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The prospective development of the northern seaboard



18

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The prospective development of the northern seaboard

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Preface

Each year, the Directorate-General for Regional Policy and Cohesion of the European Commission launches a number of studies in the field of regional policy and regional planning. These studies mainly aim at providing a basis for policy formulation internally, as well as the preparation of programmes and initiatives and a basis for analysing the impact of current or planned activities. The most interesting or innovative of these are published in a series entitled Regional development studies.

With this series, the Directorate-General hopes to stimulate discussion and action in a wider sphere on the research results received. The publication of the studies is addressed to politicians and decision-makers at European, regional and local level, as well as to academics and experts in the broad fields of issues covered.

It is hoped that by publicizing research results the Commission will enrich and stimulate public debate and promote a further exchange of knowledge and opinions on the issues which are considered important for the economic and social cohesion of the Union and therefore for the furure of Europe.

Readers should bear in mind that the study reports do not necessarily reflect the Official position of the Commission but first and foremost express the opinion of those responsible for carrying out the study.

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Background

The way in which Europe's land space is used is a major determining factor in its future development. Hitherto physical and strategic planning has been carried out within national boundaries, but the gradual dismantling of frontiers and the need for coherent development of the Community's territory has meant that a wider frame of reference is required.

To encourage the emergence of transnational planning strategies the Commission has launched a series of research initiatives to look at planning issues at a European level in a regional context. A total of 10 regional groupings, defined on the basis of geographical proximity, community of interest and developing mutual interrelationships have been delineated. The northern seaboard area is one of these.

The northern seaboard region covers the North Sea coastal regions in Denmark, Germany, the Netherlands and the United Kingdom. It occupies an important position within Europe and plays a major role as a bridge between the EC and the Nordic countries and as a gateway to Eastern Europe. It is important to the EC as a source of primary energy, particularly gas and oil, and materially assists realization of the policy objective of diversifying both fuels and sources of supply; it accounts for a major part of EC output of both arable and livestock products; it is a major tourism source and destination (Map 1.1).

The North Sea, the unifying feature of the study area, plays a key role in the development of the regions which border it. It acts as a source of economic resources, a waste dumping ground and transport highway. Conflicts between different elements of this multifaceted role epitomize the conflicting pressures facing the region as a whole.

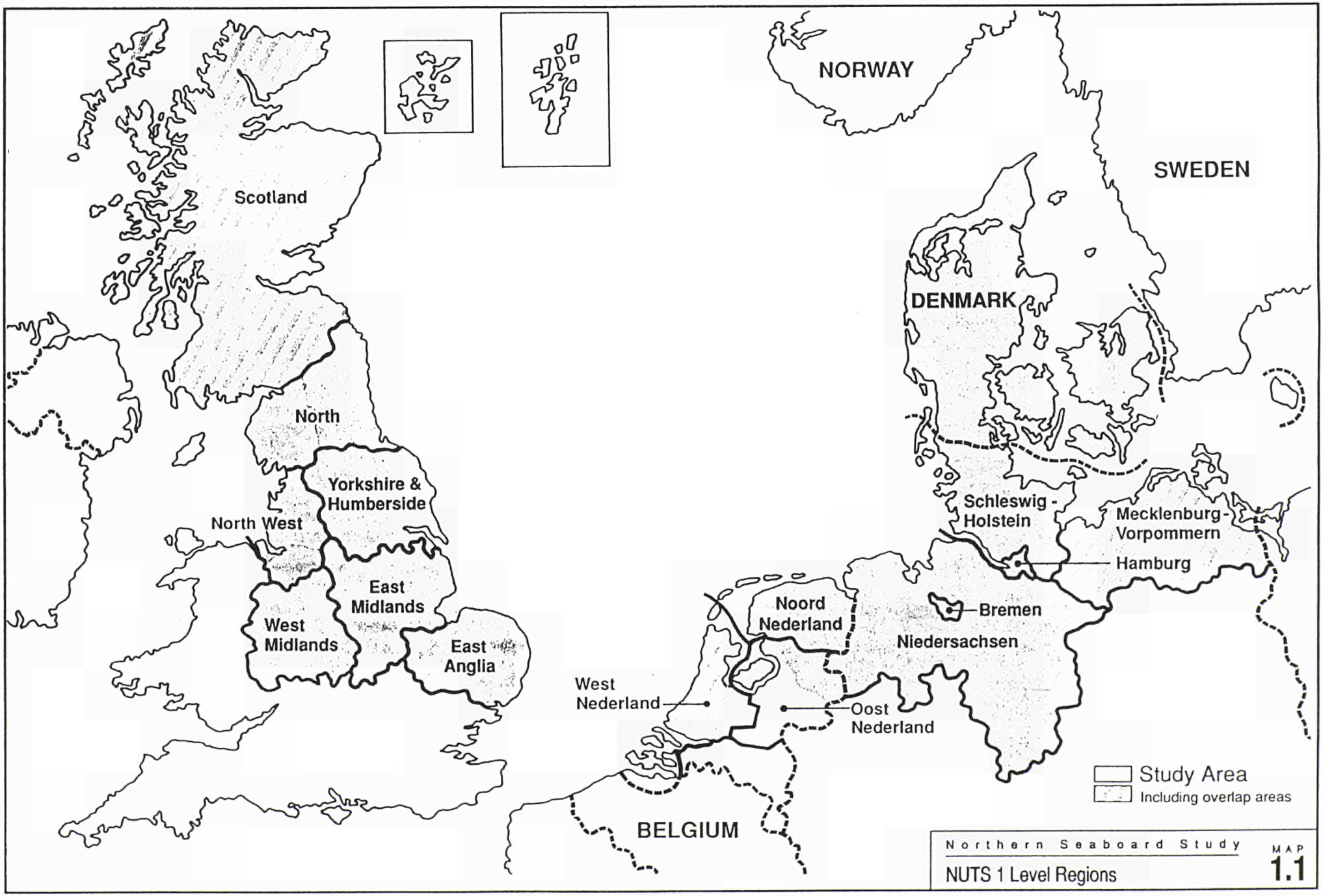
Approach

Overview

The central thrust of the study is to identify common issues facing the regions comprising the northern seaboard study area, to assess prospects for their development and to suggest policy measures that may be applied at Community, regional and national levels to help regions realize their full potential to achieve sustainable development. The study provides a basis for a more coherent approach to the use of Community territory, based on a thorough understanding of issues and major developments at the level of the individual regions.

The work was carried out in three phases. The first phase described the study area and identified current trends. The analysis highlighted interrelationships and contrasts between regions, and identified common constraints and opportunities for future development.

The second phase developed regional base scenarios: the most likely pattern of development over the next decade, based on prevailing trends and policies. Baseline scenarios were prepared for each region to examine the local implications of the trends. This approach was


NORWAY
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Vorpommern
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Oost
Nederland
BELGIUM
Study Area
Including overlap areas
Northern Seaboard Study
NUTS 1 Level Regions
MAP
1.1

vertical and treated the individual regions of the study area as discrete geographical regions rather than as administrative units. This regional focus helped to analyse the interrelationships between the economic, social and physical development factors.

The third phase examined the implications of deviation away from the base scenario for a number of key themes of spatial development. It investigated the possible extent of deviations away from the base scenario; it reviewed the spatial implications of such deviations and it analysed the scope for mitigation of negative prospects and promotion of positive prospects. The themes examined were: the resources of the North Sea, the environment, maritime transport, land transport, rural land-use change and economic growth. This approach was selected because of doubts about the practicality of generating a series of discrete alternatives 'scenario A emphasis X, scenario B emphasis Y, etc.'. The difficulty with such an approach is that the broad scope of the study and the relatively short time scale would not allow the identification of comprehensive scenarios within the realm of probability.

The key concepts

A conceptual framework was formulated to provide methodological rigour to the base scenario generation process, and to give an overall spatial context, wider than that of the study area, within which to place the analysis of natural regions. The starting point for this thinking was the practical relationship between areas at the economic heartland of Europe and the more remote areas. How do the remote areas interact with the heartland? What is the spatial dimension of this relationship? Is it a continuum, or are there identifiable steps between the heartland and the remote areas? What will be the impact of this relationship on future spatial development?

The first phase output highlighted the importance of physical and economic links between the regions and the undefined 'centre' of Europe. An increasingly important factor for successful spatial integration will be the ability of northern seaboard regions to tap into the heartland regions. In deliberating these ideas it became evident that the conceptual framework would benefit from a simple refinement.

This led to the definition of a metastructure containing three zones. The core represents the traditional industrial and commercial heartland of Europe and stretches from south-east England to north-east Italy, encompassing the Randstad, the Ruhr, Belgium and north-east France, and contains the major cities: London, Paris, Brussels, Amsterdam, Rotterdam, Munich and Milan. The corona is the surrounding area which has strong functional links with the core; it is able to participate in its economic activities and in its potential for wealth creation; it is strongly influenced by developments within the core. The periphery is the area beyond the corona, the boundary between the two being the point at which distance or ease of access becomes a key factor in determining the area's ability to participate in core area activities (Map 7.1).

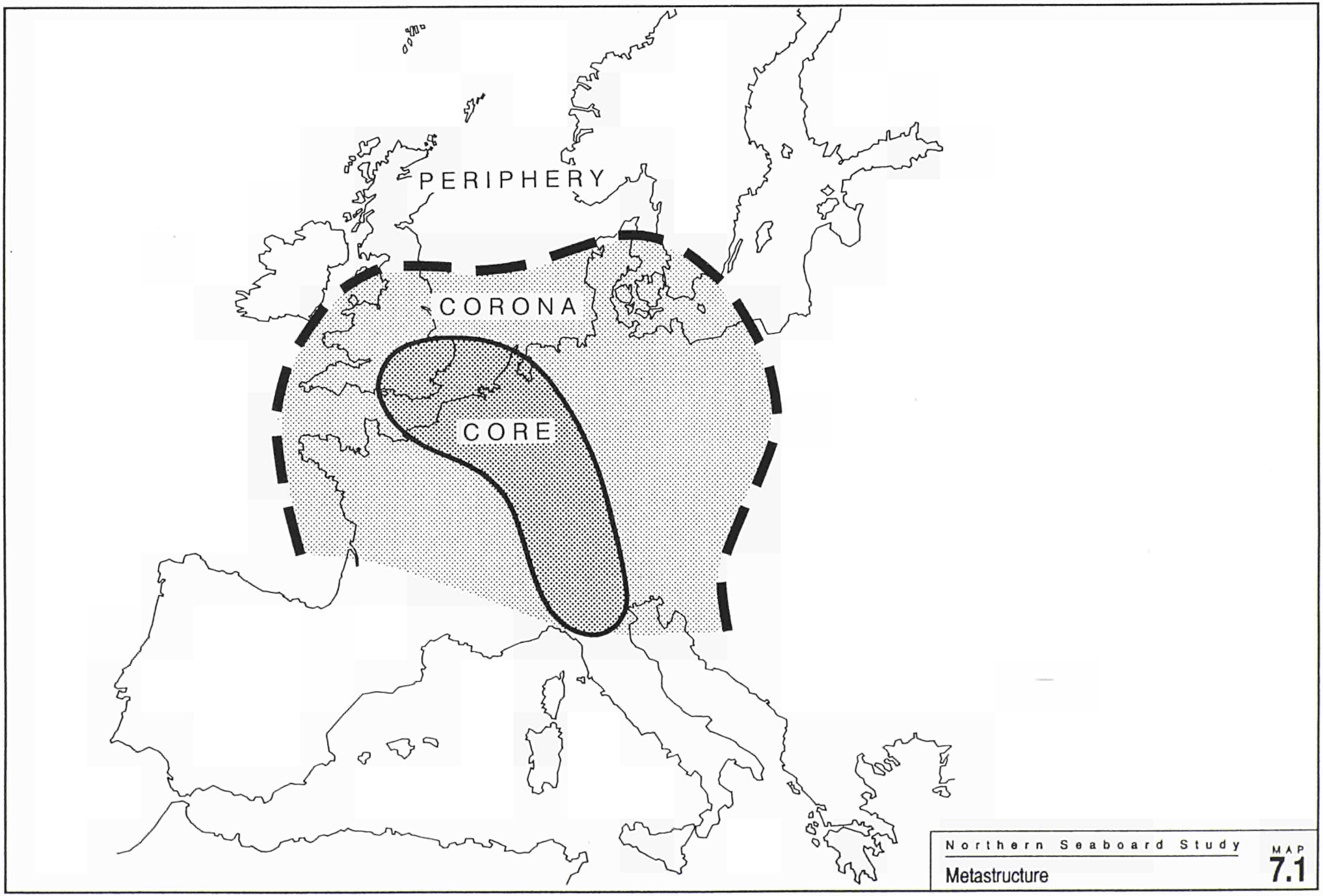
The metastructure concept has empirical validity and provides a useful framework for considering the relationship of the northern seaboard region to the rest of Europe and possible future inflexions to the spatial development pattern. However, it is not an end in itself, merely a stepping-stone towards an understanding of the forces which will shape spatial structure. There are no precise planning boundaries, but notional lines identify broad zones which have a different functional relationship with each other. The three zones do not represent common levels of development: the core does not necessarily equate with prosperity, nor the periphery with poverty. There are pockets of poverty in the core and areas of poverty in the periphery.

Forces driving structural changes in the northern seaboard region

Changes in the international environment

German unification will have far-reaching implications for the future development of the study area. Some of these effects have already been observed, for example substantial job losses in Mecklenburg-Western Pomerania since unification in both the agricultural and manufacturing sectors which encouraged migration into west Germany for work. With access to capital, improved inputs, modern farming systems and better management, which unification now permits, east German farms will have the potential to substantially alter the competitive balance in the northern seaboard area. A similar situation may arise in the manufacturing sector.

Economic development in Central and Eastern Europe will generate trading opportunities for study-area firms in the supply of goods, services and technical know-how. It will also bring increased competition in world markets, and in EC markets too, depending upon the extent to which the EC allows or is constrained to allow Central



Northern Seaboard Study

Metastructure

MAP 7.1

and East European producers more liberal access to their domestic markets. Any increase in agricultural imports from Central and East European sources could have a great impact especially on northern seaboard countries and jeopardize the viability of farms in a number of regions, at the same time as CAP reform would be putting them under pressure.

Transit traffic through Germany to access European markets and, through north European ports, overseas markets, is likely to increase dramatically, especially after the new infrastructure links between east and west Germany have been completed. Increased migrant flows from Central and East European countries into the western regions of Germany, and spilling over into other regions of the study area, are possible unless restrictive policies are introduced.

The enlargement of the Community is a powerful force for change that will impact upon the study area. The changing geography of the European Union is affecting peripherality. Denmark was, and still is, a peripheral region relative to the core regions of the Community, but this situation will change if and when Norway and Sweden join, and particularly when transport infrastructure improvements such as the fixed link to Sweden and the proposed high-speed rail passenger network are in place in Denmark. Denmark will then play an important role as a bridge linking Scandinavia to the heartland of the EC.

In contrast, the UK (and especially its northern regions) will become increasingly peripheral as the centre of gravity of the EC shifts further to the East. These regions are poorly connected with the rest of the Community. Scotland and the northern regions of the UK are poorly endowed with motorways; there is no motorway link across the border between England and Scotland; direct international air connections are few with most having to be made through London, and there are no ferry services to the near continent offered further north than Teesside.

The advent of the single market has a number of possible implications for the study area including: the loss of jobs as national markets are exposed to more intense competition from other parts of the Community; increased trading opportunities for those firms which are innovative and competitive; a growth in the size of firms and their increasing internationalization as they attempt to enhance market share either by internal expansion or by merger and acquisition: the rate of mergers and acquisitions has more than doubled since 1985; a concentration of production facilities in fewer locations to achieve economies of scale except where particular national tastes, consumer preferences or transport cost considerations make a local production centre necessary or advisable; a change in the map of optimum warehouse and depot locations and distribution networks; a consequent concentration of economic power in the stronger regions, which could well be outside the study area.

Development and sectoral trends

The study identifies the following demographic trends:

- the population in the study area as a whole will continue to grow until the end of the century, followed by a slower growth or decline;
- however, growth will be concentrated in a few regions, and most (NUTS 2) regions would experience population decline were it not for the effects of international migration;
- extra-EC migration and migration between EC Member States are expected to add over 9 million to the total population of the northern seaboard study area by 2020;
- the population in all regions will show a considerable shift towards the elderly age groups;
- dependency rates will increase and the labour force will fall, increasing labour costs;
- retirement migration will become a more important element in population redistribution.

The study identifies a number of trends in urban settlement patterns:

- urban centres will continue to be the main focus for economic development prospects, notwithstanding continuing pressures for decentralization;
- the pattern and hierarchy of centres will not exhibit significant change, although towns in the emerging Rotterdam-Berlin axis will be strengthened;
- the current pattern of urban restructuring – inner area 'decline' combined with suburban and peri-urban growth – will continue;
- in the longer term, infrastructure developments will create new nodal points which may emerge as strategic centres.

The study identifies several major trends related to environmental issues:

- the region's environmental problems are unlikely to be resolved over the next decade;
- public concerns will put increasing pressure on policy-makers and businesses;

- environmental controls on agricultural and manufacturing activities will intensify;
- new methods to dispose of solid waste will be promoted;
- recycling, energy conservation and efficiency will be encouraged.

The manufacturing and services sectors have been undergoing radical transformation in recent years in response to a variety of pressures. These will continue to influence the pace and direction of industrial development in the study area over the next decade. We have identified the following key trends:

- the business environment is becoming much more competitive;
- business is also becoming more international;
- technological development will become increasingly important not only to improve the goods and services produced but also the means of producing them and delivering them to consumers;
- technical developments, particularly in IT and telecommunications, and new management philosophies are giving rise to changes in organizational structures such as less rigid management hierarchies, and relocation of non-essential activities to remoter locations;
- the labour force in the study area will stabilize or contract over the next decade, with the exception of the Netherlands;
- male activity rates will fall in all countries and female rates will rise, except in Denmark. There will also be a significant ageing of the labour force;
- there will be growing public concern over the environment which will increasingly be reflected in stricter controls on industry.

The net effect of the trends observed in agriculture by the end of the century are likely to be:

- a general decline of the area of arable land under cultivation by at least 10 to 11% as a result of set-aside;
- a further 4 to 5% of arable land will be farmed less intensively, chiefly because of stricter environmental controls;
- farm productivity will increase on the remaining areas;
- there will be fewer but larger farms;
- production volumes will be maintained more or less at present levels;
- average farm incomes will decline and put pressure on marginal farms;
- the decline in farm employment will continue at a marginally higher rate;
- the unification of Germany may affect the competitive position of farmers in the old *Länder* of Germany, particularly in the arable sector;
- the inclusion of EFTA countries in the EC will have only a marginal impact on the agriculture of the study area;
- improved access to EC markets for Central and East European countries is unlikely to occur on a significant scale much before the end of the decade.

The fisheries sector is not expected to experience significant change. Fish stocks will take a long time to recover even if existing and new common fisheries policy (CFP) initiatives are successful. The prospects for the year 2000 are thus:

- increasing restrictions on fishing effort, e.g. quotas backed up by increased inspection and perhaps a centralized monitoring system;
- an extension of the use of structural elements into policies such as the existing decommissioning schemes and land-based job creation schemes;
- a stabilization in fish prices, due to factors such as the availability of illegally landed fish, increased imports and cheaper substitutes;
- a general decline in earnings although individual earnings could well increase;
- a contraction in the size of fleets as a consequence of decommissioning schemes and falling earnings;
- a continued fall in employment;
- a decline in the fortunes of small fishing ports;
- a concentration of fishing effort on fewer but larger ports (e.g. the Scottish fleet is now centred on major population centres such as Frazerburgh while smaller ports have died);
- a growing number of distressed communities where alternative jobs do not exist or are insufficient to replace those once provided by fishing and allied processing activities.

Aquaculture, as an alternative to fishing, has developed rapidly over the past decade with financial support from the EC. Stabilization rather than growth is expected over the next decade as environmental concerns are likely to lead to restrictions on the number of sites and size of farms, and increases in production costs.

The following trends are expected to characterize the tourism sector:

- the dominant flows will be intra-European and predominantly domestic;

- world tourism will become an increasingly significant element in total demand;
- people will take more but shorter holidays;
- the private car will continue to be the dominant mode of holiday transport;
- growth in air travel will continue;
- rail travel for tourism will recover with the completion of high-speed links;
- tourist locations in non-urban areas will be put under high pressure;
- serious problems of environmental absorption will multiply.

The following trends are expected to shape the future of transport:

- the strong growth of freight and passenger transport will continue;
- the growth in road freight transport will slow down, but continue to increase its share in spite of increased importance attached to rail and water transport;
- passenger travel by air will grow strongly;
- the growth of transport demand will be particularly high in the hinterland of main ports;
- more congestion and delays are expected as investment in new transport capacity is unlikely to match demand;
- a number of major transport infrastructure projects will be in operation (e.g. the Great Belt fixed link);
- strong east-west transport corridors – e.g. Rotterdam-Berlin – will become increasingly important.

The present pattern of port development is unlikely to change significantly before the end of the century, but the following trends may alter the situation over the longer term:

- principal traffic growth will be in the short sea and containerized cargo markets;
- competitive pressures between ports will lead to a concentration of shipping services on fewer larger ports;
- the ability of ports to compete will be critically dependent on access to their hinterland through new fixed-links projects and long distance rail services;
- the single market increases the attractiveness of port areas for distribution facilities, light industry and assembly activities.

These trends lead to three main results: Rotterdam will consolidate its strong position as a transit port; the volume of trade passing through Bremen and Hamburg should increase; and smaller ports will continue to decline.

The following trends will affect the telecommunications sector:

- basic telecommunications in eastern Germany will reach West European levels;
- digital technology will increasingly replace analogue technology;
- advanced services will increase their penetration rate;
- the use of radio transmission and of high bandwidth applications will be higher.

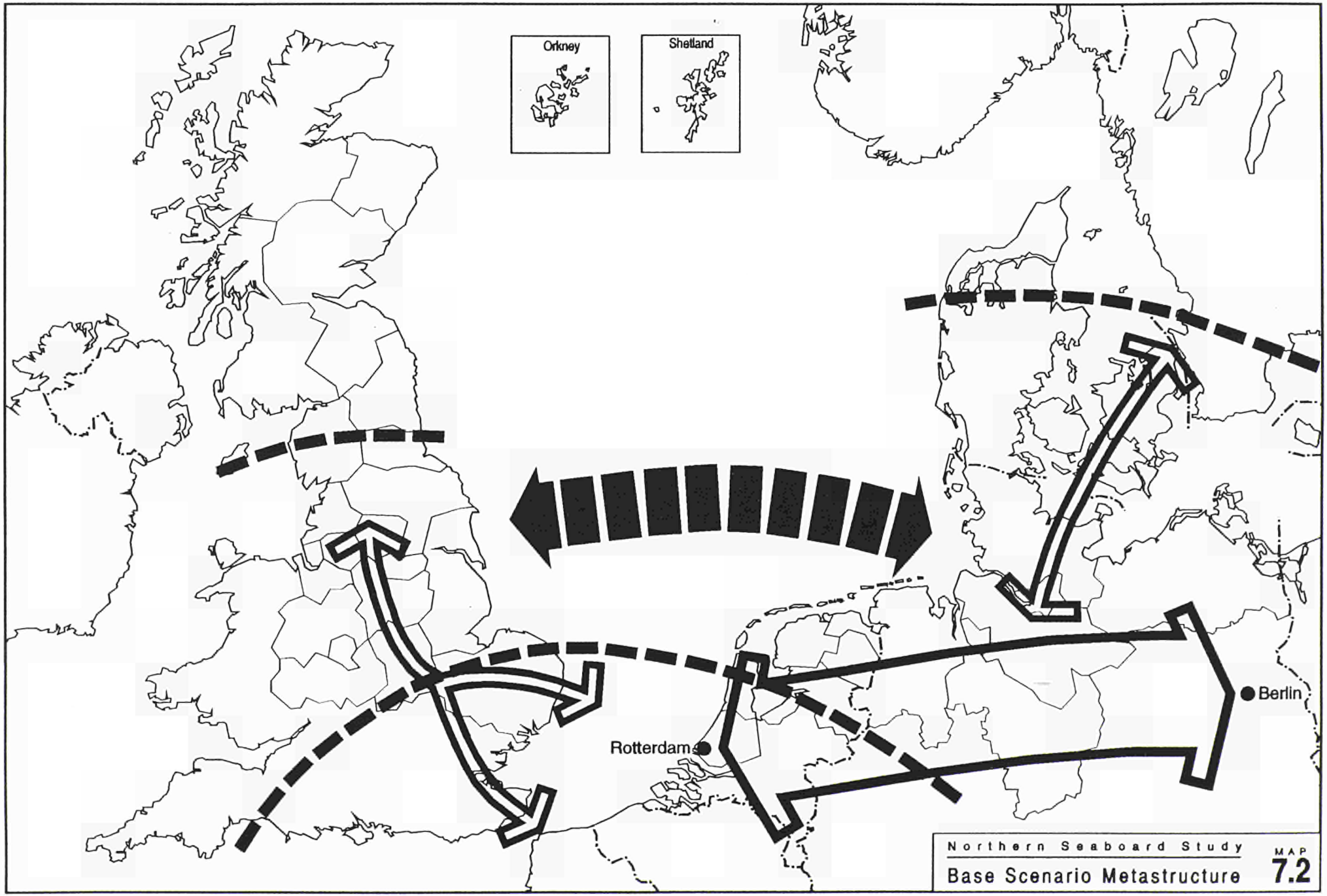
The following trends are expected in the energy sector:

- the northern seaboard region will continue to supply around 50% of the total energy requirements of the European Community;
- energy resources of the region will be able to sustain present levels of production;
- the most significant development is the expanding role of natural gas;
- only marginal shifts in the location of energy generation capacity are expected;
- the decline of indigenous coal production will continue;
- environmental issues will become more and more important and the role of renewables is expected to become greater.

Base development scenarios

Base scenario metastructure

Map 7.2 in Chapter 7 shows the base scenario metastructure. The most powerful element influencing the pattern of development over future years will be the emerging Rotterdam-Berlin axis, which touches the southern fringes of the study area. The strength of this axis lies in the two major growth poles which it connects: Rotterdam, the premier port in Europe and the heart of the Randstad, an established and thriving industrial, commercial and financial centre; and Berlin, capital of the unified German State, gateway to the East.



Northern Seaboard Study

Base Scenario Metastructure

MAP 7.2

This axis is already manifest in infrastructure developments in the Netherlands and Germany which define a major east-west transport corridor, and in the development pressures building up along its route, notably at Enschede/Hengelo on the Dutch/German border, and in the Hannover region, located at the critical junction of east-west and north-south transport routes and on the former border of west and east Germany.

Two subsidiary axes are defined: one running north/north-east through north-west Germany and Denmark, the other running from the Channel ports of south-east England, north-east to the industrial heartland of England in the West Midlands, with a spur to the haven ports, opposite Rotterdam. At some point along these subaxes peripherality starts to become an issue. A clear problem is the axis leading nowhere: peripherality will be less of an issue in Denmark, with Norway and Sweden beyond, than in Scotland which can form socioeconomic linkages only towards the south.

It is concluded that urban centres will continue to act as the main generators of growth and agents for change. Urban centres outside the main axes offer potential for economic regeneration, but they will have to overcome the problems of disadvantageous location and, in some cases, a weak socioeconomic base in order to realize that potential.

The Rotterdam-Berlin axis links important urban centres: Utrecht, Nijmegen, Arnhem, Enschede/Hengelo, Osnabruck, Hannover and the cluster of towns in Braunschweig and, finally, Berlin. The Nordic axis incorporates the urban centres of Bremen, Hamburg, the Baltic ports of Lübeck and Kiel, Odense, Arhus and finally, Copenhagen.

The British corridor merges into the South-East region of the UK, reflecting the dominance of Greater London on development in the south-eastern UK. The influence of the haven ports on the east coast, offering maritime links to the continent avoiding the congested south-east, pulls the corridor boundary north to include Cambridge. The corridor encompasses six major conurbations (West Midlands, East Midlands, Greater Manchester, West Yorkshire, South Yorkshire and Merseyside).

Regional manifestations of the base scenario

In Denmark, the eastern subsidiary axis will tend to strengthen the spatial dominance of the eastern part of the country, in particular the Copenhagen capital city region. Major infrastructure investment projects will reinforce the 'corridor' effect of eastern Denmark as the link between the Nordic countries and mainland Europe.

The Oeresund fixed-link project will extend the influence of Copenhagen into southern Sweden and the Fehmarn fixed link will attract a large volume of both road and rail traffic between Sweden and Germany. Western regions will be affected by continued structural changes in fishing and agriculture. These will result in loss of employment and encourage decline at the expense of eastern regions.

The unification of Germany and the growing liberalization of the economies of Eastern Europe are encouraging the creation of a strong east-west development axis running across the southern regions of the study area, stretching from Rotterdam in the west to Berlin in the east. The axis is superimposed over a long established north-south development corridor. The junction of these two axes lies in the Hannover area, an area exhibiting real signs of growth, with significant inward investment, and a possibility of over-heating.

In contrast, the coastal region is a comparative backwater, off the main lines of communication, and in danger of becoming increasingly peripheral as these become stronger. These areas have the relative comfort of being able to tap into the growth axis in a way which the more remote northern seaboard regions (e.g. Scotland, northern Jutland) are unable to do.

The eastern parts of Mecklenburg-Western Pomerania are expected to remain relatively undeveloped. The problems of integration of the new *Länder* into the single Germany, and of the former Eastern bloc States with Western Europe, will tend to leave these areas very isolated. The exploitation of tourism resources and the increase in transport flows between Scandinavia and Central Europe are likely to have an insignificant impact at the regional level.

The continuation of the main axis to its western end at Rotterdam passes through the Dutch 'engine room', the Randstad. The southern region of the study area, fringing the developing east-west transport axis demonstrates strong growth potential. The cities of Enschede, Utrecht, Arnhem and Nijmegen are particularly well placed to take advantage.

In contrast the northern regions of Friesland and Drenthe mirror the problems of relative isolation of the German coastal regions: the fishing industry is contracting, agriculture is declining; agro-industrial activities,

dependent upon fishing and agriculture, are under threat; traditional manufacturing industries are contracting, the services sector is poorly developed and lacks growth potential, and there is substantial out-migration.

The spatial continuity is broken by the North Sea. In the continental study area, there is a continuity of spatial development which facilitates – even promotes – integration and transnational development objectives. The physical barrier formed by the sea affects economic activities, social characteristics, and inevitably, the resulting pattern of spatial development. Apart from maritime links across the North Sea with continental study area ports, the UK can be treated as a separate spatial system.

The east-west axis in the south of the region will be strengthened through improved transport links to the haven ports serving the Midlands and the North, but any beneficial impact will be incidental and localized. The southern fringes of the region will continue to be influenced by their proximity to London.

The East and West Midlands regions are closely tied in with the trans-Pennine region by a dense motorway network providing excellent movement within the three regions and further north. The spatial structure of the West Midlands region has a strong radial form, modified by more recent motorway investment which promotes east-west links. This confluence of motorways will continue to promote the area as a centre for distribution industries.

The existing spatial structure of the trans-Pennine region will be reinforced, with Manchester and Leeds confirming their dominance. The centre of gravity is likely to shift to the east, as the Humberside ports grow while Liverpool continues to decline.

Edinburgh and Glasgow will remain the key focuses for employment and population growth in Central Scotland and will continue to act as the poles of the Scottish region. Regional relay ports are being considered to complement the main hub ports and overcome the disadvantages of distance from English and European mainland ports, and the overall lack of competitive modern facilities.

The existing development pattern in the Highlands and Islands – small scattered settlements – will be costly to support but social and cultural factors will be a strong drive to maintain this pattern. The expected reduction in public investment will increase the burden of isolation of the more remote settlements, and private investment is likely to concentrate in the more favourable east coast areas around Inverness and Aberdeen.

Alternative metastructures of the northern seaboard

Two alternative 'visions' of the northern seaboard are generated using the framework described in the previous section: the integrated scenario and the fragmented scenario.

The integrated scenario

The core-corona-periphery metastructure is the outcome of a scenario of integrated regional development. The structural characteristics of this metastructure are:

- a core firmly anchored in the north-west of the Community; the size of the core may increase and encompass regions previously in the corona;
- the corona is wider than under the base scenario and the area covered by the periphery shrinks; this indicates an improvement of the situation for more remote regions.

The achievement of a more integrated pattern of development across the Community constitutes a key objective of EC regional policy. The integrated development scenario suggests massive success for the Commission's regional policies.

Various measures will need to be implemented to increase the likelihood of the integrated scenario:

- infrastructure investment to strengthen north-south secondary axes and to integrate the rest of the corona into the main axes;
- measures to promote development of secondary centres in the corona and periphery such as cities in the central belt of Scotland, and the establishment of new economic poles of development (e.g. science parks);
- a proactive policy by private and public authorities to attract investment and visitors into the periphery;
- measures to mitigate any adverse impact of the common agricultural policy (CAP) and the common fisheries policy (CFP), especially in areas of marginal agriculture and areas where fishing is the mainstay of the economy;

- an improvement of telecommunication links (including advanced services) and transport infrastructure in the corona and periphery;
- the development of radial (east-west) axes through better infrastructure, more opportunities for communication and increased trade;
- the promotion of maritime traffic through the North Sea between the regions of the study area;
- increased cooperation between the authorities of the study area to implement sustainable management and exploitation of the resources of the North Sea.

Some exogenous factors are conducive to an integrated scenario. For example, the population living in the periphery may increase due to retirement migration; the trend towards employment decentralization may increase; the Nordic countries may join the European Community, which would boost the development of a Nordic regional core.

The fragmented scenario

Under a fragmented scenario, the main core of Europe is the same as in the base scenario. However, there is a major shift of the core southwards and eastwards, which would place London in the corona, although it would remain a major centre with a large hinterland.

Factors conducive to such a shift have been described above. The main features of this scenario are:

- the area covered of underdeveloped regions increases. Pressure on the regions in the corona intensifies, for example in north Germany and north Holland;
- north-south links are dominant with two major axes plunging into the heart of Europe;
- radial (east-west) links weaken. The Rotterdam-Berlin axis does not materialize. Maritime traffic, and in particular long sea ferry services, fail to develop.

From the point of view of the regions of the northern seaboard, this is a pessimistic scenario, which regional policy should aim to prevent.

Major policy issues

The major policy issues relating to urban settlement are:

- how to manage development pressures in the Rotterdam-Berlin axis;
- how to manage the process of urban restructuring while supporting the role of cities as engines of growth.

The major issues relating to the environment are:

- how to obtain agreement to more rigorous measures to bring the region's severe environmental problems under control more quickly;
- the economic impact of environmental controls on specific industries and the areas dependent on them.

The major issues in the agriculture sector are:

- the effects of CAP reforms on rural income and employment, especially in marginal areas;
- the effects of set-aside on the landscape.

The major issues in the fisheries sector are:

- how to adjust fishing capacities to fish stocks to ensure a long-term sustainable fishing industry;
- how to create alternative job opportunities for communities hitherto dependent upon fishing and allied activities.

The major policy issue in the tourism sector is how to obtain the economic benefits which tourism can bring without adverse social and environmental impact.

The major issues in the transport sector are:

- how best to resolve the severe and growing problems of urban traffic congestion;
- how to accommodate the rising demand for road transport for both passengers and freight;
- how to minimize the environmental impacts of traffic and transport systems;
- whether or not the trend towards concentration of port activities can or should be discouraged, and if so what is the best strategy for supporting the many regional smaller ports.

The major issue in the telecommunications sector is the speed at which advanced services will be introduced in more rural and less-developed regions, and the implications for the ability of these regions to compete. It is unlikely, however, that by the year 2000 telecommunications will have had much impact on the pattern of economic development.

The major issues in the energy sector are:

- how best to mitigate the social and economic impact on mining communities of the decline of indigenous coal;
- how to weigh up the localized visual impact of the development of renewable sources against their contribution to reducing atmospheric pollution.

Conclusions

The last phase of the study moves away from the base scenario. Previous phases outlined two alternative visions of the northern seaboard, the spatial implications of which translate into two alternative metastructures. In 20 years the northern seaboard will look very different and there is inevitably a great deal of uncertainty about the relative strength and timing of different factors affecting spatial development. While the base scenario represents a picture of the most probable scenario, we think that some elements of these alternative development prospects may well materialize, bringing alterations to the base scenario.

This study has demonstrated both the limitations and the potential of spatial planning at the level of transnational super-regions such as the northern seaboard.

The main limitations are:

- the huge variations in the characteristics and problems of regions spanning such a large area, which makes it difficult to carry out anything but a superficial analysis at the level of individual regions;
- the difficulty of ignoring the national perspective, since national policies and conditions are such a key element in the development of any region;
- the difficulty of moving away from a sectoral framework, since it is sectoral issues, trends and policies which provide the unifying elements across the regions.

The difficulty in making firm suggestions for specific spatial policies or projects is symptomatic of these limitations. It is relatively easy to have a vision at this scale, less easy to define new but practical ways in which this vision might be made to materialize. In short, we found this an uncomfortable scale at which to carry out spatial planning.

Nevertheless, the exercise will be proved well worthwhile if it enables those concerned with development in the regions to place their regions in a wider context. This is particularly so in the mainland part of the study area, where there is much in common between the regions on opposite sides of political frontiers. The study can form the starting point for a debate between neighbouring regions, and regions with common interests.

The other outcome which justifies this study is that it highlights the spatial implications of sectoral policies, in particular those of the European Community. This may prompt further, in-depth study of the regional impact of specific policies, and lead to sectoral policies more sensitive to the needs of specific regions.

Many sections of this report examine possible policy options for mitigation of negative prospects and promotion of positive ones. It is hoped that this study will help policy-makers formulate strategies and implement programmes which will be effective in achieving a sustainable development of all the regions of the northern seaboard and in reducing undesirable disparities.

Spatial analysis at the level of transnational regions should be a major building block of any development strategy. Adequate institutional arrangements should be set up for ensuring that the spatial development plans of individual regions are coordinated.

An in-depth understanding of the current situation and trends is a necessary condition for a reliable prospective analysis. Although this study has considerably improved the knowledge of both the existing and possible future of the northern seaboard, there remains a host of unexplored themes and 'grey areas'. These, in our view, justify additional research.

Areas for further research

Examples of areas where further research is desirable:

- an analysis of the regional impact on incomes, landscape and socioeconomic conditions of reform of the common agricultural policy;
- the preparation of a tourism strategy for the North Sea coasts of the Netherlands, Germany and Denmark based on an analysis of the environmental capacity of each part of the coast;
- the cross-Channel region: analysis of development capacity in south-east England and the near Continent (France, Belgium and the Netherlands) in the context of the Channel Tunnel;

- the 'north' North Sea basin: analysis of links between Scotland and the Nordic bloc to identify investment opportunities to mitigate peripherality.

The future is uncertain; it is also risky because pressures are building up on many regions. There is a growing consensus that new and radical policy initiatives are needed. In such an uncertain and risky world, policies should be constantly monitored and evaluated. This also justifies, in our view, additional research.

Développement potentiel de la région côtière septentrionale de la mer du Nord Document de synthèse

Historique

1. La manière dont l'espace européen est utilisé constitue un facteur déterminant de son développement futur. Jusqu'à présent, la planification physique et stratégique a été effectuée dans le cadre des frontières nationales, mais le démantèlement progressif des frontières et la nécessité d'un développement cohérent du territoire de la Communauté exigent un cadre de référence plus large.

2. Afin d'encourager l'émergence de stratégies de planification transnationales, la Commission a lancé une série d'initiatives en vue d'étudier les possibilités de planification au niveau européen et dans un contexte régional. Au total, on a délimité dix groupements régionaux définis sur la base de la proximité géographique, de la communauté d'intérêt et des rapports réciproques en matière de développement. La région côtière septentrionale de la mer du Nord est l'une de ces régions. Le sud-est de l'Angleterre et la Belgique ne font pas partie du champ de l'étude. Toutefois, ces régions sont couvertes par l'étude concernant le développement potentiel des régions des «capitales centrales». La partie septentrionale du bassin de la mer du Nord est couverte par l'étude consacrée aux régions nordiques.

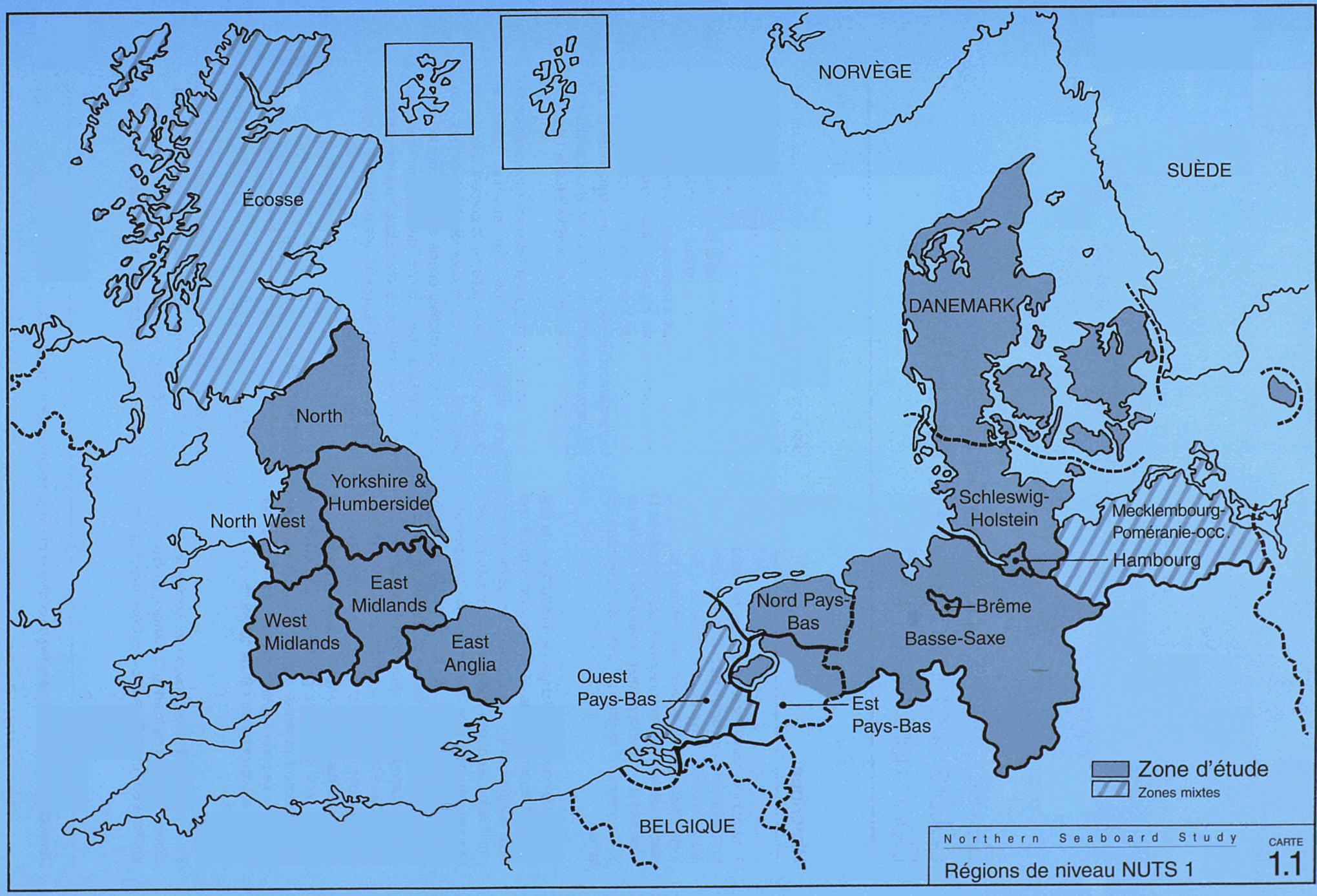
3. La région qui nous occupe ici couvre les zones côtières de la mer du Nord au Danemark, en Allemagne, aux Pays-Bas et au Royaume-Uni. Cette région occupe une position importante en Europe et joue un rôle majeur en tant que pont entre la CE et les pays nordiques, d'une part, et en tant que porte vers l'Europe de l'Est, d'autre part. Elle est importante pour la CE en tant que source d'énergie primaire, en particulier de gaz et de pétrole, et elle contribue concrètement à la réalisation de l'objectif politique de la diversification des combustibles et des sources d'approvisionnement; elle représente une part importante de la production communautaire pour les produits de l'agriculture et de l'élevage, et elle constitue une source et une destination importantes du point de vue touristique (carte 1.1).

