 2005). For instance, for Norway, small changes in daily maximum wind strength are expected, but the number of days with winds exceeding 15 metres per second could increase by four days a year by the end of the century (Iversen *et al.,* 2005).

Impacts, responses and adaptation

Climate change will affect a broad range of human activities and welfare in different ways and to different extents. A distinctive characteristic of the effects of climate change in the NORA region is that they will probably be mixed: some effects will be negative, creating new challenges for the development of the regional economies. Yet, climate change is also seen as a potential source of new opportunities. Action can be taken to adapt to and

to mitigate climate change. Mitigation measures[20] are beyond the scope of this review, which focuses on the specific impacts of climate change on the main economic sectors of the region and on potential adaptation measures. The long-term economic development of the NORA territories will depend on timely adaptation and reasonable management of the region's environment and natural resources. This section considers the impacts of climate change and points out some responses in terms of adaptation in the following areas: fisheries and aquaculture; agriculture, forestry and hunting; energy and mineral resources; transport and accessibility; and tourism. It will also point to the potential effects on settlements and traditional communities.

There will be changes in the migratory trends, stocks and fertility of fisheries

Fisheries in the NORA territories are large in a European context, and constitute the most important economic sector in the Faroe Islands and Greenland (see section 2.2). The dominance of this sector makes the impact of climate change on fisheries especially important to understand and, where possible, plan for. Many coastal and marine ecosystems are already under pressure from various human activities that result in pollution, overfishing and damage and loss of habitats (OSPAR, 2009). The potential effects of climate change, along with other pressures, render marine ecosystems particularly vulnerable.

While it is difficult to anticipate the precise effects of climate change on fisheries and aquaculture across the region,[21] the projections set out above and the analysis of the characteristics of the region's fisheries (see section 2.2) make it possible to highlight a number of potential effects. First, sea temperature changes and changes in salinity are expected to affect migration patterns and the distribution of key fish stocks. Possible changes include a northward shift in fish stocks in response to warming, but also the appearance of new fish stocks from the south (ACIA, 2004) (see Box 2.34). Second, sea temperatures are linked to growth rates and the fertility patterns of key stocks, which have implications for catch quotas and fisheries management. Research suggests that cod may become fertile one year earlier if water temperature increases by 2°C (Drinkwater and Sundby, 2006). Third, climate change is expected to lead to loss of habitat for key species. Ocean acidification, coastal erosion and changes in sea temperatures all have damaging effects on the fragile marine environments that sustain key stocks. Associated impacts are the possible invasion and establishment of non-indigenous species, changes in the distribution, abundance and seasonality of plankton and fish, increased chemical

pollution and eutrophication (an increase in the concentration of chemical nutrients in an ecosystem), which can lead to severe reductions in water quality.

Box 2.34. **Changes in fish migration**

ACIA (2004) describes possible impacts on the distribution of important fish stocks in the Arctic region at an increase in ocean temperature of 1-2°C. However, there may be some variation in the rates at which stocks react to change. For instance, pelagic fish living in the open water column are highly mobile and responsive to change, while demersal fish, living at or near the bottom of the sea, tend to be slower to respond to variations. Particular attention has focused on the impact of cod stocks, which are already subject to high pressures from commercial fisheries. Key cod stocks are predicted to respond to temperature increases by moving north of Iceland and into the Barents Sea (Stenevik and Sundby, 2007; ACIA, 2004). Stocks are also expected to move to deeper waters. Seasonal migration patterns may also change substantially, *e.g.* migration may increase if coastal sea ice disappears altogether (Drinkwater, 2005). Warming due to climate change could lead to the establishment of a new Greenlandic cod stock, but is also likely to lead to a decrease in the stock of shrimp (ACIA, 2004). Stocks of herring and mackerel may move from the North Sea into the North Atlantic and total stocks may also increase. Anchovy, sardines and tuna are possible new species in the North Atlantic. Productivity in the Arctic Ocean may increase, and, crucially, accessibility to fish stocks could improve with the melting of sea ice.

Climate change also has important implications for aquaculture, a key sector for the NORA territories. In many areas, current sea temperatures are favourable for cultivating key species, such as Atlantic salmon and sea trout. In Greenland, reduced sea-ice coverage may also provide opportunities not currently available. However, increased water temperatures will make some areas that currently rely heavily on aquaculture too warm and increase the risk of disease and algae bloom. For instance, in the south of Norway, an increase in water temperature of 2–3°C will negatively affect the cultivation of salmon (Lorentzen and Hannesson, 2005). This could encourage southern industries to move to the north of the country, thereby contributing to an increase in fish farming density and thus to increasing risks of spreading diseases (see section 2.2). In addition, any increase in extreme weather events will also affect the viability of aquaculture, as fish pens can be damaged in stormy conditions.

Better technology can enable adaptation

Uncertainties about the precise nature and impacts of climate change make it difficult to propose detailed and specific responses. However, it is worth noting that in the past commercial fishing has regularly had to adapt to changes in the availability of key fish stocks. Such changes can be negative or positive and can be a challenge for industry adaptation, *e.g.* decommissioning of vessels, substantial job losses and the high costs of adapting vessels and machinery to fishing new species.

There are opportunities to develop new technologies to exploit and adapt to change, especially in the already technologically advanced NORA fleets. However, this requires investment and support. Many traditional fishing communities lack means of developing alternative economic activities and would require support. For instance, in Greenland, a shift from shrimp fisheries to cod fishing would require investment in new equipment and could negatively affect communities that are highly dependent on shrimp fishing. The impact on Greenlandic communities will depend on the ability to adapt and the costs of adaptation.

For the aquaculture industries, options include the farming of new species (see section 2.3), shifts in location and means of preventing or fighting diseases. Research and development is under way on new types of fish cages for use in more open waters that would dramatically open up the scope for fish farming. At the same time, research into more effective vaccines continues. However, the side effects of medical treatment are controversial, and may not be acceptable in the long run.[22] A recent OECD Workshop on the Economics of Adapting Fisheries to Climate Change (held in Busan, Korea, in June 2010) suggested that aquaculture may be part of the adaptation to climate change. As a production system aquaculture can more easily be adapted to climate change through technological developments and by growing species that better resist such change (temperature, salinity, etc.).

Flexible, responsive fisheries management is required

In the meantime fisheries management needs to be flexible and to provide an incentive structure that preserves fish stocks. In particular, a number of studies have highlighted the pressures that could result from migration from one economic zone to another (*e.g.* Hannesson, 2007). In this respect, the period during which the stock does not belong to one country is critical: the shorter it is, the more likely the stock is to survive. However, the strong national interests involved mean it may take time for the parties to agree on a new arrangement for the distribution of quotas. As

shown in section 2.2, the difficulty of monitoring the movements of stocks and the conflicting interests of stakeholders and countries make adapting fisheries management systems a particularly challenging task. However, in the past it has been possible to develop systems and bilateral and multilateral agreements for the management of shared and straddling stocks. For instance, as herring stocks recovered and returned to international waters, an international management regime was agreed for the stock, based on an agreement between Norway, Russia, the Faroe Islands and Iceland (Churchill, 2001; Hoel and Kvalvik, 2006). Similarly, systems would have to be developed to cover newly accessible stocks, *e.g.* in the Arctic, and new species.

Climate change could create opportunities for some sectors, while threatening others

Owing to their harsh weather conditions, agriculture and forestry play a modest role in the NORA territories. However, a warmer climate, increased precipitation and an extended growing season will mean increased productivity with longer crop seasons or the harvesting of new ones. The effects are already being felt. In Greenland, sheep farming is already increasing in importance, as is agriculture in the south, given a longer crop season and the introduction of new vegetables. Agriculture and farming activities are thus making an important contribution to the local economy of southern Greenland (Thostrup and Rasmussen, 2009). In the north of Norway, climate change is expected to increase grass yields and offer scope to farm new crops. Studies indicate that the northern limit for growing wheat may move 160 to 180 km per 1°C increase in mean temperature (Kuusisto, 2004). In Iceland, higher temperatures and better pastures could improve conditions for livestock and crops for human consumption. Additionally, afforestation and revegetation are being considered as a means of carbon sequestration (Clement, 2006).

But warmer weather also create challenges, especially for traditional communities

However, milder winters and a damper climate could lead to the invasion of non-native species, an increase in the risk of diseases, pests,[23] fungus and insect attacks, all of which can cause extensive damage to crops and habitats, as well as to more flooding, run-off and erosion. The impact of climate change on more traditional hunting and herding activities in the NORA regions can also be important. For instance, a long tradition of reindeer herding is still an important part of the indigenous culture and economy in the northern regions of Norway. Warmer weather and irregular winter seasons will affect traditional reindeer migration routes, will reduce

reindeer's access to food, and will affect the way of life and main economic activity of traditional reindeer herding communities (see Box 2.35). In Greenland, hunting sea mammals is important, especially for some settlements of the North, where traditional hunting and fishing are the main economic activity and the main source of food. As ice and weather conditions become less predictable, major changes are likely in the distribution of mammals, as many species rely on stable sea-ice conditions for feeding and new species may appear (Hovelsrud and McKenna, 2006). Finally, warmer weather makes the ice cap thinner. This will affect dog sledge routes and higher risk of breaks in the ice will make traditional hunting and fishing much more dangerous. The effect on the local economies of traditional herding and hunting communities in Norway and Greenland is potentially very large.

Box 2.35. **Climate change and reindeer herding**

Reindeer herding exists in Norway, Finland, Sweden, Russia, Greenland, Alaska, Mongolia, China and Canada. A small herd is also maintained in Scotland. There are about 100 000 herders and 2.5 million semi-domesticated reindeers in the world (United Nations, 2010). Approximately 6 500 Sami work as reindeer herders in the Sami area: Norway, Sweden, Finland and Russia (Kola Peninsula). In Norway, as of 2006/07, there were a total of 556 Siida units (or groups of reindeer owners) with a total of 2 936 people. Of these, 403 Siida units and 2 200 persons are in the county of Finnmark, numerically the most significant region for reindeer husbandry in Norway. The total number of reindeer in Norway fluctuates but is normally around 200 000. Since reindeer herding takes place in nature and is very dependent on the conditions that nature provides, changes that occur have an impact on reindeer husbandry. Frozen ground underlies most of the region and if warming degrades the permafrost, traditional reindeer migration routes are likely to be disrupted. Moreover, according to the ACIA (2005), irregular winter seasons, with periods of rain and freezing create an ice layer on the ground that reduces reindeers' access to the underlying lichen of the pastures. Such conditions represent a major change from the norm, and in some years, have resulted in extensive losses of reindeer. Future changes in the extent and condition of snow could have major adverse consequences for reindeer herding and the associated physical, social and cultural livelihood of the herders. But it is still not clear how and how much reindeer herding will be affected by increased climate change.

Sources: International Centre for Reindeer Husbandry, *http://icr.arcticportal.org*; United Nations (2010), "Study on the Impact of Climate Change Adaptation and Mitigation Measures on Reindeer Herding", Economic and Social Council, Permanent Forum on Indigenous Issues, Ninth Session, E/C.19/2010/15, 8 February, New York.

The expansion of new and existing activities needs to be governed within a sustainable framework

Agricultural activities are already increasing in many parts of the NORA region and could be developed further. The changing natural environment offers an array of opportunities for more agricultural or forestry-based economic activities in local communities (as in southern Greenland). Yet, efforts to exploit new opportunities arising from climate change should go hand in hand with preservation and conservation of the region's unique and extremely valuable habitats and environments. Some environments can help mitigate climate change. For example, wetlands, in particular peat bogs, are very effective carbon sinks. Restoration and conservation of such areas could be a means of addressing climate change and preserving important natural habitats in the NORA region, as the Nordic countries, and especially Iceland, have recognised (Thostrup and Rasmussen, 2009); Scotland is also exploring this (Edwards, 2010). Finally, research is needed to address potential negative effects on agriculture and forestry (*e.g.* an increase in pests, fungus or insect attacks).

Adaptation of traditional communities will require support

In Greenland, traditional hunting methods are based on detailed knowledge of sea-ice conditions and have been developed over thousands of years. Although these methods have adapted to past climate variations, dramatic changes in sea-ice cover could be beyond the adaptive capacity of hunting-based communities.[24] In addition, scope for adaptation depends on a range of complex processes and factors. For instance, institutional constraints, loss of habitat, animals of prey, as well as federal regulations and restrictions all limit reindeer herders' ability to adapt (Tyler *et al.*, 2007).

Energy and mineral resource sectors will also be affected

Climate change can affect energy supply and energy demand. For instance, severe weather, a rise in sea levels, coastal erosion, increased precipitation and runoff could all affect energy production and potentially damage existing sites. But climate change could also have positive effects on the production of energy. Most electricity production in Norway and a substantial part in Greenland, Iceland and the Faroe Islands is based on hydropower. Increased precipitation and a substantial increase in runoff during winter in large parts of the hydropower production areas could yield higher potential for hydropower production (Beldring *et al.*, 2006). At the same time, it is assumed that higher temperatures will reduce the demand for heating, while the demand for cooling/air-conditioning is low and is not

expected to increase with increased temperature. In a study of the Nordic electricity market, Gabrielsen and Bye (2005) assume that the inflow to hydropower plants will increase by 13% in 2040 and that electricity demand will decrease with increasing temperature. Both effects could contribute to a reduction in electricity prices. It may, however, be costly to utilise this potential as long as the main increase in runoff comes at a time of the year when the magazines are filled. To what extent utilisation of this potential will require new magazine capacity is uncertain, but an increase is clearly expected.

A warmer climate could increase access to a range of opportunities for mineral and oil exploitation, particularly in Greenland, where exploration for mineral resources previously hidden by ice sheets has already begun. In addition, climate change could increase accessibility to the expected considerable reserves of petroleum off the coasts of Greenland and facilitate its transport. Oil and gas fields in the north of the Arctic Circle currently account for a small share of the world's hydrocarbon production. However, the share could rise significantly in coming decades as sea ice recedes and as technical challenges are addressed and costs decrease.

The ability to drill wells in ice-covered seas will be critical to the efficient development of Arctic resources. Existing drilling units in ice-covered waters generally have a limited operational window, although the receding ice cap will increase this window. Fit-for-purpose Arctic drillships are being developed in Norway for water depths of more than 80 metres. New technologies such as subsea and sub-ice drilling are being considered. A majority of offshore fields will most likely be developed using subsea technology and well-stream transport to land. For easing oil flow at the surface, effective solutions are still to be developed, including fluid conditioning, pressure-boosting and well intervention technologies (OECD/IEA, 2008). Moreover, the Arctic presents many of the high-profile challenges associated with deepwater operating conditions: remoteness, personnel safety, environmental footprint and high costs. An extreme climate and hazards from ice and icebergs add to these difficulties. As mentioned in Chapter 1, the recent tragedy of the Deepwater Horizon oil spill in the Gulf of Mexico, the economic dependence of the NORA region on maritime resources, and the fragility of its rich ecosystems, make it particularly crucial to carry out any further development of the oil industry under the strictest environmental regulation and control.

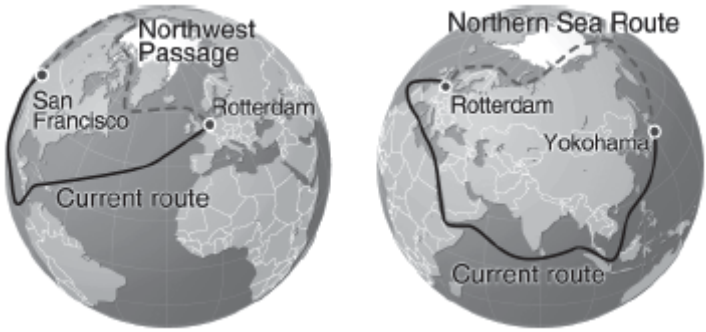
More can be done to develop renewable energy resources and energy efficiency

With energy-related emissions of carbon dioxide accounting for 61% of global greenhouse-gas emissions, the energy sector is at the heart of efforts to cut emissions (OECD/IEA, 2008). Improved energy efficiency, energy savings and increased use of renewable energy are pillars of the international response to climate change and are also reflected in NORA approaches to the issue. For instance, efforts are being made in Greenland to improve household insulation and to expand hydropower energy. As noted in section 2.3, the NORA territories are in a favourable position to capitalise upon and further develop their physical resources and technical expertise in energy efficiency and renewable energy. Increasingly integrated plans are being developed to consider how best to approach these issues, although in some cases these have not been implemented. Plans must consider the need to invest in and expand new technologies and develop the skills to work in new sectors. There is scope to further develop co-operation and collaboration within the region on these issues. In this regard, the Nordic Council of Ministers has established a working group to promote co-operation between the Nordic countries on energy efficiency. Nordic Energy Co-operation aims at the development of technologies and means to oversee the creation of a sustainable energy system across the Nordic regions.

The potential impact of climate change on sea transport is a major issue

Accessibility and transport are key challenges for the NORA region's development (see section 2.1). As a result, the impact of climate change on accessibility is a key concern. In particular, any reduction in the amount of sea ice has important implications for maritime access. Some projections suggest that the Arctic Ocean could be free of ice during part of the summer by the middle of the century (ACIA, 2004). As a result, the length of the navigation season in the Arctic could increase by 20-30 days by 2040 and 90-100 days by 2080 (ACIA, 2004). Faster shipping routes, especially between the North Atlantic and North Pacific, could offer easier access to markets and resources for the NORA territories; it could even give them a more central place in global shipping routes (see Figure 2.2). Additionally, as the scope to develop further economic activities in the Arctic increases, demand for marine transport will increase. Climate change over the last decade has already led to increased shipping activity in the Arctic (Valsson, 2009). Greater use of the northwest route is attractive, as it shortens transport distances between the Far East and European ports by 40%, allowing savings in journey times, fuel and carbon emissions).

Figure 2.2. **Current and future sea routes around the Arctic basin**



Source: UNEP (2007), *Global Outlook for Ice and Snow*, Geneva.