4. La mer du Nord, qui est l'élément centralisateur de cette région, joue un rôle essentiel dans le développement des régions qui la bordent. Elle agit en tant que source de ressources économiques, lieu d'immersion de déchets et voie express pour le transport maritime. Les conflits qui existent entre les différents éléments de ce rôle multiple traduisent les tensions conflictuelles auxquelles est confrontée la région dans son ensemble.

Approche

Synthèse

5. L'objet central de l'étude est d'identifier les problèmes communs aux zones constituant la région d'étude des zones côtières septentrionales de la mer du Nord, d'évaluer leurs perspectives de développement et de


NORVÈGE
SUÈDE
Écosse
DANEMARK
North
Yorkshire &
Humberside
North West
East
Midlands
West
Midlands
East
Anglia
Schleswig-
Holstein
Mecklembourg-
Poméranie-occ.
Hambourg
Nord Pays-
Bas
Brême
Basse-Saxe
Ouest
Pays-Bas
Est
Pays-Bas
BELGIQUE
Zone d'étude
Zones mixtes
Northern Seaboard Study
Régions de niveau NUTS 1
CARTE
1.1

proposer des mesures politiques susceptibles d'être appliquées aux niveaux communautaire, régional et national, en vue d'aider ces régions à transformer pleinement leur potentiel en un développement durable. L'étude fournit une base pour une approche plus cohérente en matière d'utilisation du territoire communautaire fondée sur une compréhension globale des problèmes et des principales évolutions au niveau des différentes régions.

6. Ce travail a été effectué en trois phases. La première phase a consisté à délimiter le champ de l'étude et à identifier les tendances actuelles. L'analyse a permis de mettre en évidence les rapports réciproques et les contrastes entre les régions ainsi que d'identifier des contraintes et des possibilités communes en vue du développement futur.

7. La deuxième phase a porté sur la mise au point de scénarios de base régionaux, c'est-à-dire le schéma de développement le plus probable au cours de la prochaine décennie basé sur les tendances et les politiques existantes. Des scénarios de base ont été élaborés pour chaque région de manière à étudier les implications locales des tendances constatées.

Il s'agissait d'une approche verticale qui considérait les différentes régions faisant partie du champ de l'étude comme des régions géographiques discontinues plutôt que comme des unités administratives. Cette approche régionale permet d'analyser les liens réciproques entre les facteurs de développement économiques, sociaux et physiques.

8. La troisième phase a porté sur l'étude des implications d'une variation par rapport au scénario de base pour un certain nombre de thèmes clés du développement spatial. Il s'agissait d'étudier les possibilités de variation par rapport au scénario de base, de passer en revue les applications spatiales de ces variations et d'analyser les possibilités de réduction des perspectives négatives et de promotion des perspectives positives. Les thèmes étudiés ont été les suivants: les ressources de la mer du Nord, l'environnement, le transport maritime, le transport par terre, le changement d'affectation des sols en zone rurale et la croissance économique.

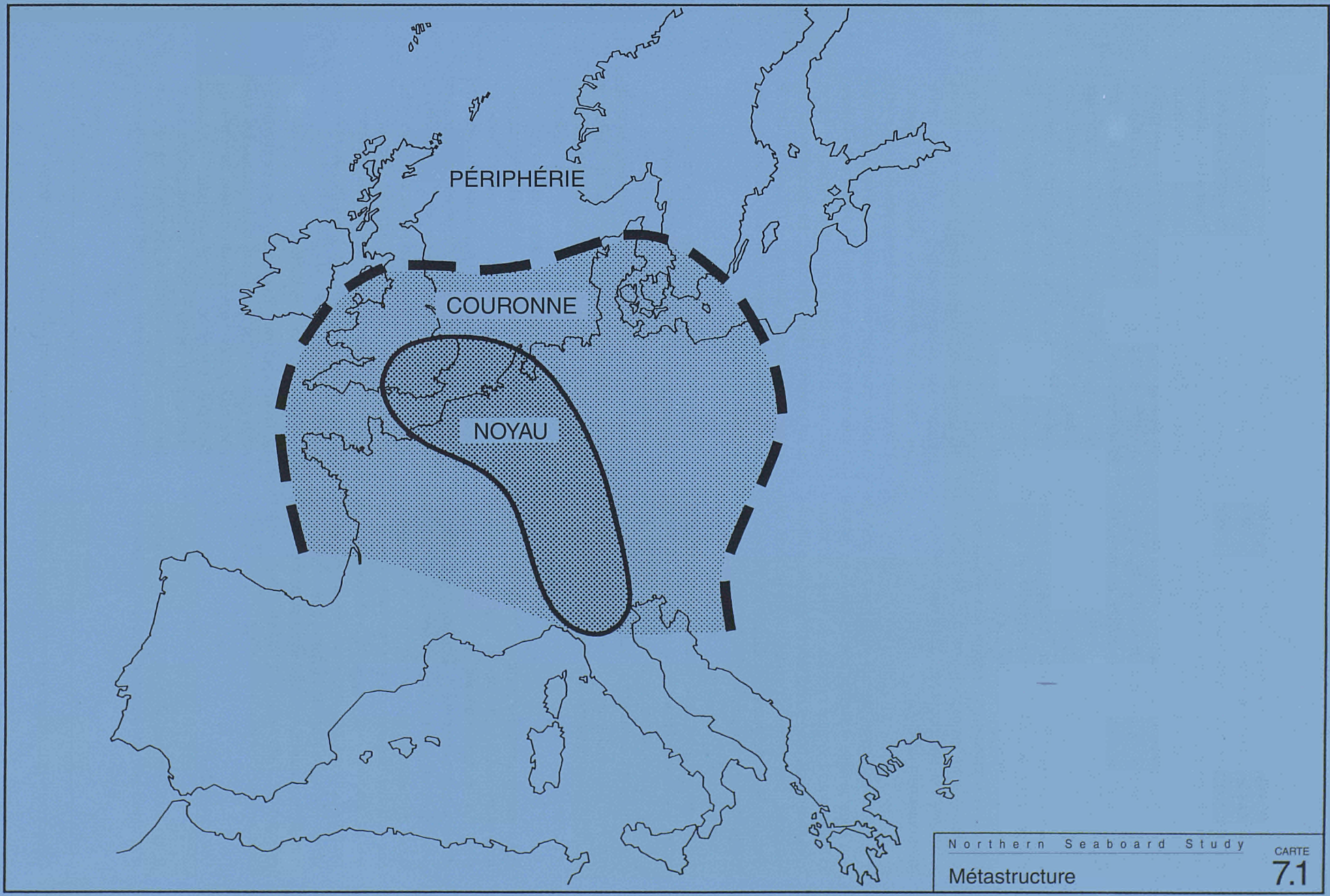
Les concepts clés

9. Un cadre conceptuel a été formulé afin d'apporter une rigueur méthodologique au processus d'élaboration du scénario de base et de donner un contexte spatial global plus large que celui du champ de l'étude dans lequel devra se situer l'analyse des régions naturelles. Le point de départ de ce raisonnement a été la relation pratique entre les régions situées au cœur économique de l'Europe et les régions plus éloignées. De quelle manière s'effectue l'interaction entre les régions éloignées et les régions centrales? Quelle est la dimension spatiale de cette relation? S'agit-il d'un continuum ou existe-t-il des degrés ou des paliers identifiables entre la région centrale et les régions plus éloignées? Quel sera l'impact de cette relation sur le développement spatial?

10. La première phase a permis de mettre en évidence l'importance des liens physiques et économiques entre les régions et le «centre» indéfini de l'Europe. L'intégration spatiale fructueuse dépendra, dans une mesure croissante, de la capacité des régions côtières septentrionales de la mer du Nord d'avoir un bon accès aux régions centrales (à cet égard, l'impact du tunnel sous la Manche sera important). La discussion de ces idées a fait apparaître clairement qu'il serait souhaitable que le cadre conceptuel soit défini d'une manière simple.

11. Cela a conduit à la définition d'une *métastructure* comportant trois zones. Le noyau est constitué par le centre de l'Europe traditionnellement industriel et commercial et s'étend du sud-est de l'Angleterre au nord-est de l'Italie, englobant le Randstad Holland, la Ruhr, la Belgique et le nord-est de la France et comportant aussi les villes importantes que sont Londres, Paris, Bruxelles, Amsterdam, Roterdam, Munich et Milan. La *couronne* est la région environnante qui a des liens fonctionnels étroits avec le noyau; elle est en mesure de participer aux activités économiques et au potentiel de création de bien-être de ce dernier; elle est fortement influencée par les évolutions au sein même du noyau. La périphérie est la région située au-delà de la couronne, la frontière entre les deux étant le point à partir duquel la difficulté ou la facilité d'accès devient un facteur clé pour déterminer si la région est en mesure de participer ou non aux activités du noyau (carte 7.1).

12. Le concept de métastructure a une validité empirique et fournit un cadre utile pour l'étude des relations de la région côtière septentrionale de la mer du Nord avec le reste de l'Europe ainsi que d'éventuelles inflections futures du schéma de développement spatial. Il ne constitue toutefois pas une fin en soi, mais plutôt une étape sur le chemin de la compréhension



Northern Seaboard Study

CARTE 7.1

Métastructure

des forces qui façonneront la structure spatiale. Il n'y a pas de limites de planification précises, mais des notions identifiant de larges zones ayant une relation fonctionnelle différente les unes avec les autres. Les trois zones susmentionnées ne représentent pas des niveaux de développement communs: le noyau ne doit pas nécessairement être assimilé à la prospérité et la périphérie ne doit pas nécessairement être assimilée à la pauvreté, car il existe des poches de pauvreté dans le noyau et des zones de pauvreté dans la périphérie.

Forces génératrices des changements structurels dans la région côtière septentrionale de la mer du Nord

Changements dans l'environnement international

13. La réunification de l'Allemagne aura de très profondes implications sur le développement futur de la région faisant l'objet de la présente étude. Certains de ces effets peuvent être observés dès à présent, par exemple, d'importantes pertes d'emploi dans le Mecklembourg-Poméranie-Occidentale depuis la réunification, et cela tant dans le secteur agricole que dans le secteur industriel, ce qui encourage une migration vers l'Allemagne de l'Ouest de gens à la recherche d'un travail. Grâce à la réunification, l'accès au capital, l'amélioration des moyens de production, la modernisation des systèmes d'exploitation agricole et une meilleure gestion permettent à présent aux exploitations agricoles est-allemandes de modifier substantiellement l'équilibre concurrentiel dans la région côtière septentrionale de la mer du Nord. Une situation similaire pourrait se produire dans le secteur industriel.

14. Le développement économique en Europe centrale et de l'Est aura pour effet de créer des possibilités commerciales pour les entreprises de la région dans le domaine de la fourniture de biens, de services et de *know-how* technique. Il provoquera également une concurrence accrue sur les marchés mondiaux et également sur les marchés de la Communauté en fonction de la mesure dans laquelle la CE accorde ou est contrainte d'accorder aux producteurs d'Europe centrale et de l'Est un accès plus libéral à ses marchés intérieurs. Tout accroissement des importations de produits agricoles en provenance d'Europe centrale et de l'Est pourrait avoir une incidence particulière sur les pays de la région côtière septentrionale de la mer du Nord et constituerait une menace pour la viabilité des exploitations agricoles dans un certain nombre de régions alors que, dans le même temps, elles seraient soumises à des pressions résultant de la réforme de la PAC.

15. Après l'achèvement des nouvelles liaisons d'infrastructure entre l'Allemagne de l'Est et l'Allemagne de l'Ouest, il est à prévoir que le trafic de transit traversant l'Allemagne à destination des marchés européens et, via les ports de l'Europe du Nord, à destination des marchés d'outre-mer connaîtra un accroissement très considérable. Si des politiques de limitation ne sont pas appliquées, on pourrait assister également à un accroissement des flux migratoires des pays d'Europe centrale et orientale vers les régions occidentales de l'Allemagne et, de là, vers d'autres régions de l'Europe occidentale concernées par la présente étude.

16. L'élargissement de la Communauté constitue un levier de changement important qui aura une incidence sur la région concernée. L'évolution géographique de l'Union européenne aura une incidence sur ces régions périphériques. Le Danemark était et est toujours une région périphérique par rapport au noyau de la Communauté, mais cette situation sera modifiée en cas d'adhésion de la Norvège et de la Suède et surtout lorsque des améliorations de l'infrastructure de transport, telles que le lien fixe vers la Suède et le réseau TGV-passagers, seront réalisées au Danemark. À partir de ce moment, le Danemark jouera un rôle important en tant que pont entre la Scandinavie et la région centrale de la CE.

17. À l'inverse, le Royaume-Uni (et plus particulièrement ses régions septentrionales) deviendra de plus en plus périphérique à mesure que le centre de gravité de la CE se déplacera vers l'est. Ces régions sont médiocrement reliées au reste de la Communauté. L'Écosse et les régions septentrionales du Royaume-Uni ne sont que pauvrement dotées en autoroutes. Il n'existe pas, en effet, de liaisons autoroutières entre l'Angleterre et l'Écosse, les liaisons aériennes internationales directes sont peu nombreuses et passent le plus souvent par Londres, et il n'y a pas non plus de services de ferry vers le continent au nord de Teeside. Ces tendances pourraient encore être renforcées par l'ouverture du tunnel sous la Manche.

18. La création du marché unique comporte un certain nombre d'implications éventuelles pour la région concernée et, parmi celles-ci: la perte d'emplois à la suite de l'ouverture des marchés nationaux à une concurrence plus intense de la part d'autres régions de la Communauté; l'accroissement des possibilités commerciales pour les entreprises innovatrices compétitives; un accroissement de la taille des entreprises et une plus grande internationalisation dès lors qu'elles cherchent à augmenter leurs parts de marché par une expansion interne ou par fusion et acquisition (le taux de fusion et d'acquisition a plus que doublé depuis 1985); une concentration des unités de production dans un plus petit nombre de localisations afin de réaliser des économies d'échelle, sauf dans les cas où un centre de production local est nécessaire ou souhaitable, eu égard à des goûts nationaux spécifiques, des préférences du consommateur ou des considérations liées au coût des transports; une modification de la carte d'implantation des entrepôts et des dépôts ainsi que des réseaux de distribution; une concentration du pouvoir économique dans les régions les plus fortes qui pourraient se situer en dehors de la région faisant l'objet de la présente étude.

Développement et tendances sectorielles

19. L'étude identifie les tendances *démographiques* suivantes:

— dans l'ensemble de la région concernée, la population continuera à augmenter jusqu'à la fin du siècle et il y aura ensuite une croissance plus faible ou un déclin;

— toutefois, la croissance démographique sera concentrée dans un petit nombre de régions et la plupart des régions (NUTS 2) connaîtraient un déclin démographique si les effets de la migration internationale ne se faisaient pas sentir;

— les migrations venant de l'extérieur de la CE et entre les États membres de la CE devraient représenter un afflux de plus de 9 millions de personnes s'ajoutant à la population totale de la région concernée d'ici à 2020;

— dans toutes les régions, la pyramide des âges fera apparaître un glissement vers les groupes de personnes âgées;

— les taux de dépendance augmenteront et la main-d'œuvre diminuera, ce qui aura pour effet d'accroître le coût de la main-d'œuvre;

— la migration des retraités deviendra un élément de plus en plus important de la redistribution démographique.

20. L'étude identifie un certain nombre de tendances dans les *schémas d'habitat urbain:*

— les centres urbains continueront d'être le principal foyer des perspectives de développement économique en dépit de pressions permanentes en faveur de la décentralisation;

— la structure et la hiérarchie de ces centres ne connaîtront pas de modifications significatives bien que l'on puisse assister à un renforcement des villes situées dans l'axe Rotterdam-Berlin en pleine expansion;

— le schéma actuel de restructuration urbaine — déclin des centres villes avec, parallèlement, développement suburbain et périurbain — sera maintenu;

— à plus long terme, le développement des infrastructures créera de nouveaux nœuds de communication qui pourraient devenir des centres stratégiques.

21. L'étude identifie plusieurs tendances essentielles en matière d'*environnement:*

— il est peu probable que les problèmes que rencontre la région en matière d'environnement trouvent une solution au cours de la prochaine décennie;

— les préoccupations exprimées par l'opinion publique exerceront une pression croissante sur les responsables politiques et les entreprises;

— il y aura une intensification du contrôle des activités agricoles et industrielles du point de vue du respect de l'environnement;

— de nouvelles méthodes d'élimination des déchets solides seront encouragées;

— le recyclage, les économies d'énergie et le rendement seront stimulés.

22. Les *secteurs secondaires et tertiaires* ont subi, au cours des dernières années, une transformation radicale sous l'effet d'une multitude de pressions. Celles-ci continueront à influencer le rythme et l'orientation du développement industriel dans la région étudiée au cours de la prochaine décennie. Nous avons identifié les principales tendances suivantes:

— les entreprises évoluent dans un environnement de concurrence de plus en plus intense;

— l'activité économique s'est également internationalisée;

— les progrès technologiques deviendront de plus en plus importants non seulement pour améliorer les biens et les services produits, mais également pour améliorer les moyens de les produire et de les fournir aux consommateurs;

— les progrès techniques, en particulier dans le domaine des transports internationaux et des télécommunications, ainsi que les nouvelles philosophies en matière de gestion donneront lieu à des modifications dans les structures organisationnelles telles que des hiérarchies de gestion moins rigides ou une relocalisation des activités non essentielles vers des sites plus éloignés;

— dans la région concernée, la main-d'œuvre se stabilisera ou diminuera au cours de la prochaine décennie, sauf aux Pays-Bas;

— dans tous les pays, les taux d'activité des hommes diminueront tandis que les taux d'activité des femmes augmenteront, sauf au Danemark. Il y aura également un vieillissement significatif de la main-d'œuvre;

— une préoccupation de plus en plus grande s'exprimera au sujet de l'environnement et cela se traduira par des contrôles de plus en plus stricts des entreprises productrices.

23. À la fin du siècle, l'effet des tendances observées dans le secteur de l'*agriculture* sera probablement caractérisé par les faits suivants:

— un déclin général d'au moins 10 à 11 % de la superficie des terres arables cultivées par suite du gel des terres;

— en outre, 4 à 5 % des terres arables seront exploitées d'une manière moins intensive, essentiellement en raison du renforcement des contrôles en matière de protection de l'environnement;

— la productivité agricole augmentera sur les superficies restantes;

— le nombre d'exploitations diminuera, mais elles seront d'une taille plus grande;

— les volumes de production seront pratiquement maintenus aux niveaux actuels;

— le revenu agricole moyen diminuera et cela aura pour effet d'exercer une pression sur les exploitations marginales;

— l'emploi agricole continuera à diminuer à un rythme légèrement plus élevé;

— l'unification de l'Allemagne pourrait affecter la position concurrentielle des exploitations agricoles dans les anciens Länder allemands, surtout dans le secteur des grandes cultures;

— l'adhésion des pays de l'AELE à la CE n'aura qu'un impact marginal sur le secteur agricole de la région faisant l'objet de la présente étude;

— il est peu probable que l'accès aux marchés de la CE soit amélioré de façon significative pour les pays de l'Europe centrale et de l'Est avant la fin de la décennie.

24. Il ne devrait pas y avoir de changements significatifs dans le secteur de la pêche. Les ressources halieutiques mettront un temps relativement long à se reconstituer, même si les initiatives existantes et les nouvelles prises dans le cadre de la politique commune de la pêche sont fructueuses. Les perspectives pour l'an 2000 sont donc les suivantes:

— restrictions de plus en plus importantes en matière d'effort de pêche, par exemple des quotas faisant l'objet d'une inspection renforcée et, peut-être, un système de suivi centralisé;

— extension de l'utilisation d'éléments structurels dans les mesures politiques tels que le régime existant de cessation définitive de l'activité de pêche et les programmes de création d'emplois;

— stabilisation du prix du poisson en raison de facteurs tels que la mise à la disposition de poisson débarqué illégalement, l'accroissement des importations et l'apparition d'espèces de substitution moins chères;

— diminution générale des revenus, bien que certains revenus puissent connaître une augmentation;

— réduction des flottilles résultant des régimes de cessation d'activité et de la diminution des revenus;

— poursuite de la diminution de l'emploi;

— déclin des petits ports de pêche;

— concentration de l'effort de pêche sur un nombre réduit de ports plus importants (par exemple, la flotte de pêche écossaise est à présent axée sur des centres démographiques importants, tels que Fraserburgh, entraînant la mort de ports de moindre importance);

— il y aura un nombre croissant de communautés en difficulté du fait qu'il n'y a pas d'alternative ou d'alternative suffisante pour remplacer les emplois perdus dans le secteur de la pêche et des activités de transformation annexes.

25. En tant qu'alternative à la pêche, l'aquaculture a connu un développement rapide au cours de la décennie précédente grâce à l'aide financière de la CE. Au cours de la prochaine décennie, on prévoit à cet égard une stabilisation plutôt qu'une croissance, étant donné que les préoccupations formulées en matière d'environnement conduiront probablement à des limitations en ce qui concerne le nombre et la taille des exploitations ainsi qu'à un accroissement des coûts de production.

26. Les tendances suivantes devraient caractériser le secteur du *tourisme:*

— les flux dominants seront intra-européens et essentiellement nationaux;

— le tourisme mondial représentera une part de plus en plus importante de la demande globale;

— les gens prendront davantage de vacances, mais d'une durée plus courte;

— la voiture particulière continuera d'être le mode de transport dominant pour les vacances;

— la poursuite de la croissance du trafic aérien;

— le tourisme empruntant le rail se développera grâce à l'achèvement des réseaux TGV;

— les sites touristiques dans des zones non urbaines seront soumis à une pression de plus en plus forte;

— l'aggravation et la multiplication des problèmes en matière d'absorption par l'environnement.

27. Les tendances suivantes devraient déterminer l'avenir dans le secteur du *transport:*

— la forte croissance du trafic de fret et de passagers se poursuivra;

— la croissance du transport de fret par route connaîtra un ralentissement, mais continuera néanmoins à augmenter sa part de marché en dépit de l'importance accrue accordée au transport ferroviaire et fluvial;

— l'important accroissement du trafic aérien pour les passagers;

— l'accroissement de la demande de transport sera particulièrement importante dans le *Hinterland* des principaux ports;

— on prévoit une augmentation des encombrements et des retards étant donné qu'il est peu probable que les investissements en matière de nouvelles capacités de transport puissent répondre à la demande;

— la réalisation d'un certain nombre de grands projets d'infrastructures (par exemple le lien fixe du «Great Belt»);

— d'importants corridors de transport est-ouest deviendront de plus en plus importants, par exemple Rotterdam-Berlin.

28. Le schéma actuel en matière de *développement portuaire* ne changera probablement pas beaucoup avant la fin du siècle, mais les tendances suivantes pourraient modifier la situation à plus long terme:

— l'accroissement principal du trafic s'effectuera à courte distance et sur le marché des conteneurs;

— la concurrence accrue entre les ports conduira à une concentration des services de transports mari-

times dans un petit nombre de ports plus importants;

— la compétitivité des ports dépendra essentiellement des possibilités d'accès à leur *Hinterland* grâce à de nouveaux projets de liens fixes et à des services ferroviaires de longue distance;

— le marché unique rend plus attrayantes les zones portuaires pour les infrastructures de distribution, l'industrie légère et les activités de montage et d'assemblage.

29. Ces tendances auront pour principale conséquence le renforcement du rôle déjà important de Rotterdam en tant que port de transit, l'accroissement du volume des échanges passant par Brême et Hambourg ainsi que la poursuite du déclin des ports de moindre importance.

30. Les tendances suivantes caractériseront le secteur des *télécommunications:*

— les télécommunications de base en Allemagne de l'Est atteindront le même niveau qu'en Europe de l'Ouest;

— la technologie numérique remplacera de plus en plus la technologie analogique;

— les services avancés verront leur taux de pénétration s'accroître;

— l'utilisation plus fréquente des transmissions radio et des largeurs de bandes élevées.

31. Les tendances suivantes sont prévues dans le secteur de l'*énergie:*

— la région côtière septentrionale de la mer du Nord continuera à couvrir 50 % environ des besoins globaux en énergie de la Communauté européenne;

— les ressources énergétiques de la région seront en mesure d'assurer les niveaux de production actuels;

— l'évolution la plus significative sera le rôle de plus en plus important du gaz naturel;

— seules des modifications légères sont prévues dans la localisation des capacités de génération d'énergie;

— le déclin de la production de charbon se poursuivra;

— les questions d'environnement deviendront de plus en plus importantes et le rôle des énergies renouvelables devrait s'accroître.

Scénarios de développement de base

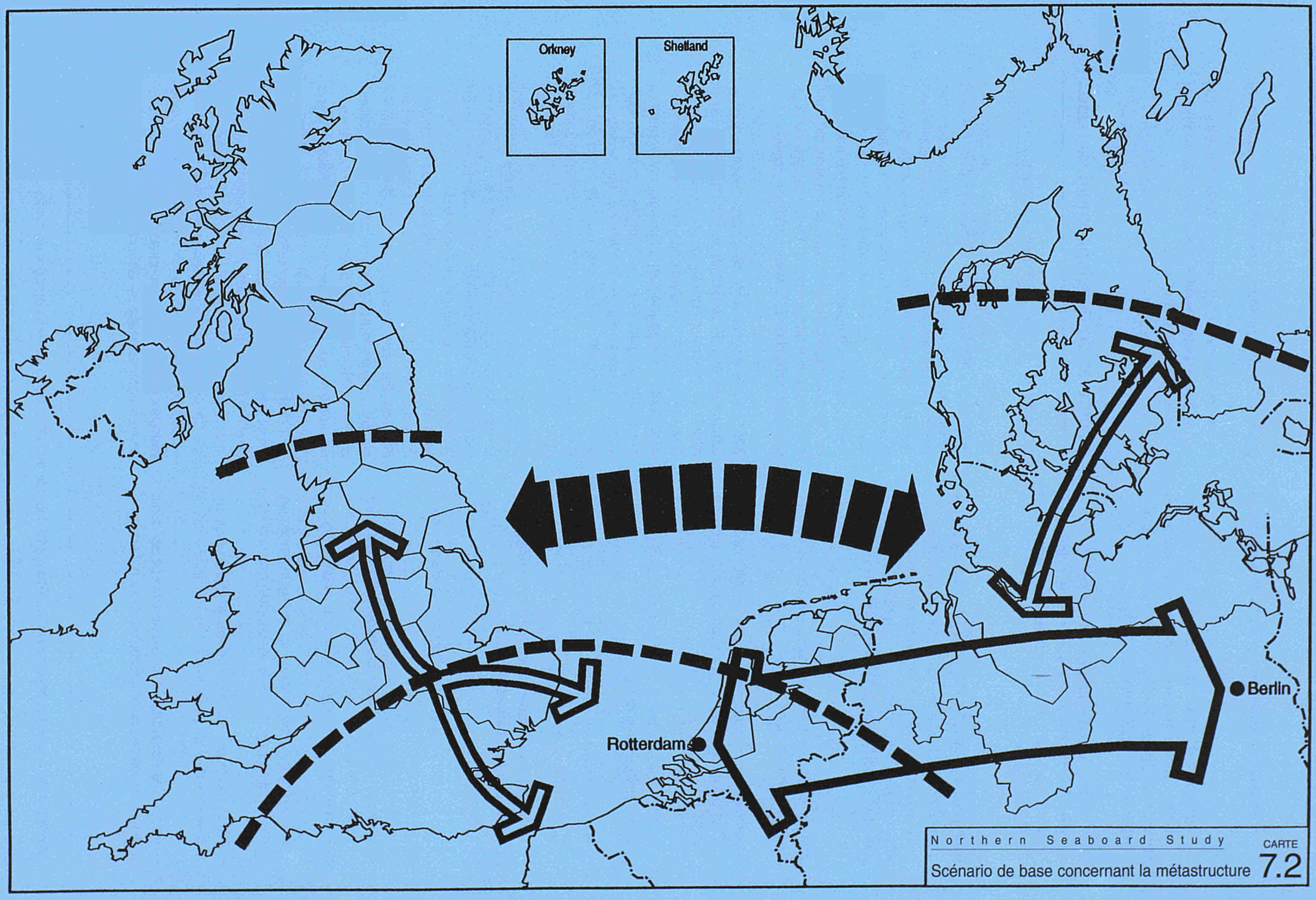
Scénario de base concernant la métastructure

32. La carte 7.2 fait apparaître le scénario de base concernant la métastructure. L'élément le plus puissant influençant le schéma de développement au cours des prochaines années sera l'émergence de l'axe Rotterdam-Berlin qui affecte la frange méridionale de la région faisant l'objet de l'étude. La puissance de cet axe réside dans les deux principaux pôles de croissance qu'il relie, à savoir Rotterdam, le premier port d'Europe situé au cœur du Randstad Holland qui est un centre industriel commercial et financier actif, et Berlin, capitale de l'État allemand unifié et porte ouverte sur l'Est européen.

33. Cet axe se manifeste déjà dans l'évolution infrastructurelle aux Pays-Bas et en Allemagne puisqu'il définit un important corridor de transport est-ouest et que des activités de développement se concentrent déjà tout au long de cet itinéraire, notamment à Enschede/Hengelo, sur la frontière germano-néerlandaise, dans la région de Hanovre, qui se situe au point de jonction critique des axes de transport est-ouest et nord-sud, et également sur l'ancienne frontière entre l'Allemagne de l'Ouest et l'Allemagne de l'Est.

34. Deux axes secondaires ont également été définis: l'un en direction du nord/nord-est traversant le nord-ouest de l'Allemagne et le Danemark et l'autre partant des ports de la Manche dans le sud-est de l'Angleterre et allant vers le nord-est en direction du centre industriel de l'Angleterre dans les West Midlands, avec un embranchement en direction des ports anglais faisant face à Rotterdam. En certains endroits situés le long de ces axes secondaires, la périphéricité commence à être un problème. Ce genre de problème se pose clairement lorsque l'axe ne mène nulle part, et, à cet égard, la périphéricité du Danemark sera moins accentuée avec la Norvège et la Suède en arrière plan qu'en Écosse, dont le désenclavement socio-économique ne peut se faire que vers le sud.

35. La conclusion qui s'impose est que les centres urbains continueront d'être les principaux créateurs de croissance et les principaux agents du changement. Les centres urbains situés en dehors des axes principaux



Northern Seaboard Study

CARTE 7.2

Scénario de base concernant la métastructure

offrent des possibilités de déploiement économique, mais ils auront à surmonter les difficultés liées à une localisation défavorable et, dans certains cas, à une base socio-économique assez faible s'ils veulent concrétiser ces possibilités.

36. L'axe Rotterdam-Berlin relie des centres urbains importants: Utrecht, Nimègue, Arnhem, Enschede/Hengelo, Osnabrück, Hanovre et les agglomérations urbaines du Braunschweig ainsi que, enfin, Berlin. L'axe nordique englobe les centres urbains de Brême, Hambourg, les ports de la Baltique que sont Lübeck et Kiel, Odense, Århus et, enfin, Copenhague.

37. Le corridor britannique débouche dans la région du sud-est du Royaume-Uni, reflétant ainsi la domination du «Grand Londres» sur le développement du sud-est du Royaume-Uni. Cette prédominance pourrait être renforcée par l'ouverture du tunnel sous la Manche. L'influence des ports du Haven sur la côte est, qui offrent des liaisons maritimes avec le continent en évitant la région encombrée du sud-est, pousse les limites du corridor vers le nord de manière à englober Cambridge. Le corridor englobe six conurbations principales (West Midlands, East Midlands, Greater Manchester, West Yorkshire, South Yorkshire et Merseyside).

Caractéristiques régionales du scénario de base

38. Au Danemark, l'axe secondaire oriental contribuera à renforcer la prédominance géographique de la partie orientale du pays et, en particulier, celle de la région de la capitale, Copenhague. Deux grands projets d'investissement d'infrastructure renforceront l'effet de «corridor» de l'est du Danemark en tant que lien entre les pays nordiques et le continent européen.

39. Le projet de lien fixe d'Oeresund aura pour effet d'étendre l'influence de Copenhague vers le sud de la Suède tandis que le lien fixe de Fehmarn attirera un volume important de trafic tant routier que ferroviaire entre la Suède et l'Allemagne. Les régions occidentales seront caractérisées par des changements structurels permanents dans les secteurs de la pêche et de l'agriculture. Cette évolution aboutira à une perte d'emplois et à un déclin dans les régions orientales.

40. L'unification de l'Allemagne et la libéralisation croissante des économies en Europe orientale favorisent la création d'un puissant axe de développement est-ouest traversant les zones méridionales de la région concernée et s'étendant de Rotterdam à l'ouest jusqu'à Berlin à l'est. Cet axe se superpose à un corridor de développement nord-sud qui existe depuis longtemps. L'intersection de ces deux axes se situe dans la région de Hanovre qui présente des signes concrets de croissance avec un important investissement interne et un risque de surchauffe.

41. En revanche, la région côtière connaît une stagnation relative, à l'écart des principaux axes de communication et elle est confrontée aux risques de devenir de plus en plus périphérique. Ces régions ont toutefois l'avantage relatif de pouvoir tirer un certain profit de la proximité de l'axe de croissance, ce qui n'est pas le cas des zones les plus éloignées de la région côtière septentrionale de la mer du Nord qui nous occupe ici (par exemple, Écosse, Irlande septentrionale).

42. Les parties orientales du Mecklembourg-Poméranie-Occidentale devraient demeurer relativement peu développées. Les problèmes liés à l'intégration des nouveaux Länder à l'Allemagne unifiée et ceux des pays de l'ancien bloc de l'Est à l'Europe occidentale auront pour effet de laisser ces régions dans un isolement assez marqué. L'exploitation des ressources touristiques et l'accroissement des flux de transport entre la Scandinavie et l'Europe centrale ne devraient avoir qu'un impact peu important au niveau régional.

43. Le prolongement de l'axe principal vers son extrémité occidentale à Rotterdam traverse le Randstad Holland, véritable «salle des machines» des Pays-Bas. Les zones méridionales de la région étudiée, qui bordent l'axe de transport est-ouest en plein développement, présentent un important potentiel de croissance. Les villes d'Enschede, Utrecht, Arnhem et Nimègue sont particulièrement bien placées pour en tirer profit.

44. En revanche, les régions septentrionales de Frise et de Drenthe reflètent les problèmes de l'isolement relatif des régions côtières allemandes: la pêche et l'agriculture sont en déclin, le secteur agro-industriel dépendant de la pêche et de l'agriculture est menacé, les industries manufacturières traditionnelles connaissent une baisse d'activité, le secteur des services est faiblement développé et ne présente guère de potentiel de croissance, tandis que ces régions sont en outre caractérisées par un important exode.

45. La continuité géographique est rompue par la mer du Nord. Dans la région continentale faisant l'objet de l'étude, il y a une continuité du développement spatial

qui favorise et encourage l'intégration et le développement transnational. La barrière physique que constitue la mer a des répercussions sur l'activité économique, les caractéristiques sociales et, inévitablement, sur le schéma de développement spatial qui en résulte. Abstraction faite des liens maritimes trans-Manche avec les ports de la région continentale, le Royaume-Uni peut être considéré comme un système spatial distinct.

46. Dans le sud de la région, l'axe est-ouest sera renforcé par l'amélioration des liens de communication vers les ports du Haven desservant les Midlands et le Nord, mais tout impact bénéfique ne serait que mineur et localisé. La frange méridionale de la région continuera d'être influencée par la proximité de Londres.

47. Les régions des Midlands de l'Est et de l'Ouest sont étroitement reliées à la région transpennine par un réseau d'autoroutes dense offrant d'excellentes communications à l'intérieur de ces trois régions et, au-delà, plus au Nord. La structure spatiale de la région des Midlands occidentales présente une forme radiale accentuée, modifiée par des investissements plus récents en autoroutes qui favorisent les liaisons est-ouest. Cette confluence d'autoroutes continuera de promouvoir la région comme un pôle d'attraction pour le secteur de la distribution.

48. La structure spatiale existante de la région transpennine sera renforcée avec une confirmation de la prédominance de Manchester et de Leeds. Le centre de gravité se déplacera probablement vers l'est en raison de la croissance des ports de Humberside et de la poursuite du déclin de Liverpool.

49. Édimbourg et Glasgow demeureront les principaux centres d'emploi et de croissance démographique dans le centre de l'Écosse et continueront d'assumer leur fonction de pôle de la région écossaise. Les ports relais de la région doivent permettre de compléter les ports principaux et de surmonter l'inconvénient de la distance par rapport aux ports anglais et aux ports du continent européen ainsi que de compenser la pénurie générale d'équipements modernes et compétitifs.

50. Les schémas de développement existant dans les Highlands et dans les îles — petites zones d'habitation dispersées — s'avéreront assez coûteux du point de vue de l'aide qui doit leur être apportée, mais des facteurs sociaux et culturels plaident en faveur du maintien de ces schémas. La réduction prévue des investissements publics aura pour effet d'accroître la charge de l'isolement des zones de peuplement les plus éloignées tandis que l'investissement privé sera concentré sur les régions côtières orientales plus favorisées autour des centres d'Inverness et d'Aberdeen.

Métastructures alternatives de la région côtière septentrionale de la mer du Nord

51. En utilisant le cadre défini au chapitre précédent, on peut faire apparaître deux «visions» alternatives de la région côtière septentrionale de la mer du Nord: le scénario intégré et le scénario fragmenté.

Le scénario intégré

52. La métastructure noyau-couronne-périphérie résulte d'un scénario de développement régional intégré. Les caractéristiques structurelles de cette métastructure sont les suivantes:

— un noyau fermement ancré au nord-ouest de la Communauté; la dimension de ce noyau peut augmenter et englober des régions précédemment situées dans la couronne;

— la couronne est plus étendue que dans le scénario de base et la région couverte par la périphérie est réduite; cela indique une amélioration de la situation pour les régions plus éloignées.

53. La réalisation d'un schéma de développement plus intégré pour la Communauté constitue un objectif fondamental de la politique régionale de la CE. Le scénario de développement intégré correspond à un succès massif de la politique régionale de la Commission.

54. Différentes mesures devront être prises pour accroître la probabilité du scénario intégré:

— des investissements d'infrastructure en vue de renforcer les axes secondaires nord-sud et d'intégrer le reste de la couronne aux axes principaux;

— des mesures visant à promouvoir le développement de centres secondaires dans la couronne et dans la périphérie tels que des villes situées dans le «Central Belt» de l'Écosse et visant aussi à favoriser la création de nouveaux pôles économiques de développement (par exemple les parcs scientifiques);

— une politique proactive des autorités publiques et privées en vue d'attirer des investissements et des visiteurs dans la périphérie;

— des mesures visant à limiter les effets négatifs de la politique agricole commune (PAC) et de la politique commune de la pêche (PCP), surtout dans les zones d'agriculture marginale et celles où la pêche constitue le pilier principal de l'économie;

— une amélioration des liens de télécommunications (y compris les services avancés) et de l'infrastructure de transport dans la couronne et dans la périphérie;

— le développement d'axes radiaux (est-ouest) grâce à une meilleure infrastructure, à davantage de possibilités de communication et à un accroissement des échanges;

— la promotion du trafic maritime en mer du Nord entre les différentes régions faisant l'objet de l'étude;

— l'accroissement de la coopération entre les autorités responsables de la région faisant l'objet de l'étude, en vue d'une gestion et d'une exploitation durable des ressources de la mer du Nord.

55. Certains facteurs exogènes conduisent à un scénario intégré. Ainsi, par exemple, la population de la périphérie peut s'accroître en raison de l'immigration de retraités; la tendance à la décentralisation de l'emploi peut se renforcer; les pays nordiques peuvent adhérer à la Communauté européenne, ce qui pourrait promouvoir le développement d'un noyau régional nordique.

Le scénario fragmenté

56. Dans le cadre d'un scénario fragmenté, le noyau principal de l'Europe est le même que dans le cadre du scénario de base. Toutefois, il y aurait un important glissement du noyau vers le sud et vers l'est, ce qui aurait pour effet de situer Londres dans la couronne tout en demeurant un centre important avec un vaste *Hinterland.*

57. Les facteurs conduisant à un tel glissement ont été décrits ci-dessus. Les principales caractéristiques de ce scénario sont les suivantes:

— les régions caractérisées par le sous-développement augmentent. La pression exercée sur les régions de la couronne s'intensifie, par exemple, dans le nord de l'Allemagne et dans le nord de la Hollande;

— les liens nord-sud sont prédominants avec deux axes principaux en direction du cœur de l'Europe;

— les liens radiaux (est-ouest) s'affaiblissent. L'axe Rotterdam-Berlin ne se matérialise pas, le trafic maritime — et, en particulier, les services de ferry longue distance — ne se développe pas.

58. Du point de vue des zones composant la région côtière septentrionale de la mer du Nord, il s'agit là du scénario pessimiste dont la politique régionale devrait pouvoir empêcher la réalisation.

Principales questions politiques

59. Les principales questions politiques relatives à l'*habitat urbain* sont les suivantes:

— comment gérer les tensions de développement dans l'axe Rotterdam-Berlin;

— comment gérer le processus de restructuration urbaine tout en favorisant le rôle des villes en tant que moteurs de la croissance.

60. Les principales questions relatives à l'*environnement* sont les suivantes:

— comment obtenir un consensus sur des mesures plus rigoureuses visant à maîtriser plus rapidement les graves problèmes auxquels sont confrontées les régions dans le domaine de l'environnement;

— l'impact économique des contrôles en matière d'environnement sur des secteurs spécifiques et les branches annexes.

61. Les principales questions concernant le secteur de l'*agriculture* sont les suivantes:

— les effets de la réforme de la PAC sur le revenu et l'emploi rural, surtout dans les régions marginales;

— les effets du gel des terres sur le paysage.

62. Les principales questions relatives au secteur de la *pêche* sont les suivantes:

— comment adapter les capacités de pêche aux stocks halieutiques de manière à garantir une activité de pêche durable à long terme;

— comment créer des emplois alternatifs pour les communautés jusqu'à présent tributaires de la pêche et des activités annexes.

63. La principale question politique relative au secteur du *tourisme* est de savoir comment on peut retirer des avantages économiques du tourisme tout en évitant des effets négatifs sur les plans social et de l'environnement.

64. Les principales questions relatives au secteur du *transport* sont les suivantes:

— comment résoudre au mieux les problèmes de plus en plus aigus et nombreux qui se posent en matière d'encombrement de la circulation urbaine;

— comment faire face à la demande croissante de transport routier tant pour les passagers que pour le fret;

— comment limiter les effets négatifs du trafic et des réseaux de transport sur l'environnement;

— peut-on ou doit-on décourager la tendance à la concentration des activités portuaires et, dans l'affirmative, quelle est la meilleure stratégie pour favoriser les nombreux petits ports régionaux.

65. La principale question relative au secteur des *télécommunications* est, d'une part, le rythme auquel les services avancés seront introduits dans les régions rurales et moins développées et, d'autre part, les implications de la capacité de concurrence ainsi offertes à ces régions. Il est toutefois peu problable que, d'ici à l'an 2000, les télécommunications aient un grand impact sur les schémas de développement économique.

66. Les principales questions relatives au secteur de l'*énergie* sont les suivantes:

— comment limiter du mieux possible l'impact social et économique négatif du déclin du secteur houiller sur les communautés concernées;

— comment évaluer l'impact visuel localisé du développement des sources d'énergie renouvelable par rapport à leur contribution à la réduction de la pollution atmosphérique.

Conclusions

67. La dernière phase de l'étude s'écarte du scénario de base. Les phases précédentes décrivaient deux visions alternatives de la région côtière septentrionale de la mer du Nord dont les implications géographiques se reflètent dans deux métastructures alternatives. Dans vingt ans, la région côtière septentrionale de la mer du Nord aura un aspect très différent et il existe inévitablement une grande part d'incertitude au sujet de la puissance relative et de l'émergence des différents facteurs affectant le développement spatial.

Bien que le scénario de base représente le scénario le plus probable, nous pensons que certains éléments de ces deux autres perspectives de développement pourraient bien se concrétiser et modifier ainsi, dans une certaine mesure, ce scénario de base.

68. La présente étude a fait apparaître à la fois les limitations et les possibilités de la planification spatiale au niveau de superrégions transnationales telles que la région côtière septentrionale de la mer du Nord.

69. Les principales limitations sont les suivantes:

— les variations énormes en ce qui concerne les caractéristiques et les problèmes des régions constituant l'ensemble faisant l'objet de la présente étude rendent difficile toute analyse autre qu'une analyse superficielle au niveau des différentes régions;

— la difficulté d'ignorer la dimension nationale, étant donné le caractère essentiel des politiques et des conditions nationales du point de vue du développement de toute région;

— la difficulté de s'écarter d'un cadre sectoriel, étant donné que ce sont essentiellement des problèmes, des tendances et des politiques sectorielles qui constituent les éléments unificateurs entre les régions.

70. La difficulté de présenter des suggestions fermes en vue de la mise en œuvre de politiques ou de projets spatiaux spécifiques est symptomatique de ces limitations. Il est relativement facile de dégager une vision à cette échelle, mais ce qui l'est beaucoup moins c'est de définir de nouvelles modalités pratiques permettant de concrétiser cette vision. En résumé, il nous est apparu malaisé de réaliser une planification spatiale à cette échelle.

71. Cet exercice s'avérera toutefois utile s'il permet à tous ceux qui sont concernés par le développement régional de situer leurs régions dans un contexte plus vaste. Cela est particulièrement vrai pour la partie conti-

nentale de la région couverte par l'étude où il existe de nombreux points communs entre les régions situées de part et d'autre de frontières politiques. La présente étude peut être le point de départ d'un vaste débat entre régions voisines et régions ayant des intérêts communs.

72. L'autre élément qui justifie la présente étude est qu'elle met en lumière les implications spatiales des politiques sectorielles et, en particulier, celles de la Communauté européenne. Cela peut inciter à réaliser une étude en profondeur de l'impact régional de certaines politiques spécifiques et conduire à l'élaboration de politiques sectorielles prenant davantage en compte les besoins spécifiques des régions.

73. Un grand nombre de chapitres du présent rapport examinent les options politiques possibles en vue de limiter les perspectives négatives et d'encourager les perspectives positives. L'espoir est que la présente étude aidera les décideurs politiques à formuler des stratégies et à mettre en œuvre des programmes permettant de parvenir concrètement à un développement durable de toutes les zones de la région côtière septentrionale de la mer du Nord et de réduire les disparités non souhaitées.

74. L'analyse spatiale au niveau des régions transnationales devrait être un élément important de toute stratégie de développement. Des accords institutionnels appropriés devraient être conclus en vue de garantir la coordination des plans de développement spatial des différentes régions.

75. Une connaissance approfondie de la situation actuelle et des tendances qui se profilent est absolument nécessaire si l'on souhaite établir une analyse prospective fiable. Bien que la présente étude ait permis d'améliorer considérablement la connaissance de la situation actuelle et de l'avenir éventuel de la région côtière septentrionale de la mer du Nord, il subsiste néanmoins une multitude de thèmes inexplorés et de «zones grises», ce qui, à notre avis, justifie amplement une recherche complémentaire.

Domaines de recherche complémentaire

76. Exemples de domaines dans lesquels une recherche complémentaire est souhaitable:

— une analyse de l'impact régional de la réforme de la politique agricole commune sur les revenus, le paysage et les conditions socio-économiques;

— l'élaboration d'une stratégie en matière de tourisme pour le littoral de la mer du Nord aux Pays-Bas, en Allemagne et au Danemark basée sur une analyse de la capacité environnementale de chaque partie de la côte;

— pour la région trans-Manche: une analyse de la capacité de développement dans le sud-est de l'Angleterre et le proche continent (France, Belgique et Pays-Bas) dans le contexte du tunnel sous la Manche;

— pour la partie septentrionale du bassin de la mer du Nord: une analyse des liens entre l'Écosse et le bloc nordique en vue d'identifier les possibilités d'investissement permettant d'atténuer la périphéricité.

77. Le futur est incertain, il comporte également des risques en raison des tensions qui s'accumulent dans de nombreuses régions. Il existe un consensus croissant au sujet de la nécessité de nouvelles initiatives politiques radicales. Dans un tel monde, plein d'incertitudes et de risques, les politiques menées devraient être en permanence contrôlées et évaluées. À nos yeux, cela aussi justifie une recherche complémentaire.

Chapter 1: Introduction

Background

The way in which Europe's land space is used is a major determining factor in its future development. Hitherto physical and strategic planning has been carried out within national boundaries, but the gradual dismantling of frontiers and the need for coherent development of the Community's territory has meant that a wider frame of reference is required.

To encourage the emergence of transnational planning strategies the Commission has launched a series of research initiatives to look at planning issues at a European level in a regional context. A total of nine regional groupings, defined on the basis of geographical proximity, community of interest and developing mutual interrelationships have been delineated. The northern seaboard area is one of these.

The purpose of this study is to identify common issues facing the regions comprising the northern seaboard study area, to assess prospects for their development and to suggest policy measures that may be applied at Community, regional and national levels to help the regions to realize their full potential to achieve sustainable development. The study will thus provide a basis for a more coherent approach to the use of Community territory.

The northern seaboard region occupies an important position within Europe:

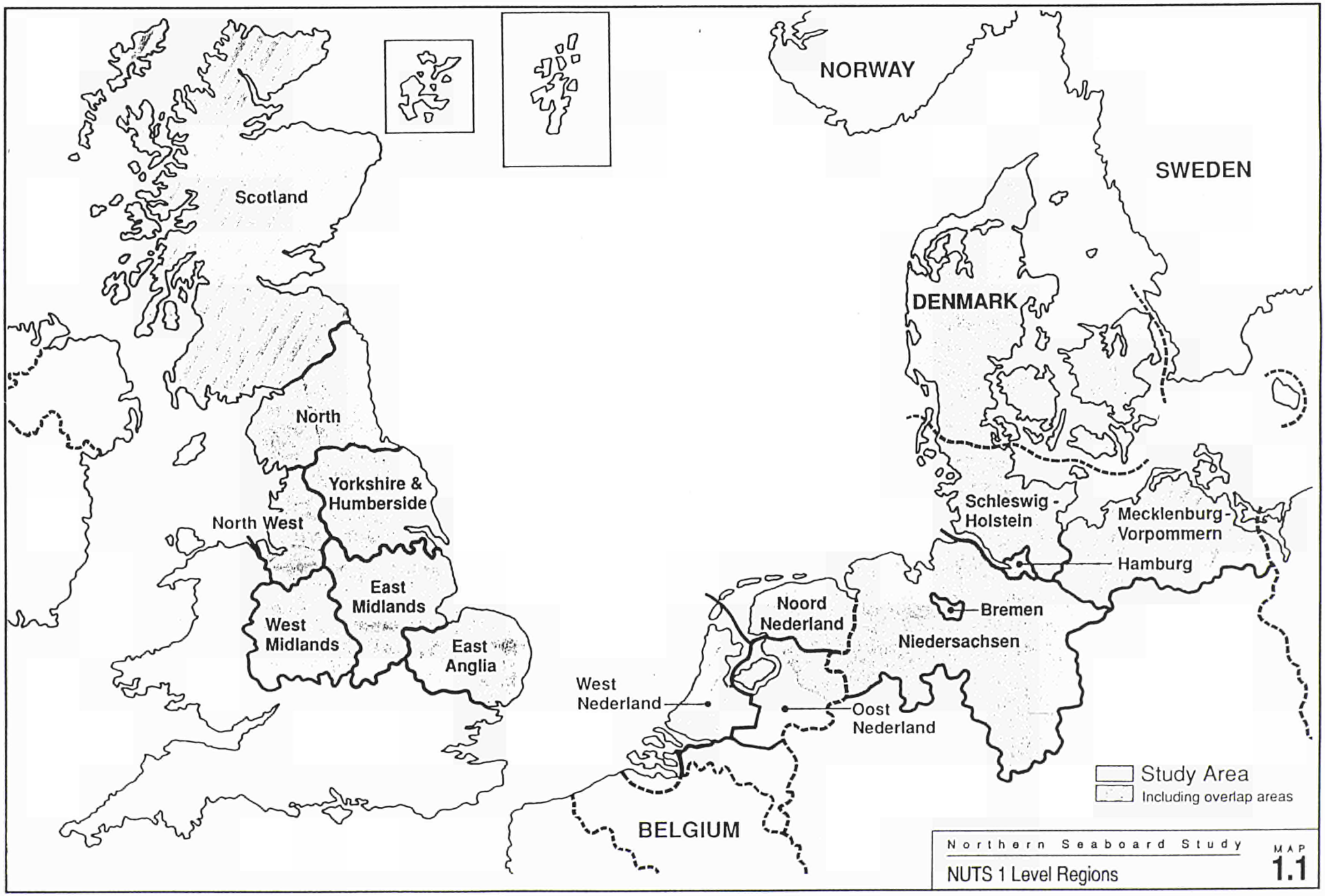
- the study area plays a major role as a bridge between the EC and the Nordic countries and as a main gateway to Eastern Europe;
- it is important to the EC as a source of primary energy, particularly gas and oil, and materially assists realization of the policy objective of diversifying both fuels and sources of supply;
- it accounts for a major part of EC output of both arable and livestock products;
- it is a major tourism source and destination.

In addition it is noteworthy that:

- the study area is of more importance economically to its smaller constituent members, the Netherlands and Denmark, than to either Germany or the UK which have a wider, more worldwide orientation;
- Germany is the economically dominant partner in the study area.

The North Sea, the unifying feature of the study area, plays a key role in the development of the regions which border it. It acts as a source of economic resources, as a waste dumping ground and as a transport highway. Conflicts between different elements of this multifaceted role epitomize the conflicting pressures facing the region as a whole.

The regions covered by the northern seaboard study area are presented in Table 1.1 which uses the nomenclature of territorial units for statistics (NUTS) established by the Statistical Office of the European Communities. This nomenclature is based primarily on the institutional divisions currently in force in the Member States and employs a three-level hierarchical classification of regions, NUTS 1, NUTS 2 and NUTS 3. Only the first two levels are used in this study. Map 1.1 shows the NUTS 1-level regions. Map 1.2 shows the Nuts 2-level


NORWAY
SWEDEN
DENMARK
Scotland
North
Yorkshire &
Humberside
North West
East
Midlands
West
Midlands
East
Anglia
Schleswig -
Holstein
Mecklenburg -
Vorpommern
Hamburg
Bremen
Noord
Nederland
Niedersachsen
West
Nederland
Oost
Nederland
BELGIUM
Study Area
Including overlap areas
Northern Seaboard Study
NUTS 1 Level Regions
MAP
1.1

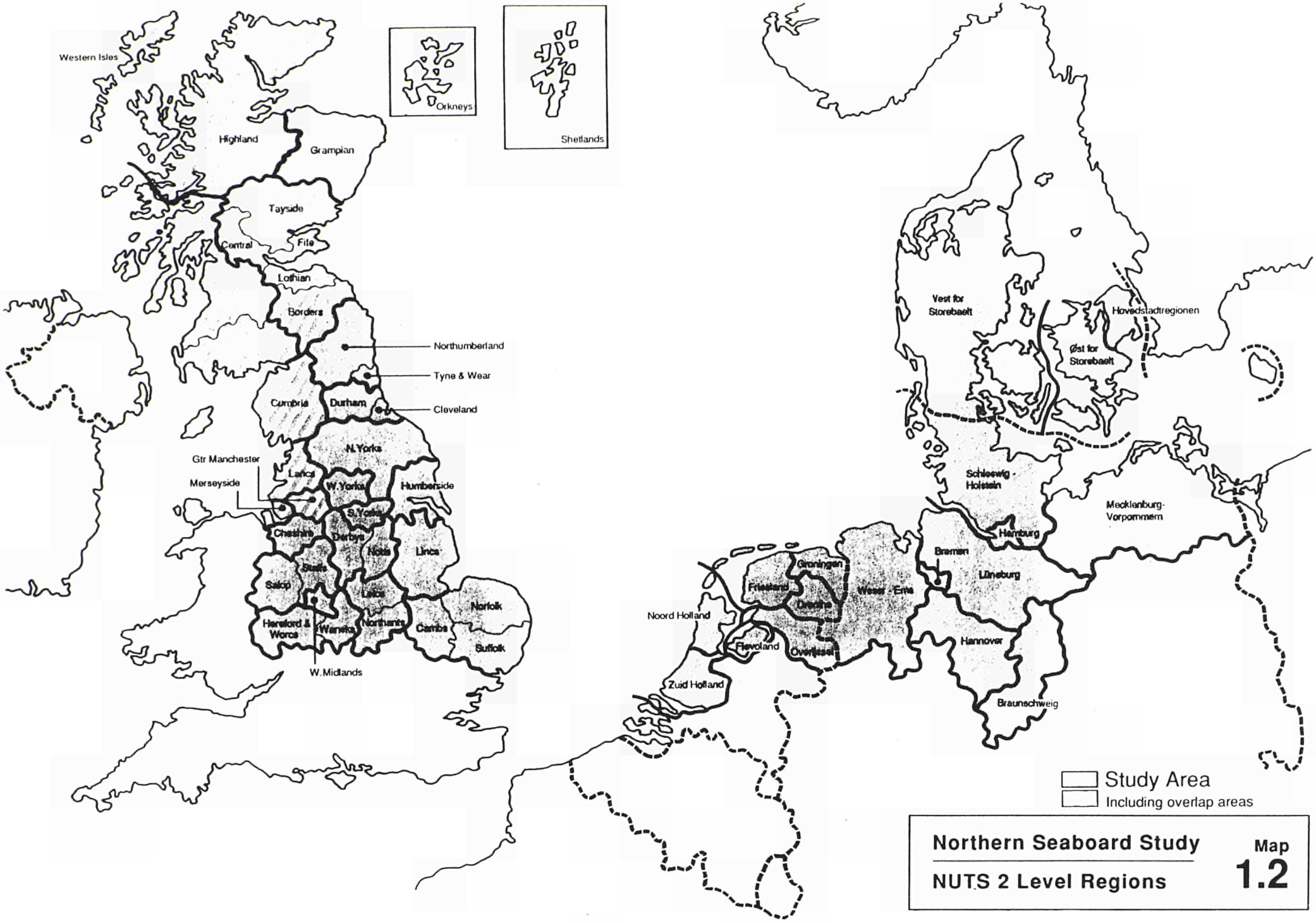

Western Isles
Orkneys
Shetlands
Highland
Grampian
Tayside
Central
Fife
Lothian
Borders
Northumberland
Tyne & Wear
Cleveland
Cumbria
Durham
N.Yorks
Gtr Manchester
Merseyside
Lancs
W.Yorks
Humberside
S.Yorks
Cheshire
Derbys
Notts
Lincs
Shrops
Staffs
Leics
Norfolk
Hereford & Worcs
Warwks
Northants
Cambs
Suffolk
W.Midlands
Vest for Storebælt
Hovedstadtregionen
Øst for Storebælt
Schleswig-Holstein
Mecklenburg-Vorpommern
Hamburg
Bremen
Lüneburg
Groningen
Friesland
Drenthe
Weser-Ems
Noord Holland
Flevoland
Overijssel
Hannover
Zuid Holland
Braunschweig
Study Area
Including overlap areas
Northern Seaboard Study
NUTS 2 Level Regions
Map
1.2

Table 1.1. NUTS 1 and NUTS 2 regions by country

Member State	NUTS 1 regions	NUTS 2 regions
Denmark (all)		Hovedstadsregionen Øst for Storebælt Vest for Storebælt
Germany (part)	Bremen	
	Hamburg	
	Mecklenburg-Western Pomerania	
	Lower Saxony	
		Braunschweig
		Hannover
		Lüneburg
		Weser-Ems
	Schleswig-Holstein	
The Netherlands (part)	North Netherlands	Groningen
		Friesland
		Drenthe
	West Netherlands* (part)	North Holland
		South Holland
	East Netherlands (part)	Overijssel
		Flevoland
United Kingdom (part)	North	Cleveland/Durham
		Cumbria
		Northumberland/Tyne and Wear
	Yorkshire and Humberside	Humberside
		North Yorkshire
		South Yorkshire
		West Yorkshire
	East Midlands	Derbyshire/Nottinghamshire
		Leicestershire/ Northamptonshire
		Lincolnshire
	East Anglia	Suffolk/Norfolk/ Cambridgeshire
	West Midlands	Hereford and Worcester/ Warwickshire
		Shropshire/Staffordshire
		West Midlands
	North West	Cheshire
		Greater Manchester
		Lancashire
		Merseyside
	Scotland* (part)	Borders/Lothian/ Central/Fife/Tayside
		Grampian
		Highlands/Islands (part)

NB: An asterisk indicates the regions with overlap with other Commission transnational studies.

regions. Map 1.3 shows the nine regional groupings defined by the European Commission for the transnational studies.

Unless mentioned otherwise (e.g. trade) all references to the countries (Germany, the UK, the Netherlands, Denmark) refer to those parts of these countries in the study area.

Study organization

The study was carried out by a consortium of companies under the leadership and coordination of Price Waterhouse. Figure 1.1 shows the study organization.

We assembled an experienced international team comprising two elements:

(i) A multinational core team of planners and sectoral experts with a European perspective and an in-depth understanding of the technical issues. The team included experts in:

- regional economics;
- regional planning;
- transport planning;
- environmental planning;
- industrial economics;
- fisheries economics;
- energy economics;
- telecommunications economics;
- tourism planning;
- demography.

(ii) Regional planning teams based in and familiar with each of the EC Member States concerned. These teams were responsible for preparing the regional analyses and have contributed to the development of the scenarios and thematic discussions. They were:

- COWIconsult in Denmark;
- ARSU in Germany;
- Haskoning in the Netherlands;
- Llewelyn-Davies and MDS-Transmodal in the United Kingdom.

Overview of the methodology

One important thrust of the study is to identify common themes across groups of regions and for the regions of the study area as a whole. This was based on a thorough understanding of issues and major developments at the level of the individual regions.

We achieved this by establishing a dialogue between the international core team of planners, economists and sectoral experts, and the teams of regional planners in each country. As the study progressed, the emphasis shifted from the regional teams to the core team.

We undertook the study in three phases, with a report at the end of each phase. Figure 1.2 shows an overview of the methodology.

Phase I – Current development status

The first phase aimed at providing an outline of the situation in the study area as it exists at present and identifying current trends contributing to that situation, including the basic information and framework for the subsequent phases of the study.

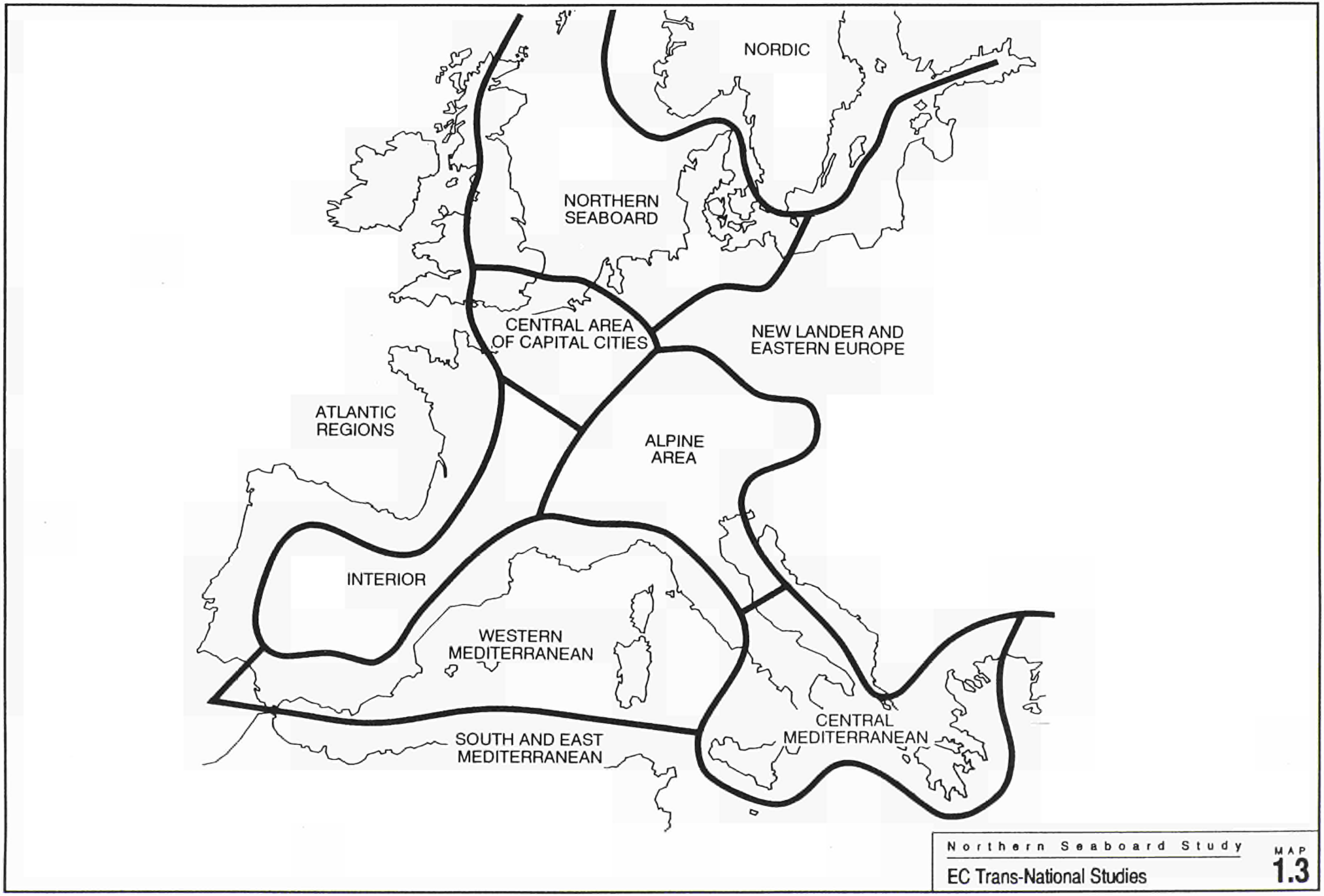
Our work in Phase I was at a macro level, essentially sectoral, and dealing with issues horizontally across the study area but illustrating these with regional examples. We chose this approach in preference to a series of descriptions of the regions as being a more fruitful analytical foundation for the subsequent scenario building.

The analysis of Phase I was synthesized for the northern seaboard as a whole and for groups of regions, in order to bring out interrelationships, comparisons and contrasts between the various regions, and to identify common constraints and opportunities for future development.

Phase II – Base scenarios

The main objective of Phase II was to provide a base scenario for the northern seaboard region, i.e. an assessment of the most likely development over the next decade, based on prevailing economic and social trends and policies in the different regions of the study area.

The focus shifted to the regional level and a baseline scenario was prepared for each region, where the local implications of the trends identified in Phase I were examined. Our approach to this phase was thus vertical and put the emphasis on individual regions of the study area, treating them as discrete geographical regions rather than as administrative units of different national systems. Indeed the study brief emphasized the need to



Northern Seaboard Study

EC Trans-National Studies

MAP 1.3

Figure 1.1 - Study organisation

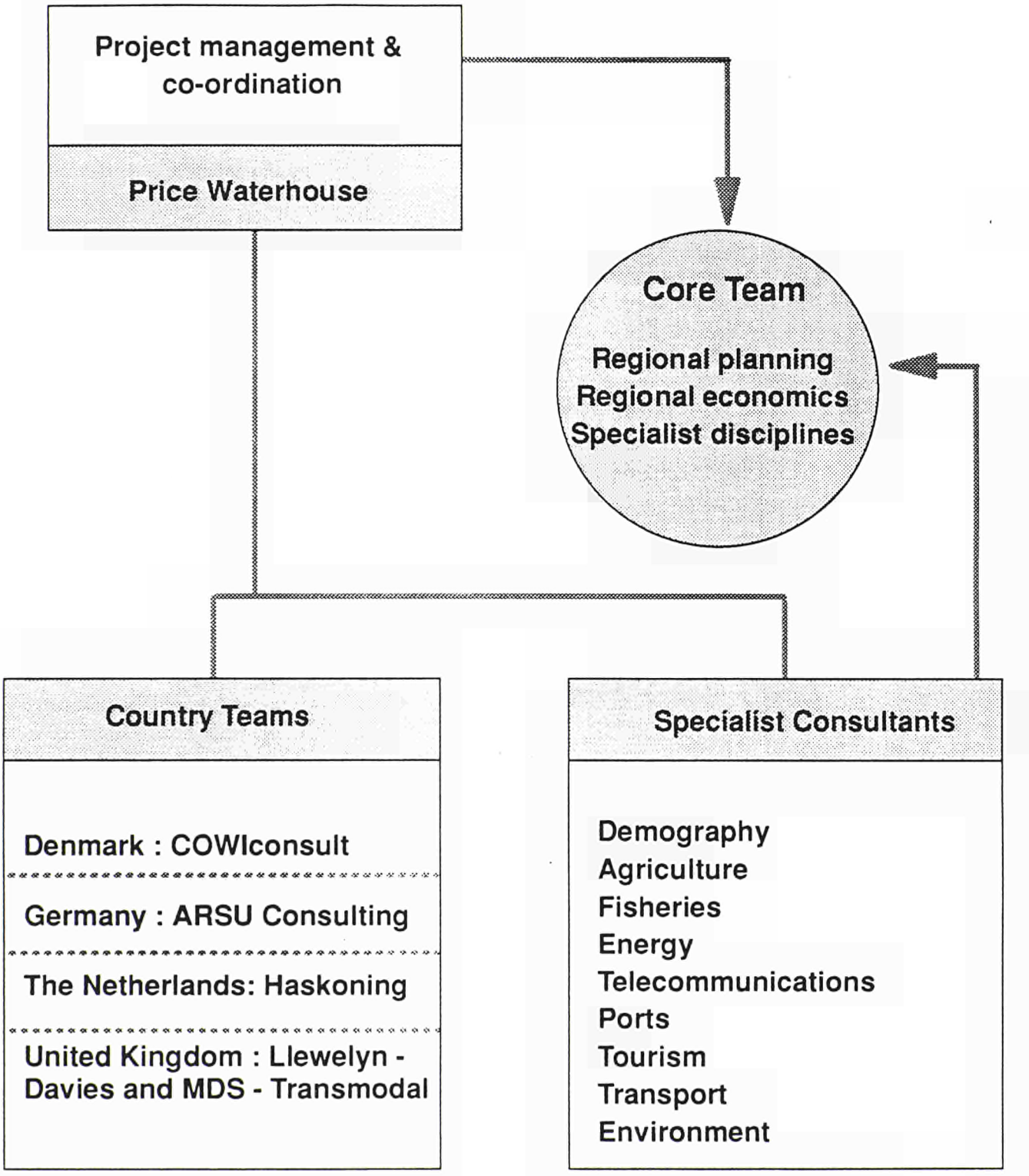
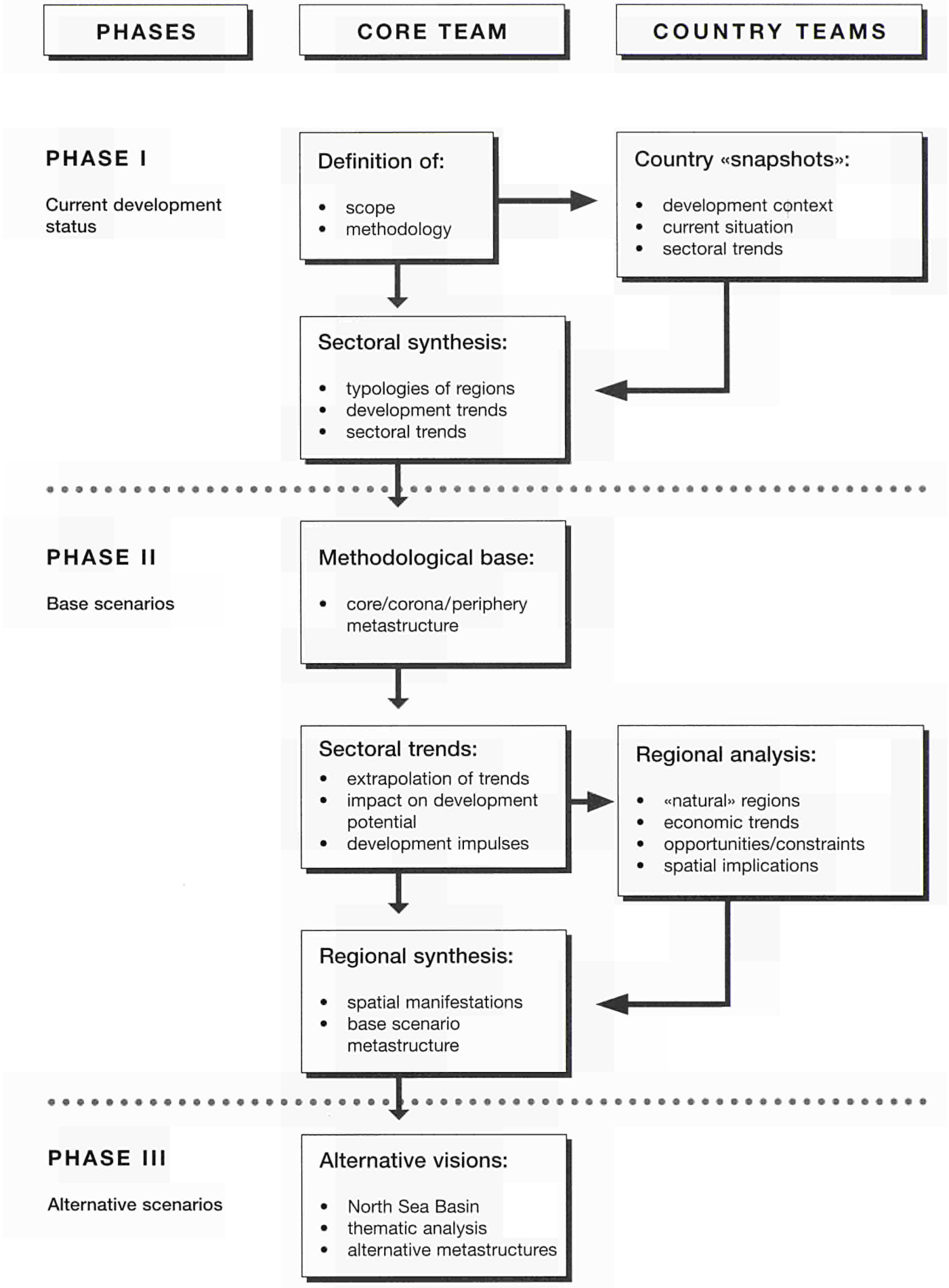


Figure 1.2 - Overview of the methodology



develop an intermediate frame of reference and move away from planning within administrative boundaries. We developed the idea of 'natural' or 'planning' regions and have used these as the basis for the development of our scenarios.

This regional focus helped us to analyse the interrelationships between the economic, social and physical aspects of development. It also provided a coherent picture of problems and trends in each region as seen by the regions themselves.

A synthesis was made of the individual regional discussions to present a picture, for the study area as a whole, of the situation we think will most likely exist at the turn of the century. An important part of this synthesis was the introduction of a concept of a core-corona-periphery metastructure which places the study area in the wider European context and provides a convenient summary of the current spatial development pattern and potential.

Our nominal planning horizon is the next decade, say the year 2000, although this should not be interpreted too strictly. We are concerned to describe the likely situation at the beginning of the next millennium not at some specific date in the future. Thus the year 2000 is used as a shorthand and references to it should be interpreted flexibly.

The base scenario is predicated upon a continuation of existing socioeconomic trends, but it is not merely a trend scenario. It attempts to accommodate the impact of various events, policies and projects such as reform of the common agriculture policy (CAP) and common fisheries policy (CFP) and construction of the Great Belt fixed link that are likely to be implemented over the next decade.

Our reading of these events, as regards, for example timing and likely impact, is necessarily speculative, and with hindsight, could well prove inaccurate. Even so, given their potential to influence spatial development, a view needed to be taken and incorporated in our scenario.

The results of Phase II were included in a second interim report, which we submitted in December 1992. This report included:

- our assessment of likely developments in each sector;
- base scenarios for each of the regions;
- a regional synthesis.

Phase III – Alternative scenarios

Our base scenario represents our considered view of the most likely outcome of development over the next 10 years or so. While of interest in its own right its purpose is to act as a point of reference for alternative development scenarios. Comparison of the scenarios will provide a basis for recommendations intended to inform and enhance regional policies, promote better balanced regional development and encourage a more internationally minded approach to regional planning.

The methodology for this last phase was discussed during several internal workshops and discussions with DG XVI. The discussion centred on the practicality of generating a series of discrete alternatives, 'scenario A emphasis X, scenario B emphasis Y...' etc. The difficulty with such an approach is the presumption that the broad scope of the study, the generalized level of detail and the relatively short time scale would allow the identification of comprehensive scenarios which are in the realm of probability. DG XVI asked that we concentrate on alternatives within the limits of 'reasonable' probability.

It was agreed that we should focus on a thematic analysis, i.e. an examination of the possibility/ probability and implications of deviation away from the base scenario for a number of key themes or elements of spatial development. This involved:

- an investigation of the possible extent of deviations away from the base scenario;
- a review of the spatial implications of such deviations;
- an analysis of the scope for mitigation of negative prospects and promotion of positive prospects.

The following themes were selected:

- the resources of the North Sea;
- the environment;
- maritime transport;
- land transport;
- rural land use change;
- economic growth.

The analysis of Phase III was finalized by the core team after extensive discussion – including country workshops – with the regional teams and sectoral experts.

It must be stressed that we were specifically asked not to prepare policy recommendations; we were dealing

with policy analysis. Our approach was not 'goal driven' – that is we did not attempt to derive a coherent set of policies aimed at achieving a specified pattern of spatial development. Rather, our focus was the scope for variation in each area of policy and the spatial implications of some policy alternatives. Attention was focused on the trends and elements that can be influenced by policy, not on the possible impacts of uncertain external events.

It is the Commission's intention that this analysis will provide an input into a dialogue with the regional and national authorities, and subsequent policy formulation at those levels.

The remainder of this report comprises three parts which correspond to the three phases of the study. It is set out as follows:

(i) Part I – 'Present situation and trends' – summarizes the key features of the study area as it exists at present ('present situation') and then identifies the main factors and trends underlying the current development pattern. Our objective in Part I is to provide a foundation for the construction of the base scenario, and a convenient framework for comparing and contrasting the regions of the study area. Chapter 2 and Chapter 3 give a brief overview of the present situation and of the trends and changes expected over the next decade. Chapter 2 presents a number of major changes in the international environment which will have significant and widespread implications. This chapter also deals with four aspects of the socioeconomic and physical development context: demography, economic activity (including trade), urban settlement pattern and the environment. Chapter 3 presents the present situation, and identifies the trends for eight economic sectors. In Chapter 4 we sum up the main factors which will shape the future development of the northern seaboard, and give a first assessment of the spatial implications of the sectoral trends. We also identify a number of policy issues.

(ii) Part II – 'Regional analysis: Base development scenarios' – sets out the base scenario. Chapter 5 presents two typologies of the regions of the study area. The first typology is based on the official NUTS nomenclature; the second one, original to this study, identifies 'natural regions'. Chapter 6 presents our vision of the most likely pattern of development in each region over the next decade. Chapter 7 provides a regional synthesis based on the key findings of our sectoral and regional analyses. Chapter 7 also introduces our concept of the core-corona-periphery metastructure, and uses it to summarize the spatial implications of the base scenario for the study area as a whole.

(iii) Part III – 'Alternative development scenarios' – presents our analysis of possible variations from the base scenario. In Chapter 8 we discuss the scope for variation within each policy area, and highlight the spatial implications of these variations. In Chapter 9 we adopt an integrated approach of the prospective alternative developments of the northern seaboard. Chapter 10 gives our concluding remarks.

Part I – Present situation and trends

Part I summarizes the key features of the study area as it exists at present, and identifies the main factors and trends underlying the current development pattern.

We cover 12 policy areas, or themes. Chapter 2 presents a number of major changes in the international environment which will have significant and widespread implications: the unification of Germany, the liberalization of East and Central European countries, the enlargement of the European Community and the completion of the single market. In this chapter we then give an overview of the development context. It deals with four aspects of the socioeconomic and physical development context: demography, economic activity (including trade), urban settlement pattern and the environment.

Chapter 3 presents eight economic sectors: manufacturing and services, agriculture, fishing, tourism, transport, ports, telecommunications and energy.

Each section has a similar structure: we give an overview of the present situation, followed by a discussion of the key sectoral trends. We identify the most significant trends which will shape the future of the study area as a whole over the next decade. The identified trends will have both positive and negative impacts on development potential in different areas, the net effect being the outcome of specific local circumstances. Appropriate policy responses may thus differ from one region to another and from one sector to another. It is however important to take common regional characteristics and possible synergies into account.

In Chapter 4 we sum up the main factors which will shape the future development of the northern seaboard, and discuss some of the spatial implications drawn from the sectoral analysis. We also identify the most important issues to be addressed by policy.

Our objective in Part I is to provide a foundation for the construction of our base scenarios, and a convenient framework for comparing and contrasting the regions within the study area.

Unless mentioned otherwise (e.g. trade) all references to the countries (Germany, the UK, the Netherlands, Denmark) refer to those parts of these countries in the study area.

Chapter 2: Development context

Chapter 2 deals with the socioeconomic and physical context within which regional development occurs. We discuss this context under five headings:

- changes in the international environment;
- economic activity;
- demography;
- urban settlement pattern;
- the environment.

Changes in the international environment

In this section we identify and describe four major changes in the international environment which have, and will have far-reaching effects on the northern seaboard region. These are:

- German unification;
- political and economic liberalization in Central and Eastern Europe;
- enlargement of the European Community, in particular to the Nordic regions;
- completion of the single market.

German unification

German unification will have far-reaching implications for the future development of the study area. Some of these effects are already observed.

There have been substantial job losses in the region of Mecklenburg-Western Pomerania since unification in both the agricultural and manufacturing sectors which has encouraged commuting flows into west Germany for work. The region has a more youthful age structure than that in the other German regions in the study area and a relatively larger labour force and this could therefore encourage a more permanent outflow in the form of migration. As residents of the former GDR territory are now EC citizens, with the same rights to work and residence anywhere in the EC as their west German neighbours, such migration could just as well be to other States as to west Germany.

The farm structure in east Germany is radically different from that in the rest of northern Europe, based as it was on a system of large collective farms. With access to capital, improved inputs, modern farming systems and better management, which unification now permits, these farms will have the potential over the next decade to substantially alter the competitive balance between farms and regions in the northern seaboard area. A similar situation may arise in the manufacturing sector.