However, at the same time, changes linked to global warming could have more negative local impacts. More severe weather and storms could affect the reliability of local ferry and transport services, especially to remote coastal communities. It could also make routes across sea ice less stable for hunters and indigenous populations. Additionally, increased shipping activity raises energy consumption and pollution and creates the risk of environmental damage from intentional or accidental spillages and discharges that can damage sensitive ecosystems, such as those in the Arctic. Concerns are also raised about the potential for invasive species to be transported to new marine environments via new sea routes. For instance, as new sea routes open, it is expected that ships coming from warmer oceans will be carrying organisms that could become established in the Arctic Ocean (ACIA, 2005).

Direct and indirect effects will also be felt on road and air transport. Despite the high proportion of sea transport in the region, road transport is still vital, especially as rail networks are not well developed.[25] A warmer climate and reduced snow and ice coverage could improve road accessibility. However, increased levels of precipitation could lead to a greater risk of flooding, subsidence, landslides and heavier snowfalls (Nordiska Vägtekniska Förbundet, 2006). In addition to floods and severe weather, extreme high tides are also a threat to infrastructure in low-lying areas. Finally, an aspect of transport in the region that is less directly affected by climate change, but is linked to increased carbon dioxide emissions, is air travel. The NORA territories rely heavily on air transport for internal and external connectivity, especially in extremely remote areas. The increased cost of air travel and concerns about its environmental impact

could have a negative impact on accessibility and transport options for remote communities, *e.g.* as oil prices increase, there could be further pressures for reducing some routes.

Further sea-transport infrastructure and appropriate regulations and standards would be required

Climate change could have both positive and negative implications for regional and local transport, and these should be planned for. Increased maritime activities and new global transport routes may require new harbours; for example, transhipment harbours could be developed to service large cargo vessels and feeder ships that distribute goods to local harbours. Several possible locations for a transhipment harbour in Iceland have been considered (Valsson, 2009). Also, new areas may become accessible and offer new development opportunities, which would increase demand for infrastructure to open up areas and connect communities and resources.

The design, construction and operational standards of future Arctic marine activities, including international maritime law, will require adaptation. For instance, despite thinning and retreating Arctic ice, reinforced ships will still be needed in Arctic waters. In some cases, icebreakers and surveillance will be necessary to maintain routes, *e.g.* by providing cargo vessels with support from icebreakers. However, future ice conditions, especially ice thickness, are very uncertain, and high-resolution regional sea-ice models will be needed. In addition, infrastructure developments will have to be sensitive to the surrounding fragile environments and harsh climatic conditions. In view of changing transport patterns and shipping movements, OECD countries recognise the importance of monitoring fleets and the effects of their movements on ecosystems (OECD, 2008d).

The impact on settlement patterns is likely to be high

Negative effects on traditional sectors and changes in the surrounding environment could place considerable pressures on fragile communities and particularly on indigenous populations, leading to outmigration and social pressures. As mentioned, changes in the distribution of Arctic mammals or fish stocks and negative impacts on reindeer herding, would directly affect Inuit and Sami populations since these are their main source of food and income. Beyond the direct economic impacts of climate change, the potential impact on the living conditions and quality of life of people in the region is crucial to the viability and vitality of this sparsely populated region and would require special attention. The relative "marginality" of the NORA

region and its strong reliance on natural resources mean that its populations have faced and responded to considerable change in the past (Thostrup and Rasmussen, 2009). However, future climate change may be outside the range of past climate variation and raise particular challenges for some of the most isolated or specialised settlements.

Sectors such as tourism could be encouraged

Improved accessibility and new economic opportunities may bring people to the region and build populations in some areas. In Greenland for instance, the development of new mining opportunities will open up new employment opportunities, attracting workers and families to the areas around the new mining sites. Tourism is a growth sector, and climate change is expected to affect opportunities for its development. A warmer climate may change tourism in NORA territories by increasing access to areas that previously were inaccessible, because of sea ice for instance. Increased awareness of the vulnerability of the Arctic to climate change may also increase the popularity of NORA territories as a tourist destination. The number of travellers to Greenland is already increasing, having more than doubled from 1999 to 2008 (Round, 2009). More generally, "green tourism" is a growth area which the region could capitalise upon. In the longer term, some local tourist attractions based on wildlife may be affected by changes in features such as glaciers and certain plants, animals or opportunities for recreational fishing. For winter tourism, less predictable snowfalls could be a problem in some areas. However, the effects of climate change in other winter resorts, *e.g.* in the Alps, could be even greater and thus lead to an increase in tourist numbers to more northerly destinations.

Training and support for adaptation in communities will be critical

Communities facing the impacts of climate change may require support. In some cases this will be necessary to mitigate the negative impacts of change, *e.g.* to help fishing communities diversify, tackle structural or environmental damage, and stem outmigration. In other cases, support is necessary to allow communities to respond to new opportunities and adapt in a proactive manner, *e.g.* in order for new jobs in emerging sectors such as mining or green tourism to benefit local inhabitants, training and educational opportunities will have to be provided to develop the skills and capacity these sectors require. Otherwise, local populations could miss out on new job opportunities, owing to the lack of appropriate skills and training.

There is a need for adaptive development strategies

Adaptive strategies need to span a range of activities and time scales. For instance, short-term coping mechanisms in response to situations that threaten livelihoods should be considered to support communities through "abnormal" or extreme seasons or years. However, longer-term adaptive strategies that help individuals, households and communities change their productive activities and modify local rules and institutions to secure livelihoods also have to be planned (Berkes and Jolly, 2001). It is essential to work with local communities in developing such strategies because of their superior knowledge of and links to their area. For instance, in the development of Arctic oil and gas resources in Russia and commercial and tourism industries in the Scandinavian north, local knowledge is increasingly recognised as vital. Knowing where it is safe to build, how to site the foundations for a new road, airstrip or pipeline, what terrain to avoid, and how to do so responsibly while protecting biological diversity will all be increasingly important (Tisdall, 2010).

It is important to integrate adaptation to climate change in overall strategic planning (coherent planning and implementation of adaptation efforts at strategic, regulatory, budgetary and operational levels). Coherent *ex ante* adaptation plans could help reduce vulnerability to many effects of climate change. In contrast, "development as usual" may increase vulnerability. This points to the need to assess climate risks and vulnerabilities systematically and to include potential adaptation measures in development policies, plans and projects (OECD, 2009c). There have been some advances in this respect. For instance, Iceland has adopted a Climate Change Strategy that includes research on the likely impacts of climate change on Iceland, taking into account a possible rise in sea level in designs of communities and constructions on shore, and assessing opportunities and threats related to increased maritime activity. The strategy also sets out plans for carbon sequestration, emissions reductions, research and innovation in fields related to climate change, and climate change adaptation measures (Ministry for the Environment of Iceland, 2007). Yet, in general, development policies, plans and projects in NORA territories, as in many OECD countries, are just starting to integrate the impact of climate change and need to go further in building comprehensive adaptation plans.

Moreover, integrating environmental factors in sectoral and economic policies will be crucial. As mentioned in Chapter 1, the unique environments of the NORA region, and the high degree of economic dependence on natural resources, make environmental preservation especially crucial. Integration of environmental factors in sectoral and economic policies is still limited. The Faroe Islands and Greenland do not have a clear sustainable development strategy. They integrate environmental criteria in the

development of individual economic activities (*e.g.* Greenland pays considerable attention to physical and ecological environmental factors during all stages of mineral resource activities). However, the relatively larger potential effect of climate change on vulnerable ecosystems (*e.g.* increasing pressure from transport, oil, mining or tourism activities; uncertainties regarding the effects of climate change on fisheries) calls for going a step further and giving high priority to the development of comprehensive national strategies for sustainable development. Norway has long been a key promoter of environmental and social sustainability as well as sustainable economic growth as essential objectives of economic policy (OECD, 2010c). Its experience could serve as a benchmark for the development of sustainable development strategies in the Faroe Islands and Greenland.

Conclusions

This chapter has reviewed four key challenges for the NORA region: how to improve accessibility and to try to overcome the challenges raised by its peripheral location; how to improve both the competitiveness and sustainability of one of the main economic activities of the region, fisheries; how to use innovation, research and technology to improve the efficiency of traditional sectors and to further expand economic activities in emerging or new niches and sectors, and finally, how adaptive responses could help to deal with climate change and to take advantage of potential economic benefits of global warming.

Co-operation to address the main regional challenges is already a fruitful area of interaction across the NORA region and more widely. The characteristics shared by the NORA territories indicate that regional co-operation can be an important vehicle for addressing these challenges. Similar and shared approaches and systems are used and international links and agreements are also in place. At the same time, the NORA territories have specialised expertise which could be a basis for complementarities and productive exchanges of technical know-how. For small territories like those of the NORA region, joining efforts, resources and complementarities may result in a clear advantage in areas such as exchange of research, development of new technologies, shared branding or the development of regional tourism. Yet, co-operation also presents challenges. NORA territories compete directly for resources, agreements are sometimes difficult to reach, and the benefits of co-operation are not tangible in the short term. The following chapter will focus on the rationale, opportunities and challenges for co-operation in the NORA region.

Notes

1. As noted in Chapter 1, with the exception of Norway where recent surveys show that male mobility in peripheral municipalities has increased relative to female mobility, resulting in only minor differences.

2. It is important to note that in Norway peripheral regions have high population turnover, with high immigration from abroad as well as outmigration. In this case policy measures for sparsely populated areas should be based not only on attracting migrants but also on encouraging people to remain there.

3. In the 1950s, Norway had active relocation policies which met with resistance. The issue is not currently on the agenda.

4. Investment in infrastructure can facilitate development and help to diminish local disadvantages. However, parallel measures (promoting innovation, investment incentives, or the improvement of education and working skills) will also be needed to ensure that a remote or peripheral location can take full advantage of the opportunities that improved infrastructure creates (Vickerman, 1991, 1995).

5. Recent media coverage in the Faroes has shown that the price of Internet access is five times higher than in Denmark (Dimmalætting, 2010).

6. The amounts received in each of the territories are very different. The block grant from Denmark accounts for 57% of government revenue in Greenland (2009) and 12% of public revenue in the Faroe Islands.

7. An illustrative example could be flying from Torshavn to Reykjavik (800 km) from Tuesday to Thursday (days without a direct flight). This would mean going first to Copenhagen (1 310 km in the opposite direction) to get a direct flight to Iceland (2 100 km flying over the Faroe Islands). The waste of time and money is obviously considerable.

8. Interviews conducted during missions to the country.

9. The statistical information available varies from country to country, *e.g.* with regard to years available and/or measurement used. Hence, the tables are not directly comparable, but they show the tendencies in each of the countries and these tendencies can be compared.

10. However, the devaluation of the Icelandic *kroná* means that the sale of exported fish in foreign currencies has absorbed the consequences of decreasing fish prices on the market. Today Icelandic shrimp fisheries have started again because devaluation has made it profitable.

11. In Norway, the fleet was composed of 6 789 vessels in 2008, less than half of the size of the fleet ten years earlier (13 248 vessels). In Iceland fleet numbers peaked in 2001 (2 012 vessels) and decreased by 25% in 2008 (1 529 vessels) (Nordic Statistics).

12. Conversely, there have been major fleet concentrations in countries where no "official" market in rights exist and may be due to the fact that fishing rights are traded in a largely uncontrolled and non-transparent manner.

13. ICES is a network of more than 1 600 scientists from 200 institutions; it gathers data, disseminates knowledge, provides scientific advice and promotes marine research on oceanography, the marine environment, the marine ecosystem, and on living marine resources in the North Atlantic.

14. The organisation has a budget of only NOK 6 million. Co-operation has traditionally focused on research and policy making, yet increased attention is given to innovation and co-operation. A committee of senior policy officials functions as a think tank and advisory body to identify issues of common interest and opportunities for co-operation (NORA/Norden, 2009).

15. For instance, in the Faroe Islands, the Fisheries College offers a three-year course of secondary education designed to train students for the Faroese fish processing and aquaculture industries. The country's marine school provides students with a five-month course that prepares them for work on board fishing or merchant vessels. The Centre for Marine Studies and Engineering offers courses on the international standards for maritime training and provides internationally recognised maritime qualifications (Ministry of Fisheries and Natural Resources). In Norway, the University of Bergen has a Fisheries Ecology and Aquaculture Research Group and offers several master's programmes in areas such as fisheries biology and management or aquaculture biology.

16. Based on the Nordic Committee of Senior Officials under the Nordic Council of Ministers for Energy.

17. The application of biotechnology to marine biology.

18. Past attempts to develop small-scale, high-quality products in Greenland usually encountered problems for ensuring deliveries.

19. In the North Atlantic Region, land rise is also an important factor determining relative sea level rises (Hanssen-Bauer, 2009). Globally, the sea level may increase by 18-59 cm by 2100 compared to the end of the last century, depending on the emissions scenario. However, these estimates exclude uncertainties in climate-carbon cycle feedbacks as well as uncertainties concerning the full effect of changes in ice sheets. The upper value of the estimated rise in sea level should therefore not be considered as an upper limit (IPCC, 2007).

20. Mitigation refers to actions to address anthropogenic causes of climate change. It aims to slow down changes by reducing emissions and enhancing "sinks" of CO_2 and other greenhouse gases. Recent OECD analysis shows that beyond the effects of the economic crisis, ambitious policy action to address climate change makes economic sense, and that delaying action could be costly (OECD, 2009b).

21. Oceans' ecological systems are extremely complex and there are major uncertainties about oceanographic responses to an increase in air temperatures and in acidification due to higher levels of CO_2. Additionally, patterns of change will vary greatly across the area. For instance, owing to increased freshwater runoff, coastal areas may be more vulnerable to changes in salinity and in ecosystems.

22. For instance, overuse of antibiotic pharmaceuticals may lead to the development of resistant bacteria, as has already been noted in Norwegian fish farming. Resistant bacteria in fish farms also imply an increasing threat to natural fisheries because of the escape of farmed fish to open seas.

23. Among vector-borne diseases, the likelihood of increased frequency of ticks has attracted most attention in the NORA territories. Ticks transfer serious diseases that in some cases paralyse the body or have other serious long-term effects.

24. Historically, mobility was high – when the climate changed most hunters moved, following the prey and the conditions they were used to. But with the sedentary settlement pattern that has increasingly characterised the Arctic – and definitely Greenland – during the last century, this is no longer an option. Traditional hunting communities have therefore become more vulnerable to changes in climate and resources.

25. With the exception of some tracks that link western and northern Norway to the European railway network.

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Chapter 3

Governance and co-operation in the NORA region

Chapter 3 focuses on the potential of transnational co-operation in the NORA region. The similarities in framework conditions and challenges shared by the NORA regions, the small size of markets and the limited resources within each of the NORA territories argue for collaborative efforts, exchange of know-how and best practices, and transnational co-operation to confront some of the main challenges of the region. The chapter starts with a description of the wide and complex web of territorial co-operation already present in the NORA region. The second section explores both the range of potential benefits of transnational co-operation, and the main barriers that regional co-operation faces. The third section describes the main areas in which there is potential for transnational co-operation. Finally, the fourth section provides a series of recommendations to overcome the barriers to co-operation and to maximise the contribution of transnational co-operation in the NORA region.

Introduction

Coastal Norway, Iceland, the Faroe Islands and Greenland are unique and distinct territories. They certainly cannot be described as a "functional" region in the usual sense of the term, as this implies, in particular, highly integrated labour and product markets. Nevertheless, they share deep historical ties, a strong network of international links and long traditions of co-operation. Regional co-operation can offer a way to confront common challenges more effectively and to take advantage of shared potentialities. While it can offer various benefits, it also implies challenges and limitations.

Co-operation needs to be seen as a way to obtain both direct benefits and indirect advantages. As the preceding chapters of this report have highlighted, the NORA territories share a range of common development opportunities and challenges, most notably those linked to: improving accessibility; the sustainable development of resource-based sectors; economic diversification; and adapting to climate change. Their shared demographic, economic and environmental characteristics point to the possibility of mutually beneficial co-operation. Regional co-operation can increase the profile and "voice" of NORA territories; help them to reach "critical mass" in key areas of economic activity, such as R&D or shared branding; and create a framework for a better response to transnational issues such as environmental degradation, management of marine resources and climate change. However, territorial co-operation is not an easy option. As well as offering a basis for co-operative work, regional commonalities imply that NORA territories compete in many sectors, *e.g.* fisheries. Moreover, notwithstanding their shared characteristics, the region's territories differ and they are separated by large distances, so that determining the focus of co-operation and achieving commitment can be complex.

This chapter considers the evolving role of territorial co-operation in the NORA territories. Section 3.1 considers the wide range of co-operative arrangements in the NORA region. Section 3.2 analyses the potential benefits and challenges of NORA-based co-operation. Section 3.3 builds on the conclusions of preceding chapters to explore the potential for co-operation in specific fields. The multidisciplinary nature of territorial co-operation in the NORA region requires a strong rationale and motivation for co-operation. Section 3.4 focuses on a series of recommendations to strengthen and maximise the contribution of territorial co-operation in the NORA region.

The analysis is subject to two important qualifications, which should be made explicit at the outset. First, this review focuses on the value of co-operation for addressing the challenges facing the region's economies. It does not offer specific policy recommendations to the authorities in *individual* NORA territories. Second, the scope for co-operation is far greater in some fields than in others. In areas such as fisheries, the NORA economies confront *shared* problems – the policy responses of each can have implications for the others. This points to the need for co-operative solutions. In other fields, such as dealing with public service delivery in sparsely settled areas at a time of population ageing, they are dealing with problems that are *common* but not shared. The policy responses of each NORA member may have little impact on the others, but the similarity of problems and circumstances suggests considerable scope for policy learning from one another. In these policy domains, co-operation is likely to focus largely on the sharing of information and experience. Other fields of policy, of course, lie between these extremes. This distinction between shared and common problems should be borne in mind when assessing the potential for joint action in different spheres.

3.1. Territorial co-operation: an ongoing reality in the NORA region

Since the 1990s, there has been a surge of interest in territorial co-operation. Territorial co-operation goes beyond exclusive trade concerns and deals with a number of common challenges and joint interests, such as climate change or economic growth. In this regard and in the context of increasing internationalisation, globalisation and integration, interconnections and co-operation between countries and regions have intensified and expanded.