Modernization of the east German economy and the development of infrastructure links to integrate the two parts of the unified State will demand substantial capital investment. To the extent that this is provided from domestic German sources, rather than from foreign loans or private foreign investment, funds available for investment in west Germany will be reduced; local firms might then be unable to modernize or expand. Additionally, shortages of capital could push up interest rates, so increasing costs, and exert upward pressures on the German currency, so decreasing the international competitiveness of German exports.

Liberalization in Central and Eastern Europe

Another development that will profoundly affect the study area is the opening up of Central and Eastern Europe. Some major effects are described below.

Economic development in Central and Eastern Europe will generate trading opportunities for study area firms in the supply of goods, services and technical know-how. It will also bring increased competition in world markets, and in EC markets too, depending upon the extent to which the EC allows or is constrained to allow (e.g. by the GATT negotiations) Central and East European producers more liberal access to their domestic markets. Any increase in agricultural imports from Central and East European sources could impact especially on northern seaboard countries and jeopardize the viability of farms in a number of regions, at the same time as CAP reform would be putting them under pressure.

Transit traffic through Germany to access European markets and, through north European ports, overseas markets too, is likely to increase dramatically, especially after the new infrastructure links between east and west Germany have been completed.

Increased migrant flows from Central and East European countries into the western regions of Germany, and spilling over into other regions of the study area, are possible unless restrictive policies are introduced.

Enlargement of the European Community

The enlargement of the Community is a powerful force for change that will impact upon the study area. One aspect that has not been addressed elsewhere and merits comment is how the changing geography of the Community is affecting peripherality. Denmark was, and still is, a peripheral region relative to the core regions of the Community, but this situation will change if and when Norway and Sweden join, and particularly when transport infrastructure improvements such as the fixed-link connections to Sweden and the proposed high-speed rail passenger network are in place in Denmark. Denmark will then play an important role as a bridge linking Scandinavia to the heartland of the EC.

In contrast, the UK and especially its northern regions will become increasingly peripheral as the centre of gravity of the EC shifts further to the east. These regions are poorly connected with the rest of the Community. Scotland and the northern regions of the UK are poorly endowed with motorways; there is no motorway link across the border between England and Scotland; direct international air connections are few with most having to be made through London, and there are no ferry services to the near continent offered further north than Teesside.

The concept of peripherality has a clear political dimension, reflecting the nature of central government and the physical shape of the country. Denmark and Ireland are possibly more peripheral to the core regions in terms of geographic disadvantage than many parts of the United Kingdom. However their governments are able to present an uninhibited case for investment to overcome structural disadvantages.

The British case on peripherality is 'weakened' by the fact that the south-east of England forms part of the central core, and other regions, notably the Midlands, benefit from their proximity to the south-east. The non-interventionist tendency of the present government means that the peripheral areas such as Scotland, do not benefit from the firm advocacy in central government that they might get under different political circumstances.

The single market

The advent of the single market has a number of possible implications for the study area including:

- the loss of jobs as national markets are exposed to more intense competition from other parts of the Community;
- increased trading opportunities for those firms which are innovative and competitive;
- a growth in the size of firms and their increasing internationalization as they attempt to enhance market share either by internal expansion or by merger and acquisition: the rate of mergers and acquisitions has more than doubled since 1985;
- a concentration of production facilities in fewer locations to achieve economies of scale except where particular national tastes, consumer preferences or transport cost considerations make a local production centre necessary or advisable;
- a change in the map of optimum warehouse and depot locations and distribution networks;
- a consequent concentration of economic power in the stronger regions, which could well be outside the study area.

Economic activity

Present situation

Structure of employment

The pattern of employment varies quite widely across the study area. Map 2.1 summarizes this variation.

The agricultural sector's share in total employment varies from less than 1% (Bremen) to 11.2% (Flevoland, the Netherlands) as compared with the EC average of 7.6%. In general agriculture is relatively less important as a source of employment in the study area than in the EC as a whole, for in only four regions (Lüneburg 10.2%, Weser-Ems 9.7%, both in Germany, and Flevoland, 11.2% and Drenthe 8.4%, both in the Netherlands) is its share greater than the EC average.

Agriculture in the study-area regions is also less important than in the respective countries as a whole. Thus the national average in the UK was exceeded only in East Anglia, the Scottish regions and the West Midlands. In Germany, only in Schleswig-Holstein, in addition to Lüneburg and Weser-Ems, was agriculture's share in total employment greater than the national average of 4.5%. In the Netherlands the national average (4.9%) was exceeded only in Friesland, as well as Flevoland and Drenthe.

Manufacturing employment's share in total employment varied from 20.9% (North Holland) to 45.8% (Braunschweig). The sector's importance tends to be greater in the UK regions than elsewhere in the study area. Five of the seven NUTS 1 regions in the UK have shares greater than both the EC and national average (33.2 and 32.8% respectively). These are the East Midlands, West Midlands, Yorkshire and Humberside northern region and the North West.

In three of the German regions manufacturing's share was greater than that for the EC as a whole. There were Weser-Ems, Hannover and Braunschweig. But only in the last named region was it also greater than the national average of 40.5%.

In the Netherlands, manufacturing is of greater relative importance in the four north-eastern provinces of Groningen, Friesland, Drenthe and Overijssel, than in the other Dutch regions of the study area. Manufacturing's share there was greater than the national figure of 26.5%. In Overijssel its share was also equal to the EC average. The Danish average of 27.1% was less than that for the EC.

Service employment is of greater relative importance in the study area than the EC as a whole, with the EC average of 59.2% being exceeded in six out of the seven German regions, all of the Dutch regions, and five of the seven NUTS 1 regions in the UK. The Danish average was also greater than that of the EC.

In Germany as a whole, service employment is 58% of total employment, so the study-area regions are more dependent upon this sector compared with the rest of the country. Bremen and Hamburg, with service employment accounting for two thirds or more of total employment, are particularly dependent on the sector.

In contrast service employment in the Dutch regions of the study area is less important than in other parts of the Netherlands, for only in the two overlap areas of North and South Holland does the sector's share of total employment exceed the national average.

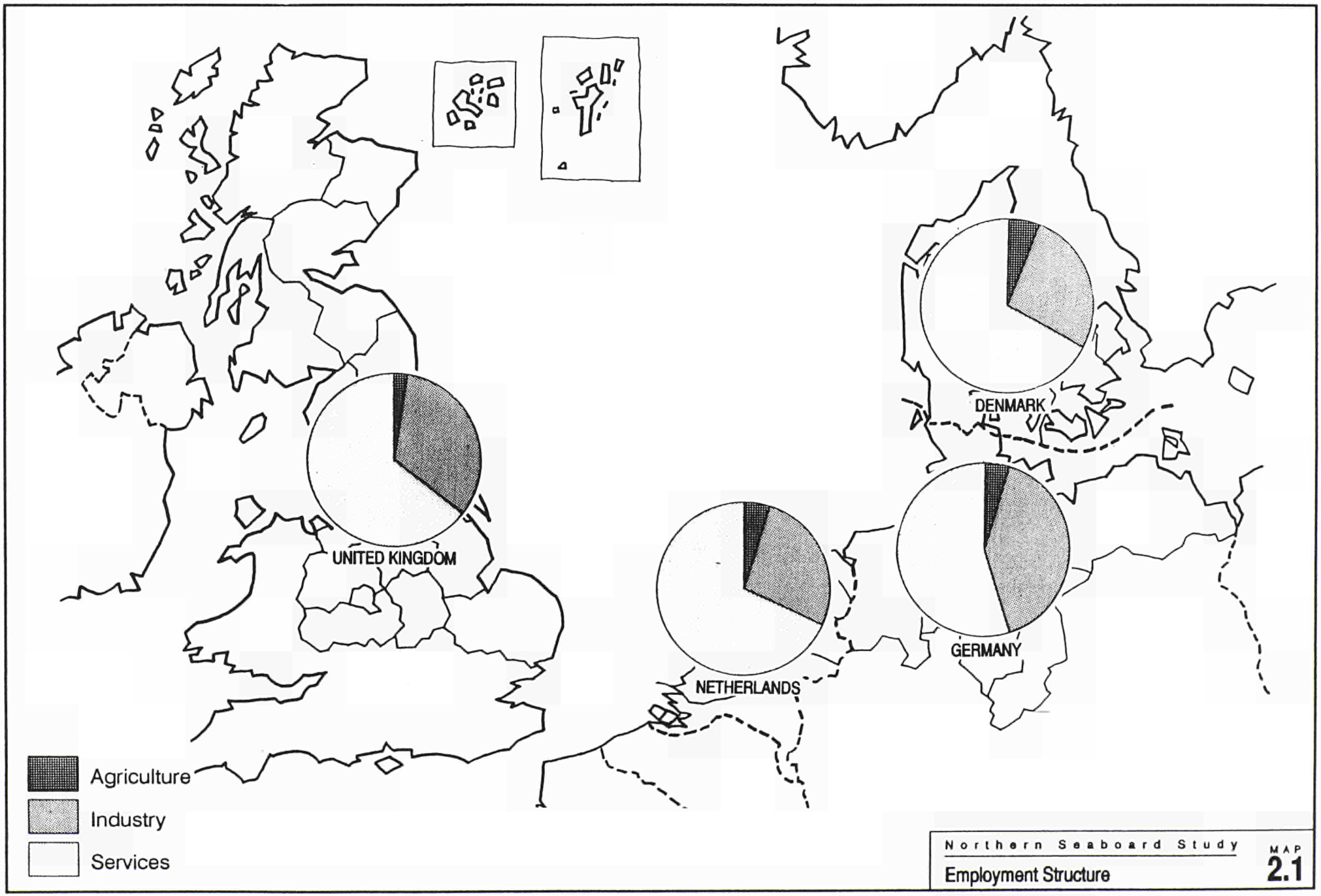
Similarly, employment in services in the UK regions is less important than in the UK as a whole, reflecting the concentration of service employment in London and the south-east, just as in the Netherlands this sector tends to concentrate in the Randstad.

Trade flows

Trade flows probably constitute the major interaction between different parts of the study area and between the study area and the outside world. As international trade data do not distinguish inland origins and destinations it is not possible to define flows at the regional level: what follows therefore relates to the national picture.

Trade with the rest of the EC

In the case of all four countries of the northern seaboard regions, trade with other EC members accounts for some 50% or more of both exports and imports. The Netherlands is the most EC-oriented as far as exports are concerned with some 80% by value of its exports in 1989 going to fellow Community members. The UK had the smallest proportion of exports destined for the EC (less than 50%): for Germany and Denmark the proportion was just over 50%. Imports displayed a similar pattern except that the EC orientation of the Netherlands, at under 60% of total imports, was less marked than in the case of exports. The proportions for the other three



Northern Seaboard Study

Employment Structure

MAP 2.1

countries were just over 50% with the UK's being again the lowest.

Intraregional trade

A high proportion of the area's trade with other EC members is with other countries of the northern seaboard, but the strength of this orientation varies markedly. Of the four northern seaboard countries, Denmark's exports were most oriented towards the study area with nearly 70% of its exports to the EC going to this region. For Germany and the UK this proportion was 36 and 39% respectively. The Dutch figure was 52%.

There was a similar pattern in the case of imports with over 70% of Denmark's EC exports going to its study-area neighbours. Germany again had the lowest proportion, under 40%; the relevant UK figure was just under 50% and that for the Netherlands 54%.

Looking now at trade flows between pairs of northern seaboard countries, Germany was the principal trading partner for each of the other three countries. It took over 50% of Danish exports and supplied over 60% of Danish imports; in the case of the Netherlands the proportions were around 66 and 74% respectively. Danish exports to the UK were only 70% of those to Germany, Dutch exports to the UK less than one half of those to Germany. For both countries imports from the UK are less than one third of the German levels.

Germany was also the UK's principal trading partner accounting for around two thirds of both imports and exports traded by the UK with study area partners.

The UK accounted for almost 50% of German exports to the study area and a further 40% were taken by the Netherlands. As far as German imports were concerned, the Netherlands was the main supplier with approaching 60% of the total. The UK supplied around one third of the total.

Structure of exports

For each country the pattern of exports to its three trading partners in the study area was similar. In the case of Denmark food was the main export category reflecting both its intensive livestock and fish-processing industries; it accounted for 35% of all Danish exports to the UK, 23% to Germany and 18% to the Netherlands. Machinery and transport equipment were the largest export items to the Netherlands (30%) and accounted for around 20% of exports to the UK and Germany. Manufactures figured prominently in trade with all three partners and chemicals were important among exports to the Netherlands.

Dutch exports showed a similar pattern. Food exports figured prominently: food was the largest export item to Germany. Machinery and transport were the principal export categories to Denmark and the UK, accounting for 25 to 30% of all Dutch exports to these destinations. Manufactures and chemicals each provided around 15% of Dutch exports to all three trading partners. There were significant exports of fuel to Germany.

UK exports comprised machinery and transport equipment, the biggest category to all three partners (40% of exports to Germany, 36% to the Netherlands and Denmark), manufactures and chemicals which together accounted for 40% of exports to Denmark and around 30% to the Netherlands. Exports of fuels were 10% of total exports to both Germany and the Netherlands.

The pattern of German exports was similar to that of the UK with machinery and transport equipment the biggest single category of exports to all three partners (over 50% of exports to the UK, nearly 40% to Denmark and around one third of exports to the Netherlands). Manufactures were the second most important category followed by chemicals. There were significant exports of food to Denmark and the Netherlands and of beverages to Denmark, both a function of the country's cereal output.

Trends

In the study area as a whole the primary sector accounts for 4%, manufacturing 33% and services 63% of total employment, with wide variations from region to region. By the year 2000 the primary sector share will have declined, because of shrinking employment in agriculture and fisheries, that of the manufacturing sector will be more or less around its present levels and that of the services sector will have risen.

An increasingly competitive environment

The manufacturing and services sectors have been undergoing radical transformation in recent years in response to a variety of pressures. These will continue to influence the pace and direction of industrial development in the study area over the next decade.

The business environment is becoming much more competitive. A major factor in this has been the deregu-

lation and privatization of State-owned enterprises, pioneered in the UK but taken up by other countries. This trend will continue to operate. New competitive pressures will arise from a variety of sources including the completion of the single European market, enlargement of the Community, the opening up of Eastern Europe and its increased market orientation and tougher national and Community policies in subsidies, competition, procurement and mergers.

Business is also becoming more international. Foreign direct investment in the EC rose from ECU 16 813 million in 1985 to ECU 41 166 million in 1989. In the latter year northern seaboard countries received 63% of the total, of which 71% went to the UK.

Data on mergers and acquisitions confirm this trend towards a greater internationalization of business. Up to the late 1980s most merger and acquisition activity was national, but the late 1980s were characterized by an unprecedented increase in the number of cross-border deals. In 1989 some 1150 major acquisitions of EC companies were made, of which around 20% were UK companies, making the UK the most favoured target nation. On the other hand, UK companies were the most acquisitive and accounted for over one third of all acquisitions made by EC countries of EC companies.

To compete internationally enterprises must become more competitive not only on price but on quality, design, delivery, customer service, etc. This need will provide the impulse for a range of other changes through which enterprises will try to accommodate the increasingly competitive environment.

Technological development

Technological development will become increasingly important not only to improve the goods and services produced but also the means of producing them and delivering them to consumers. Advances in computers and telecommunications are major forces for change currently, but new areas, such as new materials and genetic engineering, may have a similar impact in the future.

Organizational changes

Technical developments, particularly in IT and telecommunications, and new management philosophies are giving rise to changes in organizational structures. These are manifested in less rigid management hierarchies, greater devolution of management responsibilities and accountabilities, hiving off of non-core activities, relocation of non-essential activities to more remote locations, etc. and reflect business's efforts to make itself leaner, more efficient and more responsive to the market-place.

As a consequence of technological and organizational changes and improvements in transport networks, enterprises are becoming more footloose and less tied to specific locations. Locational decisions are increasingly based on personal non-business considerations such as the availability of pleasant working environments, easy travel-to-work journeys, etc.

Labour supply

The labour force in the study area will stabilize or contract over the next decade, with the exception of the Netherlands. Male activity rates will fall in all countries and female rates rise, except in Denmark. There will be a significant ageing of the labour force.

This evolution of the labour supply has three implications:

(i) pressure will be placed on employers to seek higher productivity from their workers (investment in labour-saving equipment, in-service training, recruitment of more skilled operators, etc.);
(ii) they may need to persuade staff to stay on beyond retirement age and to encourage women who gave up work on marriage back into employment (provision of crèches, flexible and part-time working, etc.);
(iii) there will be a more general need for a better trained, more skilled, more flexible workforce (improved basic education, provision of further education and training, provision of better opportunities for updating and learning new skills throughout working life).

Environmental concerns

There will be growing public concern over the environment which will increasingly be reflected in stricter controls on industry. This will create pressures e.g. to develop clean technologies, reduce/recycle/recover wastes, develop products capable of disassembly and reuse when their useful lives have come to an end. These pressures will impinge on competitiveness, viability, and location of enterprises. However the trend to pollution control could also generate many opportunities for enterprises concerned with the development of products and services to help clean up the environment.

Demography

Present situation

The northern seaboard study area is mainly densely settled lowland, with the exception of the hill and mountain districts of northern Britain and Scotland and the Harz mountains area lying in the south-east sector of the German portion of the study area.

Population levels and densities

It is estimated (beginning of 1990) that just under 55 million people live in the study area, comprising around 16% of the EC total. The UK regions account for 52% of the 55 million; 26% live in the German regions with the Dutch and Danish regions providing 13 and 9% of the total respectively.

The study area shows great contrasts in population density. At one extreme lie a number of densely populated metropolitan regions, mostly in the UK and Germany. At the other extreme are sparsely populated upland areas. Map 2.2 illustrates this pattern.

Population growth

The population in the study area as a whole is growing very slowly, although this average conceals wide variations. Over the period 1980-90 it grew by only 0.8% as compared to 2.9% for the EC. The Dutch regions grew by 5.7%, the Danish by only 0.3%. The UK and German regions grew by 1.9 and 1.5% respectively. Map 2.3 shows the pattern of growth for NUTS 1 regions.

Growth rates have tended to decline over the past 30 years; in the 1960s they were more than double those experienced in the 1980s. This decline has been particularly rapid for Denmark.

The seven fastest-growing NUTS 2 regions, with growth in excess of 5% over the period 1980-90, were located in the UK. These mostly comprised regions with quite small populations in 1980 e.g. North Yorkshire 0.67 million, Lincolnshire 0.55 million. The fastest growing was East Anglia. Four of the Dutch regions appeared in the eight next fastest-growing regions. The UK also accounted for 13 of the 21 regions showing positive growth.

The UK had eight and Germany six of the 16 regions exhibiting population decline over this period. These tended to be regions containing large urban centres (e.g. Merseyside, Bremen). This combination of population decline in large urban regions and growth in low population regions accounted for the modest overall growth in the UK regions as a whole.

Natural increase

Population growth is the outcome of natural increase and migration. Growth in the four study-area countries has been determined for most of the past decade by the levels of natural increase. This has been highest in the Netherlands and lowest in Germany. Regional variations in natural increase reflect in large measure the differing age structures. The regions with the largest population of the elderly had the highest crude death rates and lowest natural increase rates. In Germany, these tended to be the large cities whereas in the UK they were the retirement regions.

The chief contributor to this trend of slow and declining growth rates has been the decline in fertility rates, provoked by the increasing participation of women in the labour force, which has led to postponement of births, and smaller families.

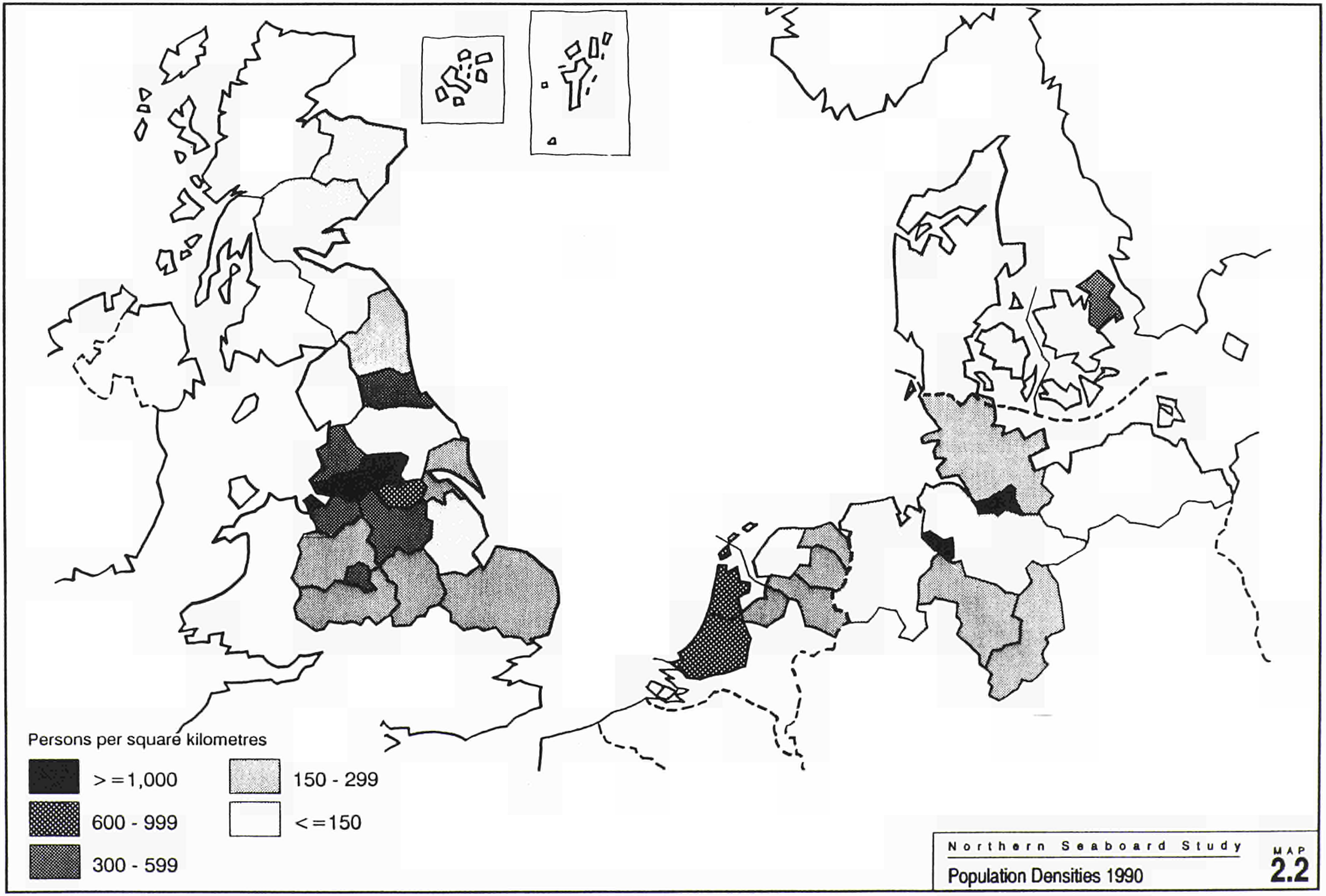
Fertility rates are lowest in Germany, highest in the UK but in all four countries of the study area, rates are below the replacement fertility rate. The corollary of Germany having the lowest fertility rates is that it has the lowest dependency ratios in the study area (the numbers of children and the elderly expressed as a percentage of those of working age).

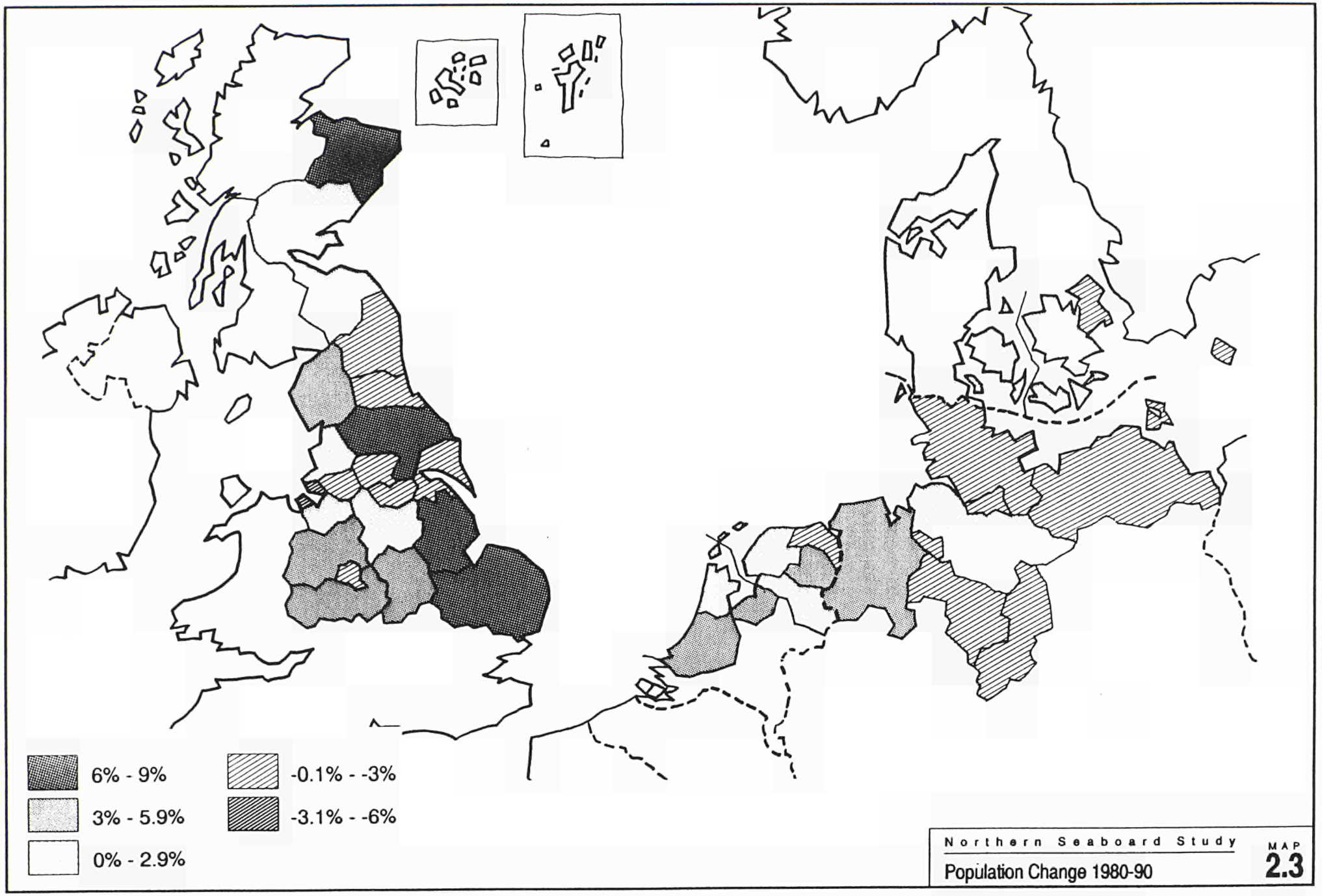
This decline in fertility rates has been partly offset by higher numbers of women in the child-bearing age groups and by improvement in mortality rates, particularly among the elderly as a result of better health care and healthier lifestyles. Despite this, natural increase rates have tended to level out. The rate is now negative in Germany and close to zero in Denmark.

Migration

The other component of growth is migration. International migration began to make a contribution to population growth in the study area in the late 1970s. This was significant in Germany and explains why despite having the lowest rate of natural increase of the four countries it had the second highest growth rate in the period 1980-90, after the Netherlands.

There were modest net gains from international migration in all countries of the study area. In the UK these


Persons per square kilometres
>=1,000
600 - 999
300 - 599
150 - 299
<=150
Northern Seaboard Study
Population Densities 1990
MAP
2.2



Northern Seaboard Study

Population Change 1980-90

MAP 2.3

were mostly felt outside the study area in the South-East. International migration was concentrated in the largest cities.

At the regional level internal migration is a more important influence on population redistribution. Three types of internal migration have been identified.

(i) The growth of commuter settlements outside but with good transport links to large urban work centres to which city residents migrate while continuing to work in the city. Examples of this phenomenon can be found in all four countries of the study area, for example Bremen and Hamburg; Copenhagen; Leeds, Merseyside and Manchester.
(ii) Migrant flows associated with employment decentralization. Small and medium-sized towns in rural locations have been perceived as offering a better business environment than large city centres and have attracted company relocations and new businesses. The growth of Cambridge, Peterborough and Norwich in the UK and of Odense and Aarhus in Denmark are examples.
(iii) Retirement migration; with residence no longer determined by place of work, many of the retired relocate to coastal or inland areas offering a more favourable living environment. In the UK this process has contributed to growth in certain districts in North Yorkshire and East Anglia among others. In the Netherlands, Drenthe has attracted retired immigrants.

Patterns of growth

The study area has seen significant population redistribution over the past 20 years, and all four countries include regions that have gained people and those that have lost them. In Denmark natural increase rates have fallen as a result of falling fertility rates and are now around zero. Although there has been net migration into the study area this has been on a small scale, unlike that into Germany. As a result of these two trends population growth has been the slowest of the four national sectors of the study area. However, there has been substantial internal migration principally from Copenhagen to the outer fringes of the capital city region and to medium and small towns in Jutland.

Despite substantial international in-migration the populations of urban regions in Germany have fallen as a result of net internal out-migration (principally to neighbouring localities and associated with the development of commuter towns) and negative natural increase rates due to elderly age structures. There has been a general trend towards population decrease in the eastern regions and population increase in the western ones.

International immigration may well impose considerable pressure on German resources over the coming years. Germany has long attracted migrants from Mediterranean countries both within the EC (Italy, Spain, Greece, Portugal) and without (Turkey). With unification migration from the old GDR territories is likely to be significant. The liberalization and Western orientation of East European States may well provoke immigrant flows from these sources too. The new Germany, located in the middle of Europe, and with a long land frontier with Poland and the former Czechoslovakia is a natural target for immigrants. Such is the concern on this issue that legislation to regulate immigration from Eastern Europe is now subject to serious discussion.

The high Dutch growth rate is in large measure a reflection of development in the new region of Flevoland which has attracted considerable in-migration, principally from other regions of the country, and particularly from the Randstad area. As immigrants have been mainly younger people the region has a significantly higher birth rate and lower death rate than other Dutch regions. In contrast there has been considerable net outflow from Groningen and Friesland offset by some retirement inflow to Drenthe, again mainly to and from other Dutch locations. International immigrant flows are relatively unimportant but contributed to the growth of urban centres in North and South Holland. The age structure of the population has changed with the proportion of under-20s falling except in Flevoland and that of the over-65s rising particularly in Drenthe.

The UK regions exhibit three characteristics:

- a gradient of diminishing population growth from south-east to north-west associated with increasing distance from the UK economic hub, the capital region of the South-East;
- a sharp difference between population decline in metropolitan cores and growth in their peripheries;
- higher growth in those regions associated with development of oil and gas resources and lower growth in those with resource industries in decline (coal).

Age structures

The principal consequence of the declining fertility and mortality rates discussed earlier is an ageing population.

The number of over-65s has increased, that of under-15s has decreased, while the intervening age groups have remained fairly stable in relative size.

Age structures tend to vary between the four countries rather than within them. The proportion of elderly is lowest, (less than 15%), in the study regions of the Netherlands (which will have the highest population growth rates) ranges between 14 to 16% in the UK and Denmark, and between 14 to 18% in Germany. The Netherlands as noted above, has the fastest population growth rate. The percentage of children in the population ranges between 17 and 20% in Denmark, the Netherlands and the UK and in Germany between 12 and 17%. The working age group is largest in Germany (69 to 70%). It is slightly smaller and with a wider range (65 to 69%) in the Netherlands and Denmark. It is smallest in the UK (64 to 66%). This general picture may differ at the regional level on account of age-specific migration patterns.

Dependency rates are lowest in the German study regions (43 to 44%) and highest in the UK (mostly above 50%). In the Dutch regions they vary between 43 and 48% (exceptionally Friesland has a rate of 52% as a result of a large child population). In Denmark, the capital region has a lower rate (46%) than the other two regions (52 to 53%) because of its smaller child population.

Labour force

Participation rates (i.e. persons in employment plus the unemployed, as a percentage of the total population) vary widely across the regions of the study area but are mostly above the EC average of 44.8% (1988). They are highest in Denmark where they average 56.3% for the country as a whole and lowest in the Netherlands where the national average is 45.4%. While rates are above the Dutch average in the two overlap regions of North and South Holland, they are well below it in the eastern regions with Friesland recording the lowest rate at 41.3%.

Trends

Four sets of demographic projections were examined:

- official projections by national population offices;
- Eurostat projections which gave both lower and upper estimates;
- projections for NUTS 2 regions made by the Netherlands Economic Institute, for DG XVI, the Demeter 2015 population model (Demographic evolution through time in European regions to 2015);
- projections for NUTS 1 regions made by the School of Geography of Leeds University for Eurostat and termed ECPOP (European Community population projection model).

The first two sets of projections gave estimates of national population totals, the second two gave projections at a subnational level.

Population levels

Assumptions

Demographic predictions are fraught with difficulty and the uncertainties regarding demographic variables and lack of data require assumptions to be made. All models make assumptions about three key variables:

- total fertility rates;
- life expectancy at birth;
- migration.

Assumptions regarding the first two variables are broadly similar in all projections, but the migration assumptions differ widely.

All four sets of projections assume that the total fertility rate will be below replacement level. This is conventionally regarded as 2.1 children but is now probably a little below this because of falling mortality rates. Some models assume a modest rise over time in the total fertility rate. There is broad agreement that the UK has the highest and Germany the lowest total fertility rate. The implication of this assumption is that in the absence of migration sooner (Germany and Denmark) or later (the UK and the Netherlands) populations will decline.

The life expectancy trends in all projections are conservative in the light of recent experience and all underestimate the total populations of the countries and regions, especially of the elderly age groups.

Migration assumptions vary widely. Projections 1 and 2 above take account of net international migration. The third set of projections ignores international migration except from Germany and Ireland in the first quinquennium of the forecasting period. It also ignores migration between Member States of the European Community but allows for migration between regions within countries. The fourth set of projections considers three levels of migration:

- migration into and out of the EC
- migration between Member States within the EC
- interregional migration within individual States.

These projections produce a range of estimates of in-migration to the northern seaboard countries over the period 1990-2020 of which the ECPOP estimate of 7.8 million from outside the EC and 1.5 million from within it is deemed to be the most likely.

Results at the national level

All sets of projections show some continuation of population growth to the end of the century followed then, either by slower growth, or actual declines. The Eurostat low scenario and ECPOP projections are considered the most reliable. The results, given in Table 2.1, show for example, that all regions, but particularly those on the continent, and especially in Germany, demonstrate a considerable shift towards the elderly age groups.

Results at the subnational level

At the subnational level the ECPOP model gives projections only down to the NUTS 1 level; only Demeter gives results to the NUTS 2 level, but it must be remembered that this model ignores extra-EC migration and migration between EC Member States which together are expected to add over 9 million to the total population of the northern seaboard study area by 2020.

The principal results of these models are summarized in Table 2.2.

Age structure

The region's population is ageing as a result of the progressive fall in population growth rates throughout the study area. This trend is expected to continue and populations will continue to age: the over-65 age group will grow as workers reach pensionable age, the proportion of under-15s will continue to shrink as fertility rates continue to fall, and the working age group will also contract as fewer children enter the labour force to replace those retiring.

The ageing of the population is more marked in some parts of the study area than in others. It is expected to be particularly marked in Germany and Denmark.

Migration

Migration is a major factor in population redistribution. Retirement migration apart, migrants tend to be younger, more energetic and more entrepreneurial than the population at large and can inject a dynamic element into the economies of recipient regions. Most internal migration is over fairly small distances. The single European market will enhance mobility throughout the EC and this might encourage a greater volume of movement over longer distances.

Table 2.1. Demographic projections at the national level (thousands)

	1990	1995	2000	2005	2010
Eurostat low					
Denmark	5 135	5 174	5 196	5 191	5 150
Germany	79 113	80 566	80 292	79 222	77 576
The Netherlands	14 893	15 370	15 570	16 012	16 113
UK	57 313	58 045	58 480	58 530	58 233
ECPOP					
Denmark	5 135	5 179	5 209	5 209	5 174
Germany	79 113	79 541	78 140	78 018	76 517
The Netherlands	14 893	15 311	15 659	15 864	15 922
UK	57 309	58 098	58 612	58 826	58 878

Sources: Eurostat and ECPOP.

Table 2.2. Demographic projections at the subnational level

Growth categories	ECPOP projections 1990-2020 NUTS 1	Demeter 2015 projections 1985-2015 NUTS 2
Strong gain, over 10%	East Netherlands East Anglia	Flevoland East Anglia Hereford & Worcester Warwickshire
Moderate gain, between 2 and 10%	Schleswig-Holstein Yorkshire and Humberside East Midlands North West Scotland	Drenthe North Yorkshire Leicester, Northamptonshire Lincolnshire Salop, Staffordshire Cheshire
Stability, between – 2 and + 2%	Lower Saxony North West Midlands	Overijssel North Holland South Holland Cumbria Derby, Nottinghamshire Lancashire
Moderate loss, between – 2 and – 10%	Denmark Mecklenburg-Western Pomerania North Netherlands	Vest for Storebælt Hovedstadsregionen Groningen Friesland Humberside West Yorkshire Greater Manchester Scotland
Heavy loss, over – 10%	Bremen Hamburg	Øst for Storebælt Bremen Hamburg Hannover Lüneburg Weser-Ems Braunschweig Schleswig-Holstein Cleveland, Durham Northumberland Tyne and Wear South Yorkshire West Midlands Merseyside

Sources: ECPOP and Demeter.

International migration has played a relatively small role in population growth of the study areas except in Germany. Germany, particularly the new *Länder* is expected to bear the brunt of any future migration from Eastern Europe (with a possibility of overspill to Denmark and the Netherlands), following the new western and market-orientation of these countries.

Labour force

According to Demeter 2015 between 1990 and the year 2000 the labour force in the Netherlands is expected to increase by 1.7% and in the UK by 0.8%. In Denmark and Germany it is expected to decline, by just over 1% in the former country and by over 6% in the latter. By comparison the labour force in the EC as a whole is expected to increase by 1% over the same period.

In the Netherlands both male and female labour forces are expected to increase, while in the UK the increase in the female labour force is expected to more than offset a decline in the male. In Germany, both male and female labour forces will contract.

These prospective changes in the labour force are the result of three forces: the growth in the population of the 15+ age group; shifts in the age structure; and changes in activity rates. The main component of labour-force change varies quite markedly from country to country. In the Netherlands labour-force growth is expected to be due to an increase in the size of the 15+ age group which will more than offset the negative effect of a shift in age structures. The main component of labour-force growth in the UK is expected to be a favourable shift in age structures. In Denmark a fall in activity rates will be reinforced by a decline in the population of the 15+ age group while the large fall in the German labour force will be caused by unfavourable movements in age structures and a decline in the size of the 15+ age group.

Two trends are to be noted in particular:

- a decline in male activity rates in all countries and an increase in female activity rates in all countries except Denmark;
- an ageing of the labour force as indicated in Table 2.3.

Table 2.3 indicates that:

- the 15 to 24 age group will contract in all four countries by between 4.5 and 5.5% between 1990 and the year 2000;
- that the 50+ age group in the labour force will increase by amounts ranging from 0.5% for Germany to 5% for Denmark.

These trends have implications for mobility, both geographical and occupational, and for productivity, it being generally accepted that the more elderly age groups tend to be less mobile and less productive than younger age groups.

Urban settlement pattern

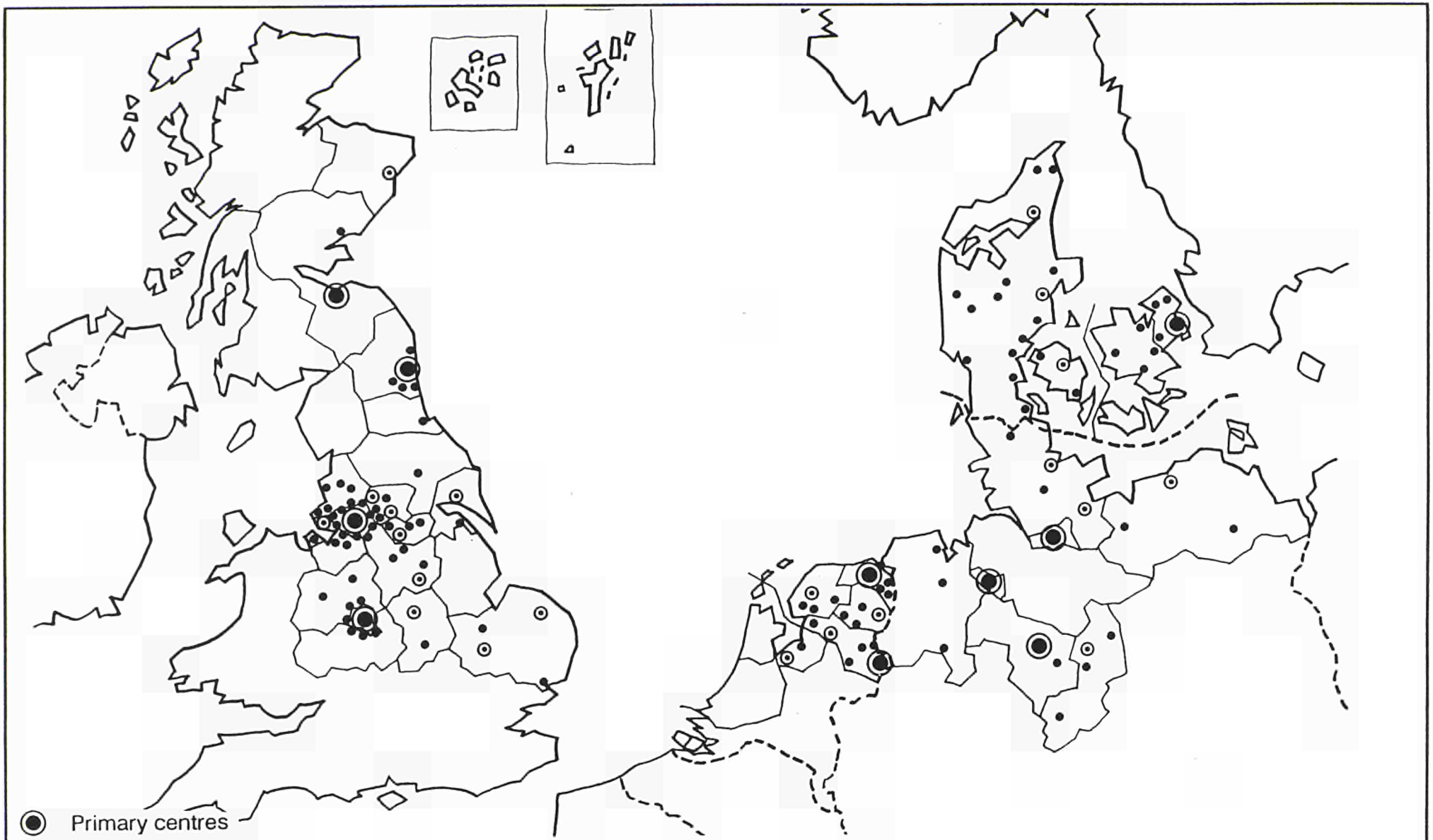
Present situation

Map 2.4 shows the study-area urban settlement hierarchy, divided into primary, secondary and tertiary centres. This simple division into primary, secondary and tertiary centres gives a valid impression of the relative hierar-

Table 2.3. Age structure of the labour force (%)

	Age 15 to 24			Age 50+		
	1990	2000	% change	1990	2000	% change
Denmark	20.4	15.9	– 4.5	19.1	24.1	+ 5.0
Germany	18.3	12.5	– 5.8	21.8	22.3	+ 0.5
The Netherlands	18.0	13.0	– 5.0	14.2	17.7	+ 3.5
UK	21.5	17.0	– 4.5	20.2	22.2	+ 2.0
EUR 12	18.9	14.7	– 4.2	19.5	20.0	+ 0.5

Source: Demeter.



Northern Seaboard Study

Urban Structural Hierarchy

MAP 2.4

chies, since each country operates as a separate economic unit and the ranking of centres will be true within the particular country. In addition, Map 2.4 also gives a view of the distribution of the main urban centres.

The main characteristic is the highly urbanized character of England – the central and northern tertiary regions in particular – compared with the more even distribution of urban centres in the rest of the study area. These English conurbations contain over 8 million people, far more than the conurbations in the other three countries put together. The Continental parts of the study area exhibit a settlement pattern which reflects historic, political and administrative areas. The result is a classic geometric pattern of a regular network of main centres surrounded by centres of a lower functional order.

Different population cut-offs are used. Towns in the UK are defined as urban areas with a population greater than 100 000; in Germany those greater than 90 000. By contrast, the towns in Denmark and the Netherlands go down to about 20 000. It is important to note that a true functional hierarchy is not determined by population size, although there is clearly a correlation between population and function. It is possible for a small town to provide a high level of service (typically in a low density rural area); conversely, a large town can provide a relatively low level of service (typically within a conurbation).

The most striking feature of the urban settlement pattern is the highly urbanized character of England – the central and northern regions in particular – compared with the more even distribution of urban centres in the rest of the study area, particularly on the Continent. It is therefore appropriate to consider the UK separately from the Continental part of the study area.

The Continental part exhibits a relatively even distribution of urban centres across a predominantly rural, agricultural landscape. A more dense concentration of settlements is observed in the Netherlands, which reflects the high national population density (355 persons per km^2) compared with the figures for Germany (246 p/km^2) and Denmark (85 p/km^2, excluding the capital city region).

There are four major urban agglomerations or conurbations which fulfil important regional and national (and some international) capital city functions: Copenhagen (1.34 million), Hamburg (2.5 million), Hannover (1.0 million) and Bremen (0.8 million). The remainder of the urban population is located in centres with a population below 300 000.

There are important differences in town size. In the Netherlands, 60% of the population is located in settlements with a population below 10 000; compared with approximately 40% in Denmark and Germany. But in Germany, over 47% of the population is in larger centres (population greater than 90 000) whereas, in Denmark, the comparable figure is about 38%.

Below the level of the major conurbations, the pattern reflects a more regular, even distribution of economic activity, where the pattern of urban centres closely parallels historic administrative areas. The result is a classic geometric pattern which, under closer examination, reveals a regular network of main centres surrounded by centres of a lower functional order.

In Denmark, Copenhagen accounts for 26% of the national population and three large towns account for a further 12%: Aarhus (261 000), Odense (176 000) and Aalborg (155 000). In all 44 towns of 10 to 100 000 population account for 21%, and 417 towns of 1 to 10 000 population for a further 21%. The general pattern of distribution is very even: there are no areas which are far from a significant urban centre, and therefore few areas which are remote from urban services.

The German analysis is based on the 18 centres which are classified as *oberzentren*, the highest order centres in the urban planning hierarchy. This is dominated by the three conurbations which account for 30% of the German study area population: Hamburg (2.5 million), Hannover (1.0 million) and Bremen (0.8 million). The second tier comprises historic centres which retain their local dominance: the three ports of Kiel, Lübeck and Rostock, and the inland town of Braunschweig. These towns account for 8% of the population. The remaining 11 towns in the population range 90 to 160 000 account for a further 9% of the population.

In the Netherlands, the two largest urban centres of Groningen (168 000) and Enschede (146 000) account for 11% of the Dutch study-area population. Eight towns in the population range 50 to 100 000 account for 20%; and 15 towns in the range 10 to 50 000 account for a further 12%. So 57% of the population is located in settlements with a population below 10 000.

The picture in the UK is dramatically different. There are six major conurbations, made up of a cluster of metropolitan boroughs: Greater Manchester (2.5 million), the West Midlands (based on Birmingham, 2.5 million), Leeds/Bradford (2.0 million), Merseyside (1.4 million), Sheffield (1.2 million) and Newcastle/Sunderland (1.1 million). These conurba-

tions account for 39% of the UK study-area population. There are 27 towns of 100 to 500 000 which account for 15% of the population. So 54% live in urban centres with a population greater than 100 000, which are large cities by the standards of the continental study area. In addition there are a further 110 towns in the range 10 to 100 000 for which recent data is not yet available (awaiting publication of the 1991 census results).

The distribution shows a strong concentration in the old industrial heartlands of the North West, West Yorkshire and West Midlands regions. The south-eastern coastal zone exhibits an urban pattern similar to that on the continent, with medium-sized towns (Norwich, Ipswich, Cambridge, Peterborough and Northampton) distributed regularly throughout a rural environment of intensive agriculture.

In Scotland, there is a very thin distribution of larger urban centres, which reflects in part the low overall population densities over much of the area (less than 60 persons/km^2, compared with the UK average of 235 persons/km^2). It also reflects the absence of a mature urban structure, for there is a larger proportion of small towns (in the population range 10 to 50 000) in Scotland than in the other UK regions.

Trends

The urban settlement pattern is not one of the primary determinants of the volume and scope of development. It is principally a reflection of the economic development forces which will have had their effect through the past. However, the settlement pattern is an important influence on those economic development forces, since it represents an essential part of the context within which those forces will manifest themselves.

Economic activity inevitably responds to the opportunities and constraints of the physical world, the space within which these activities take place. The existence and location of the aggregation of manufacturing activities, representing chains of supply between manufacturers and subcontractor suppliers; of networks of competing producers of similar goods; of pools of labour offering particular skills and technologies; of infrastructure networks; all these are significant influences on investment decisions.

Thus, in so far as the urban settlement pattern is a reflection of the past impact of economic forces, it will be an important determinant of the locational and spatial pattern of future development.

Urban centres will continue to be the main focus for economic development prospects. Notwithstanding trends towards decentralization, development of greenfield sites as new employment centres, and the releasing of industrial location through innovation in communications technology, such changes as do occur – whether positive or negative – will originate from and have their major impacts in the large urban centres.

The urban agglomerations are the principal decision-making centres which will generate change. Their inherent locational and infrastructural advantages are the reasons both for their current eminence and for their continued primary influence on the location of economic developments. So new industrial development and expansion will mainly take place in the large urban centres; similarly, contraction through industrial decline will have its greatest impact in the areas of greatest concentration.

This is not to underestimate the serious impact caused by contraction in agriculture and fishing for example; although the actual figures involved will be small in terms of the overall study area, they will have a devastating effect on the small communities involved, covering large parts of the land area of the northern seaboard.

The main expected change will result from the continued pressure on the Hannover and Braunschweig areas in Lower Saxony. This subregion is already exhibiting signs of inward investment pressure derived from its strategic location on the emerging east-west corridor, the Rotterdam-Berlin axis. These pressures are likely to reinforce the sub-regional hierarchy while strengthening its relative position with respect to the rest of the German region.

The infrastructure developments associated with this subregional development (principally road and rail networks) will have the effect of opening up new areas and creating new nodal points which may eventually emerge as strategic centres. However, the time frame of the scenario and the lag between implementation of infrastructure projects and responsive development is such that the full impact will not be felt within the trend scenario period.

The current phenomenon of urban restructuring – inner area 'decline' combined with suburban and peri-urban growth – will continue. The main urban centres have shown consistent population loss over the past decade or so resulting from outward movement of economic activity and residential development from central areas

to suburban and peri-urban locations. This has been driven by a combination of a gradual deterioration of older inner-city environments with the desire for higher quality residential and business environments, offering access to city centre functions with the quality of local environment associated with more rural locations.

This has created opportunities for the regeneration of inner-city areas; large city sites have been released through the closure or relocation of outdated, environmentally unfriendly industrial activities to more suitable sites. But the parallel reduction in the residential population has drained the economic purchasing base of inner areas, threatening local retail activity, and encouraging the creation of a daytime environment dependent on commuter transport networks, which closes down at night.

As major retail and employment centres are developed in periurban locations, so the inner areas suffer from lack of the economic critical mass to support their existence as vibrant, multifunction centres. In addition, the general economic recession proves a major constraint on the speculative redevelopment activity required to stimulate regeneration.

This pattern of restructuring – what has been described as 'cities turning themselves inside out' – must not be confused with decline. The problems of inner cities do not invalidate the important role of the large urban centres as the key locations of economic development. While the inner areas undergo serious problems of physical and socio-economic transformation, the economic entities represented by the large centres will continue to be the dominant players in the market.

The environment

Present situation

The aquatic environment

Groundwater

Groundwater pollution is a growing problem in certain intensive farming and livestock areas of the study area including East Anglia, north-east Jutland and Storstrøm in Denmark; and in large areas of Germany particularly in Lower Saxony. It arises mainly from nitrates derived from fertilizer use and slurry spreading and storage.

Control measures include the definition of areas (e.g. nitrate sensitive areas in the UK) where certain farming operations are regulated (e.g. number of fertilizer applications limited), reduction in the volume of active ingredient in pesticides, construction of storage for liquid and solid manure and silage. These measures will be made more extensive and stricter.

Other sources of pollution are industry, and improperly constructed and maintained waste dumps.

A second type of groundwater problem relates to falling water-tables which might be brought about by drought or excessive abstraction for domestic or industrial use. This causes a concentration of many pollutants and causes stress in plants.

Rivers

The main sources of river pollution are effluent from sewage works and agricultural activities: industrial discharges also contribute. This is a particular problem in Germany and the north of England.

Water quality in England has tended to decline due to increased discharges, and a succession of very dry years which has reduced the dilution factor. Rivers in Yorkshire, the North West region and Severn/Trent are significantly poorer in water quality than in the rest of the UK and Wales; some 69% of all poor/bad quality stretches of estuaries and 46% of poor/bad quality stretches of river are located within these regions.

In Germany the upper reaches of most rivers show moderate pollution. The lower reaches and stretches around towns are strongly polluted. Some stretches such as that of the Weser near Bremen are excessively polluted. The Elbe is the most heavily polluted river as it is a transport route for pollutants originating in the former GDR and Czechoslovakia. Some 80% of the population of the former GDR live in its catchment area.

The principal action, in addition to the controls on agriculture noted above, are the construction of new and improvement of existing sewage works both to reduce the level of untreated sewage and raise the standards of treatment. Discharges of hazardous substances must be reduced using the best available technologies.

Coastal waters

Coastal waters are important as spawning grounds for fish and for leisure and recreation activities. Unhappily,

extensive stretches in the study area are badly polluted including those off the coast of northern England, the waters of the German Bight, around the East Frisian islands, and between the mouths of the Elbe and Weser.

The major source of pollution is discharges from land-based sources both direct, and from remote areas via river transport; air pollution and pollution from marine-based sources also play a part. Many rivers, the Elbe, Weser and Ems in particular are heavily polluted and will be difficult to clean up. Heavy metals and man-made chemicals, especially halogenated hydrocarbons are of special concern. A particular problem in coastal waters is phytoplankton blooms caused by excess nitrogen from agricultural activities and sewage discharges.

The North Sea

The North Sea acts as a convenient waste dump not only for the northern seaboard countries but for a number of inland countries too. Until fairly recently it was regarded as having an infinite capacity for the absorption of pollution. While this view prevailed there was little pressure to reach solutions.

Rubbish was just dumped directly into the sea or into the many rivers that drain into it. The consequences of this are that the sea, and especially its coastal waters, have become heavily polluted to the benefit of the land-based origins of this pollution which have been able to transfer their problems elsewhere for someone else to worry about. The results of this have gradually become evident in the forms of polluted bathing beaches, damage to fish spawning grounds, loss of marine flora and fauna and of other marine life, part of the food chain.

Discharge from land-based activities are the principal pollutants of the North Sea. Atmospheric deposition, pollutants from ships and oil and gas rigs, and dumping and incineration of wastes at sea are other sources.

Despite the interest in cleaning up the North Sea displayed over the past 25 years it is doubtful whether any significant improvement has occurred, although a number of rivers emptying into it, like the Rhine, have become much less polluted.

The North Sea is subject to a number of international agreements, such as the conventions on marine pollution, oil pollution, sea dumping and the protection of habitats; and a variety of organizations have an interest or role in its protection, such as the Rhine, Oslo and Paris Commissions, IMO and the Economic Commission for Europe.

Perhaps the chief mechanisms for protecting the North Sea are the three-yearly ministerial conference of North Sea countries and EC directives. The conference system has led to a number of specific agreements on reducing discharges of pollutants (e.g. those of toxic substances and atmospheric pollutants to 50% of their 1988 levels by 1995, others including dioxin to 30%; to end ocean incineration by 1992) and to the adoption of the precautionary principle. Despite commitments to the contrary the UK is still dumping toxic wastes and will continue sludge dumping until 1998.

The Greenpeace 'Zero 2000' agenda to stop all pollution of the North Sea by the end of the century by the adoption of clean production technologies and legally binding commitments failed to be accepted at the 1990 conference but has been accepted by the Nordic States and has been endorsed by the European Parliament.

The atmospheric environment

Atmospheric pollution/acidification is a current problem. The main pollutants are SO_2 and NO_x and the principal sources are power stations and road traffic. The prospective run-down in coal-fired power generation in favour of gas will contribute significantly to a reduction in emissions of the former. However, all the northern seaboard countries anticipate a continuing increase in road traffic; the wider use of catalytic converters will have minimal impact on the level of NO_x emissions. Road traffic is a major source of other air pollutants such as lead, CO and CO_2.

The effects of global warming are long term. Nevertheless preventive action needs to be taken now if these are to be avoided. The main greenhouse gases are CO_2, CH_4 and CFCs with power stations, industry, traffic and domestic households as their principal sources. Abolition of CFCs and a reduction in CO_2 emissions by energy conservation measures and the use of non-fossil fuels for power generation are among the preventive measures currently in use. The problems posed by the continued growth in road traffic may need radical measures such as road pricing and a carbon tax if vehicle emissions are to be controlled.

The terrestrial environment

The northern seaboard countries are currently faced with a wide range of environmental problems which are,

to a greater or lesser extent, common throughout the area. They are unlikely to be resolved over the short term if ever, and will be of equal, if not more concern by the year 2000 than today. They include:

- industrial dereliction, to which will be added the problems of redundant military installations as these are run down;
- loss of landscape from agricultural development (removal of hedges, drainage,); potential dereliction as a result of set-aside; loss of man-made landscapes as a result of agricultural decline (hill farmers going out of business, etc.);
- pressure on green belt and greenfield sites for industry, housing and infrastructure development; similar pressure on coastal and estuarine locations for port, refinery, residential and industrial development;
- loss of flora and fauna and habitats by development of all types;
- urban decay, urban sprawl, urban congestion;
- pressure on natural landscapes and wildlife areas (both coastal and upland) from tourism and retirement development;
- commercial development at key transport nodes such as motorway junctions;
- the pressure to find new landfill sites for waste disposal.

While all the study-area countries have a system of planning and development controls to help resolve problems and conflicts they are not always capable of doing so.

Trends

The environmental problems facing the northern seaboard area today will still be around awaiting a solution in the next century. They have built up gradually over many years and are incapable of resolution overnight even if the political will were there to take concerted action. In this section we discuss measures that are likely to be taken over the next decade to alleviate these problems.

Agriculture

Over the next decade environmental controls on agricultural activities will intensify in the face of growing concern about the environmental impact of modern farming methods: water pollution from pesticides, nitrates, and phosphates, ammonia emissions from livestock and slurry spreading and storage, eutrophication, destruction of habitats, loss of landscape value, etc. The main focus of control will relate to action to reduce the level of run-off and leaching of nitrates into the soil and into watercourses. Financial assistance will be available to farmers to compensate for the increased cost of environmentally-friendly farming practices.

Manufacturing

There will be increased controls too on industrial emissions and discharges to protect both the terrestrial and aquatic environments. Particular concerns will be to tighten up on uncontrolled discharge of hazardous wastes resulting in the contamination of water courses.

Solid waste

Attention will be given to progressive methods of solid waste disposal to cope with the expected increase in the volume of waste generated. Particular efforts will be made to promote recycling in order to reduce the amount of land required for landfill sites.

Power generation

Action will be taken to promote efficiency in power generation, burn less polluting fuels and increase controls on emissions to reduce the level of atmospheric pollution and acid deposition. In parallel with these measures, the promotion of renewable energy sources will reduce dependence on fossil fuels, although the impact will be marginal over the scenario period. Commitment will vary throughout the study area; Denmark has a particularly progressive policy to reduce overall energy consumption, to promote renewable sources (especially wind power) at the expense of coal and oil. The nuclear power industry is likely to come under increasing pressure to meet more particular environmental standards and to meet more rigorous economic criteria.

Transport

Policies will promote the idea of the more environmentally-friendly modes of transport – rail and inland waterways – in preference to road transport. However, the exigencies of transport operations will minimize the impact of such policies. In practice road transport will continue to offer the most convenient and flexible mode of transport, for both passengers and freight; it is more appropriate for regular small consignments required by industry operating under the 'just in time' philosophy.

The drive to increase the role of rail transport will pose its own environmental difficulties. The construction of the proposed Betuwe rail link through the eastern Nether-

lands may face similar difficulties as those faced by the TGV Paris-Côte d'Azur and the Channel Tunnel rail link through Kent.

Fisheries

The common fisheries policy attempts to deal with the collapse of fish stocks caused by overfishing and pollution of coastal waters. Stocks will take many years to recover and the outlook for the fishing industry is grim. Prospects for fish farming, introduced as an alternative, are not bright as fish farms are major polluters.

Chapter 3: Sectoral analysis

Introduction

This chapter describes the present situation and identifies the trends for eight sectors. These are:

- manufacturing and services;
- agriculture;
- fishing;
- tourism;
- transport;
- ports;
- telecommunications;
- energy.

Each section has a similar structure: we give an overview of the present situation, followed by a discussion of the key sectoral trends.

Manufacturing and services

Present situation

The key industries

Manufacturing

Manufacturing employment in the study area is estimated at 7.1 million (1985), equivalent to about 15% of the EC total. The UK regions account for about 75% of this total, the German regions 14% and the Danish and Dutch regions 5% each. The principal centres of manufacturing activity are to be found in the British regions especially the North West, York and Humberside and West Midlands; but also in East Midlands, the North and Scotland. Outside the UK the only notable centre is Lower Saxony in Germany.

The most important manufacturing activities in the study area by size of employment are:

- food, drink and tobacco, with 13% of the total study area given over to manufacturing employment, chiefly located in Yorkshire and Humberside, the North West, Scotland and East Midlands regions of the UK;
- mechanical engineering (10%), mainly in the West Midlands, North West, Yorkshire and Humberside regions of the UK;
- electrical engineering (8%), chiefly in the West Midlands and North West regions of the UK and Lower Saxony in Germany;
- metals manufacture (8%), in the West Midlands and Yorkshire and Humberside regions of the UK;
- chemicals (7%), in the North West and North of the UK;
- motor vehicles and parts (7%), in Lower Saxony and Bremen in Germany and West Midlands and the North West in the UK;
- paper, printing and publishing (7%), in North West regions of the UK and Scotland.

Between the mid-1970s and the late 1980s output of the EC mechanical engineering industry declined and that of metal manufacture showed only a small increase. However, all the other sectors identified above recorded growth at a rate faster than that of the manufacturing

sector as a whole, twice this rate in the case of chemicals, motor vehicles and electrical engineering.

Services

Approximately 40% of service employment is in nonmarket activities (i.e. services that are not traded, such as education, health, government administration) in both the EC and the study area. The largest activities in the market sector are retailing, wholesaling, hotels and catering, and banking and finance. The four countries represented in the study area account for 55% of total EC employment in the market sector and of this total the UK is responsible for 49%, Germany 35%, the Netherlands 11% and Denmark only 4%.

In Denmark the largest market services sectors are wholesale and retail trade; business services; transport and storage; and finance and insurance. The sector as a whole has grown by 10% over the past decade with financial services, and especially business services, expanding rapidly.

Trade/catering is the principal market sector in the Dutch regions of the study area. Commercial services are also strongly represented. Compared with the country as a whole services employment in the study area regions is underrepresented.

The services sector in Germany has shown strong growth particularly in the non-metropolitan regions. Traditional retailing and transport activities have tended to contract especially in urban centres.

The structure of service employment in the UK study regions is similar and the pattern broadly reflects that of the country as a whole, except that employment in government administration and financial service is underrepresented, a reflection of the importance of London and the south-east as a location for these activities. Distribution/hotels/catering is the major market sector.

There has been a long-term trend in all countries of the study area for manufacturing employment to contract, partly as a response to rises in labour productivity, and for service employment to increase. Generally, the growth in service jobs has been insufficient to completely offset the loss of jobs in manufacturing. Additionally, the service jobs created have tended to be filled by women, while the contraction in manufacturing has put men out of work.

Research and development (R&D)

R&D activities are not well developed in the study area. Partly this is a reflection of the economic structure.

In the Dutch regions of the study area small and medium-sized firms dominate; they tend to be larger in manufacturing than in other sectors but even so 70% of all concerns fall in the SME category. Many are production branches of bigger firms located elsewhere and there are no leading-edge activities which could spearhead innovation. Some 90% of Dutch R&D expenditures are made by companies with more than 500 employees with two thirds accounted for by just five companies; none of these have research centres in the study region. Some externally commissioned research is carried out in the universities in Groningen and Twente.

SMEs are the predominant form of enterprise in Denmark. There, 87% of firms employ less than 20 employees and account for 30% of all employees. The small proportion of firms employing over 100 workers account for 40% of the total. Small firms are not research oriented – this is the province of the largest firms. Business is dominated by the food and services industries and these tend to adopt known technologies developed elsewhere. In any event national R&D spending is very low.

In the UK R&D spending is predominantly by government and tends to be focused on the defence sector. Private industry's expenditure is low and there is a reluctance to support research where there is little prospect of an early pay off. In any event, apart from that carried out in the universities, a major part of the R&D activities tend to be carried out outside the study area, mainly in the south-east and along the M4 corridor to the west of London.

Recent research has suggested that R&D activities favour a location in medium-sized cities as these best satisfy the needs of both firms conducting R&D and their staff. Firms require access to a pool of experienced workers and good communications with head offices. Workers want access to alternative job opportunities and a pleasant working environment. None of these requirements are satisfied by either a rural or a big city location. This may help to explain the dearth of research centres in the continental regions of the study area where the majority of urban centres are small, typically below 50 000 population.

R&D underpins the potential advantage of an area *vis-à-vis* lower cost producer countries or regions. It is the means by which innovation leads on to the supply of high quality goods and services. While R&D may not be highly developed in the study area, the basic requirements are there: a pool of skilled labour,strong technical and academic institutions, and a culture of improvement through training and quality.

Technological advancement depends upon the willingness to invest in research and development and the ability to translate this effort into commercial applications and to disseminate knowledge of these throughout industry.

A good proxy for a region's technological capacity is the presence of science parks and technology centres. In this respect the northern seaboard study area displays mixed experience.

In Denmark, there are two science parks (Aarhus and Copenhagen), and several technology centres.

In the German sector of the northern seaboard area there are three technology centres. That at Hannover is concerned principally with medical subjects and closely associated with the medical school. Hamburg's particular strengths lie in CAD/CAM; it has two key sites, the privately managed but State financed HIT Technologiepark and the private sector Hamburg High-tech Centre. Bremen science park accommodates firms engaged in computer science, industrial automation, robotics and CAD/CAM.

The Zernike science park in Groningen, one of four such institutions in the Netherlands has close links with the university and with the academic hospital. Its main strength is in medicine, including pharmaceuticals and biotechnology. It also has interests in nuclear research.

The UK has a number of science parks. The Herriot-Watt University Research Park in Edinburgh was established in 1971 and has particular strengths in electronics and computer technology; biotechnology; offshore and petroleum engineering; opto-electronics and photoelectronics. It combines close university links with a strategic site close to Scotland's Silicon Glen, a regional high-tech development that has attracted major multinational corporations such as IBM. A second technology centre has been set up more recently in the west of Scotland.

There are four science parks in England at Nottingham, Birmingham, Cambridge and Warwick. The Cambridge science park, promoted by Trinity College specializes in medical research, including pharmaceuticals and biotechnology. The Warwick science park and that at Aston, Birmingham, have drawn on the region's traditional engineering skills to develop specific strengths in computer aided manufacturing and robotics.

Trends

In addition to the trends discussed in the next paragraphs, the structure of the manufacturing and services sector will be affected by a series of trends identified in Chapter 2 (first section on economic activity). These are:

- an increasingly competitive and international environment;
- the growing role of technological development;
- organizational changes;
- changes in labour supply;
- growing environmental concerns.

Changes in the manufacturing base

The manufacturing sector in the study area is heavily biased toward low-growth and average-growth activities and this will depress economic growth prospects over the coming decade *vis-à-vis* other regions of the EC.

Only some 15% of manufacturing employment in the study area is in high growth sectors – including electrical engineering and rubber and plastics production. The former embraces the manufacture of electronic components, telecommunications equipment (the communication services sector is high-growth), data processing and office equipment, and precision instruments. The sector would benefit from tighter controls on environmental pollution.

Certain activities such as office equipment and precision instruments where production activities have been extensively internationalized, face increased competition from Japan, South East Asia, the USA and Central and Eastern Europe. The plastics industry is characterized by rapid technological development, has good export prospects in Eastern Europe, but could suffer from tighter environmental controls.

Within the study areas the higher growth industries are located primarily in the English regions, including West Midlands and the North West, but also in Lower Saxony in Germany.

Low-growth industries include metals processing and manufacture; manufacture of motor vehicles and other

transport equipment; food manufacture; textiles, clothing and footwear; timber and furniture. These account for around two thirds of all manufacturing employment in the study area with a high concentration in the UK regions.

Average growth industries include basic chemicals; the manufacture of paper and paper products; and mechanical engineering. These account for around 20% of employment. The mechanical engineering and chemical industries are two of the biggest exporters. Export prospects are good, especially in Central and Eastern Europe, for capital goods and speciality chemicals and paper products (e.g. for photocopiers; fax machines). Stiffer environmental regulation could increase demand for energy conservation and clean technology products, and for paper products (more biodegradable than plastics) but reduce that for fertilizers and pesticides.

Structural changes in employment

There is a slow long-term shift in employment away from manufacturing and towards services. Between 1985 and 1988 the share of total employment in the Community accounted for by services increased from 55 to 59% while the share of industrial employment declined from 35 to 33% over the same period. In three of the four countries which are part of the study area, services now account for around two thirds of total employment (the Netherlands 68.6%, Denmark 67.1%, UK 64.8%). Only in Germany is the share of services (55%) less than the EC average.

This trend has been paralleled by an increase in female participation rates and a fall in male rates. In the UK for instance female rates have risen from 43.7% in 1971 to 52.4% in 1989 while male rates have fallen from 80.5 to 74.3% over the same period.

The two trends are not unconnected, as service employment offers more job opportunities for women than for men. But the increase in female activity rates owes as much to demographic trends (e.g. women having fewer children, having their children later in life, etc.) as to an increase in jobs available.

To some extent the sectoral shift is reallocative in so far as certain service functions previously undertaken by manufacturing units internally have been hived off or subcontracted out to external agencies. It also reflects a rising real demand for services both as an input to other activities e.g. specialist services like consultancy to industrial firms and direct to the public, particularly by the financial services sector.

These trends have a number of possible implications:

(i) A decline in these areas heavily dependent on manufacturing activities; this fate has already overtaken the traditional heavy industries such as shipbuilding and steel making. Market and technological development will put other manufacturing sectors at risk; competitive advantage will determine which regions thus threatened will succumb to the pressures.
(ii) A rise in male unemployment rates which could both generate increased demands for retraining programmes to equip the unemployed with the requisite skills to take up alternative job opportunities and act as a spur for them to migrate in search of jobs to growth areas.
(iii) Pressure on the service industries, which tend to be labour-intensive activities, to improve labour productivity to meet growing demands in the event that demographic trends limit expansion of the labour force.

Sectoral threats and opportunities

The main manufacturing activities in the study area are food, drink and tobacco; mechanical engineering; electrical engineering; metals manufacture; chemicals and the manufacture of motor vehicles and parts. Three quarters of all manufacturing employment in the study area is to be found in the UK regions. Only some 35% manufacturing employment is in high or average growth sectors.

Sectors in long-term decline

The study area contains a number of regions seriously affected by the long-term structural decline of their basic industries, in the face of stagnant world demand and competition from low cost producers in the developing world. The sectors concerned include:

- shipbuilding;
- textiles, clothing, footwear;
- wooden products and furniture;
- iron and steel;
- coal.

This long-term trend will continue although in some regions the sectors concerned have already been all but eliminated.

Sectors facing increasing competitive threats

Other sectors face new threats either from stagnant or falling demand, or from low cost producers in other

parts of the Community, Eastern Europe and Asia. Much of the study area's industry falls into this category.

Vehicle manufacturing, for example faces depressed demand which is unlikely to pick up significantly before the turn of the century. The sector is likely to be increasingly affected by environmental pressures to restrict private road transport. Competition from southern and Eastern Europe and Asia is also increasing.

The defence industry, until recently a growth sector, is suffering from the reduction in East-West tension, while in export markets there is increasing competition from countries such as China.

The area's chemical and pharmaceutical industries are world leaders. However in the future there is likely to be increased competition from Eastern Europe as outdated plants there are replaced. To retain its lead, the area's industries will be dependent on investment in R&D to maintain the lead in innovation and the development of new products and speciality chemicals such as carbon fibres. Plants in the study area could be vulnerable if they are producing basic chemicals not feeding leading-edge speciality chemical production plants.

The pharmaceutical industry is likely to face competition from Japan and new technologies.

In all these industries the key to survival will be technological development to keep down costs, improve product quality and introduce new products.

Sectors with growth potential

Food and drink processing employs large numbers of people in many parts of the study area. These sectors are relatively protected from competition except that from other EC countries, because of the higher quality and hygiene standards that are required as well as the influence of taste. Expansion in this sector is likely, with the trend towards more highly processed foods as disposable incomes rise.

Other sectors which will also benefit from a secular increase in demand, although facing a highly competitive market, can compete by superior knowledge. These include:

- telecommunications;
- information technology including computer science, automation, robotics and CAD/CAM;
- biotechnology;
- aerospace;
- environmental technology and measure instruments.

Another sector which might be added to this list is train and tramway systems, which could benefit from investment in modernizing the infrastructure of Eastern Europe.

In all parts of the study area, services are expected to grow in relative importance if not absolutely. After a period of rapid growth in the 1980s the producer services sector is currently undergoing a shake-out from which it will emerge leaner and fitter to resume its growth path. Consumer services are also expected to resume their growth trend once the current recession is over.

Summary of factors underlying the study area's lack of competitiveness

The factors underlying the lack of competitiveness of manufacturing and services in much of the study area can be conveniently summarized as follows.

In the more peripheral and agricultural regions, the main problems are:

- remoteness from the main markets, coupled with a poorly developed transport and telecommunications infrastructure;
- poorly developed economic infrastructure, in particular an underdeveloped producer services sector and inadequate information networks.

In the older industrial areas, the dominant problems are:

- reliance on industries in long-term decline;
- a workforce with outdated skills;
- a heritage of industrial dereliction.

In both types of region growth sectors are underrepresented, and the business structure is not dynamic, dominated by branch plants and SMEs, with a consequent lack of R&D activity.

Agriculture

Present situation

The northern seaboard study area comprises approximately 23.6 million ha, or just under 11% of the EC land

area (excluding the new Federal German *Länder*), of which around 16 million ha are used for agricultural purposes (13% of EC total), with a further 3 million ha under forest. Arable land accounts for some 9 million ha of agricultural land (13.5% of EC total) and permanent grassland for the balance of 7 million ha. Denmark has over 90% of its farmland under crops; the proportion in the other study area regions are 62% in the UK, 59% in Germany (excluding Mecklenburg-Western Pomerania) and 43% in the Netherlands.

Excluding the new German *Land* of Mecklenburg-Western Pomerania, there are some 413 000 farm holdings in the study area, with an average size of around 37 ha which compares with an EC average of 13.3 ha. Almost half of these holdings are under 20 ha in size and about 20% are in excess of 50 ha. The bulk of the larger units are to be found in the UK (54% of the total), and Germany (26%). They account for 25% or more of all holdings in all the UK regions and in Schleswig-Holstein.

The region displays a very wide range of farm types including intensive cereal production (Schleswig-Holstein, Lower Saxony, East Anglia); intensive livestock (Denmark, Lower Saxony, parts of the Netherlands and the UK), intensive horticulture, (the Netherlands) dairying (parts of Germany, the Netherlands and Denmark) and upland sheep and beef production (Scotland).

The northern seaboard area is a major agricultural producer and accounts for about 16% of the total value of agricultural output in the EC. In particular it accounts for just over a quarter of EC cereal output, roughly one third of its potato production and between 20 and 25% of its sugar production (mainly in the UK and Lower Saxony). It contains roughly one fifth of the EC cattle herd (including 16% of the dairy herd) and one third of the pig herd. Sheep production is significant only in the UK regions, notably in the north of England and Scotland.

Certain products are particularly important to specific regions of the study area. Thus dairying accounts for roughly half the value of agricultural output in North Netherlands, around a third in Schleswig-Holstein, North and North West England, and about a quarter in Lower Saxony and West Midlands; beef cattle contributes between 20 and 25% of output in Scotland and North England; and pigs a similar proportion in Denmark and Lower Saxony. Arable crops account for over 40% of the value of output in East Anglia and the East Midlands, over a third in Yorkshire and Humberside and over a quarter in Scotland and the West Midlands. The importance of fruit and vegetables is above the EC average in East Anglia, North West England and West Netherlands where the greenhouse production of vegetables is significant.

Agriculture is relatively unimportant in employment terms. In the EC as a whole agriculture, forestry and fisheries account for some 7.5% of employment. In the study area as a whole this proportion is much less, but there are a number of regions where it is higher. These include the non-metropolitan areas of Denmark, Lüneberg and Weser-Ems in Germany and Drenthe and Flevoland in the Netherlands. Farm employment in the UK regions is well below the EC average.

The proportion of farmers working full-time on their farms varies widely throughout the study area. In the UK part-time farming is relatively insignificant. In the Netherlands some 75% of farmers are employed full-time but this proportion falls to 44% in Denmark. Part-time farming is important in Germany. It is estimated that in both Denmark and Germany around one third of farmers spend less than half their time on their farms.

Agriculture's contribution to total gross value-added varies widely across the regions. Compared to the EC average of 2.7% it is higher in Denmark (3.5%) and the Netherlands (4.1%) than in Germany (1.2%) and the UK (1.3%). In most of the NUTS 1 regions of the study area, agriculture's share of total GVA exceeds the national figure (in East Anglia it is more than three times the national average) and, apart from some of the UK regions, it also exceeds the EC average.

In terms of labour productivity the study area contains some of the most efficient holdings in the Community with gross value-added per unit of labour being well over twice the EC average in Denmark, Lower Saxony and East Anglia where farming is capital-intensive and highly mechanized. In terms of GVA per unit of land the intensive livestock areas of Denmark and the Netherlands and the intensive arable areas of East Anglia display yields above the EC average; the more extensive farming practices and poorer soils in north England and Scotland give land productivity rates less than the EC average.

Farm incomes in the study area as measured by net value-added per full-time worker are well above the EC average; for all types of farm together they are greatest in the Netherlands, lowest in Germany, they are greater in Denmark than in the UK. The highest returns are gen-

erated by Dutch, Danish and UK dairy farms, specialized livestock farms in the Netherlands and horticultural units in the Netherlands and Denmark.

A growing proportion of agricultural output, estimated at around 75% of the total in the EC as a whole, is subject to some form of processing, and the processing industry plays an important role in the study area. The UK regions contain substantial sugar beet processing, canning, flour-milling and meat-processing plants; in the Netherlands the northern seaboard regions are heavily involved in dairy product and meat processing; in Denmark the entire food-processing sector is covered with particular strengths on the dairy and meat-processing side while in Germany, Lower Saxony has substantial meat-processing facilities.

The region is a significant exporter of temperate agricultural and food products both to other parts of the Community and to third countries. Around 20% of the regions's agricultural production is exported, of which 7% goes to other Community countries. Denmark and the Netherlands in particular, are substantial exporters of processed meat and dairy products, Schleswig-Holstein and East Anglia contribute to the third country exports of cereals, Lower Saxony is a major exporting region for pigmeat, and the north of England, Scotland and parts of the Midlands are responsible for a considerable proportion of the UK's exports of sheepmeat.

The diversity of the agricultural sector in the study area makes a generalized description difficult. However we have identified a number of common factors affecting the sector, not only in the study area, but in the EC and Western Europe generally. These are:

(i) agricultural production has been growing more rapidly than food consumption: population growth in both the study area and the EC has been slowing down;
(ii) this growth in production is the result of improved technology and increased capital investment as shown by the continuous and sustained improvement in crop and livestock yields, the growing use of farm machinery and chemical usage;
(iii) improvements in productivity have led to a sustained decline in the number of people engaged in agriculture: the share of agriculture in Community employment has fallen from 23% in 1980 to around 7.5% now;
(iv) there has been some increase in average farm size. This has been promoted by the new technologies and has in turn led to labour shedding. Although the number of larger-sized farms, and the area of farm land under their control, has risen the smaller farms still account for the largest number of farm households;
(v) the number of farm holdings and the total area of land farmed have both tended to decline;
(vi) despite the growth in agricultural output the sector's contribution to gross domestic product has tended to decline as the importance of the sector, relative to other parts of the economy, has contracted;
(vii) farming is still overwhelmingly a family business but increasingly accounts for only a part of household income. Part-time farming is a significant feature in some countries;
(viii) for a variety of reasons European governments have protected their agricultural industries from international competition, most noticeably through the medium of the CAP;
(ix) this has promoted self-sufficiency but has encouraged over-production, led to stockpiling of surplus output and subsidized sales on overseas markets to reduce surpluses. The growing costs of agricultural support have focused attention on the need for reform of the system;
(x) aspects of the agricultural support system – its protection of domestic markets against foreign producers, the subsidized sale overseas of surplus farm products – are increasingly focusing attention on its impact on international trade;
(xi) the new agricultural technologies and farming systems have given rise to increasing concerns about adverse effects on the environment (but there are a growing number of 'green farms');
(xii) changes in the agricultural sector have had a profound impact on rural areas and communities. Rural areas are already subject to pressures from a variety of sources and changes in the industry have added to these. This has led to attempts both for agricultural policies to discriminate in favour of disadvantaged regions and to seek solutions to farm problems within wider and more comprehensive regional policies.

Trends

The review of the agricultural sector in the study area identified a number of issues thought likely to impact on the industry over the next decade. The trends explored below come under the following three headings:

- CAP reform;
- EC enlargement;
- environmental controls.

CAP reform

Summary

The reform of the CAP adopted in 1992 comprises:

- a gradual reduction in the support prices paid for the main farm products;
- the introduction of set-aside schemes and compensation payments which are roughly based on the value of production foregone size;
- increasing payments under the Structural Funds to encourage environmentally-friendly farming and to assist disadvantaged regions and producers.

As they stand the proposals will primarily affect the largest farms with the highest yields, which are mostly located in the study region, particularly in East Anglia and Schleswig-Holstein and also in Lower Saxony and parts of Denmark.

By raising average production costs, farms located on more marginal land are likely to become less competitive and will either be forced out of production or will accelerate the rate of structural change. Areas that could be particularly affected in this way are to be found in northern England and Scotland, the German regions and possibly Denmark.

To the extent that the larger farms simply raise production from the land still available for cultivation, the set-aside schemes will not necessarily cut output.

Analysis

The CAP reforms were focused principally on the cereals sector, where fairly radical proposals have the potential to substantially reshape the industry. More limited proposals were made for the livestock sector.

A phased lowering of the target price for cereals by 29% from 1992/3 levels over three years is proposed. To cushion farmers against the full impact of these cuts, compensation payments will be made, but to be eligible for these, farmers will be obliged to set aside 15% of their arable hectarage defined as the average area under cultivation in 1989-91 to cereals, oilseed and protein crops.

The compensation payment will be based on the difference between the 1992/93 target price of ECU 155/tonne and that in the relevant year which will be progressively reduced. Thus as target prices are lowered, the value of the compensation payment will increase.

Compensation payments are to be made on a hectarage basis, the conversion from a tonnage to an area payment being made by reference to an average cereal yield.

Member States have the option to determine average yields on a per farm or a regional basis. If the latter is chosen, within any given yield region, farmers with below average yields will clearly benefit.

Compensation will be paid on the 15% of arable land set-aside. Farmers will need to undertake a complicated calculation of likely net revenues with and without set-aside (i.e. allowing for savings in costs of cultivation of land set-aside) before deciding whether to take up the scheme.

Farmers will have the option to rotate or not rotate land set aside. As it will be the poorest quality land that is set aside first, rotation will capture land of increasing quality. If farmers do not intend to rotate they will be required to set aside more than 15% to compensate for having only the poorest land taken out of cultivation. Small farmers (defined as those producing less than 92 tonnes of cereals) will be exempt from the set-aside requirement but remain eligible to receive compensation on 15% of their hectarage.

The compensation/set-aside scheme is for a three-year period initially but is likely to remain in force thereafter particularly if EC and world prices remain out of balance.