Such co-operation manifests itself in various ways and displays different forms and structures, depending on the needs of the participants (Faludi, 2007; Perkmann, 2007). Co-operation can range from sporadic consultation involving limited resources to wide-ranging and well-resourced programmes with accompanying institutional frameworks. In North America, territorial co-operation has developed around pragmatic issues, such as economic interdependence or environmental concerns; separate bodies generally deal with specific issues (OECD, 2003). In the European Union, given the high level of political integration of the member states and the large number of relatively small countries, numerous rules and structures have accumulated to guide and support territorial co-operation. In particular, the Interrregional Co-operation Programme (INTERREG) has had considerable impact by providing dedicated resources for territorial co-operation and embedding institutionalised networks of co-operation

involving public administrations from local, regional, central and EU levels (OECD, 2009a). In the Pan Yellow Sea Region (OECD, 2009a), covering the coast of northern China, south-west Japan and western and southern Korea, regional linkages have been driven by the private sector, which has established intensive manufacturing links. Of course, none of these large regions resembles NORA, which is in many respects *sui generis*. Nevertheless, as will be seen, elements of their experience with co-operation can be helpful in identifying possibilities for NORA.

Co-operation in the Nordic and in the NORA region

A shared cultural heritage is at the heart of Nordic co-operation

Territorial co-operation and relations within the Nordic region have a long history. From a historical perspective, "Nordic relations have been characterised as much by disintegration as by co-operation" (Sundelius and Wiklund, 1979). However, the 20th and 21st centuries have seen increasing political, economic and social co-operation through various programmes and organisations. Within the NORA region and the wider Nordic area, contemporary co-operation arrangements have a strong basis in a shared cultural heritage and linguistic kinship, and are founded upon shared values in relation to democracy, justice and the rule of law. Thus, common societal and cultural links lie at the heart of co-operation in the region, and formal political relations gradually developed as needed to manage problems (Sundelius and Wiklind, 1979). Thus, informal co-operative activities commonly existed before formalised institutional channels for interaction were created, and joint structures have played a secondary role. This path of development distinguishes Nordic co-operation from the experience of neighbouring EU countries, where co-operation and integration efforts have often been initiated "top-down", based on political interaction and decision making.

While there were some early attempts at long-range, comprehensive Nordic co-operation schemes,[1] less formalised, more sectorally based co-operation has proven to be a more enduring basis for the development of what Andren (1967) has described as "cob-web co-operation". The main objective of Nordic co-operation is not to merge the Nordic countries into one political unit but to facilitate constructive and mutually beneficial management of various regional problems (Sundelius and Wiklind, 1979). As a result, Nordic, and more specifically NORA, co-operation has not led to the levels of integration and co-operation that are pursued in the European Union. However, intense institutionalised intergovernmental co-operation, mainly through the Nordic Councils (see below), has helped to

develop a single, strong Nordic position on and role in some international issues.

In this regard, co-operative structures are in place throughout the region and fulfil a wide range of functions and roles. As with all forms of territorial co-operation, the traditions, structures and systems in place vary, in terms of their focus, scale, structure and degree of formality. In terms of formal territorial co-operation in the region, there are various types of arrangement, *e.g.* intergovernmental, bilateral and sectoral co-ordination/co-operation, programme-based co-operation, often linked to European Union territorial co-operation programmes, and sub-national co-operation. Within these categories there is some overlap and variation in the extent to which co-operation arrangements are formalised, whether they are externally or internally driven, the resources at stake, and the key actors and institutions involved. However, each approach has its distinguishing characteristics and implications for the NORA territories. The following outlines some of the key co-operation arrangements in place in the region.

Intergovernmental/parliamentary co-operation

Intergovernmental co-operation: reinforcing the visibility and international role of the Nordic countries

The NORA territories are strongly linked into a wider Nordic network of intergovernmental co-operation, which involves high-level co-operation on a wide range of issues. Key examples are the Nordic Council and the Nordic Council of Ministers. These pillars of co-operation are supplemented by additional bilateral agreements and networks. Involvement in these organisations offers the Nordic countries a range of benefits, including a platform for building co-operative links with neighbouring countries (such as the Baltic states or Russia), an opportunity to agree upon and promote a shared position and common strategies on key themes, and access to resources and know-how. The Nordic Council and the Nordic Council of Ministers are well-established, wide-ranging regional partnerships, involving Denmark, Finland, Iceland, Norway and Sweden, and also the three autonomous territories, the Faroe Islands, Greenland and Åland. The councils were established on the basis of co-operation in the aftermath of World War II. Their overall objective is to strengthen Nordic interests and culture around the world. More specifically, co-operation has led to a wide range of agreements and co-ordinated actions, most notably on the free movement of labour across borders for the countries' citizens.

The Nordic Council is an inter-parliamentary body in which five countries (Denmark, Finland, Norway, Sweden and Iceland) and three self-governing territories (the Faroe Islands, Greenland and Åland) are represented. The Nordic Council has traditionally held a strong advisory and initiatory role (Sundelius and Wiklund, 1979). The council has a total of 87 elected members of which seven are from Iceland, two from the Faroe Islands and two from Greenland. The representation of the NORA territories is thus relatively small; this potentially limits their influence. However, the autonomous territories have exerted greater influence on Nordic co-operation since the "Åland Document" was adopted by the ministers for Nordic co-operation in September 2007. This document recognised the right of the Faroe Islands, Greenland and Åland to participate in the work of common Nordic institutions and co-operation bodies on the same terms as member countries. As an illustration of this higher relevance, the Faroe Islands chaired Nordic co-operation on fisheries in 2010, organising a high-level conference in October. Over time, co-operation has grown to cover a range of different policy areas, including culture, research, the environment and regional co-operation (Qvortrup, 2001). More recent concerns include climate change and globalisation. For example, at their summer meeting in Finland in June 2007, the Nordic prime ministers approved a declaration on a long-term joint Nordic approach to globalisation. The statement includes specific measures regarding research and innovation, marketing of the Nordic region, and enhanced energy and climate co-operation, among others. Current political co-operation on policy matters mainly takes place in the Council's five specialist committees and in its executive body, the Presidium (responsible for foreign and security policies). The Council submits proposals for co-operation initiatives to the Nordic Council of Ministers and the member governments for approval and implementation.

Founded in 1971, **the Nordic Council of Minsters** is an intergovernmental forum which deals with co-operation within the region. It consists of ten thematic councils of ministers which bring together the Nordic ministers for specific policy areas a couple of times a year. In addition, the eight ministers for Nordic co-operation (representing the five member countries plus Greenland, the Faroe Islands and Åland) assume responsibility for the co-ordination of inter-governmental co-operation. The five Nordic countries hold the presidency in the Nordic Council of Ministers for one calendar year at a time. The presidency draws up a programme presenting the political priorities for intergovernmental co-operation during the year to come. The Council of Ministers also serves as a forum for discussion of external links. For instance, countries can consult with each other on EU-related issues that affect members (Stenback, 1997). Over time, the work of the Council of Ministers has gradually expanded and intensified.

Agreements are generally reached through consensus, which helps ensure that the voice of Iceland and the autonomous territories is heard. Issues on which there is likely to be strong disagreement (*e.g.* whaling) tend to be avoided (Qvortup, 2001).

In operational terms, the ten thematic policy councils of ministers correspond to the key areas of labour; business, energy and regional policy; fisheries and aquaculture, agriculture, food and forestry; gender equality; culture; legislative affairs; environment; health and social affairs; education and research; and finance. Alongside the councils is a range of Nordic institutions that facilitate co-operation on a wide range of issues (Box 3.1). Each of the component parts of the Council co-ordinates institutions and working groups in its own policy areas (Norden, 2009). The sectoral/thematic structure of the Council of Ministers allows for treating each area relatively independently and handling it on its merits rather than as part of some larger political "package deal" (Sundelis and Wiklund, 1979). However, this has also led to a "compartmentalised" view of co-operation.

Box 3.1. **Specialised Nordic institutions under the auspices of the Nordic Council of Ministers**

NordForsk is the Nordic research board with responsibility for co-operation on research and researcher training in the Nordic region. Established on 1 January 2005 under the auspices of the Nordic Council of Ministers for Education and Research, the organisation focuses on research areas in which the Nordic countries are international leaders, and promotes research and researcher training of high international quality. NordForsk has three main functions: co-ordination, funding and policy advice. Today NordForsk has an established partnership with eight national research bodies and a project portfolio of more than 200 projects involving more than 11 000 scientists. NordForsk is one of three organisations at the Nordic Centre in Oslo. The other two are the Nordic Innovation Centre and Nordic Energy Research.

The Nordic Innovation Centre (NICe) initiates and finances activities that enhance innovation and co-operates primarily with small and medium-sized companies in the Nordic region. It contributes to increasing innovation and the competitiveness of Nordic industry by encouraging work on innovation and collaboration across borders, and strengthening inter-Nordic policy initiatives in order to promote more effective policy making in the Nordic countries. The project portfolio of the Nordic Innovation Centre consists of approximately 120 ongoing projects and networks.

Nordic Energy Research is the funding institution for energy research under the Nordic Council of Ministers. It promotes research and innovation in new energy technologies and systems by fostering competitiveness, co-operation and

Box 3.1. **Specialised Nordic institutions under the auspices of the Nordic Council of Ministers** (*cont.*)

increased knowledge creation in Nordic research initiatives. It supports areas of energy research of common interest to Nordic stakeholders which have the potential for transnational research co-operation, such as renewable energy, energy efficiency, the hydrogen economy, energy market integration, and the impact of climate change on the energy sector. The organisation has provided studies on technical and economic options relating to the introduction of renewable energy systems in sparsely populated areas.

The Nordic Centre for Spatial Development (Nordregio) is the centre for research, education and documentation on spatial development. The institute's major areas of interest are: regional development, urban and rural systems, demography, governance and gender, innovation and knowledge, global climate change and local adaptation, and international energy policy. These areas are viewed primarily from a Nordic or broader European comparative perspective. Geographically, Nordregio focuses specifically on the Nordic countries, the Baltic Sea region, the Arctic, and more generally on the European space.

The Nordic Centre for Welfare and Social Issues works on social policies in the Nordic countries through education, information, the promotion of research, development work, network building and international co-operation. The goal is for research on these areas to help develop the Nordic welfare model and strengthen Nordic co-operation.

Nordic Culture Point is the contact point for Nordic cultural co-operation. It serves as a secretariat for culture programmes and expert groups of the Nordic Council of Ministers, provides information on programmes and supplies advice to those applying for support. It also promotes Nordic culture within and outside the Nordic region. The institution was established in 2007 at Suomenlinna/Sveaborg in Helsinki under the auspices of the Nordic Council of Ministers.

Established by the Nordic Council of Ministers in 1995, the **Nordic Gender Institute** (NIKK) is a transnational resource and information centre on gender research and gender equality in the Nordic countries. It initiates, co-ordinates and executes projects that focus on illustrating gender equality and policy issues.

Sources: www.nordicinnovation.net/; *www.nordforsk.org*; *www.nordicenergy.net*; *www.nordregio.se*; *www.nordically.org*; *www.kknord.org; www.nikk.no.*

The NORA territories are involved in other territorially based co-operation arrangements

NORA territories also participate in **the Arctic Council**, which extends co-operation beyond the specifically Nordic framework. The Arctic Council is an intergovernmental forum. It aims to promote co-operation and co-ordination among its member states: Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, the Russian Federation, Sweden and the United States. In addition to its member state representatives, the Arctic Council has "permanent participants", a status that is open to organisations for the indigenous peoples of the Arctic. Common initiatives are discussed and approved at ministerial meetings. Six working groups focus on the Council's thematic programmes: the Arctic contaminants action programme; the Arctic monitoring and assessment programme; conservation of Arctic flora and fauna; emergency prevention, preparedness and response; protection of the Arctic marine environment, and sustainable development. However, the council only meets on a six-monthly basis and issues non-binding declarations.

The West Nordic Council, originally called the West Nordic Parliamentarian Council of Co-operation, was formed in 1985 by Greenland, the Faroe Islands and Iceland. In 1997, the name was changed to the West Nordic Council and the member parliaments approved the current council's charter. Each of the parliaments of Greenland, Iceland and the Faroe Islands appoints six representatives to the Council. The West Nordic Council makes recommendations that are presented to the parliaments of the members. The Presidium consists of one member from each delegation: the president, the first vice-president and the second vice-president. The main objectives of the West Nordic Council are: promoting West Nordic (North Atlantic) interests; acting as guardians of North Atlantic resources and North Atlantic culture; promoting West Nordic interests through the West Nordic governments; following up on the governments' West Nordic co-operation; and liaising with the Nordic Council on issues of particular interest to the West Nordic communities. Over the years, the West Nordic Council has dealt with such issues as rescue facilities in the North Atlantic, tourism, energy and infrastructure. However, it is not possible for the West Nordic Council to grant direct financial aid or support to projects.

The specific challenges of the NORA region motivated the creation of the Nordic Atlantic Co-operation

In 1996, the Nordic Council of Ministers, aware of the specific challenges and potentialities of the North Atlantic region, resolved to create the **Nordic Atlantic Co-operation (NORA)**. NORA covers the Faroe Islands, Greenland, Iceland and the west coast of Norway. It is funded as a regional committee under the regional political collaboration programme of the Nordic Council of Ministers and is supplemented by contributions from the four participating territories and the West Nordic Fund. The NORA organisation is the unique regional strand within the Nordic Council system dealing with the specific challenges of this group of territories.

The overall aim of the organisation is to help strengthen collaboration in the region in order to make the North Atlantic a powerful Nordic region characterised by strong, sustainable economic development (NORA, 2004). NORA focuses on furthering collaboration among the business community, research organisations and the development agencies throughout the region. More specifically, it aims to:

- create a political and professional framework in which North Atlantic issues may be addressed and strategic joint initiatives developed;
- facilitate and implement project collaboration;
- work towards development that is consistent with the Nordic principles of sustainability; and
- develop NORA as an attractive platform for Nordic collaboration with surrounding countries (NORA, 2009a).

The organisation functions as an intergovernmental collaborative agency and facilitator (NORA, 2009a). Activities are organised around multi-annual strategic programmes and a "project-based" platform, which is used to stimulate and facilitate transnational collaboration. NORA's current project activities focus on marine resources, tourism, information and communications technology, and transport (Box 3.2).

Box 3.2. **NORA projects**

A significant part of NORA's activity is to provide financial support for projects that promote development and co-operation across the region. Support is provided for main projects, pre-project development and network building activities. A requirement of funding is the participation of at least two NORA territories in the project. NORA provides a maximum of 50% of the budget and a maximum annual contribution of DKK 500 000 over a period of three years.

By the end of 2009, NORA had more than 60 active projects in its portfolio. Examples include:

Marine resources

Advanced fish gutting machine: the project aims at developing a new machine that can clean fish without substantially destroying the entrails. These fish by-products can be processed for human consumption, animal feed or processed further to yield peptones which are used and highly valued by the biotechnology industry. NORA funding: DKK 100 000.

North Atlantic delicacies: the project is a part of the Nordic focus on New Nordic Food and will develop speciality products based on North Atlantic Food traditions and ingredients, using local ingredients such as salt fish, rhubarb and angelica. NORA funding: DKK 646 000.

Tourism

Sanitation in tourist cabins: wilderness cabins in Greenland and Norway are popular accommodation for tourists who want to experience the wilds. The cold climate and generally primitive construction of the cabins make proper sanitation a challenge. The project will test alternative methods of processing and containment of wastewater in Arctic conditions. NORA funding: DKK 200 000.

Transport

El-mobility: the use of electric cars could lessen North Atlantic communities' dependence on fossil fuel. The project will test how battery-powered cars perform in the North Atlantic climate and broaden awareness of these cars as possible future transport solution. NORA funding: DKK 300 000.

ICT

Transatlantic café: under the title Café Pantopia, this project will connect café guests in Nuuk, Reykjavík, Tórshavn and Copenhagen. The project aims to shrink the large distances in the North Atlantic by creating a sense of proximity through video conferencing. NORA funding: DKK 260 000.

Box 3.2. **NORA projects** (*cont.*)

Other regional co-operation

Eiderdown: eiderdown is essentially not exploited in the region. This project seeks to explore the potential of restoring commercial and sustainable eiderdown production in Greenland and the Faroe Islands. NORA funding: DKK 660 000.

Berries: the project will utilise specially cultivated berries and new techniques to explore the potential for establishing viable commercial berry production in the harsh North Atlantic climate in Iceland, the Faroe Islands and Greenland. The project will draw on Norwegian expertise. NORA funding: DKK 700 000.

Source: NORA (2009), *NORA Annual Report*, NORA.

The NORA committee is comprised of up to three members from each of the four collaborating territories. It meets annually and, among a range of activities, is responsible for agreement on strategic programmes and for approving funding for projects. Between the annual meetings, the committee's responsibilities are carried out by a working group with one representative of each territory. The committee's work is supported by a secretariat located in Tórshavn. In addition, there are regional secretariats in Iceland, Greenland, south and west Norway, and northern Norway. In recent years, the organisation's profile has risen and it has built good links with key partners in the region and externally.

Bilateral agreements and sectoral relations

Different bilateral agreements are in place

In addition to the different forums for intergovernmental co-operation, the NORA territories have many internal and external bilateral agreements. For instance, on 1 November 2006, the Faroe Islands entered into a special economic treaty with Iceland, the Hoyvík Agreement, which established a single economic area encompassing both territories, with almost complete freedom of circulation of goods, services, capital and persons (Prime Minister's Office of the Faroe Islands, 2006). The Faroe Islands have also entered into regional free trade agreements with Norway. On their side, Norway and Iceland enjoy free trade with each other and the EU member states under the European Free Trade Association (EFTA), which also includes Liechtenstein and Switzerland.[2] As mentioned in Chapter 2.2, NORA territories also have bilateral fish agreements for the management of fish stocks.