There are an estimated 6 325 000 ha under cereals and oil-seed crops in the northern seaboard area (of which 46% is in the UK regions, 28% in Denmark, 25% in Germany and 1% in the Netherlands). Allowing for the incidence of small farms with under 92 tonnes production per annum which will not be required to set-aside, the area eligible for set-aside is approximately 5 million ha.

We believe that the large high yielding farms are unlikely to opt for set-aside. These are to be found principally in East Anglia. This leaves some 4.4 million ha as potentially participating in the scheme giving a maximum set-aside of some 660 000 ha or around 10 to 11% of the total area under cereals and oil-seeds.

Set-aside may have a dramatic impact upon the landscape; this will depend on implementation details. Judged on the results of earlier schemes land taken out

Table 3.1. Impact of the CAP reform

	Total area under cereals and oilseeds (1 000 ha)	Area likely to participate in set-aside (1 000 ha)	Maximum area set-aside (1 000 ha)	Area set-aside (as % total area)
Netherlands	88	55	8.0	9.3
UK	2 898	2 240	336.0	11.6
Denmark	1 749	1 312	197.0	11.2
Germany	1 588	794	119.0	7.5
Northern seaboard	6 323	4 401	660.0	10.4

Source: Study team estimates.

of cultivation will be left to grow weeds and become derelict. Although it must be mowed once a year agricultural chemicals are banned. The scenic quality of many hitherto attractive parts of the study area will thus be in danger of impairment perhaps permanently.

This will have knock-on effects. In many areas and for many farmers off-farm activities, particularly tourism-related, are important sources of income. If set-aside destroys the asset – the attractive countryside – that these activities rest upon then farmers and rural communities will doubly lose.

It is unclear whether the regulations will allow land to be permanently set-aside and put to alternative non-agricultural usage, such as golf-courses or caravan parks. This might provide farmers with a lifeline but would certainly not restore the landscape.

With target prices set to fall, farms in areas such as Scotland, Denmark and Schleswig-Holstein and marginal farmers elsewhere are likely to come under increasing pressure, whether opted into, or out of, the compensation scheme. Some will struggle on, some will be bought out to enlarge existing farms but many will go out of business and so further reduce the area under cultivation.

Farmers will attempt to raise productivity and cut costs to offset declining prices and loss of acreage in set-aside. This will encourage intensification, increases in farm size, greater mechanization, etc.

The rate of decline in farm employment is likely to accelerate as a consequence of these various influences, except in areas such as East Anglia where labour requirements have already been reduced to minimal levels.

Assuming an average labour requirement of 0.04/ha (based on all farm types, not just cereals) the potential loss of jobs in the study area is estimated in Table 3.2.

Thus set-aside could result in a loss of some 26 000 jobs, around 4.0% of all farm jobs in the study area, over and above the annual decline in employment due to structural change in the industry. The impact will be largest in Denmark (7% of all farm jobs lost) and the UK (4.9%). By contrast the likely impact in the Netherlands will be negligible.

In quantitative terms this employment loss is marginal, but for certain farm households and certain agricultural communities it could be critical. The gradual erosion of job opportunities threatens the viability of the rural economy, particularly in the more remote locations.

At an average yield of 4.5 t/ha, set-aside of 660 000 ha will imply a production loss of some 3 million tonnes, offset to some extent by productivity gains, which will have implications for downstream activities such as milling, transport, shipping, etc.

The main features of the CAP reform proposals for livestock are a cut in support prices for beef premium payments to encourage extensive production of beef and various quantitative production quotas for beef, sheepmeat and milk. These have little or no spatial ramifications and are not pursued.

Table 3.2. Impact of the CAP reform

	Area of set-aside (1 000 ha)	Farm employment lost (1 000 ha)	Total farm labour (1 000 ha)	Farm labour lost (as % total area)
Netherlands	8.0	0.32	95.0	0.3
UK	336.0	13.44	274.0	4.9
Denmark	197.0	7.88	112.0	7.0
Germany	119.0	4.76	180.0	2.6
Northern seaboard	660.0	26.40	661.0	4.0

Source: Study team estimates.

EC enlargement

The inclusion of the former German Democratic Republic in the Community may affect the competitive position of farmers in the old *Länder* of Germany, particularly in the arable sector. On the assumption that the large farm sizes in existence in the eastern half of Germany before unification are largely maintained and that they gain access to modern technology and management techniques, the farm structure which emerges in the new German *Länder* should make lower cost production possible and thus put smaller producers on similar land for example in Schleswig-Holstein, under pressure. Given the general economic difficulties in the new German *Länder* it may, however, take a number of years for this phenomenon to emerge.

The inclusion of the EFTA countries in the EC should have no more than a marginal impact on agriculture in the northern seaboard region. Farm support levels in most EFTA countries are at least as high as in the EC and it is doubtful whether the relatively small scale producers in these countries will be able to compete with EC producers.

Enlargement of the Community to include East European countries or at least to provide them with improved access could seriously affect producers in the northern seaboard region but is unlikely to occur on a significant scale much before the end of the decade.

Environmental controls

There is a growing public concern throughout the EC over the environmental impacts of modern farming – water pollution, eutrophication, destruction of habitats, loss of landscape value, etc. – which has already obliged governments to institute a number of control measures. It appears inevitable that over the coming years this concern will be translated into stricter control over what farmers may or may not do, and this will impact on farm practices, patterns and viability throughout the study area.

During the 1990s there is likely to be an intensification of the environmental controls which agriculture in the northern seaboard region is subjected to. Some parts of the study region have already embarked on the establishment of strict controls relating to the application of fertilizer and pesticides.

In the Netherlands the aquatic environment action programme was launched in 1987 to prevent run-off and leaching from storage of liquid and solid manure and silage and to prevent damage to water supplies due to nitrogen leaching from other sources. Under this programme farmers are required to build storage to store manure in excess of allocated spreading 'quotas' and to restrict activities in a number of other ways, for example to limit the periods during which spreading takes place.

It has been estimated that by the year 2000 these environmental measures will on average cost individual farmers HFL 10 000 to 30 000 per dairy unit and HFL 30 000 to 80 000 per intensive livestock unit. This means that in the dairy region in North Netherlands between 5 and 20% of dairy units could disappear and in intensive pig and poultry producing areas further south, 15 and 20% of farms could go out of business.

It should be noted that these reductions in farm numbers do not necessarily imply any reduction in the number of animals held or in the volume of output. It merely means there will be fewer farmers and larger farms.

In Denmark the Government is seeking to reduce both the volume of active ingredients in pesticides and the number of applications to 50% of the 1981-85 average by 1997. In view of the changes to the products being used this goal seems unlikely to impose any substantial burden on farmers.

In all of the countries of the northern seaboard farmers will increasingly be able to obtain payment for engaging in 'environmentally-friendly' farming practices. For the most part these payments will be in return for some restriction on farming activity, for example to reduce fertilizer applications in 'nitrate sensitive areas' in the UK.

Such payments will by and large compensate farmers for the cost of any environmental adjustments they need to make. It can therefore safely be argued that, with the possible exception of the legislation in the Netherlands, environmental controls will not have any significant impact on production capacity or farm incomes for the remainder of the decade.

Fishing

Present situation

In all countries of the study area fishing is an important but relatively minor activity in terms of employment and output. Viewed nationally its contribution to the economy is larger in the smaller communities of Denmark and the Netherlands than in the UK or Germany. However, because the industry is very location specific recent trends have had equally adverse effects throughout the study area.

The UK has the greatest number of fishermen, around 17 000 in 1989, or more than half the estimated total of over 30 000 in the four countries. This total was more than twice that for Denmark and four times the number in the Netherlands. The Dutch figure was more than twice that of the German. However, as a proportion of total national employment, fishing is of greatest importance in Denmark, its relative share being four times that in the Netherlands or the UK.

In terms of number of vessels, the UK fleet is the largest followed by the Danish fleet. The Dutch and the German fleets are somewhat smaller. In terms of fishing capacity (e.g. grt) the UK fleet is also the largest, followed by Denmark and the Netherlands. The average capacity per vessel (kW) in the Netherlands is much larger (800 kW/vessel) than in the three other countries. However, it should be noted that around 70% of the UK fleet consists of vessels smaller than 10 metres, and that these vessels generate mainly part-time employment. The average vessel fishing capacity has tended to increase.

The Danish fleet is the largest, in terms of catch, of the four countries represented in the northern seaboard study area, followed by the UK, the Netherlands and Germany. Around 70% of the Danish catch by volume (25% by value) is for reduction purposes – the production of fish meal and oil. The other countries are more oriented to catching fish for human consumption. The species composition of catches varies according to national preferences and the composition of the fishing fleet. Thus in the UK catch mackerel is the major species, but herring, cod and haddock are also important. The most important German species is cod, and cod is also the most important fish consumed in Denmark (with herring).

It is a general feature of the northern seaboard countries (with the exception of the Netherlands) that their fisheries are heavily dependent on the state of cod stocks in the North Sea, as the catches of cod and other roundfish contribute substantially to the gross earnings of the fleet.

While the bulk of fish landings are destined for consumption within the same territory all four of the study area countries have a strong export trade, usually in added-valued processed products, and principally but not exclusively with other EC members; there is a strong counterflow of imports into the study area from the rest of the EC. The four countries are also becoming more dependent on imports from outside the Community. This is particularly the case in Denmark and reflects, in part, that country's need to maintain its very extensive processing industries.

Denmark is the largest exporter of the four countries of fish and fish products, which account for over 5% of total Danish exports by value. Dutch exports are about 60% of those of Denmark and account for about 1% of total exports. These two countries are net exporters. Exports by the UK and Germany are less than half of those of Denmark and account for less than 1% of total exports. These countries are net importers of fish and fish products.

Exports by Denmark and the UK are relatively static while the Netherlands and Germany have posted modest increases in recent years. Imports have been increasing for all countries; these have been considerable for Denmark, where they are needed to support the processing industry.

The industry has seen rapid technological development in vessels, fishing gear and equipment (such as echo locators). Boat sizes have increased to maximize the benefits of these advances and there has been a reduction in the number of hands needed to operate the vessel. Catch capacities and efficiencies have increased. Thus there are great similarities with the agricultural industry. In farming technological developments have led to increased production and the growth of surpluses; in fishing technical trends have led to overfishing, reduced fish stocks and declining catches. Pollution, especially of estuaries and coastal waters, has also played a significant role in the decline of fish stocks. Thus the major problem today is the mismatch between catch-effectiveness and catch possibilities.

National fisheries policies have tended in the past to be more concerned with social and short-run economic objectives than with the protection of fish stocks. The EC fisheries policy, introduced in 1983, attempts to limit catches to allow fish stocks to recover by means of TACs and quotas. In the past, the apparent critical state of the stocks of mackerel and herring was the most urgent problem dealt with. Since the late 1980s however the TACs and quotas have been substantially reduced for roundfish (cod in particular) which constitutes an important source of revenue for the northern seaboard fishing fleet.

The establishment of a TAC takes as its starting point advice based on the use of fish stock models. These are at present quite imperfect, as it is extremely difficult to model the ecological developments and interactions at sea. The resulting TACs are also the result of political negotiations that consider aspects other than the biological one (e.g. social and distributional concerns).

Declining catches have led to economic and social problems not only for fishing communities but also for processors. There is an urgent need to find new job opportunities in alternative activities for both. Declining catches have generated an interest in fish farming, for example salmon farming in Scotland, but this is not a straightforward option as it both faces and generates new problems. Fish farms also produce large quantities of waste and soluble nutrients and require the use of chemicals to ward off disease and these can be toxic for other marine species. It is for these reasons that no new fish farms have been established in Denmark since 1986. Furthermore, the initial phase of fish farming is risky and expensive and once production has been established many face strong competition as has been observed in the case of salmon.

In some areas (e.g. Germany) there is a trend towards part-time fishing, in particular a combination of tourism and fishing/adventure. This development will decrease the social and economic burden of job losses.

Trends

The central problem in the fishing industry is that there are too many boats chasing too few fish. This imbalance between catch effectiveness and catch possibilities has been caused on the one hand, by technical developments in vessels, gear and ancillary equipment which have increased fishing efficiencies and, on the other, by overfishing in the past, pollution and loss of fisheries (as a result of the creation of 200 miles of exclusive fishing zones) which have reduced the fish stocks available.

The possible accession to the EC of other countries, such as Norway, may change the conditions for the northern seaboard fisheries. Norwegian waters will become part of the fishing area. However, the impact therefrom depends on the results of the negotiations, and Norway has a strong desire to maintain the present status of their fishing areas, i.e. to allow a very limited access to other fleets. Another important aspect is related to the markets, as Norwegian catches and processed goods will enter the EC market, and hence supplies within the EC may increase substantially.

The key issue facing the industry is then, to adjust fishing capacities to fish stocks so as to ensure a long-term sustainable fishing industry. This will require action on two fronts:

- to reduce fishing capacities by, for example the decommissioning of vessels;
- to conserve fish stocks by, for example control of mesh size to ensure that spawning fish are not taken and the reduction of pollution in coastal waters.

The common fisheries policy (CFP) agreed upon in 1983 provides a framework for Community attempts to deal with the industry's problems. It is to run for 20 years with a mid-term review in 1993. Various measures have been introduced, aimed at the conservation of fish stocks, such as:

- controls through inspections;
- total allowable catches (TACs);
- national quotas;
- minimum size of fish allowed to be caught;
- mesh size restrictions.

However, these measures have tended to create other problems such as:

- illegal fishing;
- increased efficiency of vessels encouraged indirectly by the quota system;
- high levels of discards, i.e. fish caught as a by-product and thrown back into the sea, usually dead, because they are the wrong species, too small, or would cause quotas to be exceeded;
- flags of convenience, i.e. vessels registered in one country, but owned by foreign nationals, and participating in the first country's quotas. This is a problem of particular relevance in the UK where an estimated 20% quota is being lost to foreign-owned, mostly Spanish, boats, sailing under flags of convenience.

Fish stocks will take a long time to recover even if existing and new CFP initiatives are successful. The prospects for the year 2000 are thus:

- little change from the existing situation;
- increasing restrictions on fishing effort, for example reduced TACs and quotas backed up by increased inspection and perhaps a centralized monitoring system (an effective EC-wide conservation policy will be impossible if enforcement is left to national organizations whose standards vary as widely as they do at present);
- an extension of the use of structural elements into policies such as the existing decommissioning schemes and land-based job-creation schemes;
- a stabilization in fish prices, due to factors such as the availability of illegally landed fish, increased imports and cheaper substitutes;
- a decline in earnings generally although individual earnings could well increase;
- a contraction in the size of the fleet as a consequence of decommissioning schemes and falling earnings;
- a continued fall in employment;
- a decline in the fortunes of small fishing ports;
- a concentration of fishing effort on fewer but larger ports (e.g. the Scottish fleet is now centred on major population centres such as Frazerburgh while smaller ports have died);
- a growing number of distressed communities where alternative jobs do not exist or are insufficient to replace those once provided by fishing and allied processing activities.

Aquaculture, as an alternative to fishing, has developed rapidly over the past decade with financial support from the EC. Stabilization rather than growth is expected over the next decade as environmental concerns are likely to lead to restrictions on the number of sites and size of farms, and increases in production costs.

The processing industry currently suffers from a shortage of local raw materials and is increasingly dependent upon imports. As both species and quality of imports may diverge from local supplies the industry may need to accommodate the change by developing new products and processing techniques. The industry also faces possible restrictions on environmental grounds (mainly concerning the quality of process water discharges) and increasing competition from processing plants in southern Europe, particularly Spain.

Tourism

Present situation

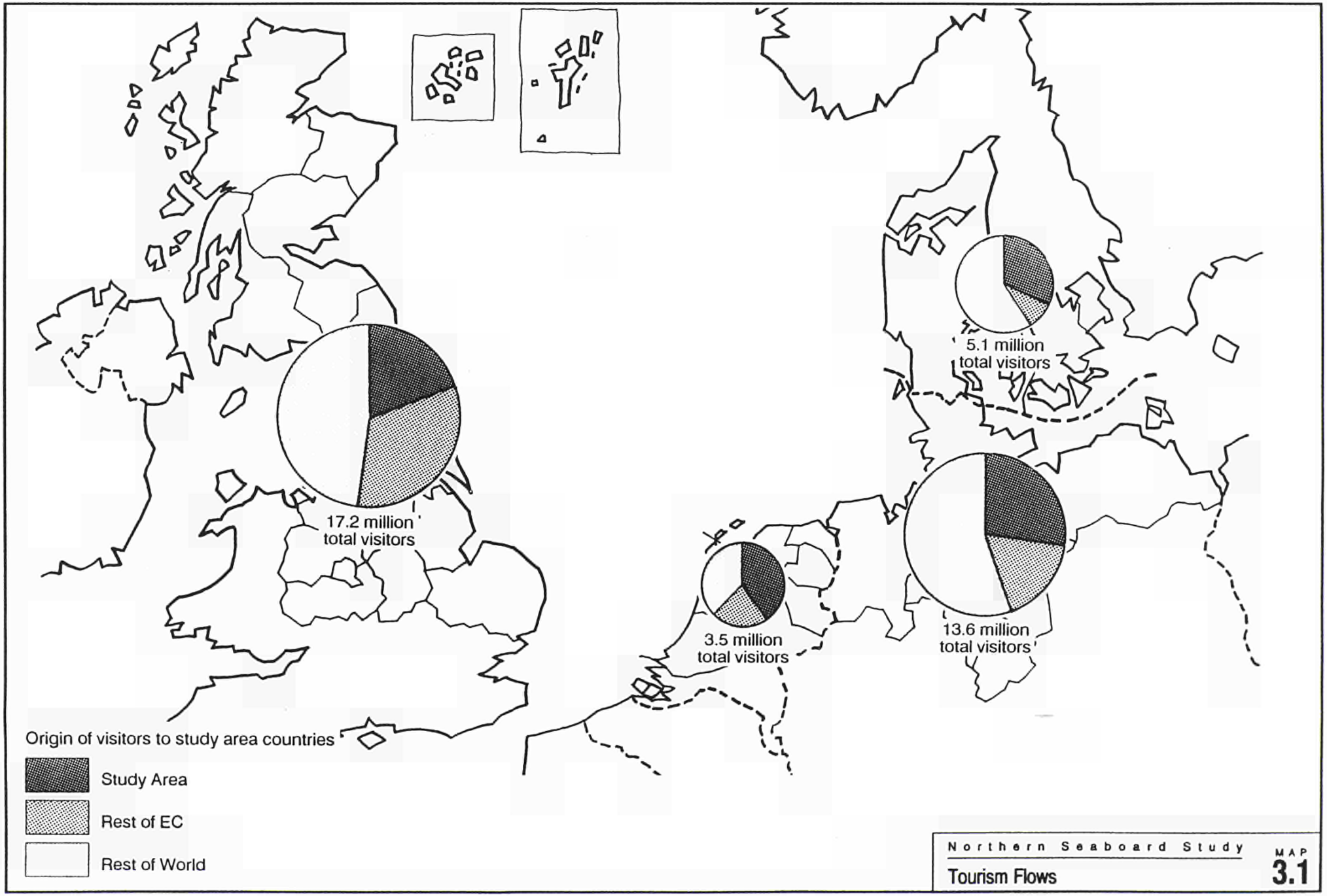
Markets

The four countries of the study area attracted some 40 million foreign visitors from all sources in 1989. The UK accounted for around 44% of this total, Germany 35%, Denmark 13% and the Netherlands 9%.

Of this total of 40 million visitors over 19 million were drawn from member countries of the EC. The distribution of these visitors to the four northern seaboard countries was roughly similar to that for all visitors with 46% going to the UK, 32% to Germany and with the Netherlands and Denmark each attracting around 11%.

The four study area countries together generated a total of nearly 10 million visitors to their own region, Germany attracted the bulk of this visitor pool (37%), with 33% going to the UK, 16% to Denmark and 14% to the Netherlands.

The importance of the study-area regions as a source of visitors varied significantly between the constituent countries. It provided 40% of all foreign visitors to the



Northern Seaboard Study

Tourism Flows

MAP 3.1

Netherlands and 31% to Denmark. For Germany the proportion was 27% and for the UK only 19%.

Thus the UK has the largest tourism industry in terms of the number of visitors it attracts and is least dependent upon its study-area partners. In contrast the countries with the smallest tourism industries, Denmark and the Netherlands, are much more reliant on visitors from their northern seaboard neighbours (see Map 3.1).

Denmark's biggest market is the rest of Scandinavia which accounts for over 40% of hotel bed-nights; Germany accounts for over 20%. No other country accounts for more than 10%. The UK contributes 6% and the Netherlands only 2%.

Germany also accounts for around 20% of the tourism market in the Netherlands in terms of all accommodation bed-nights; the UK accounts for a similar proportion. The German share could well be an underestimate because Germans tend to stay in the unserviced accommodation sector more than any other nationality. This is equally true in the case of Denmark. Apart from the USA (12%) no other country has more than an 8% share in the market (Denmark 2%).

For Germany the main international markets are the USA (14% of foreign visitors) the Netherlands (13%) and the UK (9%). Danish visitors accounted for 4.5% of the total.

The USA (18%), France (14%) and Germany (11%) are the main origins of visitors to the UK. The Netherlands provides around 6% of all visitors. No other country has more than 5% of the total (Denmark only 1.5%).

Looking at the absolute size of flows between pairs of countries in the North Sea area, that between the UK and Germany, and between UK and the Netherlands is strong; those between the UK and Denmark, Germany and the Netherlands, Germany and Denmark are moderate; and between the Netherlands and Denmark are weak.

However, taking account of the relative contribution of individual countries to another's total visitor flow, German flows to Denmark and to the Netherlands and UK flows to the Netherlands are significant, accounting as they do for around 20% of the receiving countries' visitor totals.

All four countries have large domestic tourism markets, which in terms of visitor numbers and bed-nights are larger than the foreign visitor market. The relative importance of the domestic market varies for a number of reasons (such as national preferences, population size and structure, ease of travel overseas, etc.) from country to country; in Denmark, for example it is half as large again as the foreign market; in the Netherlands it is four times as large.

It is difficult to estimate accurately the share of the study-area regions in national tourism markets. However in the Netherlands they accounted for 35% of all accommodation bed-nights in 1989; in Germany for 21%; and in the UK for 34%. But these figures relate to the total visitor market, domestic and foreign. The UK study-area regions accounted for only 22% of foreign business; the German only 12 to 13%. Thus the regions of the study area appear to attract a less than proportionate share of foreign visitors.

The tourism product

The study area countries offer a similar tourism product – a mix of coastline, gentle countryside and interesting towns and cities. These are common features on both sides of the North Sea but not universal. In addition, culture and heritage are strong elements in the UK, and to a lesser extent in the other regions, and each can boast specific attractions, mainly of regional significance, but only a very few, like Legoland, are capable of drawing visitors from a wider catchment.

The Danish holiday experience has three main components – its 7 000 km of coastline, sheltered waters and lakeland; its tranquil countryside and islands and the culture and metropolitan attraction of Copenhagen. Tourism is particularly concentrated in the coastal areas especially in North and western Jutland and on the island of Bornholm. Hotel accommodation tends to be located in the capital city, in Aarhus and on Bornholm. The rented accommodated sector is concentrated in North Jutland, in northern and western Zealand and on Bornholm. Camping is very popular and there are approximately 600 sites. Farm holidays are growing in popularity.

The Netherlands has an extensive but unexceptional coastline; the Waddenzee and offshore west Friesland islands have a more distinct character. The interior offers a small-scale landscape of fields, dykes and canals and a number of small pleasant towns.

The German study area is more varied. West of the Elbe the coast of East Friesia offers a pattern of small fishing

ports and resorts with small-scale countryside-housing camping and tourist villages in the immediate hinterland. Inland to the south and east stretches a plain of agricultural land and heath punctuated by small historic towns. The river port of Hamburg attracts urban tourism, business and conference trade. To the north of Hamburg, Schleswig-Holstein has a pastoral landscape with small towns and villages offering farm tourism and self-catering and access to two coastlines. The North Sea coast of North Friesia and the Baltic coast near Lübeck/Travemünde are particularly important coastal resort areas. Tourism in Mecklenburg-Western Pomerania is mainly concentrated on the island of Rügen but facilities are well below Western standards.

Tourism in the UK sector of the study area is based on its seaside resorts, especially important for domestic visitors, and its countryside which offers a varied landscape ranging from the lakeland of the Broads, the uplands of the North York Moors, the mountains of the Pennines and the Lake District, and the lochs, mountains and islands of Scotland. It has a well developed urban tourism based on heritage, culture and industry, provided by historic cities such as York, Durham, Norwich, Cambridge and Edinburgh and a plethora of attractions such as the Black Country and Beamish Museums and the Jorvik Viking Centre in York.

Contribution to the economy

Tourism is a major development impulse in the study area. It is a growth industry sustained by longer paid holidays and rising discretionary incomes; greater mobility made possible by growing car ownership, better transport infrastructure and technological development, particularly in aircraft manufacture, which has lowered the cost of air travel; and an increasing awareness and knowledge of other countries and cultures, through the medium of television, which has whetted appetites for travel and new experiences. The industry is innovative, tapping new markets, creating new products and developing new destinations. The identification of the active-retired as a specific market sector with its own specific requirements; the development of the 'Centre Park' holiday village concept; and the introduction of long-haul package tours are relevant examples.

Tourism can generate large volumes of visitor spending in an area and thus create jobs. It is estimated that total tourism-related employment in the UK regions of the study area, both direct and indirect, totals 457 000. In the German regions it is 123 000, in Denmark between 90 and 100 000 and in the Dutch regions around 27 000.

Tourism is credited with generating other benefits including:

- the maintenance of farm structures in rural areas by the provision of direct income earning opportunities (farm tourism) and off-farm employment for farm households;
- the provision and preservation of infrastructure and other facilities, which in the absence of visitor demand, would not have been made available or which would otherwise have been closed down or withdrawn;
- providing the catalyst for a wider-ranging economic development of the area. Urban regeneration schemes, for example are frequently focused on tourism development.

However, tourism contributes to the development pressures on the coast and its immediate hinterland and creates capacity problems in high season.

The industry is under threat from coastal pollution, for example bathing waters that fail to reach EC standards, and beaches ruined by oil deposits but it, in turn, adds to environmental pollution, for example sewage discharge from resort areas, destruction of habitats, loss of fauna and flora, beach and cliff erosion.

Trends

Tourism flows within the northern seaboard region comprise domestic flows, flows between countries within the region, and flows to the region from the rest of Europe and the world.

The dominant flows will be intra-European and predominantly domestic; international trips account for less than 10% of all tourist trips; and 80% of international tourist flows in Europe are accounted for by European travellers. Nevertheless, world tourism will expand in all age groups faster than intra-European tourism and will tend to be relatively high spending. Therefore it will form a significant element in the total demand spectrum, even if it accounts for only a relatively small percentage of total trips.

Population growth will not have a major effect on tourism demand. European population growth will be very slight over the next 20 years or so and will generate an insignificant number of additional tourists. Factors such as population structure, economic stability, taste and fashion and culture will be far more important determinants of changes in tourism patterns.

The intra-European market potential is vast, with a total 1990 population, including the former Eastern bloc countries, of over 750 million. Of particular significance to the northern seaboard area is the potential represented by the Scandinavian population of 23 million. Many of the largest urban agglomerations are adjacent or near to the northern seaboard area and represent a large potential market area for each region. The socio-economic and political changes in the former Eastern bloc countries also represent massive potential which study-area tourism destinations will be able to tap.

Changes in age structure and household size resulting from the drop in the birth rate and increasing household fragmentation under changing social conditions will have a positive impact on tourism. There will be smaller families (many without children), with access to more disposable income, and enjoying increasing amounts of leisure time. Simultaneously, the postwar 'baby boom' age groups will reach retirement age and create a large group of pensionable age with higher levels of disposable income than previous cohorts.

The trend for earlier retirement, part-time work and self-employment suggest a move towards more flexible lifestyles, and an increase in the number of households taking two or more shorter holidays, rather than one main holiday. Increase in leave entitlements following harmonization of European employment conditions combined with higher spending levels will further increase the demand for second and third holidays.

These patterns will tend to be more evident in urbanized areas, which typically exhibit smaller household size and higher income levels than rural areas. Given the high scale of urbanization in northern Europe relative to southern Europe, these characteristics will be accentuated in the northern seaboard region.

There is expected to be sustained demand for holidays in the northern seaboard region from within member countries and from those areas of northern Europe adjacent to it. But there is unlikely to be an increase in demand from south European countries. This is partly because of climate and also because visitors from these areas will tend to aim for the main urban tourism centres and attractions which are, with the exception of Copenhagen and some UK cities such as Edinburgh, located outside the study area.

The private car will continue to be the dominant mode of holiday transport, particularly for local, domestic and intra-northern seaboard holidays, with convenience and flexibility offsetting the increasing cost of petrol. There will be continued growth in air travel (which has increased dramatically in recent years), mainly to transport northern seaboard tourists to distant, warmer destinations.

Rail travel for tourism has shown a sharp decline in recent years, but is expected to show an increase with the completion of high-speed links between capital cities, with schedules and fare structures designed to compete with airlines. The impact on the study-area tourism will be slight however, and limited to capital city movements.

The potential for growth will be reflected in changing patterns of tourism attractions. However, there will be little restructuring of demand over the next 10 to 15 years. The major attractions in terms of the number of visitors will retain their primacy, although there will be increased pressure from new attractions developed to tap the mass short-term holiday market.

It is too early to state with confidence what the impact of Euro Disney (Disneyland, Paris) will be; it could act as a serious drain on smaller, less ambitious – and hence less attractive – entertainment facilities; alternatively, it could promote a trend for similar types of visits through healthy competition, and stimulate the expansion and development of equivalent competing centres in the northern seaboard area.

Given the predicted expansion in demand, the greatest pressure will be felt on tourist locations offering non-urban environments (e.g. coastal and wilderness areas) with a high standard of facilities to match those available at more conventional developed centres. This will offer scope for remote, peripheral communities to benefit, albeit on a seasonal basis, from the increase in wealth which will tend to be concentrated in urban centres and more densely populated areas.

However it also presents real problems of environmental absorption; the old tourism conundrum is how to ensure that the scale and intensity of development does not adversely affect the very qualities which attract the tourists in the first place. And the essential character of these areas can be changed forever, resulting in a real loss of history and culture. This highlights the need for great sensitivity in planning tourism development.

Transport

Present situation

Freight transport

In the EC as a whole surface transport of freight measured in tonne-km grew by 1.9% a year on average between 1970 and 1985. Road freight grew by 3.5% per annum but that by rail and inland waterways declined by 0.9 and 0.4% per annum respectively.

As a result of these trends the share of road freight increased from 55 to 69% of total surface freight transport and that of rail contracted to 20 from 30% and that of inland waterways from 15 to 11%.

Since 1985, these trends have accelerated with road freight traffic growing at 4.5% per year and rail freight declining more rapidly.

Currently, only 3% of road freight traffic crosses international frontiers: this compares with 18% for rail and over 50% for internal waterways.

Surface transport of freight between the countries of the study area is similarly dominated by road haulage; rail freight volumes tend to be less than 10% of that by road. Exceptionally, rail freight between Germany and Denmark is approaching 20% of that carried on the roads, and the rail freight of goods from the Netherlands to Germany is in excess of this proportion although that in the reverse direction is only 5% of that carried by road.

Rail is more important in trade with countries outside the study area. This tends to be because average transport distances are greater, topographic conditions, for example passage of the Alps, militate against road, and certain countries, especially Switzerland have restrictive policies on the transit of lorries through their territories.

In the case of both road and rail intra-study-area flows are dominated by those between Germany and the Netherlands, probably indicating the importance of the Dutch ports to German traders.

Compared with surface transport, air freight traffic is of marginal importance and most of it is international.

Of those airports in the study area proper, Copenhagen handles the highest volumes, twice as much as the next most important airport, Manchester, probably reflecting its greater stature as an international airport. Schiphol in the overlap region of the study area handles four times as much as Copenhagen. A large part of the air freight generated in the northern seaboard probably passes through airports outside, particularly Frankfurt and Heathrow, where there is a greater choice of services and frequencies.

Infrastructure

Whereas the road network in all four countries has been growing slowly at around 2 to 3% per year the rail network has been contracting, except in Denmark. The contraction has been particularly sharp in the UK.

Investment in land infrastructure, particularly road, has failed to keep pace with the growing demand created by the rapid increase in traffic. In real terms investment has actually contracted; as a percentage of GDP this fall has been even greater.

The rapid growth, particularly of road and air traffic, which has overtaken the rate of infrastructure provision has resulted in a number of transport bottlenecks. These include:

(i) urban congestion, which severely affects all the major cities in the study area, and to varying degrees most other urban centres. The growth in local/domestic traffic has in many cases been so dramatic that it has not been possible to increase transport capacity without destroying the city centres;
(ii) border crossings, particularly those involving a sea crossing such as the Channel and the Baltic between Denmark and Sweden;
(iii) the unification of the two Germanies has created a need for better road and rail links across the former boundary to integrate east and west;
(iv) German unification has also created demand for an improvement in the road links across Germany's new eastern frontier with Poland and the former Czechoslovakia;
(v) road and rail links between northern Germany and the northern regions of the Netherlands have also been identified as in need of expansion to improve access to Rotterdam port;
(vi) the mix of relatively rapid passenger trains and slower freight trains using the same track is a generalized bottleneck. This arises as a result of the difficulties, physical and financial, of increasing track capacity;

(vii) air traffic growth is constrained by the lack of runway capacity and the limited possibilities of expanding this because of physical and environmental considerations. This problem will primarily affect major international airports. Some of these (e.g. Copenhagen) are not constrained by the lack of runaway capacity, but must invest in new air control technology. This highlights the role of the regional airports and the extent to which they can be developed to take the pressure off the main international airports. Manchester in the UK regions and Billund in Denmark, serving a range of international destination are already playing such a role to some extent;

(viii) congested air space is a further constraint on the growth of air transport. Replacing the present 22 different systems and 42 *en route* control centres with an integrated international air traffic control organization, operated from fewer centres, using up-to-date, compatible computerized systems could, it is estimated, increase the capacity of the airlines by 30 to 50%;

(ix) similarly, if military demand for air space could be reduced that for civil traffic would be correspondingly increased.

Trends

Freight and passenger transport have been growing strongly over the past decade or so and this trend is expected to continue, particularly for road freight and road and air passenger travel.

In volume terms air freight is, and will remain, negligible. The growth in freight transport by surface modes, of around 2% per annum between 1970 and 1985, is estimated to increase to nearer 2.5% per annum over the period to the end of the century. However, partly due to a growing lack of road capacity and increasing environmental concerns, the growth in road freight transport will slow down to less than 3% per annum as compared to around 3.5% per annum in the period 1970-85. Relatively more importance will be attached to rail and water transport. Even so, the share of roads in total freight movement will continue to increase to approach 75%.

Passenger travel by air will continue to grow strongly albeit at a slightly lower rate than previously, reflecting growing congestion in the air lanes and at airports. The rate of growth of car travel is expected to remain at around 3% per annum and those of bus and rail to be just over 2 and 1% per annum respectively, higher than those recorded in the 1980s. By the year 2000 the share of car travel is expected to have risen slightly to around 84% of all passenger transport by surface means. Despite its rapid growth, passenger travel by air will be only around 10% of that by all surface modes.

The growth of demand for transport is expected to be particularly high in the following areas:

- in the major urban centres throughout the study area;
- in the hinterlands of the main ports in Germany and the Netherlands, and to a lesser extent in the UK;
- for links between the former West and East Germany, particularly for road links, as a major shift from rail to road transport is taking place in the latter, where rail was more favoured under the former regime.

Investment in new transport capacity is unlikely to match demand as a consequence of budget limitations, increasing environmental opposition and the difficulties of land acquisition, especially in urban areas. As a result congestion and delays could well increase and new transport bottlenecks appear. Implementation of the single market, however, should ease problems at border crossing points as customs and immigration regulations are eased.

A number of major transport infrastructure projects are under way or planned which will be in operation before or by the turn of the century, or shortly thereafter.

The Channel Tunnel began services in 1994. It will have limited impact on transport patterns in the study regions. It might steal some traffic from the haven ports. Some long distance freight might switch to rail and the Tunnel in preference to road and a sea crossing using a study-area port. The Tunnel and a high-speed rail network might attract passengers who would otherwise use air transport.

Of the three fixed road and rails links to improve transport connections between Denmark, Germany and Sweden the Great Belt is now under construction and will be in operation by 1996-98; the Oeresund connection between Denmark and Sweden is planned to be in operation around the year 2000; the Fehmarn connection between Germany and Denmark is still being examined and, if proceeded with, is not expected to be operational before 2005 at the earliest.

On its own the Great Belt project will primarily have domestic significance in expediting traffic flows between

east and west Denmark. It will divert road traffic using ferry routes across the Kattegat, particularly Åarhus-Kalundborg and Grena-Helsinborg. But in conjunction with the proposed electrification of the rail line between Odense and the German border, the rail link will cut travel time between Sweden and Germany. It could therefore attract rail traffic presently using the southern ferry routes Rodby-Puttgarden and Malmö-Lübeck. The various ferry ports affected by these traffic diversions will suffer job losses.

These impacts will be reinforced by the construction of the Oeresund crossing which will increase the speed of travel between Denmark and Sweden. The new link might additionally attract long distance traffic presently using the Trelleborg-Rostock ferry route to the south and the Grena-Varberg and Fredrikshavn-Göteborg ferries to the north.

The Fehmarn crossing between Rodby in Denmark and Puttgarden in Germany is at present being examined by the two governments. By the time it goes ahead, if it does, the Oeresund crossing will have been built. The new link would have a major impact on international traffic flows, both road and rail, between Scandinavia and northern Europe. It will provide a more direct, and faster, route between east Denmark/Sweden and northern Germany than the Great Belt route, and would therefore attract all through traffic from it. Depending upon the quality of the transport links between western and eastern Germany, it could well attract traffic between Sweden and eastern Germany and beyond which presently uses Danish-German and Swedish-German ferry services operating out of Rostock. It might well impact on those coastal shipping services and ports engaged in seaborne trade between Germany and the three Scandinavian countries.

Plans for a high-speed rail passenger network to serve major cities in the Community and to be in place by 2015 are under discussion. Formidable technical and organizational difficulties will need to be overcome. The proposed route of its northern axis lies outside the northern seaboard study area but it is envisaged that a number of existing rail links in the study area would be upgraded as feeder routes. The benefits of the network will depend upon ease of access to it; the precise configuration of these feeder routes will therefore be critical in this regard. The high-speed network is seen as providing a premium service, primarily for businessmen and tourists that would compete with air travel over longer distance routes.

Following the unification of East Germany with West Germany the government has given high priority to improving the former's transport infrastructure and to integrating the two systems. As a result strong east-west transport corridors, both road and rail, are being developed particularly along the Baltic coast, from Hamburg to Berlin and from Hannover to Berlin. At present the main transport axes in both east and west Germany run north-south.

With the unification of west and east Germany the improvement of the latter's infrastructure and the integration of the two systems have high priority. Proposed projects include the following:

- the construction of a new motorway along the shore of the Baltic from Lübeck to Stettin;
- the upgrading of existing motorways from Hannover to Berlin and from Hamburg to Berlin;
- the construction of new high-speed rail links from Hannover and Hamburg to Berlin;
- the construction of rail links: Lübeck/Rostock/Stralsund, Hamburg/Berlin, and Uelzen/Salzwedel/Stendal.

A major east-west axis for both road and rail runs from Rotterdam to Hengelo in the Netherlands, which links via Hannover with these new cross-German routes.

A major trans-European transport corridor from Rotterdam to Berlin, and beyond, thus exists in embryonic form, which will be strengthened by the SEM and the upgrading of particular links.

Ports

Present situation

The North Sea as a transport highway: bridge or barrier?

In respect of its function as a transport highway the shape of the North Sea is important. It is very roughly an inverted triangular shape, widest at the top (north), narrowest at the bottom (south). Hence the northerly sea crossings take considerably longer than the southerly, for example Newcastle-Esbjerg 18½ to 20½ hours, Harwich-Hook of Holland 5½ to 6½ hours.

The time difference is important because of a perceived three-day rule in the European freight market, i.e. the

ability to make a round trip between the UK and the near Continent within three days. This favours the short-sea crossings across the southern stretches of the North Sea except for trips between a northern origin and a northern destination (e.g. northern England and Denmark) where the quickest route is via the direct sea route, say Newcastle and Esbjerg, but not necessarily within a three-day time frame.

If either the origin or the destination has a more southern location, for example Edinburgh-southern Netherlands, then it is quicker to use one of the short-sea crossings, rather than a direct sea route, trucking the freight south to access a suitable port.

Hence routes across the North Sea tend to be lateral, across the northern or southern reaches, for example Tynemouth-Esbjerg or Harwich-Hook of Holland, not diagonal except in the fringe areas between these two broad zones, such as Grimsby-Scandinavia. Thus in the UK there are no ferry services offered to the near continent further north than Teesside. Ports further north offer services only to north European/Scandinavian destinations.

The southern stretches of the North Sea can be viewed as a bridge between the UK and the Continent. Further north as the North Sea widens and the journey coast to coast takes longer it becomes more of a transport barrier.

The port network

There are a vast number of ports of different size and function in the study region; Denmark for example has over 100 and there are some 40 on the east coast of the UK between the Scottish border and the haven ports. Map 3.2 shows the tonnage handled by the region's major ports in 1990.

Denmark

The principal Danish ports are Aarhus and Copenhagen; they are the only container ports in the country and both operate liner (i.e. scheduled) feeder services to the bigger European ports. Copenhagen is also used as a cruise port.

Of more interest are the number of ferry connections that Denmark has with neighbouring countries and with the UK, a function of its location and island configuration. The principal road ferry link with Sweden is from Elsinore to Elsingborg. Most rail transport now uses the Danlink route across the Oeresund, and to a lesser extent the Copenhagen-Elsingborg route. Other road-rail ferry runs between Frederikshavn on the northern tip of Jutland and Göteborg. The route from Grenaa to Varberg is a road ferry link only.

There are three car ferry links with Norway across the Skagerrak and two road/rail ferry links with Germany from Rödby (to Puttgarden) and Gedser to (Wernermunde). These latter links will be affected by ongoing and proposed fixed link projects discussed above. The UK ferries run from Esbjerg.

Germany

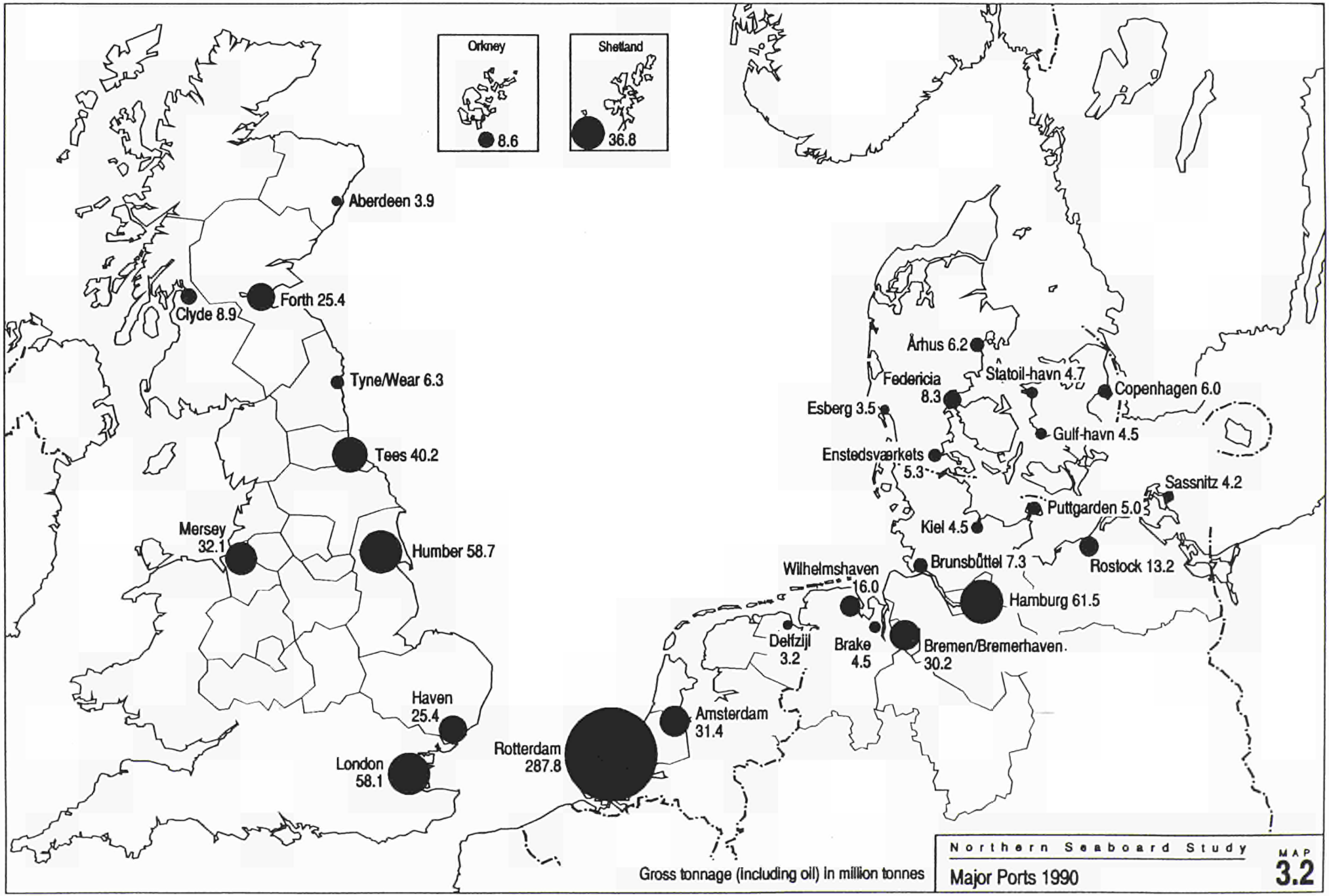
Germany has a number of ports on both its North Sea and Baltic coastlines; most are subject to actual or proposed improvement/expansion projects.

Hamburg and Bremen (with Bremerhaven), located on the rivers Elbe and Weser respectively, are the principal ports, and the only two container ports. The rivers are being dredged so that they might accommodate the largest container ships currently in service. There are four bulk ports (Brake, Emden, Nordenham and Brunsbüttel) of which the first two are also break-bulk ports. Wilhelmshaven is an oil port and Cuxhaven a roll-on roll-off port.

On the Baltic coast Lübeck and Kiel are the main all purpose ports, both are ferry ports and the former a transit port also. Rostock and Wismar, all purpose and bulk ports respectively, are the principal ports in the former East German territory. There are four rail ferry ports with connections to Denmark and Sweden, and the Sassnitz/Trelleborg ferry service is shortly to be reinstated.

German unification in 1990 and the political and economic changes in Eastern Europe have effectively widened the catchment area for west German ports. There has been a considerable growth in transport volumes between the former GDR territory and especially Hamburg and to a lesser extent Bremen (Bremerhaven). The current turmoil in the former Comecon countries has so far limited the transport volumes switched to west German ports but their role as transit ports for these areas is expected to grow.

Poor hinterland transport facilities have restricted the development of most German ports, apart from Hamburg and Bremen. German unification has added to the need for improvement, both for transport connections to eastern Germany to handle the growth in traffic flows


Orkney
8.6
Shetland
36.8
Aberdeen 3.9
Clyde 8.9
Forth 25.4
Tyne/Wear 6.3
Tees 40.2
Mersey
32.1
Humber 58.7
Haven
25.4
London
58.1
Rotterdam
287.8
Amsterdam
31.4
Delfzijl
3.2
Wilhelmshaven
16.0
Brake
4.5
Bremen/Bremerhaven
30.2
Hamburg 61.5
Brunsbüttel 7.3
Kiel 4.5
Rostock 13.2
Puttgarden 5.0
Sassnitz 4.2
Enstedsværkets
5.3
Esberg 3.5
Federicia
8.3
Århus 6.2
Statoil-havn 4.7
Gulf-havn 4.5
Copenhagen 6.0
Gross tonnage (including oil) in million tonnes
Northern Seaboard Study
Major Ports 1990
MAP
3.2

to/from this area and for better connections to the former East German ports, especially road links: they were formerly served chiefly by rail.

German ports have also been disadvantaged by tight government regulation of the inland transport market which meant that it was cheaper for freight originating in or destined for West Germany to use Dutch or Belgian ports rather than German. This competitive disadvantage is expected to disappear as the single European market leads to deregulation of transport markets and the harmonization of tax and other policies affecting the transport sector.

The Netherlands

Within the main study area there is only one Dutch port of any significance, Delfzijl including the river Eems facilities at Eemsmond, and the minor port of Harlingen. Together they accounted for less than 1% of total freight throughput of all Dutch ports in 1990. Rotterdam just outside the main study-area boundary accounts for approaching 80% of all trade through Dutch ports. The role of Rotterdam is the most interesting aspect of port development in the study area by virtue of the major role it plays as a transit port for German imports and exports.

German trade passes through four principal ports – Hamburg, Bremen, Rotterdam and Antwerp. A study undertaken by the Port of Rotterdam Authority in 1986 revealed that Rotterdam accounted for 62% of German imports through these four ports, more than twice the volume of goods handled by Hamburg and Bremen combined. It accounted for 22% of exports, less than that for either of the two German ports.

However Rotterdam's share in north German trade, was only 10% of imports and 5% of exports. The two German ports traded virtually 90% of this trade.

The study also revealed the great importance to Rotterdam in this transit trade, of inland shipping services both as regards southern and central German trade flows and also north German trade.

An analysis of trade flows by regions accessible and not accessible by water showed that Rotterdam's share in that of the latter was insignificant. It can be argued therefore that inland waterways are the principal factor in Rotterdam's role as an entry port for German trade. Plans for future development of the port include rail development of its hinterland, particularly the construction of a line from Rotterdam via Nijmegen to Germany to widen its catchment area.

The Rotterdam Port Authority study cast some interesting light on modes of access to Hamburg and Bremen ports. It revealed that the share of rail transport was surprisingly high for both ports and that inland shipping services were very important for Hamburg.

The United Kingdom

The principal British ports, in terms of volume of throughput, are those on Teesside, Grimsby/Immingham, Felixstowe, and Hull. Lesser ports include Tyne, Ipswich, the River Trent and Yarmouth.

The four main ports are the only ones involved in deep sea cargoes, either bulk or containers, and all, except Grimsby are in the short-sea unitized business too, along with Ipswich (Harwich) and Tyne. Most of the minor and lesser ports are involved in the short-sea bulk trades and there are ferry facilities at Harwich, Felixstowe, Grimsby/Immingham, Hull/Humber and Tyne. Ferry services across the North Sea are multipurpose carrying both freight and passengers. Freight tends to be unaccompanied trailers and containers with the emphasis on cost rather than speed. Accompanied trucks tend to use the Dover Straits routes. All the passenger-ferry routes are subject to competition from the shorter sea routes across the Channel and basically serve only niche markets. The Felixstowe and Harwich ferries will face increased competition from the Channel Tunnel post-1994. Those further away will be less threatened; in any event they are more underpinned by freight.

Trends

The present pattern of port development is unlikely to change significantly over the short term to the end of the century. But a number of trends can be identified which could well alter the situation over the longer term.

The principal areas of traffic growth are in the short-sea and containerized-cargo markets where growth of 6 to 8% per annum is possible. Deep sea traffic, particularly of bulks, such as iron and steel, coal and grain, is expected to grow at a much slower rate, perhaps 2 to 4% per annum, containers a little faster. Ports trading in these sectors will fare accordingly.

Competitive pressures between shipping lines and ports are inducing changes in the structure of these activities.

Ports have always been under pressure to provide facilities to accommodate larger ships. Initially felt in the crude and dry bulk trades, this pressure is now being felt in the deep sea container sector where ports handling this trade increasingly need to provide berths with 13m draft and cranage with post-Panamax vessel outreach and high handling rates. In the short-sea trades pressure is on ports to provide facilities to handle ferries of 6 to 7 metres at all stages of the tide.

Larger vessels, in turn, demand a stronger concentration of cargoes on fewer ports and this leads to increased feeder services to these ports to provide the required cargo volumes (a pattern similar to the hub and spoke systems developing in air transport).

Received wisdom is that this trend will increasingly lead to a concentration of shipping services on one main continental port, probably Rotterdam. This concentration will adversely impact on other ports and their own particular systems of hinterland access.

However, the strategy of port concentration is viable only to the extent that cost savings in the operation of larger vessels between a few main ports are higher than the additional costs of the required feeder services and the longer inland transportation distances to load centres. There is limited evidence that this is the case at present but to the extent that the single European market reduces inland transport costs, such cost savings may materialize in the future.

Ease of access from and to its hinterland is a major determinant of port development. The fixed link projects from Denmark to Sweden and Germany will clearly favour the north German ports of Hamburg and Bremen/Bremerhaven, possibly at the expense of Copenhagen and Swedish ports. On the other hand, a number of Danish, German and Swedish ferry ports would be adversely affected by construction of these links. The liberalization of Eastern Europe in conjunction with the development of road and rail links between east and west Germany and the modernization of the infrastructure in the former should increase the volume of freight passing through Bremen and Hamburg.

The only other fixed-link project that will be in place by the end of the century, the Channel Tunnel, is unlikely to cause any diversion of cargoes between ports. It will impact on ferry traffics but not on those in the study area which will be beyond its area of influence.

In the UK the government's road programme emphasizes the provision of better access to ports and schemes are in hand that will benefit the Humber ports, Yarmouth/Lowestoft and Teesside, among others.

Elsewhere road congestion problems will focus more attention on inland waterways and rail. This places Rotterdam in a very strong position as its role as a transit port is based very strongly on its access to the Dutch and German waterways network. Inland shipping services are also important for Hamburg.

There are plans to improve rail access to both Rotterdam and Hamburg ports and the fixed-link projects are likely to generate more benefit to rail than road transport.

However, the development of long distance rail services to Mediterranean ports could attract Middle Eastern and Far Eastern cargoes which otherwise might have utilized North Sea ports.

Ports are under pressure to add value to their services and one response to this is to develop distribution facilities within their estates. There is a trend for deep sea importers to distribute across Europe from a single site but the preferred location is in the Rhine delta ports of Rotterdam and Antwerp. However, as the single European market develops and encourages increased trade between Member States, there will be an increasing logic in domestic distribution facilities being located in port areas, consolidating goods produced within a country with imports. For similar reasons light industry and assembly activities may find port estates are sensible plant locations.

Containerization has reduced the demand for dock labour, but until fairly recently, it has been difficult for ports to shed surplus labour owing to the strength of the unions and schemes like the dock labour scheme in the UK, which have protected dockers' jobs. This is now changing, most rapidly in the UK, and is shifting the balance of advantage between ports. The larger ports which most suffered from labour surpluses which could not be shed and restrictive practices, are now able to win cargoes from the smaller and shallower (i.e. less suited to containerization) ports which have prospered over the past two decades. Losses in traffic will lead to some dereliction and local economic decline. The new labour relations environment also offers opportunities to develop waterside industrial and distribution activities in port estates.

Telecommunications

Present situation

The telecommunications sector is important in its own right as an economic activity but also as a major influence on other activities.

It is a rapidly growing and evolving activity whose main characteristics have contributed to decreasing costs and the introduction of new products and services. These are:

- swift technological development;
- an increasingly competitive environment as State monopolies have been broken up and deregulation extended.

Of the four study area countries Denmark has the highest penetration of basic telecommunications services (54.9 telephone lines per 100 population); the UK has the lowest (44.6 lines/100 population). Penetration is higher in the old Federal Germany than in the Netherlands. In the former East Germany it is only 10.8 lines per 100 population.

Denmark also leads in the provision of enhanced services; for example 33.4 subscribers per 1 000 population for cellular phone services. By virtue of its early introduction of a deregulated telecommunications structure the penetration of these services is also high in the UK.

Tariffs have a major influence on call volumes and patterns. Domestic telecommunications tariffs (for a representative basket of basic services) are lowest in Denmark and the Netherlands. British tariffs are lower than those in Germany, especially for business users. Denmark also has the lowest tariffs for international traffic but those in the Netherlands are the highest in the four countries. UK tariffs tend to be higher than German, especially for residential users.

Reflecting its higher levels of penetration and lower charges Denmark has the highest call volume of the four; the Netherlands has the lowest with a volume less than one half of that of Denmark (446 calls per head as against 902). In the former East Germany calls were very low at only 133 per head.

Local calls are the major component of this traffic (52% of the total in the Netherlands, 77% in the UK). International calls contribute only 1 to 3%.

Telephone call patterns give an indication of the level of interaction between countries. Some 21% of outgoing calls from the study-area countries are to other study-area countries; this proportion is lowest for Germany and the UK, perhaps reflecting their more internationally oriented economies. The strongest telecommunications links are with Germany especially so for the Netherlands where calls to Germany account for 24% of all outgoing calls.

Call patterns also reveal that:

(i) some 70% of calls from the Netherlands are to other EC countries (39% to the three other study-area countries) compared with about 40% in the case of Denmark, Germany and the UK. More than half of all outgoing Dutch calls are to only three countries – Germany, Belgium and the UK;
(ii) around 30% of Danish calls are to Norwegian and Swedish destinations;
(iii) UK traffic with the rest of Europe is the lowest of the four countries (48%). The UK's major destination is the US (21%) but because UK-US telecommunications rates are the lowest in Europe, many European calls to the US tend to be routed through the UK.

Trends

The study area is generally well served with telecommunications infrastructure, with the exception of eastern Germany. However, it is envisaged that by the end of the century basic telecommunications facilities in this area will be comparable to those in the West. The German authorities have decided to upgrade facilities using a wireless-based technology and plan to recruit 80 000 subscribers within the next seven years. In other countries of the study area there will be increased penetration of basic services but with Denmark maintaining its lead over the other three countries.

The rates of penetration of advanced services will depend upon the dates the services are introduced, the technology provided, the market structure, tariffs and equipment prices and as such they will vary considerably from country to country and from service to service.

Over the next decade because of its considerable advantages in terms of speed, capacity, quality and security and, because it allows speedier communications between computers, digital technology will increasingly replace analogue.

In parallel with this there will be a spread of integrated services digital networks (ISDN). This is a major inter-

national initiative to introduce a range of common standards and services on to the emerging digital network. ISDN will be able to accommodate a range of advanced services such as high-speed fax, videotext and video conference.

All four countries in the study area have introduced a commercial ISDN service and all four countries intend to have a national network before the end of the 1990s.

By the end of the century radio transmission will become more common; in particular there will be strong demand for mobile communications and this is likely to lead to pressures for operators and governments to give up radio spectrum from fixed uses to allow this new sector to develop.

There will also be greater use of high bandwidth applications to enable high capacity data communications and video applications, although, to some extent, this trend will be slowed by bandwidth compression technologies which will enable some of these applications to be handled on narrow band.

Telecommunications are already having major impacts on how firms operate (EDI systems/JIT techniques, Eftpos, etc.) and how they are organized (e.g. leaner and less rigid hierarchies, relocation of organizational units) and those trends will accelerate and spread. It is unlikely, however, that by the year 2000 telecommunications will have had much impact on promoting development in rural and peripheral areas. These benefits await to be realized.

Telecommunications and regional development

The interest in telecommunications in this study is in its implications for spatial development, particularly in its value as a vehicle for ameliorating the problems of peripherality and providing a more balanced development of Community territory. Unfortunately, despite many studies, there is no clear evidence as to whether, on balance, telecommunications contribute positively or negatively to regional development.

Proponents argue that telecommunications permit the relocation of existing businesses and facilitate the start up of new enterprises in low-cost less-developed areas without any loss of essential facilities and services, either to companies or staff, because these can be accessed remotely. But it can be equally argued that such service delivery over telecommunications links could well displace similar services provided locally and thus negate the perceived benefits to less-developed locations of the new activities attracted.

In any event two aspects of telecommunications development inhibit the potential benefits it can bring to less-developed areas.

(i) Despite increasing competition, it seems likely that the de-averaging price policies (i.e. the move to marginal cost pricing) and the profit enhancement policies of deregulated enterprises could well lead to increased prices to telecommunications users in less-developed and particularly rural areas as compared to those in urban areas, especially for the newer enhanced and alternate services. The less dense population of potential subscribers to these services in rural areas implies higher unit infrastructure and operating costs which will need to be recovered in the tariffs charged, although some public subsidy of basic services can be envisaged.
(ii) New services will always tend to be provided first in more developed areas, where the major markets lie, so that standards will always lag behind in less-developed areas.

Both of these considerations reduce the attractions of less-developed areas as a business location although EC initiatives are being made to address this problem.

Telecommunications development cannot be considered in isolation from transport developments. For some businesses, for example those operating in a JIT environment, a less-developed location is only feasible if good transport links are available to permit speedy, regular deliveries to their customers. In these cases complementary development of telecommunications and transport are needed if less-developed areas are to benefit.

For other activities telecommunications can replace travel and avoid the need for proximity; it can also provide a means of accessing specialist skills that are in short supply and of augmenting labour shortages, for example by involving married women in the job market via services such as teleworking and teleconferencing. While such businesses might thus more easily thrive in a less-developed location, considerations such as the need for periodic face to face contact will continue to give rise to a need for good quality transport links.

Telecommunications and transport networks, therefore, are best viewed as complementary technologies.

Energy

Present situation

Primary energy

The northern seaboard is the most important region in the Community in terms of primary energy resources. It encompasses the offshore oil and gas fields of the North Sea, and major onshore resources such as the Groningen gas field and the most productive UK coalfields. The major proportion of the energy resources of the four countries represented in the northern seaboard lie within the study region.

Proven reserves of oil at 535 million tonnes lie principally in UK fields and are equivalent to six years production. UK reserves alone account for about 60% of the EC total. Proven reserves of gas total 2 894 billion m^3 (approximately equivalent to 2 605 million tonnes oil), some 86% of the EC total, equivalent to 20 years production. The Netherlands own 68% of these resources, the UK 19%, Germany 9% and Denmark 4.5%. These reserves account for one third of the oil reserves and three fifths of proven gas reserves.

The UK accounts for virtually all coal reserves, which at 5 600 million tonnes of oil equivalent, have a reserves: production ratio (based on 1990 production of 93 million tonnes) of about 100 years. Thus coal accounts for 64% of all primary energy reserves and some 70% of all proven North Sea energy resources are under UK control.

North Sea oil and gas

All production of North Sea oil and gas by EC Member States is piped to a landfall in the relevant country except that some Norwegian oil and gas is landed in the UK (at Teesside and St Fergus respectively). There are no interconnections between national offshore pipeline systems. There are oil terminals at Sullom Voe, Flotta, Nigg Bay, Cruden Bay and Teesside in the UK and at IJmuiden in the Netherlands; and gas terminals at St Fergus, Barrow (Morecambe Bay) Dimlington, Easington, Theddlethorpe and Bacton in the UK and at Bergen in the Netherlands, Esbjerg in Denmark and Emden in Germany. The UK sector has the most extensive network of offshore pipelines. Outside the UK sector the most significant offshore pipeline is that supplying Norwegian gas from the Statfjord field to Germany via a landfall at Emden (Norpipe). This will be complemented by a second transmission system for Norwegian gas (Zeepipe) which will run from the Troll field to Zeebrugge in Belgium.

Coal

Production of coal within the northern seaboard region is confined to the UK. The bulk of output goes to the power utilities for electricity generation.

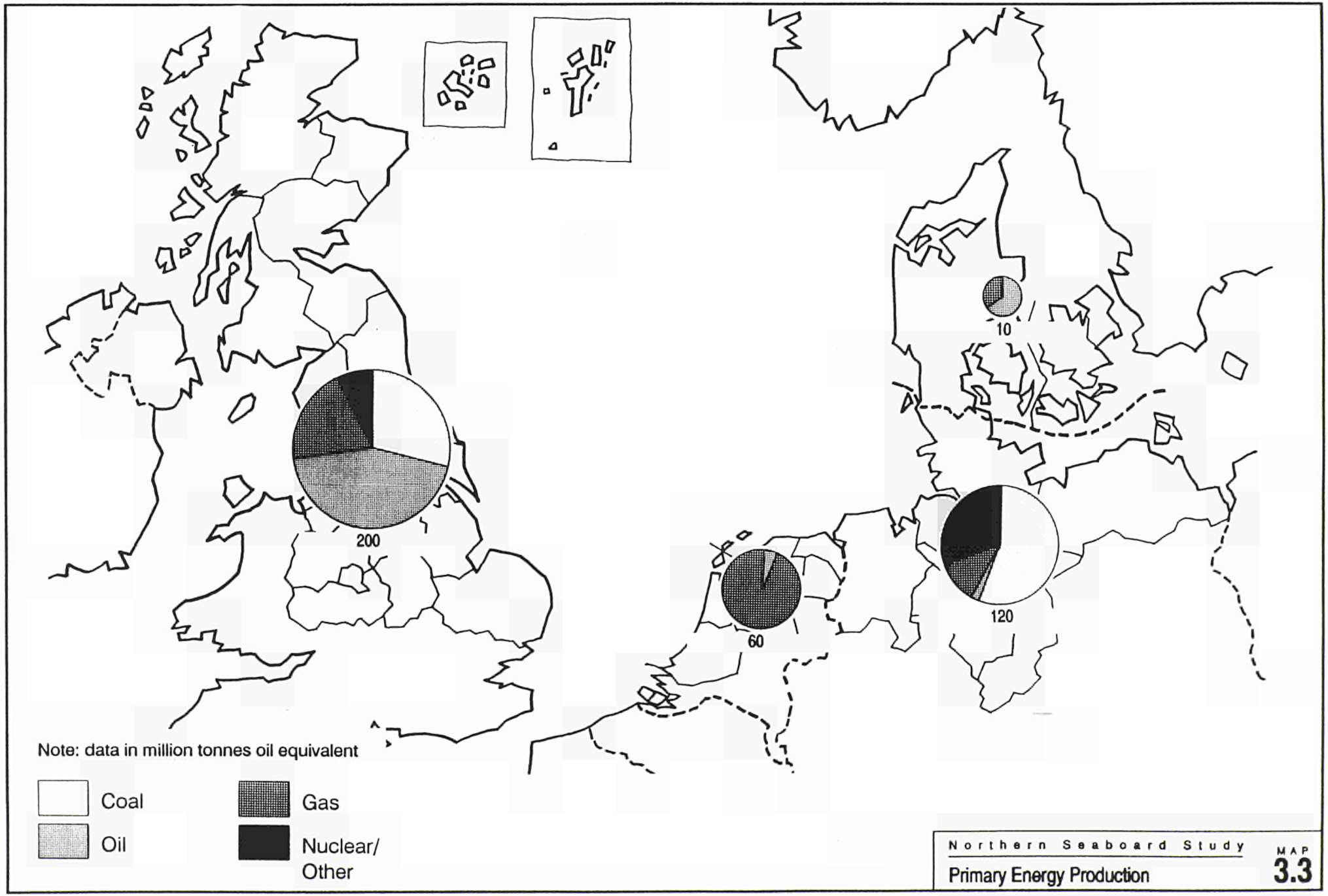
Before privatization of the electricity-supply industry in 1989 and the introduction of open competition in power generation, the bulk of coal output had a guaranteed market with the sole generator at a price well above international prices. Private generators were obliged to enter into interim supply contracts with the coal industry at privatization, but as from 1993 will be free to obtain coal from any source. They are now actively looking to expand imports, and are proposing to upgrade existing and build new port capacity and handling facilities. Unless the coal industry can drastically reduce costs it will lose the major part of its market. One report has suggested that only 14 of British Coal's 60 collieries may be commercially viable and these would need a workforce of only 11 000 against BCC's existing labour force of 50 000. There are no plans in the UK to build additional coal-fired capacity. Elsewhere Denmark, the Netherlands and Germany have plans to construct significant coal-fired capacity to be supplied by imported fuel.

Production of primary energy

As Map 3.3 shows, of the four study area countries the UK is the largest producer of primary energy and contributes around 40% of the EC total. Crude oil accounts for some 50% of its output, coal for 25%, natural gas for 16% and nuclear energy for most of the balance. The bulk of nuclear energy production takes place outside the study areas, but apart from some coal production from South Wales, coal, oil, and gas output all originate in the study area.

Dutch primary energy production is mostly of natural gas (91%) with oil providing most of the balance. There is a small nuclear contribution. Most of the oil and gas output originates in the study area. The Netherlands contributes around 12% of the EC total.

Germany is the second largest producer of the four study-area countries and accounts for some 20% of the EC total. Coal and lignite are the dominant fuels (around 60%) but mining areas lie outside the study region. Nuclear energy accounts for around a quarter of German production but this too is located outside the



Northern Seaboard Study

Primary Energy Production

MAP 3.3

study-area regions. The balance of German output of primary energy is chiefly natural gas with a smaller contribution from crude oil. The German study-area regions provide only 3% of output of primary energy.

Denmark provides only 1% of EC output, mainly crude oil.

The UK regions are the principal source of study-area output of coal and the major source of its crude oil production; the Netherlands provide over half of natural gas production against a UK contribution of around 35%.

Primary energy demand

The structure of primary energy demand varies between the four countries, reflecting mainly the local resource base. The Netherlands and Denmark are heavily dependent on one fuel – gas and oil respectively – which provides about 50% of energy needs. Demand is more diversified in the UK and Germany.

The share of primary energy demand supplied by oil, mostly imported, has tended to decrease for mainly strategic reasons, and more recently, that of coal has too. These shares have been captured by nuclear electricity and natural gas.

The Danish economy is the most energy efficient, consuming 0.29 tonnes of oil equivalent per USD 1 000 GDP; the corresponding figure was 0.39, 0.40 and 0.47 tonnes per USD 1 000 GDP for Germany, the UK and the Netherlands respectively. Unit energy requirements have fallen in all States over the past decade.

Primary energy balances

North Sea resources have contributed significantly to the extent that the study-area countries, and the EC, can meet their energy requirement from indigenous supplies. The UK is virtually self-sufficient in primary energy (1989) covering 99% of requirements from indigenous sources. The Netherlands achieved 91% self-sufficiency but Denmark and Germany met only about half of their requirement from local sources (roughly the same proportion as the EC as a whole).

To reduce strategic and commercial vulnerability diversification of fuels has been pursued in parallel with diversification of sources, and intra-Community trade has played an important role in offsetting the risk of interruption of extra-Community supplies. If Community supplies are included as part of indigenous sources, the level of energy self-sufficiency in Germany, the most import-dependent country rises to above 60%.

Trade in energy

A large proportion of the region's energy output is exported to Community destinations. Only in the case of UK coal is the bulk of production in the region used within the region, mainly as fuel for power generation, which power is exported from the region to other parts of the UK. The northern seaboard region provides over half of the entire EC's requirements (their own included) for natural gas (mainly from the Netherlands and Denmark) and 22% of its oil needs (mainly from the UK).

The demand for electricity has grown steadily in line with GDP and now accounts for 18% of total final energy consumption in the EC. It has a major influence on the evolution of the primary energy market. Generators have actively pursued a fuel diversification strategy and a substantial proportion of generation capacity has been adapted for dual and multifuel operation. Coal accounts for more than 50% of primary fuel inputs for generation in Germany and the UK; in Denmark its share is over 90%. Gas is the chief fuel in the Netherlands where coal is the second most important fuel. Nuclear power is non-existent in Denmark and of negligible importance in the Netherlands; it is the second in importance to coal in Germany and the UK. However, apart from France, the nuclear programme is at a standstill in the EC and the only planned addition to capacity outside France is at Sizewell B in the UK, just inside the study area. Prospects are for an increasing penetration of the power generation market by natural gas in Germany, the UK and Denmark and by coal in the Netherlands. Increasing interest is being paid to renewable energy, particularly wind energy, by the three continental members of the study area, especially Denmark.

The strong interest in gas reflects the size of indigenous (and Norwegian) reserves and the proving in commercial operations of combined/cycle gas/steam turbine technology which offers much improved conversion efficiencies as compared with conventional single cycle plant. In addition gas offers substantial environmental advantages over coal and oil-fired generation.

Even so, coal is and will remain, the dominant fuel for power generation. The problems of emissions will remain to be resolved. A variety of technologies are currently available for reducing SO_2 and NO_x pollution but the abatement of CO_2 emissions must be sought by

increasing thermal-electric conversion efficiencies. This is difficult with conventional plant and will require the introduction of more advanced equipment; that which is currently available suffers from poor reliability.

Within the EC trade in electrical energy is less than 10% of consumption, despite substantial excess capacity in some countries. There are few interconnections between national power transmission systems, and these are primarily for reasons of system security not energy exchange. This reflects national policies of independent autarkic power planning.

The European Commission has estimated that considerable savings would accrue from the development of an integrated transmission system and a pan-European merit-order dispatch, deriving mainly from utilizing spare French nuclear capacity. The development of such a system is unlikely to impact to any great extent upon the study area. However, trade between the EC and the Nordic countries could increase significantly should the latter join the Community and any further interconnections of systems would particularly concern Denmark.

Greater use of imported coal and natural gas could favour coastal locations for any new power stations but the difficulties of getting planning permission and securing wayleaves for new transmission lines will militate against this. This may well tip the balance in favour of existing sites or sites on industrial land close to local centres and this will be reinforced to the extent that efficiency considerations encourage CHP (combined heat and power).

Contribution to the economy

The energy sector is capital-intensive and is not a big employer of labour either absolutely or relative to the total labour force. The fuel and power products sector as defined by Eurostat accounts for around 2% of the labour force in the UK, just under 2% in Germany, about 1.5% in the Netherlands and under 1% in Denmark. However, it provides around 10% of total gross value-added in the Netherlands compared to 8 to 9% in the UK. The relevant figure for Germany is just under 5% and for Denmark 2 to 2.5%.

Trends

Total energy demand

The northern seaboard region will continue to supply around half of the total energy requirements of the Community for at least the next decade. Although the energy reserves of the region are fairly well defined, and have for the most part reached a mature phase of development, the depletion profile is a gradual one. This is due in part to the declining energy-intensity of economic activity throughout the Community. On average the EC States reduced their energy requirement per unit of economic output by 2% per year over the 1980s, and this improvement in efficiency of use can be expected to continue throughout the 1990s – even without the impetus of higher real energy prices.

On the basis of an unconstrained supply-demand balance, the outlook for international oil prices is broadly stable; however, when account is taken of the rate of absorption of technological progress in the capital stock (particularly with regard to control systems), further significant gains in energy saving are assured.

By 2000, the energy intensity of economic activity will be reduced to around 85% of its present level. The total demand for energy should be no more than 10 to 15% greater than in 1990 even if GDP growth returns to its historical trend rate of 2 to 3% per annum. In most instances, the energy resources of the northern seaboard region will be able to sustain present levels of production throughout the 1990s and well into the first decade of the next century.

Changes in the structure of the energy market

The greater impact on the region is likely to come from changes in the structure of the energy market rather than from changes in total demand. In addition to the probable decline of the nuclear energy (not developed here) we have identified four main changes.

The rise of natural gas

Perhaps the most significant development is the expanding role of natural gas in the structure of primary energy supply of the EC and in particular the switch to gas in the power generation market. As with offshore oil, the extraction of North Sea gas has a limited, and geographically specific, impact on the economy of the northern seaboard region. Although there is a continuing programme of investment in field extensions and in subsea pipelines, particularly in the northern sector, the capacity of existing onshore facilities is adequate to deal with most new developments offshore, and the sites of petrochemical processing industries are also well established.

Table 3.3 Forecast of the development of gas production and trade (in billion cubic metres)

		1989	1995	2000	2010
Norway	Local demand	2	2	4	4
	Contracted exports	29	27-31	34-46	30-40
Netherlands	Local demand	36	32	31	30
	Contracted exports	28	25-30	25-30	20-25
UK	Total	43	52	63	10-35
Denmark	Total	2	3	3	3

Source: IEA.

The natural gas trade in the region will peak during the first decade of the next century with the build up of imports from the Norwegian sector of the North Sea, while supplies from the UK and the Netherlands will be sustained at least at their present levels. The latest International Energy Agency (IEA) forecast of the development of the gas trade into the next century is given in Table 3.3 above.

One new feature of onshore development in the energy sector is the tendency for the power generation industry to seek coastal sites to take advantage of increasing supplies of gas – or of imported coal. In the UK alone, initial planning applications have been submitted in respect of around 10 GW of new gas-fired electricity generating capacity (from 15 + plants) to be built by 2000, mostly along the east coast.

Elsewhere in the region, Denmark and the Netherlands have plans (according to a survey by the IEA in 1989) to construct a significant amount of coal-fired capacity over the following decade (around 3 GW and 2 GW, respectively), although in the case of Denmark it is likely that natural gas will now be substituted in a proportion of this capacity. All this capacity will be supplied by imports. In Germany, around 1 GW of additional coal-fired capacity may be commissioned up to 2000; it is not clear whether this will be supplied by indigenous or imported coal.

It is unlikely that such (marginal) shifts in the location of power generating capacity will prompt a significant reorientation of manufacturing activities. Other things remaining equal, generation will tend to be located as close to load centres as possible, and in any event the transmission grids are well developed throughout the region.

The decline of indigenous coal

In terms of the impact on local employment, the rise in the use of gas may be overshadowed by the continuing decline in the demand for indigenous coal. With the UK, the removal (in 1993) of the obligation on the power generating industry to use domestic coal may result in a very severe contraction in output and in employment in the mining industry (the power industry takes around three quarters of national coal output). It is too early to have a clear view on what proportion of the power market will be lost to coal imports – this will depend on the outcome of commercial negotiations over the price of UK coal in the post-1993 period – however it is generally believed that up to half of the market is at risk. British Coal currently has around 50 000 employees.

Atmospheric pollution

One of the factors driving the increased demand for natural gas is the lesser environmental impact of that fuel in comparison with coal and fuel oil: minimal SO_2 emissions, NO_x emissions reduced by one half to two thirds, and one third to one half less CO_2 produced per unit of electricity generated. The EC 1988 Directive on emissions from large combustion plant requires a three-stage reduction from 1980 levels of SO_2 emissions from existing plant over 50 MW, with overall Community targets of 25, 43 and 60% reductions by 1993, 1995 and 2003 respectively. There is a simultaneous two-stage reduction in NO_x emissions with an overall Community target of – 20% (relative to 1980 levels) by 1993 and

– 36% by 1998. Since these controls on existing plant are not plant-specific, Member States have considerable discretion in how the overall target is achieved – for example by installation of FGD (flue gas desulphuration) equipment, greater use of low-sulphur fuels, etc.

The role of renewable energy sources

Environmental concerns – including parallel legislation regarding emissions from new combustion plants – are also pushing for a far more significant role for renewable energies in the next decade, although the pattern is likely to vary significantly from country to country. Here again the northern seaboard region is likely to take the lead.

By the year 2000, renewables will begin to make a significant contribution to total electricity supply in the Netherlands and (particularly) in Denmark (5.5 and 9.0% respectively).

Within Europe, Denmark is pursuing the most active policy to promote both energy efficiency and the use of renewable energy sources, for both environmental and strategic objectives. Official policy for the Danish economy is to reduce total (gross) energy consumption by 15% by 2003 (with respect to 1988) – i.e an annual reduction of approximately 1%; within this total, more severe reductions are planned for coal and oil (40% or greater), compensated by sharply increased use of natural gas (+170%) and energy from renewable sources (+100%). By the year 2000, up to 10 000 MW of wind turbine capacity may be installed in Denmark, accounting for 6% of electricity generation. Such a development would of course have a major visual impact on the environment of the seaboard region.

Denmark has the most 'active' energy policy in the EC driven by strategic and environmental considerations. It stresses conservation, energy efficiency and use of renewable sources. It aims to reduce energy consumption by 15% by the year 2005 (with respect to 1988) and encourages the development of combined heat and power (CHP) systems using natural gas and renewable sources (refuse, biogas, wind energy). Germany has a similar active policy. By contrast, in the UK, these matters tend to be left to market forces.

EC policy is directed towards the establishment of open access to energy markets. Hitherto it has tended to concentrate on supply-side issues, including the encouragement of trade. It is now increasingly concerned with environmental matters, for example controls on power station emissions, which will *inter alia* reinforce the trend towards gas, and demand-side issues, such as the merit of a carbon tax.

As part of its work on promoting trade in energy the Commission has identified a number of projects to relieve transmission bottlenecks. Most are outside the study area. Those that will impact on the northern seaboard region include the following:

- the Midal gas pipeline (between Emden and Ludwigshafen) and the Zeepipe project, both to be commissioned in 1992/3, which will improve EC access to Norwegian gas;
- the interconnection of Denmark and Norway (Scanpipe project) which will similarly tap the latter's gas resources;
- the interconnection of the UK and continental European gas transmission systems (the pipe would be located outside the study area).

Chapter 4: Sectoral trends – A synthesis

Introduction

In earlier chapters we have summarized the key features of the study area as it exists at present and we have identified, for each sector, our vision of the future given a continuation of existing trends.

In this chapter we sum up the main factors which will shape the future development of the northern seaboard and pull together the main findings of Chapters 2 and 3. In addition we identify and describe a number of major changes in the international environment which will have significant and widespread implications: the unification of Germany, the liberalization of the Central and East European countries, the enlargement of the European Community and the completion of the single market ('1992').

We also make a first assessment of some of the spatial implications that can be drawn from the sectoral analysis and identify important issues to be addressed by policy.

This chapter is divided into two main sections. These are: development and sectoral trends, a synthesis; and spatial implications of the sectoral analysis.

Development and sectoral trends – A synthesis

Economic activity

Decline of the primary sector, growth of the services sector

In the study area as a whole the primary sector accounts for 4%, manufacturing 33% and services 63% of total employment, with wide variations from region to region. By the year 2000 the primary sector share will have declined, because of shrinking employment in agriculture and fisheries, that of the manufacturing sector will be more or less around its present levels and that of the services sector will have risen.

An increasingly competitive and international environment

The manufacturing and services sectors have been undergoing radical transformation in recent years in response to a variety of pressures. These will continue to influence the pace and direction of industrial development in the study area over the next decade.

The business environment is becoming much more competitive. A major factor in this has been the deregulation and privatization of State-owned enterprises, pioneered in the UK but taken up in other countries. This trend will continue to operate. New competitive pressures will arise from a variety of sources including the completion of the single European market, enlargement of the Community, the opening up of Eastern Europe

and its increased market orientation, tougher national and Community policies in subsidies, competition, procurement and mergers.

Business is also becoming more international. To compete internationally, enterprises must become more competitive not only on price but on quality, design, delivery, customer service, etc. This need will provide the impulse for a range of other changes through which enterprises will try to accommodate to the increasingly competitive environment.

Increasing importance of technological development

Technological development will become increasingly important not only to improve the goods and services produced but also the means of producing them and delivering them to consumers. Advances in computers and telecommunications are major forces for change currently, but new areas, such as new materials and genetic engineering, may have similar impact in the future.

Emergence of new types of firms, leaner, more flexible and increasingly footloose

Technical developments, particularly in IT and telecommunications, and new management philosophies are giving rise to changes in organizational structures. These are manifested in less rigid management hierarchies, greater devolution of management responsibilities and accountabilities, hiving off of non-core activities, relocation of non-essential activities to remoter locations, etc. and reflect business's efforts to make itself leaner, more efficient and more responsive to the market-place.

As a consequence of technological and organizational changes and improvements in transport networks, enterprises are becoming more footloose and less tied to specific locations. Locational decisions are increasingly based on personal non-business considerations such as the availability of pleasant working environments, easy travel-to-work journeys, etc.

Stricter environmental controls on the industry

There will be growing public concern over the environment which will increasingly be reflected in stricter controls on industry. This will create pressures, for example to develop clean technologies, reduce/recycle/recover wastes, develop products capable of disassembly and reuse when their useful lives have come to an end. These pressures will impinge on competitiveness, viability, and location of enterprises. But the trend to pollution control could also generate many opportunities for enterprises concerned with the development of products and services to help clean up the environment.

Demography

Over the next decade the population in the study area as a whole will continue to grow until the end of the century, followed by a slower growth or decline. This growth will be concentrated in a few regions, and most (NUTS 2) regions would experience population decline were it not for the effects of international migration. Extra-EC migration and migration between EC Member States are expected to add over 9 million to the total population of the northern seaboard study area by 2020.

The population in all regions will show a considerable shift towards the elderly age groups, leading to an increase in dependency rates, a fall in the labour force, increasing labour costs. Retirement migration will become a more important element in population redistribution, with a significant impact on the urban settlement patterns.

We discuss in the next paragraphs some of these trends.