Sectoral/thematic co-operation reinforces exchanges and capacities in key sectors

National and regional governments and policy practitioners have also been involved in less formalised forms of co-operation, with an intensive flow of projects, treaties and programmes between NORA members, and also with third – mainly neighbouring – countries or groups of countries. The scale and impact of this type of co-operation is variable and difficult to measure. However, such sectoral co-operation offers scope to develop and reinforce co-operative links and capacities in key sectors, to secure agreements on common approaches and strategies, and to exchange knowledge. A good example of sectoral co-operation, with a strong focus on the NORA region, is the North Atlantic Tourism Association (NATA), established in 2007, which is a forum for collaboration among the tourism councils of the Faroe Islands, Iceland and Greenland. NORA partners are also involved in wider networks. For example, co-operation on fisheries and the marine sector has been of vital importance in working towards the sustainable development of fisheries, securing international agreements on total allowable catches (TACs) and fishing regulations, and promoting research and sharing knowledge (see Chapter 2).

A good example of shared links with external partners is Nordic-Scottish co-operation, which was based around policy co-operation in areas such as information technology (IT), university networking, development of small and medium-sized enterprises (SMEs), and forestry. The Nordic-Scottish co-operation provided a platform for regular contacts and communication among policy makers and practitioners and for building and maintaining professional and individual relationships. The co-operation provided an effective forum for identifying and developing shared policy interests, which were subsequently taken forward in practical form. The periodic Nordic-Scottish conferences were considered an effective and successful method for learning and exchange of experience (Aalbu and Bachtler, 2004). Policy co-operation also provided an umbrella for research and training initiatives. Finally, the co-operation facilitated dissemination of information on programmes, projects, organisations and initiatives (Bachtler and McMaster, 2005). More recently this co-operation has been channelled through EU-driven programme-based co-operation (see below).

There is a strong interaction with the EU

In terms of external links, relations with the European Union are very important. No NORA territories belong to the EU. However, each of the NORA economies maintains strong links and interactions with it. For instance, NORA territories have agreements in place with the EU and have

adopted EU legislation, *e.g.* in relation to free movement of goods and capital. Norway's and Iceland's relations with the EU are mainly governed by the European Economic Area Agreement (EEA). The EEA was established in 1994, following an agreement with the member countries of the European Free Trade Association. The EEA extends the EU's Single Market, with the exception of Agriculture and Fisheries, to EFTA members, except Switzerland. This means that they must comply with EU Single Market legislation. Through the EEA Agreement, Iceland and Norway participate, albeit without voting rights, in a number of EU agencies and programmes, covering enterprise, environment, education and research programmes (CEC, 2010). Finally, Greenland's and the Faroe Islands' relations with the EU are different from those of Denmark, which is an EU member state. Key relations are regulated by bilateral agreements on free trade and fisheries (see Box 3.3).

In addition to co-operative agreements, partners from NORA territories are also involved in EU programmes. For example, the EU's Seventh Framework Programme for Research and Technological Development is open to all NORA territories, following recent agreements with the Faroe Islands and Greenland. The Framework Programme allocates grants to research actors in Europe and beyond, in order to co-finance research, technological development and demonstration projects which have "European added value" (CEC, 2007). Grants are determined on the basis of calls for proposals and a peer review process.

Programme-based co-operation offers substantial resources for regional interventions

There is increasing emphasis on programme-based co-operation in the region. Programme-based co-operation commonly results from intergovernmental co-operation, but it can deliver more tangible project-based outputs, is a more "visible" form of co-operation, draws in a wider range of participants and is a particularly important source of support for new and innovative interventions (McMaster *et al.*, 2006). As a result, in territories around the NORA region, especially in the EU member states, national, regional and local organisations are increasingly involved in co-operation programmes. Especially relevant is the involvement of NORA partners a number of e EU territorial co-operation programmes (INTERREG). In particular, the EU's Northern Periphery Programme (NPP) involves the Faroe Islands, Greenland, Iceland and Norway (Box 3.4). EU-funded territorial co-operation programmes are seven-year strategic programmes with agreed objectives, priorities, budgets and targets. They have relatively good resources and offer a distinctive approach to territorial co-operation. They are however externally driven and

Box 3.3. **Relations of the Faroe Islands and Greenland with the EU**

The EU's official relationship with **the Faroe Islands** is regulated by two bilateral agreements – a bilateral fisheries agreement from 1977 and a free trade agreement from 1991, last revised in 1998. In 1974, a year after Denmark joined the European Economic Community (EEC), the Faroese Løgting (Parliament) decided by a unanimous vote not to apply for EU membership. Instead, an interim trade agreement was concluded between the Faroes and the European Commission (EC). This interim trade agreement was replaced in 1991 by a formal agreement on trade between the Faroes and the EEC which contained several restrictions on the quantities of Faroese goods that were to enter the Community free of duty (especially fisheries products). After negotiations, the protocol on market access was replaced in 1998. With this revision, many of the original restrictions were removed, enabling the Faroes to export most of its fish products to the EU market. The free trade agreement still has some quantitative restrictions.

Greenland originally joined the EEC with Denmark in 1973. But, after disputes over fishing rights, a referendum was held in November 1985 and approved Greenland's withdrawal. Since 1985, relations with the EU have been regulated by an agreement between the Greenlandic and Danish governments and the EU. Greenland is part of the EU's Overseas Countries and Territories (OCT). The OCTs are closely associated with the EU. With this status, the territory is eligible for aid from the EU. Until 31 December 2006, all Community financial assistance to Greenland (EUR 42.8 million a year) was channelled through the Fisheries Agreement between the Community and Greenland. Since then, outside fisheries, Community financial assistance to Greenland amounts to EUR 25 million a year from 2007 until 2013. This amount is to be used as budget support for the Greenland Education Programme, which involves a reform of Greenland's entire education and training sector. This was established in the Programming Document for the Sustainable Development of Greenland, adopted by the Commission in June 2007. The Greenlandic government is seeking to further strengthen its co-operation with the EU across a range of areas, in particular on the environment, research and food safety.

Source: European Commission; Ministry of Foreign Affairs of the Faroe Islands.

complex to administer owing to EU regulatory frameworks and guidelines, and this makes the participation of local stakeholders somewhat difficult. They focus on a narrow range of interventions and have very broad regional coverage and do not specifically address the needs of the NORA region.

Box 3.4. **The Northern Periphery Programme, NPP**

The NPP is a seven-year INTERREG transnational territorial co-operation programme funded by the European Union, through its Cohesion Policy funding. The 2007-13 NPP is the second programme to have involved the Faroe Islands, Iceland, Greenland and Norway, along with EU member state regions in Finland, Ireland, Northern Ireland, Scotland and Sweden. The objective of the current NPP is to "help peripheral and remote communities on the northern margins of Europe to develop their economic, social and environmental potential" (NPP, 2006). The NPP aims to allocate EUR 45 million to projects in line with two key priorities:

- Promoting innovation and competitiveness in remote and peripheral areas – promoting competitiveness by increasing and developing capacity for innovation and networking in rural and peripheral areas, and facilitating development by the use of advanced information and communication technologies and transport.
- Sustainable development of natural and community resources – strengthening synergies between environmental protection and growth in remote and peripheral regions, and improving sustainable development in peripheral regions by strengthening urban-rural relations and enhancing regional heritage.

Representatives from national and regional authorities of participating territories are involved in drafting the programme, allocating resources, and managing and implementing the programme through participation in management and monitoring groups and acting as regional contact points. Organisations in the NORA territories can participate in projects funded by the NPP and obtain resources, although there are fewer resources available to non-EU participants than to EU members.

Source: NPP, Northern Periphery Programme (2006), *Operational Programme of the Northern Periphery Programme 2007-13*, CCI 2007 CB 163 OP 027; McMaster, I., H. Vironen and R. Michie (2006), *Ex Ante Evaluation of the Northern Periphery Programme*, Final Report to the Managing Authority, EPRC, November.

Many of the preceding examples of co-operation arrangements are regionally targeted, in that they focus on the NORA region or the wider Nordic area. However, there are also examples of transnational links between sub-regional and local actors. In many contexts, sub-national bottom-up initiatives can be particularly valuable for addressing narrower needs. Yet the number of transnational formal co-operation arrangements involving sub-national actors in the NORA region is relatively limited. There are a number of reasons for this. The relatively small population of the NORA territories, especially the Faroe Islands and Greenland, means that sub-national institutions have limited capacity and resources to devote to international co-operation arrangements. There are fewer resources to

support this kind of co-operation than in the EU member states where many cross-border initiatives can draw on EU Structural Funds.

Euroregions are another form of regionally targeted co-operation; they involve local and regional authorities and can be used to promote co-operation projects that ensure social and economic development, the reinforcement of regional and local democracy, and territorial cohesion (Council of Europe, 2010).[3] In the Nordic countries, many of these gain some support from the Nordic Council. Euroregions do not, however, correspond directly to any legislative or governmental institution and consequently lack political power. Instead, their work is limited to the competencies of the local and regional authorities that constitute them. Of the NORA territories only Norway, which shares a common land border with EU member states Sweden and Finland, has regions that participate in Euroregion co-operation arrangements (Box 3.5).

Box 3.5. **Norwegian involvement in Euroregions**

Gränskommittén: co-operation between Bohuslen Dalsland in Sweden and Østfold in Norway. It currently focuses on the following themes: border barriers; business; infrastructure/communications; co-operation and exchange of experience; environment; health, *www.granskommitten.com/page/236/wwwv2granskommittenorg.htm*.

Arko: co-operation among 11 Norwegian and Swedish municipalities. The aim of the activity is to develop the region as a place for cross-border co-operation by strengthening settlements and creating more jobs. Like many Euroregions, Arko applies for and engages in projects funded through the INTERREG programme, *www.arko-regionen.org/om_arko.asp*.

Mittnorden: co-operation to promote sustainable development and growth in the mid-Nordic region. The work is based on common history and culture and mutual interest in regional development, *www.mittnorden.net*.

North Calotte Council: the council was established in 1967. Members include the provinces of Nordland, Troms and Finnmark in Norway, the region of Lapland in Finland, and the province of Norrbotten in Sweden. Projects are structured around the following themes: promoting regional development and collaboration; developing the business sector and expertise environments; transport and IT connection development projects; co-operation projects pursued by or targeted at young people; and environmental and cultural development projects, *www.nordkalottradet.nu*.

Council of Torne Valley: co-operation involving areas of Norway, Finland and Sweden. It supports joint marketing of the area; business development, education and skills promotion; support for the development of infrastructure, and cultural development.

Source: *www.tornedalen.org/?pageid=16&ISO=SWE.*

3.2. Benefits and challenges of territorial co-operation

As is clear from the foregoing, there is already a high level of transnational co-operation both within the NORA region and more widely, with partners in the wider Nordic region and the EU. In view of this experience, this section explores the benefits, opportunities and challenges inherent in co-operation in more detail, focusing on why co-operation could be a useful mechanism for further promoting development in the NORA region.

Benefits

The potential benefits of regional co-operation vary according to the type of co-operation (formal/informal), the resources involved, the motivation and the organisations involved. In general terms, the range of benefits the NORA region could obtain from strengthened regional co-operation fall into several broad categories, discussed below.

Regional co-operation can increase NORA territories' profile and "voice"

The scope for co-operation programmes and policies to address areas of potentially high political and symbolic value are especially relevant in the NORA territories, owing to their comparatively small size, remoteness and sparsely populated areas. As observed in Chapters 1 and 2, the NORA territories share a wide range of historic, cultural, economic and institutional links, face common development challenges and opportunities, and have strong common interests in major international issues, such as climate change and fisheries policy. On this basis, there is a rationale for ensuring that the shared economic development interests and positions of the NORA region are voiced, with a common and coherent message, at all decision-making levels and across all relevant policy areas. Joint action has the potential to increase the profile of the NORA territories in wider international arenas and to gain more of a voice in international negotiations. In particular, the NORA organisation offers Greenland and the Faroe Islands a strong role, which, as self-governing regions of the Kingdom of Denmark, they may lack in other forums.

Greater co-operation within the NORA region could also help redress an emerging imbalance in the region's involvement in co-operation efforts and programmes. As co-operation is strengthening elsewhere across the EU, particularly in the Nordic and Baltic areas, the NORA territories could miss out on co-operation opportunities available to some of their larger neighbours, leaving them isolated or marginalised. As neighbouring countries become increasingly integrated and new regional co-operation networks develop and have greater international profile and voice, *e.g.* the

Baltic Sea Strategy (Box 3.6), the NORA territories need to be in a position to respond and adapt to changing external relationships. Working together on key issues, NORA territories are in a better position to engage with partner networks and, where appropriate, draw lessons and adopt similar practices.

Box 3.6. **EU Baltic Sea Strategy**

The Baltic Sea region (BSR) has a long tradition of regional co-operation. The Hanse League, which began in the 12th century and prospered into the 15th century, linked together cities in northern Europe and the Baltic Sea region and demonstrated the interconnections of the sea, trade and city prosperity. However, in more recent times, the Cold War era divided the BSR and prevented regional co-operation. After the end of the Cold War, the BSR proceeded towards greater integration and unity. In 2004, the enlargement of the European Union to include Poland and the Baltic Sea countries of Estonia, Latvia and Lithuania gave the BSR a new geopolitical standing. Today, the BSR covers eight EU member states: three Nordic countries (Denmark, Finland and Sweden); three Baltic countries (Estonia, Latvia and Lithuania); the northern parts of Poland and Germany; as well as the western regions of Russia and the southern coastal regions of Norway. Though their present levels of economic and social development differ, economic growth is prevalent overall. Russia's role is especially crucial in the BSR: St. Petersburg is the biggest and fastest-growing city in the BSR and also the biggest university city. It is also the largest polluter of the Baltic Sea.

The Baltic Sea's ecology is vulnerable and unique; it is the largest brackish water reservoir in the world. Environmental concerns about the sea are apparent in the BSR's many environmental activities. The ten countries that make up the Baltic Sea region, in co-operation with the European Commission, have developed Baltic 21 in response to the UN-endorsed global strategy to promote sustainable development (Agenda 21). The BSR is one of the world's first macro-regions to adopt common goals for sustainable development.

The EU has focused efforts on development in the BSR, especially since EU enlargement in 2004. It has crafted a Northern Dimension Policy which has covered the BSR since 1998. Northern Dimension Policy framework documents were adopted in 2006 as a regional expression of EU/Russia common spaces. They focus on economic co-operation, security and justice, research, education and culture, environment and natural resources, and social welfare and health.

The current EU strategy for the Baltic Sea region is to co-ordinate the efforts of the various actors in the BSR (member states, regions, financing institutions, the EU, pan-Baltic organisations, non-governmental bodies, etc.) so that they can promote more balanced development within the region. The strategy was

Box 3.6. **EU Baltic Sea Strategy** (*cont.*)

requested by the eight member states on the Baltic Sea and is seen as a way of developing an integrated approach to identifying development needs and solutions, and matching them with available resources. This is the first time that a comprehensive EU strategy, covering several Community policies, targets a "macro-region". The four cornerstones of the strategy are to make this part of Europe more environmentally sustainable (*e.g.* reducing pollution in the sea); prosperous (*e.g.* promoting innovation in small and medium-sized enterprises); accessible and attractive (*e.g.* better transport links); and safe and secure (*e.g.* improving accident response). To date the strategy encompasses some 80 flagship projects.

Sources: *http://ec.europa.eu/regional_policy/co-operation/baltic/index_en.htm*; *http://eu.baltic.net*.

Co-operation is a way to achieve critical mass

For potentially small organisations in remote regions, co-operation is a particularly effective way to attain "critical mass" and to undertake activities, develop ideas or initiate processes that they would not have been able to attempt alone. Critical mass is what local actors and organisations most commonly seek in transnational co-operation, especially in remote areas (CEC, 1999). Remote and peripheral areas have limited resources and may be unable to solve certain problems on their own or to take full advantage of some of their potential (see Chapter 2). In contrast, by pooling their strengths, they can overcome these limits and achieve otherwise unattainable results. There are different areas in which the argument of economies of scale and joint efforts and resources would result in a clear advantage, including: the development of new technologies to improve the efficiency and value added of resource-based sectors; development of renewable energy technologies; co-operation in research or in education and training; shared branding for supporting regional business networks; and the development of regional tourism. There are some interesting initiatives in the region to exploit the strengths and complementarities of regional and neighbouring partners, especially in Atlantic Canada and Scotland (Box 3.7). However there is still a lot of potential to be exploited.

Box 3.7. **The cruise islands of the North Atlantic partners**

The North Atlantic cruise industry has grown significantly over the past decade. Its offer of rugged coastlines, natural beauty, old-world charm, hospitality, and some of the world's most majestic sights and cultural experiences have raised the profile of the North Atlantic rim. The region is quickly becoming recognised as a preferred cruise destination. In a continuing effort to further develop the trans-Atlantic market, the Cruise Islands of the North Atlantic (CINA) partners – Cruise Newfoundland and Labrador (Canada); Cruise Greenland; Cruise Reykjavik (Iceland); Cruise Torshavn (Faroe Islands); and, Cruise Orkney Islands – embarked on the development of a regional cruise brand and supporting materials. This commitment was formalised in 2007 with the signing of the Memorandum of Understanding "Working Together to Promote Cruising in the North Atlantic".

The guiding principles behind this partnership project include:

- Co-operation to increase the profile, experience and benefit of cruising the islands of the North Atlantic.
- Development of a consistent brand identity to enhance the North Atlantic Rim's overall profile and desirability as a cruise destination for European and North American cruise lines and passengers.
- Creation of collateral marketing material to complete previously designed market-ready cruise itineraries in the region. In conjunction with the new brand, the new marketing support materials will raise the profile of the region and the benefits it has to offer cruise lines and their customers by emphasising the unique experiences that the North Atlantic offers.

The strategy focuses on branding the North Atlantic as an internationally preferred cruise destination and elevating the region's profile with potential customers. The CINA brand "Take LIFE to a Higher Latitude – Cruise Islands of the North Atlantic" was launched in September 2009 during Seatrade Europe in Hamburg, Germany. By working together, CINA partners hope to increase cruise passenger sales and participation in established trans-Atlantic sailings in 2010-11 and influence the development of new capacity and cruise options as of 2013.

Norway is not part of this collaboration but together with the Faroes and Iceland is part of "Cruise Europe North", a parallel initiative for collective marketing of the eastern part of the North Atlantic seas as a cruise destination.

Sources: Atlantic Canada Opportunities Agency; *www.cruisenorthatlantic.com*.

Co-operative efforts can unlock financial resources…

The potential for territorial co-operation to add institutional and financial resources to domestic interventions and open up new ways to respond to development challenges is particularly important for the NORA territories, especially in light of the economic crisis and as pressures on key economic sectors such as fisheries increase. In the context of NORA co-operation, the role of financial pooling is particularly important, owing to the potentially limited financial and institutional resources available, especially in smaller communities. Past involvement in a number of existing co-operation programmes shows that co-operative efforts can be a key to unlocking financial resources, especially for new and innovative interventions. The Nordic Council and the EU offer substantial resources to support the development of co-operative activities. Thus, resources are available for organisations to call on to support co-operation. However, for smaller NORA-based organisations, especially in sparsely populated and remote areas, involvement in these large-scale programmes can appear an excessive drain on resources, too difficult and insufficiently relevant/tailored to their specific needs. Many organisations lack the critical mass required to participate in such programmes. This is especially the case for the EU INTERREG and Framework Programmes. As a result, particular efforts have sometimes been needed to engage NORA partners in wider programmes (NPP, 2006). However, through internal, strategic co-operation there is greater scope for NORA-based partners to gain the critical mass necessary to participate in these larger, better-funded programmes.

…and be a means of learning and exchange of best practices

The opportunity for learning and exchange of experience is one of the most important aspects of territorial co-operation. This can lead to horizontal processes of policy transfer, learning and institutional adaptation between countries and regions (Dühr *et al.*, 2007). Co-operating on an international basis puts efforts and expertise into perspective and offers an opportunity to develop complementary expertise (Nordregio and EuroFutures, 2005). Such opportunities are especially relevant for the NORA region, as the territories face common development concerns, such as demographic challenges, management of the fisheries sector, development of technology and innovation, and adaptation to climate change.

The learning aspect of co-operation is already highly valued in the NORA region through various ongoing initiatives, *e.g.* international conferences, joint working groups, joint academic degrees and joint projects. Moreover, the opportunities for learning and sharing practices extend beyond NORA's borders, especially to other regions facing similar

development challenges, such as Atlantic Canada or Scotland, territories with which a number of initiatives are already under way.

Co-operation can increase and intensify links with partners

In connection with joint activities and projects, territorial co-operation commonly involves a significant increase in the number and intensity of cross-border contacts at national, regional and local levels. While links may already be strong at a national level, co-operation on a single project may lead to lasting, potentially self-sustaining new links between individual organisations. For instance, through involvement in NORA and NPP co-operation projects, a number of institutions and organisations in the NORA territories and wider Nordic region have gained practical experience in transnational co-operation, had opportunities for knowledge exchange and learning, expanded their international links and networks, and delivered outputs from co-operation programmes. These co-operative actions are potential catalysts, providing opportunities that lead either to new and additional activities or to advancing existing priorities in a different way. For example, through consultation between partners co-operation activities can become more strategic and focused.

Additionally, from the point of view of the partners from NORA territories, co-operation programmes, such as the NPP, not only encourage co-operation on a Nordic scale but also allow for the development of more distant links, *e.g.* with Scotland, Ireland or Northern Ireland, which are also partners in the NPP programme. The NPP also makes provision for the inclusion of partners with shared interests from regions outside of the programme area, such as Canada and Russia. Similarly, the NORA organisation offers a bridge to wider co-operation, as it has engaged with and established productive links with organisations and territories, such as EU Territorial Co-operation Programmes and links with Canada.

Transnational responses to transnational issues

Territorial co-operation offers scope for tackling specific problems which could not be addressed in an efficient way through national policies or support programmes. The transnational challenges identified in previous chapters highlight the need for further regional co-operation. Territorial co-operation in the NORA region is especially crucial for sustainable and safe management of regional resources (*e.g.* shared fish stocks) or for addressing shared challenges (*e.g.* environmental degradation or the effects of climate change). Increasing cruise tourism in the NORA region may also require transnational co-operation to co-ordinate rescue services and respond

more efficiently in case of accidents or emergencies. Transnational institutions and arrangements can play an essential role by developing integrated approaches and reinforcing regional synergies among the NORA region's local and regional authorities.

Challenges

The NORA territories have considerable experience with co-operation. However, relations in the region are dynamic and continue to evolve. As a result, territorial co-operation must adapt and respond to new challenges and issues. The benefits of regional co-operation for facing common challenges or exploiting shared potential are clear, but co-operation also faces some barriers.

Geographic distance complicates co-operation

A clear challenge for regional co-operation in the North Atlantic is the geographical distance separating the NORA territories and the main stakeholders, as well as the lack of connexions. Currently it is difficult, if not impossible, to travel directly from one member to another, and where travel is possible it is typically infrequent, expensive and time-consuming (see section 2.1). The academic literature draws a distinction between regions that are contiguous and collaborate and regions that collaborate but are separated by another region (Axford, 2006; Perkmann, 2003). It is thought that opportunities for collaboration and the returns from doing so are higher in cross-border situations because the bond is stronger and proximity makes it easier to manage the relationship. For NORA, the question of how to characterise the relationship among the members is an interesting one. In a strict topological sense the members are adjacent, but the physical distances imposed by the ocean and the lack of connectivity limit their interaction. The distinction is important, because if NORA members perceive themselves as distant from each other they are less likely to see significant benefits in policy integration. Overcoming a sense of distance would require strengthening links and interactions among the different stakeholders and regional actors. ICT networks create opportunities for different kinds of formal and informal, cultural and economic contacts and for sharing knowledge and best practices. International conferences (organised by the NORA organisation, among others) are also a way to strengthen regional links. But overcoming the challenge of distance also requires viewing the economic benefits of transnational co-operation as greater than the costs of bridging long distances. Strengthened connectivity between the NORA territories would help here.

Geography also implies that certain co-operative arrangements will evolve more easily on a bilateral/trilateral basis. Beyond the similarities between the NORA territories, the NORA region has in many ways two distinct geographical areas. The eastern portion – coastal Norway and the Faroes – are firmly attached to Europe, while Greenland is in North America. Iceland plays a bridging role owing to its strong connections to both Europe and North America. Of course this does not obstruct co-operation on a NORA-wide scale: the cultural, historical and institutional links, and the shared challenges and complementarities, provide a rationale for NORA co-operation. Yet, it means that certain co-operative arrangements would develop more easily among two or three of the NORA members. Moreover, co-operative arrangements could be enriched through the presence of actors from neighbouring territories which have much in common with the NORA region (*e.g.* North Atlantic Canada or Scotland).

Building co-operation across territorial borders is complex

Transnational co-operation involves working with different institutional, cultural and legal settings, and the complexity of many territorial co-operation arrangements has important implications for the perceived high cost and administrative burdens involved (Wassenhoven, 2008). Co-operation activities that span multiple regional and national boundaries and need to deal with different financial, administrative and regulatory systems can involve high administrative costs. In the case of NORA, Iceland is an independent country, the Faroes and Greenland are autonomous territories, and coastal Norway is an integral part of Norway. This has not impeded co-operation in the past. Many co-operation arrangements in the NORA region involve the interaction of private or public stakeholders (universities, SMEs, research institutions) for which institutional barriers are not an issue. Moreover, similar cultures, traditions and institutional interaction in the NORA territories (including trade and labour agreements or their joint presence in the Nordic Council of Ministers) lower the administrative costs of transnational co-operation. However, some forms of joint action – such as those requiring the active involvement of the administrative institutions of the NORA territories – would require overcoming the complexities of a region composed of territories with different institutions. This is always the case in territorial co-operation: other transnational co-operation arrangements, such as the Pan Yellow Sea region or the Baltic Sea region, integrate countries with extremely different institutional and legal settings. In this case, the perception of economic benefits from collaboration seems to count more than the administrative barriers between the different territories.

Tangible benefits can be elusive in the short term

The benefits of co-operation strategies can be difficult to capture: although long-term gains may be assumed, short-term benefits can be elusive (Ferry and Gross, 2005). In many cases, the geographical scale of transnational co-operation means that resources are spread widely and measurable impacts may not be immediately apparent in all regions. For instance, a common problem for evaluating small-scale co-operation activities is the difficulty of identifying impacts, distinguishing their effects from those of other public expenditure, and determining cause and effect. Similarly, the breadth and scope of co-operation objectives make it particularly difficult to demonstrate concrete results (Taylor *et al.*, 2004). The continuity and sustainability of such activities also require particular consideration. Efficient communication of the positive outcomes of co-operative efforts among national and territorial stakeholders is crucial to encourage them to engage and invest in transnational co-operation.

Competition can be a barrier to co-operation

Some of the main economic activities of the NORA region present incentives for both co-operation and competition. For example, options for co-operation on pre-competitive activities (exchange of research, development of new technologies, education and training) are not likely to be affected by fears of losing market shares. It is more difficult to make the case for co-operation on commercial activities, because the NORA territories compete with each other. However, even in activities subject to competition (*e.g.* fisheries), certain areas require collaboration (*e.g.* managing shared fish stocks or sustainable development of fisheries) and some others would clearly benefit from co-operative efforts (*e.g.* exploiting complementarities and productive exchanges of technical know-how). Other areas in which the NORA territories compete for market share, such as tourism, could be also benefit from co-operation, as joining efforts and resources may result in a higher impact, *e.g.* shared branding campaigns and common efforts to promote cruise tourism. Experience in other programmes, *e.g.* the EU's LEADER programme, found that among groups participating in co-operative projects and activities, the advantages of co-operation outweighed the disadvantages. Participants tend to work together as long as they feel it is in their interest (CEC, 1999).

Establishing the focus of and commitment to co-operation is a challenge

Establishing an appropriate strategic and thematic focus for co-operation is necessary but can be contentious and time-consuming. Participants' concerns as regards co-operation may differ. As projects are often interdisciplinary, sectoral boundaries need to be overcome (Böhme, 2005). Co-operation processes can also be constrained by factors such as differing levels of commitment, the absence of a coherent implementation strategy, a lack of instruments to promote the objectives of co-operation, and direct competition on some issues. The appropriate spaces and levels for co-operation can be difficult to establish. For instance, research on the EU's territorial co-operation programmes (INTERREG) has shown that some areas have found it difficult to achieve a common purpose and strategic project co-operation (Taylor *et al*., 2004). It is difficult to set boundaries on co-operation, deciding whom to include and whom to exclude and at what level to participate. In the NORA region, the lack of general or sectoral development strategies to set priorities for the region could be an impediment to further co-operative efforts and to the development of a shared position on key issues for the region, such as climate change.

Changing political, institutional and financial environments may affect regional co-operation

The political and institutional environment for co-operation is changing within and outside the region. Within the NORA territories, internal economic and political changes can promote a re-evaluation of key international relationships, including NORA-focused co-operation. For instance, Iceland's application for EU membership has implications for the others. A lengthy process of negotiations with the EU lies ahead and popular approval has to be secured before full membership can be approved. However, Iceland's pursuit of EU accession may affect the resources for and priority of co-operation in other areas. More generally, strengthening links with EU programmes could mean that internal NORA-based activities would increasingly appear too small to warrant the same attention as more attractive EU or international programmes. However, a more outward-looking perspective could also support greater co-operation within the region as a platform to build more wide-ranging links. Greenland and the Faroe Islands are increasingly looking outward to enhance their competitiveness and their international profile. Co-ordination within the region could be a way for local actors to secure resources, build ideas and generate critical mass.

At the same time, the institutional and financial resources available for co-operation fluctuate, as do expectations of what co-operation can achieve. Of particular relevance to the contemporary development of territorial co-operation is the impact of the economic crisis, which could have potentially contradictory impacts (McMaster, 2010). Iceland has been particularly badly affected by the crisis and a number of the NORA territories' export markets have suffered. Economic conditions could lead to a drop in the number of organisations that are in a position to participate in co-operation activities in addition to their core activities. The variable impact of the crisis could affect the achievement of balanced participation across the area. Key organisations could suffer public-sector budget cuts, especially in Iceland, which could reduce the capacity of public-sector organisations to promote and develop co-operation. However, the crisis could also help to enhance the importance and relevance of regional co-operation. For instance, growing financial constraints could mean that organisations will seek to share best practices and will look for new development opportunities with neighbouring territories and new sources of funding through co-operation.

3.3. Opportunities for co-operation

The NORA region shares a wide range of common development concerns, which could be, and already are, the focus of co-operative activities. However, it is not generally possible to co-operate with everyone on everything. Some areas would be better addressed at sub-national, national, or international (beyond NORA) levels. The main idea driving territorial co-operation is the need to overcome individual participants' suboptimal outcomes when addressing certain challenges or exploiting certain potentials. The four main challenges for the NORA region identified at the end of Chapter 1, and analysed in Chapter 2, are used here as a framework to describe some of the main opportunities for co-operation. This section does not claim to offer an exhaustive or detailed list of opportunities for co-operation, but rather gives a brief overview of the main areas in which a potential for regional co-operation was identified during the review process. Many of the areas outlined are also activities for which the NORA territories have (or could have) distinctive capabilities, competencies and expertise in a global context.

Regional co-operation for addressing accessibility challenges

The different challenges presented by the peripheral location of the NORA region (*e.g.* remoteness, lack of connectivity, declining populations, ageing, brain drain, economic isolation and lack of critical mass, difficulties for the provision of services) may be more efficiently addressed by strengthening regional interaction and co-operation. This section identifies three main areas for co-operation. Each offers a way to expand the NORA economies and each offers opportunities for collaborative action to increase the potential benefits for each economy.

Sharing know-how would help deal with the challenges facing small and remote communities

Remote and isolated communities that rely heavily on single sectors and face demographic change are present in all of the NORA territories. The potential for such communities to learn from each other is therefore an opportunity for collaboration. With modest investment, it should be possible to provide Internet-based mechanisms to allow local leaders to share their challenges and strategies for addressing the problems such communities raise. The opportunities for co-operation in this respect transcend the NORA region and could be extended to territories facing similar challenges – Atlantic Canada, Highlands and Islands in Scotland, or northern Sweden and Finland. Strengthened co-operation and exchanges with the Northern Periphery Programme would be a way to take advantage of the accumulated experience of this EU programme in promoting development and innovation in remote and peripheral areas. On a more strategic level, based on the accumulated experience of the different territories, joint programmes of support to address demographic change, for example, could be agreed.

Co-ordinated public services may result in better service provision

There are considerable opportunities for more efficient and effective public service management among NORA members. A particular area which offers opportunities for further co-ordination is the provision of health services. Neither the Faroe Islands nor Greenland is large enough to support advanced medical technologies independently (see Chapter 1). Currently, the medical system in the Faroe Islands and Greenland relies on Copenhagen for tertiary care services. The Faroe Islands and Iceland recently signed an agreement to allow Faroese patients to be sent to Iceland rather than Denmark. Greenlandic and Icelandic authorities are currently negotiating a similar agreement to use Icelandic hospitals for certain

treatments. This reduces transport times and could substantially reduce transport costs.[4]

Another way to improve the efficiency of public management may be to increase exchanges of government staff. One way to bring new ideas to government is to send staff to another ministry in another country to observe different practices. The Nordic Council had until 2009 a system for exchange between public staff in the Nordic countries. Staff from the Faroes could travel to Finland or Iceland and work for at least one month and up to six months. This can benefit both the sending and recipient territory in terms of new ideas. Communication among the different territories is also improved when personnel have a better understanding of how each country organises its public sector and who to contact when joint issues arise. Linguistic and cultural affinities within NORA would make this a relatively easy region in which to organise such exchanges.

Joint public support would enable a reconfiguration of transport networks

An improved and more diversified transport infrastructure is crucial to overcoming the challenge of remoteness. A reconfiguration of transport networks and strengthened connections between the NORA territories and their closest neighbours (Canada, the United Kingdom) would help to expand trade opportunities and economic interaction. While the Internet allows people and firms to be aware of opportunities in other places, they cannot act upon those opportunities if transport links are limited or prohibitively expensive. As observed in section 2.1, a strengthened regional transport network would require co-ordination and joint public support from the NORA territories. International co-operation could help to improve access across the region and externally, *e.g.* by establishing more flights between Iceland and Greenland instead of relying almost exclusively on flights through Copenhagen. Regional co-operation could also lead to a more rational use of regional air hubs (for instance Reykjavik airport) to improve the connectivity within the region and with near-by countries.

Scope for co-ordination and co-operation on fisheries

The fishing industries of the NORA territories compete for both resources and markets. Extremely strong national interests are at stake and are thus a challenge for greater regional co-operation on this sector. However, co-operation and co-ordination are critical to ensuring sustainable and efficient management of the marine environment and avoiding depletion of shared fish resources (see section 2.2). Much of this co-operation takes

place within wider international arenas or on a bilateral basis. Yet the scope for NORA-based co-operation on a range of issues is clear, particularly in view of their experience in fisheries management, boosting know-how and data on stocks in NORA waters, using and developing new technologies, and undertaking joint research activities, not least those related to the effect of climate change on the sector.

Co-operation in research, innovation and education on fisheries could be intensified

Opportunities to advance understanding and expertise through co-operation on the provision of education and training in fisheries between related institutions in the NORA region is particularly attractive given the small population of the NORA territories and the weak demand for some specialist courses and subjects. It is also an invaluable opportunity for exchanges and co-operation between researchers in the field. There are already a number of opportunities to participate in such activities, *e.g.* through events and grants supported by the Nordic Council. However, in a number of NORA territories greater domestic priority could be given to building institutional links with partner universities. Networked education and training on fisheries such as the UNU Fisheries Training Programme operating in Iceland (Box 3.8) could be extended to other NORA territories. This would be facilitated by establishing a forum for co-operation to bring together experts in different fisheries-related fields (NORA/Norden, 2009).

Box 3.8. **The UNU Fisheries Training programme**

The United Nations University Fisheries Training Programme (UNU-FTP) is a postgraduate training programme that offers training in various areas of the fisheries sector for practising professionals in less developed countries. The programme is led by the Marine Research Institute in a formal co-operation with the Icelandic Fisheries Laboratories, the University of Iceland and the University of Akureyri. It is part of the United Nations University in Tokyo but is mainly funded by the Icelandic government. The Marine Research Institute hosts the programme and the UNU-FTP draws knowledge from all parts of Icelandic society. The close links between the industry, academia and institutions, along with its highly developed fishing industry and its international nature, were among the main reasons why Iceland was chosen to host the UNU-FTP.

Source: *www.unuftp.is*.

All the NORA territories have large exclusive economic zones (EEZs) and, in general, limited resources for research. This could be remedied through increased collaboration and knowledge sharing. There is great potential for participation in jointly funded projects to support innovation and research and development on fisheries. Grouping efforts and resources can allow for more focused and efficient investments. There is also a potential for exchanging know-how, technical information and high-quality data. The development of fish eco-labelling systems (in which co-operation is ongoing) could be further promoted. Finally, there would be opportunities to capitalise on the region's accumulated expertise in the sector, *e.g.* by marketing innovations as well as applying them.

"Complementarities" in the sector are a basis for co-operation

The NORA territories have different fields of expertise within the fisheries industry. Norwegians, for example, have a long tradition and expertise in aquaculture and vessel design, Icelanders in processing and traceability, and the Faroese in the application of traceability solutions and development of fishing gear. This creates opportunities for co-operation based on exploiting potential complementarities. For example, Norway could enhance the transfer of knowledge on technology applied to fish farming to other NORA territories such as the Faroe Islands and Iceland. For many years, Norwegian aquaculture firms have exported their technology and established firms in Europe or South America but much less to other NORA territories. Similarly, Icelandic companies have very high processing capabilities whereas Norwegian farming companies turn a very small fraction of their production into value-added products domestically. This also creates opportunities for co-operation (NORA/Norden, 2009).

Regional co-operation is needed to improve the basis for adapting the sector to the effects of climate change

Finally, the uncertainties surrounding the effects of climate change make co-operation all the more important, especially in relation to fisheries based on shared resources and stocks. The potential effects of climate change on fish migration and fish productivity are a source of uncertainty. Research is needed on the impact on the sector and potential adaptation measures (see Chapter 2). Co-operation and shared information provide a sounder basis upon which to base decisions on the management of stocks and adaptation strategies. This is an area that would benefit from a broader co-operative effort that would include territories beyond NORA.

Opportunities for co-operation on innovation and new business development

As mentioned above, the NORA territories face incentives to co-operate and to compete in some of the region's main activities. A number of options for co-operation in pre-competitive activities (exchange of research, development of new technologies, education and training) would result in shared benefits. Moreover, for small and remote regions such as those that constitute NORA, there are also areas in which the attraction of scale economies might be greater than the incentive to compete, *e.g.* shared branding or supporting regional business networks.

Regional co-operation on innovation and R&D offers substantial benefits

For organisations in the NORA region, opportunities to co-operate on innovation can range from the development of joint, transnational services and initiatives, to participation in jointly funded projects, exchanges of experiences, co-operation between universities and researchers, or sharing facilities and equipment in both traditional and emerging sectors. A key institution for co-operation at the Nordic level has been the Nordic Innovation Center (NICe). Support is also available through the NPP and the EU's Framework Programme. However, these are broad initiatives covering a large field and a large number of countries. Smaller-scale, more targeted support could be made available to stimulate ideas and projects, either as stand-alone initiatives or as precursors to bids to larger EU-funded programmes, for example. The NORA programme has funded, on a small scale, a series of R&D projects of relevance to the region with participation of actors from at least two NORA territories. It has also organised international conferences to foster the exchange of research and best practices at regional level on key issues such as climate change. Extending research links to external partners could also be an important way to advance research and innovation in the region (Remoe, 2009).

Regional co-operation would support a greater international role for NORA in R&D

As mentioned in section 2.3 there are several areas in which the NORA territories can provide international expertise, either as experimental fields for research or as contributors to new basic or applied knowledge. These include fishing and fish farming, small-scale renewable energy exploitation, climate change research and research related to building in extreme climatic or geographic conditions. Further regional collaboration could be the basis for the NORA region to have a greater role in international R&D activities

in fields such as these, in which the region has natural advantages. Moreover, in-depth research into the R&D projects, initiatives, strengths and potentialities of each of the NORA territories could reveal the region's comparative advantages in R&D and its untapped potentialities. Such an inventory would show the fields in which NORA research partners are most active and indicate the geographical scope for co-operation. Since it would be a waste of resources for each region to try to become a self-sufficient knowledge hub, a distributed regional model of knowledge creation could be established.

Co-operation to improve the value added of resource-based sectors

As observed in Chapter 2, research and innovation are crucial to improve the efficiency and sustainability of resource-based sectors. NORA regions could capitalise on the strong knowledge base acquired through traditional fishing and fish-processing activities and on the complementarities of the different territories to develop new niches and value-added products. There are opportunities for exchanging know-how and joint research to develop value-added food and non-food products from the marine sector *e.g.* nutrients, bio-medicines and pharmaceutical products (see section 2.3). Another emerging area of co-operation is related to small-scale renewable energy exploitation. Small communities face similar challenges for designing and installing power systems. Joint research and sharing of best practices would be therefore very useful. Beyond this, competition within the region, strong national interests and the dominance of multinational companies make the development of joint approaches to the development of oil, gas and mineral resources extremely unlikely. However, there are associated activities in which there could be useful mutually beneficial exchanges, *e.g.* provision of support service, exchange of experience in specialist training and environmental management, and ensuring health and safety in emerging industries.

Joint efforts to promote regional tourism could result in greater impacts

The capacity of individual communities, and the NORA economies as a whole, to adapt to new opportunities and adopt new practices is essential for the region's long-term growth. Among the emerging opportunities is further development of tourist offerings across the region, especially nature/adventure tourism and cruise tourism. Support to develop individual opportunities is already in place. However, transport difficulties, high costs and lack of brand recognition (see Chapter 1) have constrained the development of tourism in the region. Co-ordinating efforts across the region could lead to cross-fertilisation of ideas, joint marketing of the region

and the development of joint products for tourists: linked tourism destinations and combined activities.

Shared branding of the North Atlantic could benefit the entire region. The small size of markets and capacity restrictions argue for the development of joint ventures in the tourism industry. Competition between NORA territories could limit the effectiveness of co-operation. However, with sufficient backing, regional co-operation could result in a greater impact, a more sustainable, diversified tourism offer and wider scope to market and publicise the whole region. There is already some experience with regional co-operation: NATA is an organisation set up by the tourism councils of the Faroe Islands, Iceland and Greenland to strengthen regional collaboration on tourism and offer tourist information (Box 3.9) As mentioned, the NORA organisation has also contributed to the development of regional tourism by supporting collaboration projects. Yet efforts could go further. For instance, travel packages branding the North Atlantic image as a "last frontier", targeting the high end of the tourist market and covering several parts of the region, could be developed jointly and marketed to specialised agencies (in particular those specialised in adventure, sport- and eco-tourism). Other regions with similar conditions in terms of remoteness and small size have established co-operation agreements for joint research, marketing, policy and international representation as a way to promote regional tourism (see Box 3.10). Development of joint training packages and methods and quality assurance and accreditation schemes for small tourism entrepreneurs is another potential area of co-operation that could be supported by programmes such as the Northern Periphery Programme.

Box 3.9. **North Atlantic Tourism Association**

The North Atlantic Tourism Association (NATA) is an organisation that was set up on the basis of close collaboration between the tourism councils of the Faroe Islands, Iceland and Greenland. Its objectives are to develop a joint strategy for tourism in the western region and strengthen, co-ordinate and ensure tourism co-operation between the territories of the region. A website provides tourist information about the territories and about how to make combined trips. NATA was established in January 2007 and superseded two tourism co-operation organisations, SAMIK (tourism co-operation between Greenland and Iceland) and FITUR (tourism co-operation between Iceland and the Faroe Islands). The organisation has three board members from each territory. The chairmanship rotates every second year.

Source: *www.northatlantic-islands.com/who-are-we.php*.

Box 3.10. **The South Pacific Tourism Organisation**

The South Pacific Tourism Organisation (SPTO) is an intergovernmental organisation for the tourism sector in the South Pacific, with representation from both the public and private sectors. SPTO members include the Cook Islands, Fiji, French Polynesia, Kiribati, New Caledonia, Niue, Papua New Guinea, People's Republic of China, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. Private-sector members include over 200 of the major tourism operators in the region. SPTO's main objectives are to facilitate the sustainable development of the tourism sector in the South Pacific, to strengthen capacity within the region, and to sustainably plan, market and manage development of the tourism sector. SPTO offers the following range of products and services: research (including regional statistical analysis and market sector studies); marketing (regional branding, overseas representation, regional tourism magazine and Internet marketing among others); membership service (such as database marketing and a regional tourism conference); policy and planning (training facilitation and implementation; regional tourism policy and planning; technical assistance).

Source: *www.south-pacific.travel/.*

The nature of cruise tourism makes it an activity that benefits from joint efforts, regional interaction and common branding. A common strategy on how best to manage, develop and exploit the growing potential of cruise tourism could help to facilitate interaction and co-ordination between local entrepreneurs in providing profitable products and services. Some initiatives are already under way (see Box 3.7 on the Cruise Islands of the North Atlantic Partners). At the same time, co-operation on rescue and security services would be beneficial. Big cruise ships travelling in a remote and geographically challenging region where response resources are scarce present a number of challenges in terms of safety, as well as environmental impact, requiring strong international co-operation.

Further exchanges could be promoted in education and training

A well-educated work force is required to augment productivity, open opportunities for further economic diversification and reduce mismatch problems in the labour market. The provision of specialist training and tertiary education in the Faroe Islands and Greenland, in particular, is limited by their small population and a lack of demand. However, a range of universities in Norway and Iceland offer programmes in English that focus on the needs and problems of the North, such as research programmes on climate change, the exploitation of Arctic resources, renewable energy or

Earth sciences (see Chapter 1). There are also several joint Nordic master's degree programmes. However, few Faroese and especially few Greenlandic students enter other NORA universities or non-Danish Nordic programmes. There is scope to develop exchanges not only of students but also of teachers in colleges, universities and training institutes across the region.

Beyond formal education arrangements, and in the context of further diversification of local economies, there are opportunities for specialist training in key sectors (*e.g.* for tourist entrepreneurs). This will help local inhabitants exploit new development opportunities in emerging sectors. There may also be opportunities for institutional capacity building and exchanges between government agencies and institutions. Existing experience, such as that of the University of the Arctic, should be evaluated in order to develop further international agreements with the best institutions in the Nordic countries and beyond (see Box 3.11). Finally, distance learning and teacher education are areas in which the experience of the NORA territories with sparsely populated areas provide a good breeding ground for sharing know-how and establishing joint initiatives.

Box 3.11. **University of the Arctic**

The University of the Arctic (UArctic) is co-operative network of universities, colleges and other organisations committed to higher education and research in the North. UArctic is a decentralised organisation with international representative governance which distributes all administrative and support services among member institutions. Members share resources, facilities and expertise to build post-secondary education programmes that are relevant and accessible to northern students. UArctic Thematic Networks are independent networks of experts in specific areas of northern relevance. They develop activities on one or several of the following: research co-operation, knowledge sharing, curriculum development or joint education programmes in a specific field. They also form the umbrella for UArctic participants in international workgroups.

Source: *www.uarctic.org.*

Transnational networks of SMEs could support learning processes and connections to global networks

Challenges for expanding entrepreneurial activity in the NORA area are significant, especially in rural and remote areas and for SMEs. SMEs face obstacles such as remote locations, limited local markets, high transport

costs and, sometimes, limited access to business support networks (see section 2.3). There are a number of Nordic SME support and development organisations. However, there is scope for more specialist NORA-focused networks which could strengthen small companies through participation in joint activities, the exchange of best practices, and collective efforts to build and extend their links within the region and externally. For instance, a dedicated, online resource for NORA-based SMEs could connect SMEs in related fields. Such support could be especially valuable for SMEs in the region that are currently exposed to economic difficulties, as a result of the economic crisis, and to greater international competition.

Opportunities for co-operation on climate change

Action to address climate change will benefit from co-ordinated efforts. As section 2.4 highlighted, the effect of climate change on the NORA region will probably be mixed. Some developments could be viewed as opportunities for NORA territories to play a positive role in adapting to climate change. Other impacts will probably create considerable threats and challenges. However, the precise impacts of climate change are not easy to predict, which makes shaping responses particularly difficult. The issue of climate change is rendered more complex by the interrelations, interdependencies and conflicting implications of its effects.[5] For instance, the fact that the Arctic Ocean could be ice-free suggests opportunities for the development of transport and natural resources. However, it also raises the risk of accelerated warming, changing patterns of circulation in the oceans and atmosphere, with unknown effects on ecosystems owing to the acidification of waters (Shuckman, 2009). For such reasons, action to address the economic, social and environmental challenges of climate change requires integrated and co-ordinated efforts.

The shared characteristics of the NORA region indicate that co-operation on adaptation initiatives and the development of strategies would have major advantages. This is widely recognised by the NORA territories (Frederiksen, 2010). Efforts to adapt to climate change and environmental challenges have also led to joint actions, but more strategic and tangible co-ordination of programmes could be pursued, especially on issues linked to R&D and exchange of information and know-how; supporting adaptation at local level; joining forces to present a common front in international forums; and marketing and applying new technology.

Exchange of knowledge can support better adaptation at the local level

The impact of climate change and the vulnerability to change will vary considerably, even within small geographical areas. Similarly, adaptive capacity is context-specific: the capacity to adapt results from interactions among many socio-ecological factors, such as income level, settlement patterns, infrastructure and environment (OECD, 2009b). However, the NORA territories share a range of common features and complementary strengths which suggests that co-operation and the sharing of knowledge and information can help improve local adaptation strategies. This could lead to tailored solutions for responding to the specific development needs and concerns of these territories, *e.g.* harsh climates, sparse populations and reliance on primary resources.

A web-based information network that allows actors in the NORA region to find or share ideas or best practices for practical ways to address and adapt to climate change would be an interesting way to develop adaptation strategies. Awareness of and access to such information and know-how can be important for local stakeholders, as adaptation in one community may provide others with valuable ideas or information. Norway has plans for a web-based information system to set out adaptation challenges and options. This initiative is partly meant to facilitate information-sharing among local communities and municipalities and could be enlarged to the wider NORA region.

There is a need to better understand the impact of and potential responses to climate change in the NORA region. A wide range of studies on potential impacts are available at the macro level, but it is difficult to compare and collate the results (Næss *et al*., 2004). Advances in climatology and modelling techniques are important for reducing uncertainty surrounding future projections and will require continuing improvements in the collection, range and quality of climate-related data (OECD, 2008). These advances will be crucial for better understanding potential impacts at regional and local level. They can help to identify the ecosystems and species that are most vulnerable to climate change and the changes in different climate factors and their interaction, particularly when they determine the "tipping points" at which change is abrupt, large and potentially irreversible (OSPAR, 2009). Maximising the flow of information and strengthening co-operation across the region could offer opportunities to raise awareness. Organisations and stakeholder in the region need to understand why they should adopt certain measures and be informed of opportunities, risks, incentives for change and options. In part, the lack of comparable information is due to the fact that many studies of impacts of

climate change and adaptation are still at a relatively early stage. However, it is also related to the need for more co-ordination and joint efforts by researchers in the region and beyond and across the wide range of disciplines involved.

Even small instances of co-ordination have already demonstrated positive outcomes, such as the NORA conferences on climate change or demographic challenges, which have been well received and considered useful (Box 3.12). The experience of the Fisheries Working Group of the Arctic Transform Group could serve as a basis for strengthening co-operation in the NORA region and beyond. Although this international working group focuses on the impact of climate change in the Arctic, no NORA research institutions are among the four leading partners (Box 3.13).

Closer co-operation and co-ordination of research strategies will benefit all, especially the smaller territories with limited capacity, the Faroe Islands and Greenland. Following the 2008 Trans-Atlantic Climate Conference in the Faroe Islands, a feasibility study was undertaken to explore the scope to develop a Trans-Atlantic Climate Institute based in the Faroes. The aim of the institute would be to join interests around the Atlantic Ocean in a "semi-virtual" applied R&D institute with close collaboration among associated universities and innovative industries in Europe and North America (Nielsen, 2008). The establishment of this institute would represent an excellent opportunity to strengthen regional research and co-operation on climate change.

A shared position would make it easier to defend shared interests in international forums

Climate change is a global concern that requires co-ordinated international action, as emphasised in the Copenhagen climate talks in December 2009. Nordic countries, mainly through the Nordic Council of Ministers, already play their part in this process: working groups were set up in an effort to influence international climate policy; on 13 June 2009 the Nordic Council adopted "The Nordic Prime Ministers' Declaration on Climate Change" (Norden, 2009). Yet increased co-ordination in the NORA region could support a more targeted advocacy role in respect of key issues for the region, by presenting a common position in international forums and making sure that specific regional needs, challenges and interests are adequately reflected in international negotiations.

Box 3.12. NORA conferences on climate change and demographic challenges

In 2008, the NORA organisation co-organised three climate-related conferences within the region, one each in the Faroe Islands, Greenland and Iceland.

- The TransAtlantic Climate Conference was held in the Faroe Islands on 7-8 April 2008. More than 300 scientists, politicians and business people, including Former Vice-President of the United States and Nobel Prize Winner Al Gore, discussed the consequences of climate change for the North Atlantic maritime region. The main conference topics were: research on Atlantic Ocean climate change; innovative marine technology for CO_2 reduction; investment prospects in sustainable technologies; and creating a Trans-Atlantic Climate Institute as a knowledge hub.

- The Greenland conference focused on the dilemma created by the need to mitigate climate change and the desire to exploit oil and mineral deposits in order to contribute to regional economic development.

- In Iceland, the NORA conference took up the issue of oil consumption in the transport and fisheries sectors of the North Atlantic region. Dependence on transport over long distances and fishing as the dominant industry mean that the required cuts in the use of fossil fuels create a serious challenge. Transport and fisheries are among the main sources of CO_2 emissions in the NORA region.

In October 2009, NORA organised Challenged by Demography, a conference held in the northern Norwegian city of Alta. About 90 participants attended and discussed the region's demographic trends and challenges. At the conference there were contributions from other sparsely populated territories facing similar challenges: Bornholm (Denmark), Australia, and the Newfoundland and Labrador (Canada). The conference provided a forum for the exchange of ideas and best practices among the different territories. There was a broad consensus on the need for increasing regional co-operation beyond the NORA region.

Source: NORA (2008), *NORA Annual Report*, NORA; NORA (2009), *NORA Annual Report*, NORA.

Box 3.13. **The Arctic Transform Group**

The Arctic Transform project was funded by the European Commission's Directorate General of External Relations and is being led by four institutes: Ecologic (Germany; project lead), the Arctic Centre (Finland), the Netherlands Institute for the Law of the Sea (Netherlands), and the Heinz Center (United States). Its main goal is to develop transatlantic policy options for supporting adaptation to climate change in the marine Arctic environment. Its stakeholder-based working groups engage experts in discussions of five Arctic-related thematic areas: Environmental Governance Working Group; Fisheries Working Group; Indigenous Peoples Working Group; Offshore Hydrocarbon Working Group; Shipping Working Group. The Fisheries Working Group develops policy recommendations for adaptation to the consequences of global warming in Arctic fisheries and for preparation for the likely expansion of commercial fishing in this region. The key policy recommendations made by this working group included:

- encouraging exchange of information on Arctic marine ecosystems;
- supporting co-operative Arctic research programmes to improve understanding of these ecosystems, and to assess the probable expansion of commercial fisheries in the Arctic;
- working on a bilateral or sub-regional basis towards the management of new or expanding fisheries for shared fish stocks in the Arctic Ocean;
- considering the development of new multilateral mechanisms for conserving and managing future Arctic fisheries, including a possible Arctic Regional Fisheries Management Organisation;
- ensuring that bilateral and (sub-)regional fisheries management mechanisms are transparent and include the participation of stakeholders, including indigenous communities;
- seeking to integrate fisheries conservation and management measures with the regulation of other expanding activities, such as shipping and the development of energy resources; and
- acknowledging the subsistence needs of indigenous communities that are traditionally dependent on living marine resources.

Sources: Arctic Transform Group webpage, *http://arctic-transform.org*; Arctic Transform (2009), "Policy Options for Arctic Environmental Governance", prepared by the Fisheries Working Group, 5 March.

Marketing and applying new technologies

Co-operation in the NORA region will help to add value to technology solutions. Environmental technology and environmentally friendly solutions are among the fastest-growing industries worldwide. The competence level in these fields is high in the NORA territories, but would be increased if industries combined their expertise and their innovation capacity. This has already been identified as an opportunity at the Nordic level by the NORA organisation as well as by the Nordic Innovation Centre. An additional challenge is the fact that the environmental technology sector is fragmented; specific technologies and solutions are often provided by small companies working as subcontractors to larger enterprises. In order to compete there is scope for companies to co-operate and combine their expertise, capacity and market experience. This could allow them to provide more integrated solutions to the complex issues arising, allowing customers to take a range of actions to combat or adapt to change (Norden, 2006).

3.4. Maximising the contribution of territorial co-operation within the NORA region

A strong rationale, motivation and support for co-operation are keys to success

Co-operation within the NORA region exists and generates benefits. Yet to develop and respond to new challenges, it is necessary to maintain a strong basis and rationale for co-operation, build on experience gained in existing co-operative efforts, develop substantive means of adding value, and establish a governance framework and mechanisms for adapting to changing development concerns and relations. These issues are especially relevant for co-operation in the NORA region, in which there are complex webs of co-operation arrangements and where economic, environmental and institutional relations are undergoing considerable change. This puts co-operation in the region, and specifically the NORA organisation, in a challenging position, but one that also offers a range of opportunities.

Several factors can be considered enablers or facilitators of co-operative arrangements:

- A prevailing culture of co-operation provides an invaluable basis for co-operation. Co-operation across national borders not only involves the technical linkage of two or more systems of governance. It also has to bring together different people and social systems with differing value systems. Therefore, the culture of co-operation that exists (or may emerge) is decisive for the future of co-operation

arrangements. There has to be a will to engage in co-operation. A related issue is how easy it is to co-operate. Language problems or different standards in culture, institutions, etc., can provoke long delays in the administration and implementation of technical questions and cause frustration among co-operating actors (OECD, 2006).

- A sense of common identity is an important driver of territorial co-operation. This identity can be a regional identity based on historical and cultural factors or physical/economic interdependency. It often happens that a co-operative activity starts from physical interdependency but later develops a regional identity, or *vice versa*. Both factors influence each other in strengthening a shared sense of common destiny and thus lead to more effective co-operation (OECD, 2010).

- At the same time, expectations of the benefits to be obtained through co-operation are a driver of co-operative initiatives. It is important not only that these benefits exist, but also that the different participants are aware of these benefits and that the benefits are greater than the potential costs of co-operation.

- Establishing a governance framework to co-ordinate and manage co-operation means institutionalising a set of co-operation agreements in several different jurisdictional systems. If differences prove substantial, they can be bridged with the help of bilateral or multilateral agreements. Though informal relationships ensure flexibility, institutionalisation brings stability to co-operation arrangements.

- National or supra-national institutions play a leading role in establishing many forms of territorial co-operation. This institutional support implies that the positive involvement of higher levels of government is important, especially when co-operation is becoming established. National governments commonly need to legitimise and facilitate co-operation (Blatter, 2003; Thant, 2007) and to provide an enabling environment, for example by providing financial incentives and institutional support to the process.

As noted earlier in this chapter, some of the enablers of co-operation outlined above currently exist in the NORA region. Others are present to some extent but could be further developed. This section outlines a series of recommendations to strengthen the institutional framework for territorial co-operation in the NORA region. It starts by outlining the need for agreement on the focus of co-operation in order to streamline efforts and

gain support for the process. It then analyses briefly the role of NORA as an institutional facilitator of co-operation efforts and highlights the need to increase the NORA organisation's institutional support. This will require making the positive outcomes of regional co-operation known. Moreover, in order to strengthen the region's economic identity, the physical/economic interdependency of its members should be strengthened. Finally, the need for a geographically open approach to the activities of the NORA organisation is emphasised.

Focusing co-operative efforts

It is vital to consider where to focus efforts and which themes and issues to address

Some issues lend themselves better than others to co-operation on a NORA scale. In this regard, regional co-operation will not be possible or appropriate in certain areas, *e.g.* those that are highly place-specific, those with very strong competitive tensions, or those which already have well-established links, such as the organisations dealing with quota setting in the fishing industry.

Identifying and agreeing a focus for co-operation is of central importance to the success of co-operation efforts. Well-planned and well-defined objectives and targets help to avoid duplication of effort. It will be easier to gain support for territorial co-operation if the agenda and objectives are clear: the different governments, institutions and actors can more easily engage with, and mobilise around, clearly defined interventions. Without such an approach, co-operative efforts commonly struggle owing to a lack of commitment, a lack of funding, a lack of purpose, fragmentation of resources and effort, and divergent expectations.

The question of what co-operation can be expected to achieve has recently gained greater prominence. This is linked to pressures on public expenditures and increased emphasis on accountability and transparency in the public sector and more widely. Increasingly, territorial co-operation is assessed in terms of the extent to which it demonstrates "added value" and delivers results. For instance, the NPP places particular emphasis on projects that create innovative transboundary products and services (NPP, 2006). This is a notable shift in emphasis away from simple networking activities, which were a focus in the past (McMaster *et al.*, 2006). In this regard, territorial co-operation activities increasingly attempt to be more strategic, *e.g.* by setting out strategic plans and narrowing their focus to key areas in which they can maximise their impact.

Defining a participative long-term development strategy for the NORA region would help to focus efforts

Currently, there is no long-term participative economic development strategy for the NORA region. The NORA organisation develops a multi-annual strategic plan, stating its mission, vision, guiding principles, and action and activity areas. This is a valuable exercise, but it is internal and concerns the institution's role, not the strategy and position of the NORA region. Broadening this exercise and enlisting the participation of the main political and economic actors from the different territories would add considerable value and further direction to the key areas of co-operation and opportunities.

Identifying complementarities among the development strategies and priorities of the different territories would be a key task of such a regional strategy. Any decision on areas of further co-operation needs to be based on a close analysis of the strengths, weaknesses, opportunities and threats in terms of the region's development. In this context, it is important to note that the Faroe Islands and Greenland have not strongly pursued a domestic process of elaborating and agreeing long-term development strategies. In early 2010, Greenland's Ministry of Finance started to develop a regional planning strategy based on the potential of the different regions and of Greenland as a whole. It will be its first regional development strategy. The former Faroese government worked out an economic vision of the territory for 2015, which was presented in 2007, but the general impression is that the process of defining a comprehensive development strategy is still incomplete. The development of long-term strategies in these territories could be a key to moving co-operation in the region forward.

The development of a regional development strategy needs the support and involvement of the main economic, political and social stakeholders of the NORA region. Their involvement at the highest level would be crucial for reaching a shared vision of the goal of such co-operation. The process of developing a common strategy can also be seen as an opportunity to gain "buy-in" and agreement from key stakeholders on regional co-operation, to increase their interest and involvement, raise awareness and build momentum (Aalbu and Bachtler, 2004). Having identified and agreed themes, a strategic perspective helps bridge any gap between aspirations and delivery.

The design of a shared, coherent and participative strategy for the NORA region could have a number of advantages:

i. It would help to focus, target and streamline co-operative efforts by reaching an agreement on the key development objectives and priorities for the region.

ii. It would facilitate the development of shared views and positions on key challenges for the region, such as climate change or fisheries sustainability.

iii. It would encourage increased co-operation and interaction among actors and stakeholders from both the public and private sectors in the different territories.

iv. It would increase dialogue among the relevant parties, helping to avoid excessive competition and helping to harmonise the use of existing assets.

v. It would help to define clear long-term objectives that could win support from the member territories.

vi. It could lead to a division of roles among the various organisations in the NORA region.

Macro-regional development strategies have gained increased prominence in other regions. The EU's Baltic Sea Strategy, for example, aims to address "major challenges that are best met jointly". Without a sense of common destiny, collaboration across borders could remain mere repetition of simple exchanges of good will, resulting in unstable linkages (OECD, 2009a).

A development strategy would help to maximise the added value and impact of co-operation, by helping to ensure that planned objectives do not overlap or clash. Given the range of support available in the region, a specific challenge is to ensure that existing co-operative activities and any new actions are complementary. With a view to widening and deepening co-operation in the region, identifying gaps (areas where support is lacking) would be as important as avoiding overlaps and duplication of efforts. However, the possibility that an element of overlap could be beneficial should also be considered. For example, support for small programmes working in similar ways on similar areas in narrower fields may be able to feed and complement larger, better-funded programmes.

Strategic planning is not without difficulties. It can be criticised as a time- and resource-consuming process with limited impact. However, the lack of longer-term strategic planning can lead to *ad hoc* and uncoordinated initiatives. Moreover, a clear agenda in the NORA region could be used as a

basis for developing external links and boosting engagement with external partners and in the Nordic Council. With these potential benefits in mind, a general development strategy could be complemented in a second step by strategies for key regional sectors conducive to co-operation such as tourism, response to climate change or research and development.

The role of the NORA organisation as a facilitator of co-operation

Co-operation activities do not just happen. Effective co-operation efforts have to be adequately supported by financial and institutional resources and political support. In the case of co-operation within the NORA region, given the high number of co-operation arrangements and links across the region and externally, as well as the diverse institutional, economic and political priorities in place, the rationale for NORA-based co-operation needs to be clear. Each of the participating territories needs to buy into the process. The adoption of a widely agreed strategy for the region could help here, if it is focused on a number of clear, well-founded priorities. In order to promote co-operation and maximise its appeal and impact, external and internal partners need to engage with the region and recognise its distinct and shared qualities, benefits and opportunities.

However, there is a need for an institution or institutions in a position to drive the process forward. In order to take on this strategic facilitating role, an organisation must have sufficient resources and the profile needed to manage the task. It must be well connected, well positioned and well known in the region. Crucially, there is need for an organisation to fulfil a "brokerage" role, pulling key actors together and facilitating co-operation.

To an extent, such frameworks are already in place through the activities of the NORA organisation. In this regard, "tailored", territorially based co-operation can profit from the NORA organisation's particular assets:

- NORA's invaluable knowledge of the area and trends, the political environment and what is possible/impossible.
- In contrast to existing sectoral bodies, the NORA organisation has a distinctive capacity to draw together actors from a range of fields.
- Its status as an international agency under the Nordic Council of Ministers (NCM) places NORA in a key position to create awareness of the specific challenges facing the NORA region in the NCM. It also allows the NORA organisation to represent the particular interests of the NORA region within the NCM.

- NORA has been successful in generating and supporting co-operation projects and in particular, in facilitating knowledge exchange.
- In its role in financing and supporting regional projects, the NORA organisation is perceived as less bureaucratic and more in tune with the specific needs of the NORA territories than many other co-operation programmes, *e.g.* the NPP.
- The NORA organisation has already been conducting negotiations to extend co-operation to other territories sharing similar challenges, such as Atlantic Canada.

Nevertheless, the role of the NORA organisation as an institutional facilitator of co-operation could be further developed and embedded. Reaching high-level support from policy makers and key partners from the NORA members is essential. With the preceding in mind, a few recommendations are offered for developing a more active, higher profile, and productive role for the NORA organisation:

- The NORA organisation could play a key role in driving and facilitating the process of developing a long-term regional development strategy. As noted, NORA has knowledge of the region and a strategic position as an international agency under the Nordic Council of Ministers. However, to succeed, this process must be backed by the clear will and support of the different territories. The preparation of such a strategy could be an opportunity to create awareness of the potential for regional co-operation and to raise the interest and involvement of the main economic, political and social stakeholders.
- NORA can provide a central gateway for dealing with other territories, particularly neighbouring states with common interests and problems. The NORA organisation already has good working relations with many neighbouring regions and countries. These links have expanded and a growing share of NORA's projects and conferences involve partners from neighbouring regions. While each member of NORA will continue to have its own interests, it should be possible for the NORA organisation to identify potential international partners and initiate negotiation processes.
- More can be done to follow up on the networks and co-operation opportunities that come from NORA conferences. These international conferences have already proved to be an excellent way to initiate and expand contacts between stakeholders from different territories who might not otherwise have met. They are a

perfect forum for sharing information and knowledge. They are also a way for the organisation to extend its own links and its role as a driver of co-operation within and outside the region. However, opportunities arising from the conferences could be followed up more actively and their outcomes could be given greater international exposure. Follow-up activities could help links created through an international conference to become more established and fruitful. For instance, selective funding could help networks become self-sustaining, smaller meetings of relevant partners could be organised following a major event, and pilot project funding could ensure that key ideas and agreements around co-operation are pursued and developed.

- Beyond the organisation of conferences, there is also scope for exchange of experience among officials/experts and co-operation on relevant policy research and development programmes beyond NORA borders, *e.g.* involvement in INTERREG programmes or EU Framework Programmes. A strengthened NORA organisation could take a more strategic role in facilitating activities such as joint studies, contributions to EU policy debates, exchange of experience on common challenges, and networking and exchange agreements. Tools such as Internet platforms could also be further promoted, as they offer a useful way to share experience with partners from different territories. The North Atlantic Knowledge Network is a good example of online networking that could be further promoted (see Box 3.15). It is also a good example of the benefits of extending co-operation to new partners such as Atlantic Canada.

- The availability of NORA funding continues to be a key factor in bringing organisations together. NORA already offers a flexible source of small project funding. In order to get the most from the resources invested, projects and themes have to be carefully selected to avoid overlap with other well-functioning networks. At the policy initiation stage, it is important to consider where intervention could add value either to domestic efforts or to existing co-operation networks by addressing gaps or complementing existing programmes. For example, the NORA organisation could focus on supporting groups that normally have difficulty accessing other sources of funding (*e.g.* SMEs, traditional communities).

- The NORA region is characterised by many very small SMEs, down to a single person working on innovation and development. These firms could in many cases contribute their knowledge and expertise to international projects. However, they sometimes lack the

institutional resources, capacities or skills (language, financial, writing, etc.) to take part in international initiatives. At present some NORA projects provide a stepping stone to help project partners to participate in larger projects with higher administrative demands, such as the EU programmes NPP and FP7. These efforts could go further by providing financial and advisory support for local initiatives in order to fulfil the administrative demands of larger international projects.

- More can be done to strengthen networks and links internally and externally. Owing to the relatively small size of the NORA programme, the organisation is still somewhat unfamiliar to a number of the public and private stakeholders in the region, especially in Iceland and Norway. Increased interaction with key political and economic actors in the region is essential to raise greater support for NORA co-operation. Boosting such links could be achieved, for example, by raising awareness of the type of activities NORA is involved in or by presenting the outcomes of the different conferences. The different stakeholders need to be aware of the benefits of co-operative efforts. In a sparsely populated region, a well-connected, highly visible organisation that represents the interests of the region is invaluable.

Further institutional support for the NORA organisation will be required

The NORA organisation already fulfils some of these roles to varying degrees. However, a drive to build links with high-level and international partners, to boost the profile of the organisation and to put the organisation on a clear strategic footing will require refining and reinforcing its role. For this, greater involvement and support from the member territories and from the Nordic Council of Ministers will be needed. The NORA organisation has limited financial and human resources to devote to the ambitious role of strengthening regional co-operation. It will require a larger group of professionals if it is to increase its strategic role. Beyond that, the capacity of the organisation to engage with local actors and interests will be central to reinforcing and maximising the impact of co-operation. Successful project activities, networking activities, conferences and even lobbying all rely on solid bottom-up engagement and support, which has to be continuously fostered, *e.g.* through active – and high-level – local contact points.

Further co-ordination will also be required. Because several institutions play a role in regional co-operation in the NORA region, their co-ordination is critical. Special care should be taken to clarify the roles and interaction

mechanisms of the different institutions. Vaguely defined or overlapping mandates may compromise co-operation efforts. For the NORA organisation to play a more strategic role will probably require both an enlarged mandate and more institutionalised and smoother co-ordination with the different programmes and institutions engaged in co-operation in the NORA region and with the authorities of the member territories.

Evolving towards a functional region

NORA's objective of increasing its strategic activity will require higher involvement and support from member territories. It will therefore be important to identify the underlying logic that will allow the four members to see themselves as a functional region. That is, they will have to recognise a bond that is strong enough to encourage strategic joint action.

The term "functional region" is typically used to define a growth pole and its associated hinterland. Such a region is usually defined on the basis of economic interactions among its components (particularly in labour and product markets), and the boundaries of the region adjust as the extent of interaction increases or declines. There is typically a lead place that generates most of the dynamics by which the region as a whole grows. In the case of NORA, as observed in Chapter 1, this model is difficult to apply. The intensity of the economic interactions among its members is not very great, especially when compared, for example, with their interactions with non-members. Moreover, the region has no functional hub or growth pole.

For the NORA region to develop strong internal coherence, the notion of a functional region will have to be defined differently. As this review has shown, the considerable common ground among the NORA territories offers co-operation opportunities that could lead to better economic integration. All share a common culture, and there is a strong history of bilateral collaboration among individual members. Most importantly, all are peripheral in terms of the global economy and have common problems and similar social and economic structures. Their peripherality means that in some policy domains there are few efficient alternatives to collaboration within the NORA group. Moreover, some challenges can only be addressed efficiently by joint action.

The cluster model of a functional region

NORA is not a functional region in the commonly used sense of the term; a cluster model would better reflect NORA realities. The traditional model of a functional region is somewhat analogous to a supply chain structure, with a dominant firm and a set of smaller firms that are suppliers. The cluster model for small firm collaboration, by contrast, can be used to

generate a different sort of paradigm. Clusters of small firms allow the members to mimic the scale economies of large firms while preserving the participants' autonomy. Individually, the members of NORA are below efficient scale for performing many public and private functions. NORA can be a means of providing a way for the four members to achieve the same type of scale effect, at least in some activities. Their conditions can be seen as similar to those facing small firms. By acting jointly through a cluster, firms can achieve efficiency in production. In the cluster, no single firm dictates the strategy, but all must agree if the cluster is to be successful. Individual firms agree to collaborate in certain areas but retain autonomy of decision making outside the collaborative actions. Conceptually, NORA can play the same role. Members can pool their resources for common purposes while retaining their autonomy in other areas.

All transnational regions face significant challenges for merging different cultures and institutions. While for NORA the geographic distances separating members are a major impediment, there is a high degree of commonality of interest and culture and a shared or similar language. By contrast, other transnational regions, such as the Pan Yellow Sea region, have the advantage of closer proximity but involve members with distinct cultures and languages (see Box 3.14).

Box 3.14. **Pan Yellow Sea region**

The Pan Yellow Sea region provides an example of effective trans-border co-operation among the countries that border the Yellow Sea. Northern coastal China, western and southern Korea and south-western Japan all border the Yellow Sea and have long–standing trade and social relations. Despite three different languages and cultures, strong historical ties form the basis for the current economic partnerships. The relationship involves sub-national entities that have collaborated voluntarily to enhance economic growth. A recent OECD study of the region notes that the driving force for collaboration was the existence of matching interests among the business community in all three countries.

The OECD study draws the conclusion that a small number of necessary conditions determines the success of efforts to build greater collaboration. Economic exchange, integrated physical infrastructure and a socio-cultural network are the three principal pillars of a well-integrated trans-border region. Over time the Pan Yellow Sea region has enhanced its logistics and transport networks to improve trade and co-operation. Like the NORA region, port and air links are the only means for the exchange of goods and people. There is also a recognition that soft infrastructure is an important contributor to collaboration. This includes human resources, cultural exchange and academic linkages.

Source: OECD (2009), *OECD Territorial Reviews: Trans-border Urban Co-operation in the Pan Yellow Sea Region*, OECD Publishing, Paris.

At present, it appears that there is a rough balance in the NORA region between forces that favour integration (economies of scale, strengthened international position, sharing knowledge) and those that encourage divergence (fear of competition, distance, few economic interactions). In the Pan Yellow Sea region, rapid economic integration has taken place because of the strong economic benefits of regional collaboration. In the case of NORA there is encouragement for stronger integration at the Nordic Council level, and no strong opposition at the national levels. Recently the Greenlandic government issued a Nordic plan, stating that it is necessary to place more emphasis on the West-Nordic collaboration and give NORA the role of general co-ordinator of this collaboration. Yet, in general, it appears that individual member territories do not at present place high priority on fostering a stronger NORA, probably because they do not perceive the underlying economic logic of strengthening regional co-operation.

It is crucial to promote the positive outcomes of regional co-operation

In order to get a broader mandate and support from member territories, it will be crucial to build positive expectations for the outcomes of regional co-operation in the NORA region. As outlined above, the benefits of co-operation are sometimes difficult to perceive. Yet, the choice of the different territories to engage in co-operation is based on expectations of the benefits to be obtained: the different stakeholders need to see a rational and clear benefit from co-operative efforts. As noted in this chapter, ongoing co-operation is reporting or could report various benefits, *e.g.* increasing the visibility of the territory, creating economies of scale, learning and exchange of best practices, or transnational responses to transnational challenges. There is also untapped potential that could be further exploited. Communicating these positive outcomes – with special emphasis on the search for efficiency – to key political actors will be critical to motivate the different NORA members to support greater regional co-operation.

A reconfiguration of transport networks would help to expand economic integration

Beyond this, the Pan Yellow Sea region offers some indication of how the forces of integration can be strengthened. While it differs significantly from NORA in terms of the size of the regions, density of population and levels of per capita income, it offers some important food for thought. Recommendations for enhancing co-operation made by the OECD include: improving connectivity and the transport system to support economic interactions; expand the flow of people within the regions so that there are

stronger contacts among the various populations; and embark on joint planning to deal with common challenges, such as climate change and pollution abatement.

All these point again to the significance of strengthened transport networks for expanding economic integration. Economic integration is the defining feature of a functional region and economic integration can only occur if it is possible to move goods and people efficiently. This will require improved regional transport networks. As mentioned in section 2.1 regional co-operation could facilitate the establishment of a strengthened transport infrastructure. On the one hand, joint public support would be required to diversify air traffic routes. On the other hand, reinforced regional co-operation would enable more regional businesses and more economic and human interactions, and with this a better framework for developing and diversifying the transport infrastructure. Therefore, economic integration and improved infrastructures are parallel processes that would be enabled by co-operation. But to strengthen regional co-operation, it will be critical to demonstrate to the main stakeholders that this will result in positive outcomes and regional economic development.

Finally, another element of the required shift in transport networks is the importance of linking the members of NORA to other near-by territories. In particular, there would seem to be untapped potential for closer links between the western parts of NORA and Atlantic Canada and the eastern parts of NORA and the United Kingdom. Current transport links reinforce a Nordic focus, almost to the exclusion of other opportunities, and this in turn contributes to NORA being a less dynamic place than it might be.

Opening and expanding links

The physical barriers that currently exist between the NORA territories, the relatively low intensity of present intra-NORA economic linkages, and their natural linkages to other regions outside of NORA call for a "variable geometry" approach when searching for co-operation opportunities. In this regard, partnerships and co-operation need not necessarily cover all, or only, the NORA territories. The identification of appropriate partners should be based on an evaluation of how best to give form to an identified opportunity and on the benefits the co-operative efforts would bring to the participants and to the group as a whole. This chapter has analysed the potential for co-operation in the NORA region. However, it is crucial to take an open view on the composition of partnerships and to boost the participation of partners from outside of NORA whenever their input and the quality of their contribution justify it. For instance, research networks should be open to the best institutions in the Nordic countries and beyond. Issues related to

peripherality could also usefully integrate the experience of other territories facing similar challenges.

The Nordic Council of Ministers increasingly emphasises co-operation with neighbouring countries around the Nordic region. The Programme for the Danish Presidency of the Nordic Council of Ministers 2010 states that the Presidency will evaluate the potential for bolstering NORA's role in co-ordinating and improving the effectiveness of relations with the region's neighbours to the west and in the North Atlantic. In the context of the new environmental, economic and social challenges facing North Atlantic coastal communities as a result of globalisation and climate change, further interchanges with these neighbouring territories could result in common benefits.

The NORA territories already have working links with many neighbouring regions and countries. This review has mentioned different ongoing co-operative projects, especially with Atlantic Canada and Scotland. The commonalities and increased communication over the last few years across the territories of the North Atlantic Rim have generated increased interest in finding ways to learn more from one another and to explore opportunities for greater co-operation. For example, co-operation between SmartLabrador Inc. (Canada) and the NORA organisation has led to the development of a North Atlantic Knowledge Network online resource to facilitate dialogue, information sharing and innovative partnerships between the northern, rural and coastal communities of the North Atlantic region (see Box 3.15). Another recent example is that of cruise tourism: in a joint effort to further develop cruise tourism in the North Atlantic, Cruise Newfoundland and Labrador, Cruise Greenland, Cruise Reykjavik, Cruise Torshavn and Cruise Orkney Islands are jointly committed to the development of a new regional cruise brand and supporting materials (Box 3.7 above). Diverse institutions from Scotland have also been working with actors from the NORA region for a long time, particularly through the EU's NPP (in projects like ClimAtic; NoCry; Thing; or ROADEX IV) and through the North Sea Programme (Scottish/Norwegian project collaborations).

Box 3.15. **North Atlantic Knowledge Network**

In late 2009, SmartLabrador Inc. partnered with NORA to facilitate dialogue, information sharing and innovative partnerships pertaining to living in and developing the northern, rural and coastal communities of the North Atlantic region. The North Atlantic Knowledge Network (NKN) online tool, currently being developed by SmartLabrador, is being built on the premise that small coastal communities can develop greater sustainability and viability by sharing knowledge through ongoing dialogue. In this changing world, access to pertinent information and expertise is critical to economic success. Harnessing information and knowledge assets can play a pivotal role in building diverse and vibrant economies.

The NKN is an outcome of the Creative Solutions for Coastal Communities Conference that was held in Labrador in 2006. Organised by NORA and Canadian partners (Harris Centre and SmartLabrador), this international conference facilitated discussions and exchange of information regarding challenges and solutions for small coastal communities in the North Atlantic region. As a result of this conference, delegates from Canada, Norway, Iceland, Greenland and the Faroe Islands agreed that strong partnerships are vital to achieve the vision of building strong and sustainable coastal communities. This agreement – named the Labrador Declaration – provided concrete ideas for the development of new initiatives, committed to greater North Atlantic collaboration and identified new directions for communities, business and government to build small communities. Five key areas were identified for action in the Labrador Declaration: collaboration and communications, education and research, governance and public policy, tourism and cultural heritage, and resource development.

Organisations and businesses in Labrador and the NORA region continue to build on the experience of the 2006 conference and the ongoing relationship between NORA and SmartLabrador. In 2008, for example, the Labrador Straits Development Corporation and Southeastern Aurora Development Corporation (Newfoundland and Labrador) undertook an exploratory and fact-finding mission to North Atlantic Rim territories to obtain information concerning wildberry development, harvesting and marketing.

Source: Atlantic Canada Opportunities Agency.

Links with Russia have also expanded: agreements on fisheries, extensive co-operation on education between northern Norway and northwest Russia (including five joint master's degrees), the Northern Dimension Partnership and the Norwegian Barents Secretariat (Box 3.16).

Box 3.16. **Co-operation by NORA territories and Russia: the Northern Dimension and the Barents Secretariat**

The Northern Dimension is a partnership between the European Union, Iceland, Norway, the Russian Federation, the Nordic Council of Ministers and other Nordic institutions (the Regional Councils in the North, the Council of the Baltic Sea States, the Barents Euro-Arctic Council and the Arctic Council). The Northern Dimension policy aims at providing a common framework for the promotion of dialogue and concrete co-operation, strengthening stability, well-being and intensified economic co-operation, and promoting economic integration and competitiveness and sustainable development in northern Europe. It focuses on issues of specific relevance in the north, such as the environment, public health and social issues, culture and indigenous people. The Nordic Council of Ministers is committed to participate in the two existing partnerships – the Northern Dimension Environmental Partnership (NDEP) and the Northern Dimension Partnership in Public Health and Social Well-being (NDPHS).

The Norwegian Barents Secretariat was established after the signing of the Kirkenes Declaration on January 1993, when Norway, Sweden, Finland and Russia established the Euro-Arctic Barents Region. In 1998 the ownership of the Secretariat was transferred to the three northernmost counties of Norway, Nordland, Troms and Finnmark. The Norwegian Barents Secretariat aims at developing Norwegian-Russian relations in the north by promoting and funding Norwegian-Russian co-operation projects. The work of the Norwegian Barents Secretariat is three-fold: project financing (the Secretariat grants approximately 200 Norwegian-Russian projects annually); resource and information centre; strengthening Barents co-operation within the framework of the multilateral Barents Co-operation.

Source: www.norden.ru; *www.barents.no*.

As these examples suggest, wide-ranging and productive co-operation already exists between the NORA group and neighbouring territories. However, further opportunities could be developed and links could be improved, most notably to Scotland, Canada, the Baltic Sea region, Russia, Ireland and Northern Ireland. In each of these cases, the foundations for co-operation could include shared development challenges, such as the development of peripheral regions, sustainability of remote communities, sustainable development of marine resources and renewable energy opportunities, as well as, in some cases, relative geographical proximity. Crucially, such links could be more effectively developed, explored and exploited with NORA partners acting as a group, as opposed to separately, to undertake the time-consuming and often costly process of developing

international links. An internationally well-connected, proactive and experienced organisation offering a facilitation/brokerage role between NORA partners and external organisations would be required to ease the process of co-operation for individual organisations, especially during the initial stages.

Conclusions

For the NORA territories, the ability to boost domestic initiatives and address development opportunities in new ways through NORA-based co-operation is particularly important owing to their remoteness, small populations and the fact that, unlike other Nordic territories, they are not EU members. Territorially based arrangements also allow the organisations involved to develop an approach that is appropriate to the needs of the region, as opposed to relying on external co-operation initiatives. A wide range of co-operative efforts are already under way. However, it is possible to highlight a rationale for continuing to "widen and deepen" co-operation in the region, based on the specific and shared needs of the NORA territories. Co-operation offers the NORA territories the opportunity to increase their international profile and could be used to send important messages to outsiders about the specific development needs and concerns of the region. Additionally, where domestic resources are limited, co-operation offers an opportunity to pool institutional and financial resources and to extend networks for learning and exchange. With this in mind, it is important that future co-operation efforts look at where they can fill gaps and usefully complement existing arrangements.

There remains considerable scope for reinforcing NORA-based co-operation, which could make a valuable contribution to the continued economic and social development of the region. However, in order to add value, such co-operation should have clearly expressed objectives. Activities should be strategically planned and implemented, and co-operation efforts should take into account existing arrangements. Follow-ups to such initiatives, with a view to maximising their impact and lesson learning, will also be critical. Beyond that, it will be crucial to gain the member territories' further involvement in and support for the NORA co-operation project. For this, it will be crucial to promote effectively the benefits and outcomes of territorial co-operation. The process of designing a long-term strategy for the region with high-level political participation from the different NORA territories could provide an opportunity to gain key stakeholders' "buy-in" for regional co-operation, to increase their interest and involvement, and indeed to create a strong, agreed rationale and purpose for co-operation in the region.

Notes

1. Scandinavian Defence Alliance, Nordic Customs Union, Nordic Economic Union (NORDEK).

2. Switzerland is the only EFTA member to remain outside the European Economic Area, the integrated market formed by the EU and EFTA economies. Switzerland's economic relations with the EU are regulated by bilateral agreements.

3. Euroregions generally do not correspond to any legislative or governmental institution, do not have direct political power, and their work is limited to the competencies of their constitutive local and regional authorities. They are usually arranged to promote common interests across the border and to co-operate for the common good of the border populations.

4. In an interview with Greenland Radio on 13 November 2009, the Head of the Greenland Health Department, Anne Birkekjær Kjeldsen, estimated that the evacuation of one patient from Greenland to Denmark costs around DKK 400 000, and that the costs to Iceland could be half of that.

5. Additionally, a range of activities and policies that are unrelated to climate change will have a considerable impact on resources and activities in the region. For instance, the size and growth of fish stocks in the North Atlantic Ocean depends on exploitation rates determined by fisheries policies in the NORA territories.

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OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
(04 2011 04 1 P) ISBN 978-92-64-09761-2 – No. 57955 2011-02

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However, transnational co-operation in the NORA region faces some barriers, as it involves territories that compete in their main economic activities, are separated by large distances, and have strong institutional and economic links with other countries and regions. In order to get the most from transnational co-operation, this report recommends that the NORA territories: focus co-operation efforts on targeted themes and issues; draw up a regional development strategy; promote greater awareness of the benefits of co-operation; develop a "variable geometry" approach to regional co-operation; and enlarge and refine the role of the NORA institution as a facilitator of co-operation.

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Please cite this publication as:

OECD (2011), *OECD Territorial Reviews: NORA Region 2011: The Faroe Islands, Greenland, Iceland and Coastal Norway*, OECD Publishing.
http://dx.doi.org/10.1787/9789264097629-en

OECD*publishing*
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ISBN 978-92-64-09761-2
04 2011 04 1 P