The population is ageing

As a result of the progressive fall in population growth rates throughout the study area the region's population is ageing. This trend is more marked in some parts of the study area (Germany and Denmark) than others. These demographic trends are expected to continue and populations will continue to age: the over-65 age group will grow as workers reach pensionable age, the proportion of under-15s will continue to shrink as fertility rates continue to fall, and the working age group will also contract as fewer children enter the labour force to replace those retiring. The ageing of the population is expected to be particularly marked in Germany and Denmark. These trends have a number of ramifications.

The elderly will become more important as a consumer group. This will apply equally to government and privately provided goods and services. They will impose a growing burden on health and social services, especially as longevity improves; they will be targeted as a distinct group, with its own specific characteristics and requirements, by manufacturers and service providers, witness

the growth in leisure, recreation and tourism markets for the retired.

Major changes in the labour-market

Dependency ratios will increase as a smaller labour force will have to support a growing proportion of non-workers. The labour force will need to become more productive, through technological improvement, increased capital investment and by becoming more skilled. Because the services sector is the biggest and fastest growing employment sector and the most labour-intensive, companies in this sector will face the biggest problem. This will place emphasis on producing new entrants to the labour-market from schools and colleges who are not only better skilled but multiskilled, and also on retraining existing members of the labour force.

Incremental additions to the labour force will be sought by employers: this could range from increased overtime and delayed retirement, to enabling women to re-enter the labour force. It might encourage increased migration both from inside and outside the study area. EC citizens have work and residence rights in all EC countries under the Treaty of Rome. Their mobility was enhanced by the Schengen Agreement and will be further increased by the single European market.

Reduction in the size of the labour force and increase in dependency ratios will have the effect of increasing labour costs and putting pressure on the competitiveness of European industries. This could result in an inward flow of cheap labour from Central and Eastern Europe, North Africa and the Middle East and Asia. Alternatively, it could result in outward flows of industrial activity to countries or regions offering similar production skills and technologies at much lower cost.

Growing movements of population

Migration is a major factor in population redistribution. Retirement migration apart, migrants tend to be younger, more energetic and more entrepreneurial than the population at large and can inject a dynamic element into the economies of recipient regions. Most internal migration is over fairly small distances. The single European market will enhance mobility throughout the EC and this might encourage a greater volume of movement over longer distances.

International migration has played a relatively small role in population growth of the study areas except in Germany. Germany, particularly the new *Länder* of the former East Germany, will bear the brunt of any future migration from Central and Eastern Europe, following the new Western- and market-orientation of these countries.

Growing importance of retirement migration

With larger numbers in the pensionable age groups, retirement migration will become a more important element in population redistribution. This could have a significant impact on some rural and coastal parts of the study areas.

Urban settlement patterns

Urban centres will continue to be the main focus for economic development prospects, notwithstanding continuing pressures for decentralization. However the pattern and hierarchy of centres will not exhibit significant change, although towns in the emerging Rotterdam-Berlin axis will be strengthened. The current pattern of urban restructuring – inner area 'decline' combined with suburban and periurban growth – will continue.

In the longer term, infrastructure developments will create new nodal points which may emerge as strategic centres.

Some of these trends are discussed below.

De-urbanization

Throughout the study area there has been a general redistribution of people from the more densely populated to the less densely populated areas. This redistribution is the product of three distinct processes: retirement migration, suburbanization and employment decentralization.

(i) Increasing retirement migration: there will be an increasing retirement migration, including the relocation of retired workers from places determined by their jobs to others determined by the quality of residential environment offered.
(ii) Extension of suburbanization: there will be a growth of dormitory or commuter settlements around and connected by good transport links to large urban work centres to which the urban residents migrate while continuing to work in the urban centre.
(iii) Growing employment decentralization: there will be a growing decentralization of employment, which

will involve the migration not only of population but also of jobs out of the large urban centres and conurbations to more rural locations, usually to small and medium-sized towns in the countryside. These are perceived as offering more favourable conditions for successful business development and a better working and living environment than are to be found in urban centres. This trend can strengthen the functional base of small towns and support improved commercial, social and recreational facilities which in turn enhance their attractions as vibrant economic and social centres.

The environment

The region's environmental problems are unlikely to be resolved over the next decade. Public concerns will put increasing pressure on policy-makers and businesses. Environmental controls on agricultural and manufacturing activities will intensify. New methods to dispose of solid waste will be promoted. Recycling, energy conservation and efficiency will be encouraged.

Some of these trends are discussed below.

Growing concern about the environment

Concern about the environment constitutes a major development factor that will have an impact upon the whole study area. Increasing public concern over pollution will make governments more prepared to intervene in markets and industry more prepared to act. Increased environmental protection will impose huge additional burdens on many enterprises as they are forced to clean up their operations by installing pollution prevention equipment and waste-handling plant, or by changing their manufacturing processes or their products in order to comply with new standards and guidelines. Not only will those industries such as power stations, steelworks and chemical plants which directly pollute the environment be affected, so will those other industries such as car manufacturers which make environmentally polluting products.

Stricter controls and higher standards

In the short term the costs of environmental protection could well have an adverse effect, for example by making products less competitive. In the longer term industries and companies that show themselves responsive to consumer concerns can only benefit. A positive spin-off would be the development of recycling activities and the manufacture of pollution control and monitoring equipment.

Countries which impose strict environmental controls may see polluting industries that threaten the environment relocate to countries which impose less stringent controls, effectively shifting the environmental problems to those countries less able to afford the required remedial measures.

Also countries with higher environmental standards than those of the EC may keep out products of EC origin if these fail to meet standards required of domestically manufactured products.

Manufacturing and services

The manufacturing and services sectors have been undergoing radical transformation in recent years in response to a variety of pressures. These will continue to influence the pace and direction of industrial development in the study area over the next decade.

The business environment is becoming much more competitive and more international. Technological development will become increasingly important not only to improve the goods and services produced but also the means of producing them and delivering them to consumers. Technical developments, particularly in IT and telecommunications, and new management philosophies are giving rise to changes in organizational structures such as less rigid management hierarchies, relocation of non-essential activities to remoter locations.

The labour force in the study area will stabilize or contract over the next decade, with the exception of the Netherlands. Male activity rates will fall in all countries and female rates rise, except in Denmark. There will also be a significant ageing of the labour force. There will be growing public concern over the environment which will increasingly be reflected in stricter controls on industry.

Agriculture

The net effect of the trends observed in agriculture by the end of the century are likely to lead to a general decline of the area of arable land under cultivation by at least 10 to 11% as a result of set-aside. A further 4 to 5% of arable land will be farmed less intensively, chiefly because of stricter environmental controls. Farm productivity will increase on the remaining areas and there will be fewer but larger farms. Production volumes will be maintained more or less at present levels.

Average farm incomes will decline and put pressure on marginal farms, and the decline in farm employment will

continue at a marginally higher rate. The unification of Germany may affect the competitive position of farmers in the old *Länder* of Germany, particularly in the arable sector. The inclusion of EFTA countries in the EC will have only a marginal impact on the agriculture of the study area. Improved access to EC markets for Central and East European countries is unlikely to occur on a significant scale much before the end of the decade.

CAP reform

The following paragraphs present the possible effects of the CAP reform in more detail.

Given the importance of the agricultural sector, CAP reform has potentially significant adverse implications for the study area. As noted elsewhere the Mac Sharry proposals for cereals production discriminate against those regions which have the largest farms and the highest yields. Most such holdings are located in the northern seaboard area particularly in East Anglia, Schleswig-Holstein and Denmark. In the light, too, of possible increased competition as a result of EC enlargement, concessions to Central and Eastern Europe and the GATT negotiations, and of increased government intervention in the interests of environmental protection, CAP reforms would add to the pressures making for change in the rural areas of the study region.

The fall in the agricultural labour force has very little impact in global terms due to the small numbers employed at present. But the local impact can be very significant: rural communities are highly vulnerable to the very small numbers of jobs lost. This, in turn, threatens their very existence as viable communities, removing their economic *raison d'être*. The social fabric of long established communities cannot withstand the loss of all local employment opportunities.

Furthermore, there arises the question of what is to happen to unused or under-used land: the physical impact of set-aside policy has not been properly addressed. There is an obvious desire to retain a high quality rural landscape; but this usually means one on which care and attention is lavished, even if in an unspectacular way. The decline in agricultural activity may lead to rural dereliction on an unprecedented scale.

Fishing

Overall, we do not expect much change from the existing situation. Fish stocks will take a long time to recover even if existing and new CFP initiatives are successful. The prospects for the year 2000 are thus for increasing restrictions on fishing effort, for example reduced TACs and quotas backed up by increased inspection and perhaps a centralized monitoring system, and for an extension of the use of structural elements into policies such as the existing decommissioning schemes and land-based job creation schemes.

Other prospects include a stabilization in fish prices, due to factors such as the availability of illegally landed fish, increased imports and cheaper substitutes and a decline in earnings generally although individual earnings could well increase. The size of the fleet will contract as a consequence of decommissioning schemes and falling earnings.

These trends will lead to a continued fall in employment, a decline in the fortunes of small fishing ports, a concentration of fishing effort on fewer but larger ports (e.g. the Scottish fleet is now centred on major population centres such as Fraserburgh while smaller ports have died). There will be a growing number of distressed communities where alternative jobs do not exist or are insufficient to replace those once provided by fishing and allied processing activities.

Aquaculture, as an alternative to fishing, has developed rapidly over the past decade with financial support from the EC. Stabilization rather than growth is expected over the next decade as environmental concerns are likely to lead to restrictions on the number of sites and size of farms, and increases in production costs.

Tourism

The dominant flows will be intra-European and predominantly domestic but world tourism will become an increasingly significant element in total demand. People will take more but shorter holidays. The private car will continue to be the dominant mode of holiday transport. Growth in air travel will continue, while rail travel for tourism will recover with the completion of high-speed links.

Tourist locations in non-urban areas will be put under high pressure, and serious problems of environmental absorption will multiply.

Transport

The strong growth of freight and passenger transport will continue, while the growth in road freight transport will slow down, but continue to increase its share. More importance will be attached to rail and water transport.

Passenger travel by air will increase greatly. Growth of transport demand will be particularly high in some areas such as the hinterlands of main ports.

More congestion and delays are expected as investment in new transport capacity is unlikely to match demand. A number of major transport infrastructure will be in operation (Channel Tunnel) or under way. Strong east-west transport corridors – e.g. Rotterdam-Berlin – become increasingly important.

The following paragraphs discuss the impact of changes in transport networks on the future development of the northern seaboard region.

Changes in transport networks

Transport networks are built up in response to an actual or potential demand for transport services consequent upon economic development. As well as facilitating economic growth transport systems can also act as a catalyst for further development. Transport networks will play a key role in the spatial development of the study area over the coming decade.

The study-area countries have relatively well developed transport systems mostly geared to national requirements. However, a number of gaps and deficiencies exist including the poor transport links between western and eastern Germany, the lack of motorway links in the north of England and in Scotland; and the urban road congestion which afflicts most of the large cities in the study-area.

A number of road and rail projects to improve east-west communications in Germany have been proposed. While satisfying national aspirations these have significant implications for the wider region because they will greatly improve access between the EC heartland and Central and Eastern Europe.

The Danish Great Belt fixed-link project is similarly motivated by domestic concerns but this too has wider regional implications as it will improve communications, particularly by rail, between the EC and Sweden. The other fixed link proposals to improve communication between Denmark, Germany and Sweden are more overtly regional in concept.

These various projects and proposals in the eastern part of the study area will affect the relative growth of particular settlements (e.g. the German North Sea ports, particularly Bremen and Hamburg and the short-sea ferry ports on the Baltic coast of Denmark and Germany) as well as those locations which will fall within the catchment areas of the new routes.

On the other side of the study area, a major concern is how the Channel Tunnel will affect the peripheral areas of northern England and Scotland. Will the improved accessibility from these regions to the economic heartland of the EC in the near continent boost their economies by allowing them to play a stronger role in the emerging European economy? Or will it simply act as a giant economic drain, facilitating the flow of jobs and labour into the heartland, to the detriment of local economies, a view held by many in the peripheral regions of the UK?

Perhaps there are lessons to be learned from the French approach to integrated development. In the Nord/Pas-de-Calais region, both national and regional government down to local chambers of commerce, recognize that increased accessibility due to improved transport infrastructure is not sufficient to secure growth for the region and that complementary initiatives at all levels, dealing with the physical, economic, environmental and human facets of development are needed to capture the maximum local benefit.

The proposed EC high-speed rail network offers an interesting parallel. Will its 9 000 km of new route and 15 000 km of upgraded track result in the strengthening of existing networks and settlements patterns, and thereby reinforce the existing locational advantages of the 'blue banana' and its peripheral supporting regions? Or will it act as a major factor in opening up areas of potential (e.g. Eastern Europe) and diminish the effects of peripherality, by reducing travel times to more distant regions (e.g. Scotland)? A measured view will depend in large part on a critical examination of its stated objectives and of its practical effects.

Ports

The present pattern of port development is unlikely to change significantly before the end of the century, but a number of trends may alter the situation over the longer term.

The principal areas of traffic growth will be in the short-sea and containerized cargo markets. Competitive pressures between ports will lead to a concentration of shipping services on fewer larger ports. The ability of ports to compete will be critically dependent on access to their hinterland through new fixed-links projects and

long distance rail services. The single market increases the attractiveness of port areas for distribution facilities, light industry and assembly activities.

These trends lead to three main results: Rotterdam will consolidate its strong position as a transit port; the volume of trade passing through Bremen and Hamburg should increase; and smaller ports will continue to decline.

Telecommunications

Basic telecommunications in eastern Germany will reach west European levels. Digital technology will increasingly replace analogue technology and advanced services will increase their penetration rate. The use of radio transmission and of high bandwidth applications will be higher.

Energy

The northern seaboard region will continue to supply around 50% of the total energy requirements of the European Community. Energy resources of the region will be able to sustain present levels of production. The most significant development is the expanding role of natural gas. Only marginal shifts in the location of energy generation capacity are expected. The decline of indigenous coal production will continue.

Environmental issues will become more and more important and the role of renewables is expected to become greater. A number of proposed projects should relieve transmission bottlenecks and so promote trade in energy.

Spatial implications of the sectoral trends

In this section we give a preliminary overview of the spatial implications of the sectoral trends identified in the previous chapters. We also identify some of the key issues to be addressed by policy.

Demography

Population growth will be concentrated in a few regions; most regions would have experienced population decline but for the effect of international migration. Retirement migration will be an increasingly important factor in population redistribution, with elderly people moving to coastal or inland areas offering a more attractive environment.

There are great contrasts in population density, with dense urban concentrations (principally in the UK and Germany) compared with sparsely populated upland areas (Scotland and northern England).

The regions with greatest population growth (> 5%) between 1980 and 1990 were low density rural regions in the UK, reflecting, in part, the retirement redistribution effect; while the regions with greatest population loss were those with main conurbations.

Projections for the next 20 years indicate strong gains in rural areas (East Anglia, Hereford and Worcester, Flevoland) and the heaviest loss in more urbanized regions (e.g. Hamburg, Bremen, South Yorkshire, West Midlands, Merseyside).

Urban settlement pattern

The main spatial feature of urban settlement patterns is the highly urbanized character of the UK (particularly the central and northern regions of England) compared with the more even distribution of urban centres in other regions. Major urban centres account for 38% of the population of Denmark and Germany, and 31% of the population of the Netherlands. In contrast, 54% of the UK study-area population is in towns with a population larger than 100 000.

Major urban centres will continue to be the main focus for economic development prospects, notwithstanding continued pressures for decentralization. There will be no significant change in the pattern or hierarchy of centres, although the role of towns on the Rotterdam-Berlin axis will be strengthened. The current pattern of urban restructuring – inner area decline combined with suburban and periurban growth – will continue. In the longer term, major infrastructure developments will create new nodal points which may emerge as strategic centres.

The major policy issues are:

- how to manage development pressures in the Rotterdam-Berlin axis;
- how to manage the process of urban restructuring while supporting the role of cities as engines of growth.

Environment

The areas suffering from groundwater pollution caused by concentration of nitrates reflect areas of intensive farming such as North-East Jutland, Lower Saxony and East Anglia.

Severe river and coastal water pollution which is caused by industrial and domestic waste from urban concentrations is experienced along the German and English coasts; the German sector, particularly the Elbe, is significantly affected by pollutants derived from the upper catchment in the former GDR.

Increasingly strict environmental controls on agricultural and manufacturing activities will have a widespread – rather than specific locational – spatial effect, with the main impact being felt in regions dependent on those activities.

The major issues of relevance for spatial policy are:

- how to obtain agreement to more rigorous measures to bring the region's severe environmental problems more quickly under control;
- the economic impact of environmental controls on specific industries and the areas dependent on them.

Manufacturing

The most significant spatial implication is that about 75% of study-area manufacturing activity is located in the UK regions, concentrated in the North West, Yorkshire and Humberside and the West Midlands; Lower Saxony is the only notable concentration outside the UK.

Agriculture

Agriculture is relatively less important as a source of employment than in the EC as a whole (only Lüneburg, Weser-Ems, Flevoland and Drenthe have a share above the EC average) and than in the respective countries (only East Anglia, Scotland, West Midlands, Schleswig-Holstein, Lüneburg, Weser-Ems, Friesland, Drenthe and Flevoland have a share above the national average).

In terms of labour productivity, the study-area has some of the most efficient farms in the EC: gross value-added per unit of land is well above the EC average in Denmark, Lower Saxony, the Netherlands and East Anglia.

CAP will raise average production costs, so that marginal farms are likely to be forced out of business; regions likely to be affected are in Denmark, the German regions, Northern England and Scotland; the impact in the Netherlands is expected to be negligible.

The key issues to be addressed by policy will be:

- the effects of CAP reforms on rural income and employment, especially in marginal areas;
- the effects of set-aside on the landscape.

Fishing

Although a relatively minor activity in terms of its contribution to the economy, structural changes in fishing have a disproportionate impact due to its concentration in specific coastal communities.

The common fisheries policy (CFP) is expected to result in concentration on fewer, larger ports with a corresponding detrimental impact on smaller fishing communities.

The most important policy issues will be:

- how to adjust fishing capacities to fish stocks to ensure a long-term sustainable fishing industry;
- how to create alternative job opportunities for communities hitherto dependent upon fishing and allied activities.

Tourism

The overall existing pattern of tourism will remain, distributed across the range of coastline, urban centre and upland/wilderness destinations.

There will be increasing pressure to open up new coastal and wilderness locations offering high quality facilities, in addition to improvement of urban tourist centres and special attractions such as theme parks to cater for the increase in multiple, shorter holidays.

The major policy issue is how to obtain the economic benefits which tourism can bring without adverse social and environmental impacts.

Transport

The rapid recent growth of road and air traffic has created bottlenecks in urban centres (effectively all large towns) and at maritime crossings (Oeresund, Fehmarn Belt, Great Belt).

Priority is being given by the German Government to the improvement of road and rail links with the former GDR in order to ensure integration and to help promote economic development.

Plans for an EC-wide high-speed passenger rail network are under discussion; the precise configuration is unde-

cided but the eventual network will have a significant effect on the eventual pattern of spatial development.

The Rotterdam-Berlin axis is expected to be the focus of investment in transport infrastructure such as the Betuwe rail link, linking with existing north-south axes through Germany.

The major transport issues to be addressed in the coming years include:

- how best to resolve the severe and growing problems of urban traffic congestion;
- how to accommodate the rising demand for road transport for both passengers and freight;
- how the environmental impacts of traffic and transport systems can be minimized.

Ports

The pattern of port activities is unlikely to change before the end of the century; but competitive pressure between ports will lead to concentration on fewer, larger ports.

The ability of ports to compete will be critically dependent on high quality access to hinterlands through road and rail networks.

Rotterdam will consolidate its position as the premier transit port, while Hamburg and Bremen will handle increased volumes of trade; there will be a corresponding decline in smaller ports.

The major policy issue is whether or not the trend towards concentration of port activities can or should be discouraged, and if so what is the best strategy for supporting the many smaller regional ports.

Telecommunications

There is a powerful value in the ability of modern telecommunications technology to help overcome the disadvantages of peripherality and so provide a more balanced EC territory.

As yet, this is a theoretical, rather than a proven benefit; studies have so far failed to demonstrate a significant effect on locational constraints, except in very particular, individual examples; and the higher investment and user costs in less-developed areas offset potential benefits.

The major policy issue is the speed at which advanced services will be introduced in more rural and less-developed regions, and the implications for the ability of these regions to compete. It is unlikely, however, that by the year 2000 telecommunications will have had much impact on the pattern of economic development.

Energy

The continued exploitation of North Sea oil and gas reserves will not result in significant spatial variations; spatial impact is, in any event, limited to the immediate surroundings of transshipment and land terminal sites.

The main expected changes will concern the social and physical readjustment of declining coal mining communities, all in the UK, resulting from the removal of protected markets to supply coal-fired power stations and the switch to gas-fired generation.

The major issues of relevance for spatial planning are:

- how best to mitigate the social and economic impact on mining communities of the decline of indigenous coal;
- how to weigh-up the localized visual impact of the development of renewable sources against their contribution to reducing atmospheric pollution.

Part II – Regional analysis
Base development scenarios

Part II of the report develops our regional analysis and sets out, for each region and for the northern seaboard as a whole, a base development scenario, i.e. an assessment of the most likely development over the next decade, based on prevailing economic and social trends and policies in the different regions of the study area. Part II is divided into three chapters.

Chapter 5 presents two typologies of the regions of the study area. The first typology is based on the official NUTS nomenclature; the second one, original to this study, identifies 'natural regions'. We constructed the latter typology because the official nomenclature is unsatisfactory for the purposes of planning: official boundaries have not been drawn to create entities with similar spatial and socioeconomic characteristics.

Chapter 6 presents in detail our vision of the most likely pattern of development over the next decade. Each 'natural region' is dealt with in detail.

Chapter 7 provides a regional synthesis based on the main findings of the sectoral and regional analyses. In this chapter we summarize the spatial manifestations of the base scenario; we introduce our concept of core-corona-periphery metastructure; we then present and discuss our base scenario metastructure for the study area region as a whole; finally we introduce a rough division of the study area into regions with much and little growth potential respectively.

Chapter 5: Typologies of the northern seaboard regions

Introduction

The need for a regional analysis

The work presented in Part I was essentially at the sectoral level. It dealt with issues horizontally across the study area but illustrating these with regional examples. We chose this approach in preference to a series of descriptions of the regions as being a more fruitful analytical foundation for the subsequent scenario building.

In Part II the focus is shifting to the regional level. This regional focus helps us to analyse the interrelationships between the economic, social and physical aspects of development. It also provides a coherent picture of problems and trends in each region as seen by the regions themselves.

The main objective of the work presented in this Part II is to provide a base scenario for the study area as a whole. This base development scenario is an assessment of the most likely development over the next decade, based on prevailing economic and social trends and policies in the different regions of the study area.

A baseline scenario is thus presented for each region and the local implications of the trends identified in Part I are examined. Our approach to this phase is thus vertical: it puts the emphasis on individual regions, treating them as discrete geographical regions rather than as administrative units of different national systems. There is a clear need, emphasized by the brief from the Commission, to develop an intermediate frame of reference and to move away from planning within administrative boundaries. We developed the idea of 'natural' or 'planning' regions and have used these as the basis for the development of our scenarios.

The purpose of constructing regional typologies

The purpose of this chapter is to determine the extent to which different regions of the study area can be grouped together on the basis of certain characteristics and issues faced by them. These may be regions facing common problems where there may be scope for similar or collaborative approaches towards resolving them, or they may be regions which compete with or are complementary to others where collective action would produce more effective solutions to problems than individualistic efforts.

The purpose of constructing a regional typology is to determine the extent to which the different regions can be grouped on the basis of two main criteria, i.e. common socioeconomic characteristics and similar challenges and problems.

The categories defined by the typology are not discrete; a region could, at the same time, be classified as rural, agricultural, coastal and tourist. Neither is the typology exclusive. In addition, the description does not necessarily describe the whole region; rather the region contains large parts which fit that description.

In the first section, we present a typology which uses the official nomenclature of regions NUTS 1 and NUTS 2. Our typology distinguishes 12 different types of regions.

Because this official nomenclature is unsatisfactory for the purposes of planning, we constructed another typology based on what we called 'natural regions' – 16 in total. These natural regions are not necessarily or exclusively based on NUTS 1 and 2.

In spite of its weaknesses, we have included the first typology because it uses the official nomenclature and as such it is more familiar.

Typology based on NUTS 1 and NUTS 2 regions

Table 1.1 in Chapter 1 shows the NUTS 1 and NUTS 2 regions which comprise the northern seaboard study area. These regions are the main building blocks of the typology described in this section.

The typology based on NUTS 1 and NUTS 2 regions comprises 12 different types of regions:

- fishing dependent;
- dependent on declining heavy industry;
- metropolitan;
- retirement;
- intensive agricultural;
- island communities;
- peripheral;
- border;
- coastal;
- rural;
- port;
- tourist.

Table 5.1 shows the regions, by type and by country. The following paragraphs briefly describe each type of region.

Fishing dependent regions

A prime example of regions facing common problems are those regions dependent upon fishing. Common problems relate to overfishing and declining catches and thus a reduction in employment and incomes not only for fishermen but also for those engaged in related shore-based activities such as fish processing.

The common fisheries policy (CFP) aims at limiting catches to allow fish stocks to recover but in the interim it is inevitable that the sector will contract. New job opportunities should thus be found for those thrown out of work.

Different communities will approach this in different ways. Cooperation and the pooling of ideas and experiences offer greater scope for success than independent action.

Regions dependent on declining heavy industries

Localities dependent upon declining traditional industries (coal mining, steel manufacture and shipbuilding) also share common problems. They can thus be grouped with those communities dependent upon a declining fishing industry.

Apart from the need to find alternative employment opportunities they display other similarities such as:

- the declining industry is the sole or principal employer in the locality so that its contraction has very location-specific impacts;
- the labour force has industry-specific skills which are not easily transferrable to other activities;
- significant proportions of the workforce are in the higher age groups, reluctant to migrate to new jobs and less amenable to training to acquire new skills.

While fishing communities are to be found throughout the four national sectors of the study area, coal-mining is almost exclusively a British preserve. As noted earlier the industry faces a rapid contraction post-1993 when its special contracts with the privatized electricity generators run out. Shipbuilding communities are to be found in Germany and Denmark as well as the UK. The steel manufacturing sector is developed mainly in the UK and in Germany.

Metropolitan regions

Large urban areas constitute a separate group the characteristics of which include:

- they have been and remain the principal recipients of international migrant flows and contain significant ethnic minority groups;
- they are a principal source of internal migrant outflows, not only of the retired but of working age groups to surrounding commuter/dormitory towns;
- they are a source of businesses relocating to other areas in search of cheaper accommodation and a more pleasant working environment;
- to a greater or lesser extent they suffer from problems of traffic congestion;

Table 5.1.Typology of NUTS 1 and NUTS 2 regions, by type

	1 Fishing dependent	2 Depending on declining industry	3 Metropolitan	4 Retirement	5 Intensive agricultural	6 Island communities	7 Peripheral	8 Border	9 Coastal	10 Rural	11 Port	12 Tourism
Denmark (three regions)												
Hovedstadsregionen			●					●			●	●
Øst for Storebælt	●				●	●	●	●	●	●		●
Vest for Storebælt	●			●	●	●	●	●	●	●	●	●
Germany (eight regions)												
Seven core regions												
Schleswig-Holstein*	●				●	●		●	●	●	●	●
Hamburg*			●								●	
Bremen*		●	●								●	
Braunschweig		●								●		●
Hannover					●					●		
Lüneburg					●				●	●		●
Wesen-Ems	●	●			●	●		●	●	●	●	●
One overlap region												
Mecklenburg-Western Pomerania	●	●			●	●	●	●	●	●	●	●
Netherlands (seven regions)												
Five core regions												
Groningen					●			●	●	●		
Friesland	●				●	●			●	●		●
Drenthe				●	●			●		●		●
Overijssel					●			●		●		●
Flevoland					●					●		
Two overlap regions												
North Holland	●		●		●	●			●	●	●	●
South Holland	●		●		●				●		●	●

NB: * indicates NUTS 1 regions

Table 5.1. (continued)

	1 Fishing dependent	2 Depending on declining industry	3 Metropolitan	4 Retirement	5 Intensive agricultural	6 Island communities	7 Peripheral	8 Border	9 Coastal	10 Rural	11 Port	12 Tourism
United Kingdom (21 regions)												
18 core regions												
Northumberland / Tyne and Wear		●	●						●	●	●	●
Cleveland / Durham		●							●	●	●	●
North Yorkshire	●			●					●	●		●
West Yorkshire		●	●									●
South Yorkshire		●	●									
Humberside	●	●							●	●	●	
Derbyshire / Nottinghamshire			●							●		●
Leicestershire / Northants					●					●		●
Lincolnshire				●	●				●	●		
East Anglia*	●			●	●				●	●	●	●
Hereford and Worcester / Warwickshire					●					●		●
West Midlands			●									●
Shropshire / Staffordshire					●					●		●
Cheshire										●		●
Merseyside			●						●		●	●
Greater Manchester			●								●	
Lancashire									●			●
Cumbria		●		●					●	●		●
Three overlap regions												
Borders / Lothian / Central / Fife / Tayside		●	●	●			●		●	●	●	●
Grampian	●						●		●	●	●	●
Highlands and Islands	●					●	●		●	●	●	●

NB: * indicates NUTS 1 regions

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- they also display a range of social problems often associated with ethnic minorities;
- they frequently exhibit severe problems of physical decay and pollution resulting from the economic decline of outmoded industries.

In spite of these negative factors, urban centres do retain considerable potential for economic growth: they offer pools of relatively cheap skilled (if outmoded) labour, vacant land for development, good transport links, and concentrations of social and cultural facilities. In addition, and most importantly, they offer that particular quality of the city environment, something which is very difficult to quantify, offering residents a blend of diversity, proximity and excitement which cannot be obtained in smaller urban centres.

There is an inherent contradiction that many of the problems can be interpreted as opportunities for regeneration. The real challenge is to find the correct blend of initiatives and mechanisms which unlock the latent potential for physical and economic regeneration of the large urban centres.

There are striking differences between the British pattern of urban centres and that seen in the other countries in the study area. The British pattern is characterized by far denser urban networks than on the mainland continent. The urban concentrations in the English Midlands (based on the Greater Birmingham conurbation) and the North of England (the trans-Pennine conurbation covering the area Merseyside-Manchester-Leeds-Humberside) exhibit an intensity and continuity of urban development not seen elsewhere in the study area. The mainland continent settlement pattern certainly includes large cities (Copenhagen, Hamburg, Bremen, etc.), but these tend to be free-standing centres forming the hub of more dispersed urban networks, with a series of large towns distributed throughout the rural hinterland unlike the almost unbroken urban character of the UK examples.

Many urban centres in the study area are ringed by commuter settlements. These could be grouped together as locations which are complementary. The urban centres provide a range of employment opportunities, and possibly, recreation and entertainment facilities which can be enjoyed outside office hours; the commuter settlements provide a more pleasant living environment than can be found in the urban centres with general shopping and education facilities for families; the two are connected by good transport links which provide regular, fast and reliable services. Examples of cities supporting a ring of such satellite communities are to be found throughout the study area and include Bremen and Hamburg, Copenhagen, Leeds and Manchester, and Groningen among many others.

Retirement areas

Retirement areas are typically located on the coast or adjacent rural areas of attractive countryside. Such areas include Drenthe in the Netherlands and parts of East Anglia, North Yorkshire, Cumbria and the Border regions in Britain.

Problems in such areas often include:

- the demands put on local health communities and public transportation services by virtue of the elderly age structure of the population;
- the inability of locally born, economically active residents to compete with incoming retirees for housing because they do not have the financial means to do so;
- a consequent exodus of younger age groups.

Regions of intensive agriculture

Intensively farmed regions in the northern seaboard share common features such as farms which are larger than average size, are highly mechanized, have low labour inputs and have high productivity in terms of both labour and land.

They also face a range of common problems including:

- pressures to make their farming systems more environment-friendly;
- how to adjust their productive capacities to the realities of the market;
- a specific threat from the proposed CAP reforms which will impact more severely on such holdings than on smaller less productive ones.

Such intensively farmed areas are to be found throughout the study area including East Anglia, Denmark and the Netherlands (arable) and Denmark and the Netherlands (livestock).

Island communities

Island communities are typified, to a greater or lesser extent, by characteristics such as:

- a narrow resource base including agriculture, fishing, perhaps tourism and small-scale manufacturing. These are experiencing serious problems:
  - ☐ agriculture is mainly constrained by poor soils and climate;
  - ☐ the fishing sector is threatened by declining stocks and competition from other fleets;
  - ☐ the development of tourism faces obstacles such as difficulties of access, lack of facilities and appeal to a very narrow market;
  - ☐ the manufacturing sector suffers from high transport costs to external markets.
- a declining and ageing population as young people leave in search of job opportunities on the mainland;
- transport difficulties (e.g. irregular services, lack of direct services, lengthy journeys);
- isolation, a function of poor communications;
- low investment because of high unit costs;
- difficulties in water and energy supply;
- specific cultural identities.

These problems are perhaps felt more acutely in the Scottish islands which also suffer from extreme peripherality. Other island locations in the study area include the Danish islands, particularly Bornholm which is physically isolated from the rest of the country and the Frisian islands off the coast of the Netherlands, Germany and Denmark.

Peripheral areas

The Scottish islands and the more northerly of the regions on the mainland of Scotland together could be classified as a peripheral area. The mainland regions suffer similar deficiencies as those identified for island areas. Perhaps the biggest contribution to assisting these areas would be to improve transport links as this would help overcome some of the other perceived problems.

Border areas

The study area has two internal land borders – i.e. Denmark/Germany and Germany/the Netherlands – and one external land border, between Germany and its non-EC neighbouring countries.

The internal frontiers will progressively disappear with the single European market as that between West and East Germany disappeared with unification. The administrative structures set up on either side to exercise routine controls on the movement of goods and people across the border and to collect statistical data will be dismantled which may result in some local job losses. The disappearance of these controls might encourage commuting flows especially across the former German-Danish border when rail and road links are strengthened as a result of implementation of the Great Belt fixed link. Commuting flows on the scale of that across the former West-East German border (some 500 000) are unlikely to materialize.

The external border area may well come under pressure from increased traffic flows as the transport infrastructures on both sides of the frontier are improved and from a development of commuting. There could be an immigrant flow from east to west which would, initially at least, be concentrated in the border areas. Industrial and commercial development might also be attracted.

In any event the present situation is likely to change, giving rise to problems peculiar to the location and demanding local specific solutions.

Coastal regions

The coastline is a unifying feature of the study area. It accommodates a wide variety of uses and is subject to an equally wide range of pressures. The range and intensity of these uses vary from country to country and within each country from location to location along the coastline. They are often in conflict. The pressures upon the coastline arise from:

- urban development;
- industry, including that related to North Sea oil and gas exploration;
- port expansion and related commercial and transportation development;
- the fishing industry;
- the demands of the tourist industry;
- agricultural development;
- the impact upon the marine and terrestrial environment of all the above activities.

Of all regions in the study area the coastline is that subject to the most diverse and intensive pressures. The danger is that it will be increasingly difficult to absorb the additional pressures of new developments both in terms of the land available and its capacity to limit any negative impact.

Rural economy

Agriculture is the key element in rural life. It is undergoing structural change as a result of technical and market

forces. These have led to fewer but larger agricultural holdings which are farmed more intensively. This has involved landscape changes to permit increased mechanization and increased use of fertilizers and other inputs. As a result farms have become much more productive but less labour-intensive. The need now is to find alternative job opportunities to halt the exodus from rural areas of farming families and to sustain threatened rural communities.

At the same time rural areas close to metropolitan centres are under threat from without, for example from the movement of population from urban centres and pressures for new housing and associated infrastructure and commercial development. The problem here is how to control development so that it does not overwhelm the rural environment.

The key problem in rural areas is thus how, to preserve traditional communities and lifestyles in the face of pressures from development and changes in the structure of the farming industry.

Port regions

Two further possible typologies are port regions and tourist regions. The regions in each of these categories are competitive in that they vie with each other for business but they also have characterization and problems in common.

The principal problem in port regions is the danger of run-down as a result of loss of trade to other ports. This danger arises from:

- technical and market development making for bigger vessels to minimize costs and ports' need to upgrade their facilities to accommodate these larger vessels;
- the development of hub and spoke shipping routes;
- poor hinterland transport facilities which reduce the catchment area for the port;
- expensive inland transport costs;
- the development of long distance rail haulage.

Regions dependent on tourism

Tourist areas suffer from a range of problems including:

- the decline of the traditional seaside holiday;
- competition from sunnier, warmer destinations, such as the Mediterranean;
- the relative shortness of the holiday season (less a problem in the UK than in other study-area territories);
- environmental problems created by tourist numbers;
- the employment generation benefits of tourism are principally in the areas of part-time and female employment not male employment.

Typology of natural regions

Administrative regions are often unsatisfactory for the purposes of regional analysis and planning. Their boundaries have not been drawn to create entities with similar spatial and socioeconomic characteristics. We have therefore divided the study area into 16 'natural regions' using criteria such as:

- geographical features;
- degree of urbanization;
- economic structure;
- growth potential;
- position relative to the core-corona-periphery zones introduced in Chapter 4.

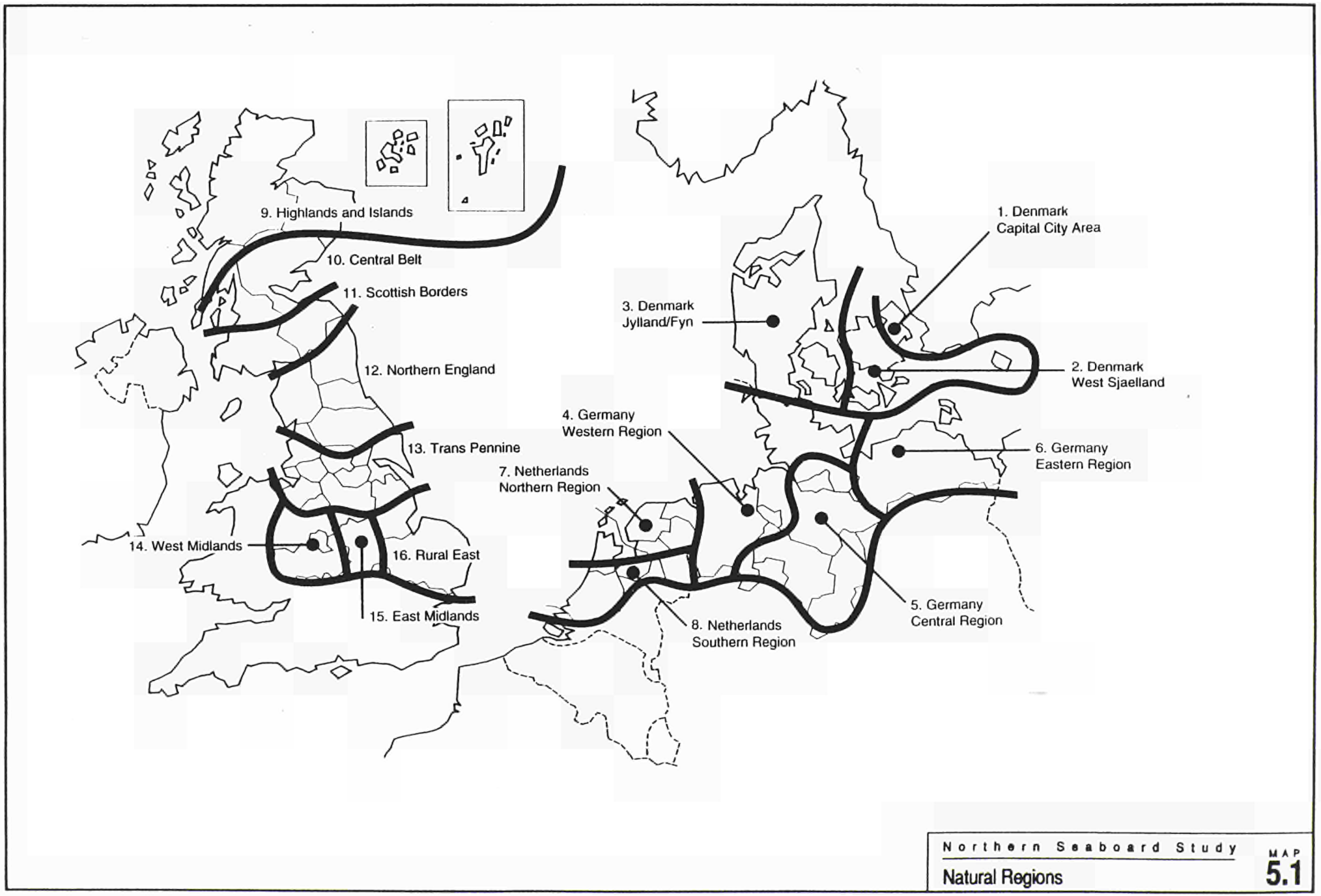
The criteria used were common to all parts of the study area, although the emphasis between these criteria varied across the study area in line with local circumstances.

Map 5.1 shows the natural regions identified in the study area. The regions are defined in the following paragraphs, country by country. We then characterize them using the same typology that we applied to NUTS regions in the first part of this chapter.

Denmark

The whole of Denmark comprises a NUTS 1-level region as far as EC statistics are concerned but for certain purposes it is useful to subdivide the country into three smaller 'natural' regions. These are:

- the Jutland peninsula and the island of Fyn;
- the western part of the island of Zealand outside the capital city area comprising the counties of West Zealand and Storstrøms, together with the island of Bornholm;
- the capital area comprising the three counties of Copenhagen, Roskilde and Frederiksberg plus the municipalities of Copenhagen and Frederiksberg. This area is approximately that of the travel-to-work area for the metropolis. It is defined roughly by the area serviced by the Copenhagen public transport network.



Northern Seaboard Study

Natural Regions

MAP 5.1

The division between the first and second regions defined above is the Great Belt which is a major transport barrier.

Germany

The German sector of the northern seaboard study area has been divided into three regions which have been determined primarily on the basis of their growth potential.

The natural regions of Germany, so defined, are:

- A western region which comprises most of Schleswig-Holstein, the north-western areas of Lower Saxony and Bremen. In detail this covers the following NUTS 2 regions:
  - ☐ Weser-Ems except the extreme southern area around Osnabruck;
  - ☐ Bremen;
  - ☐ the north western part of Lüneburg;
  - ☐ all of Schleswig-Holstein except the south-eastern corner (planning region 1).

- A central region, which comprises most of Lower Saxony and the south-east corner of Schleswig-Holstein. In detail this consists of:
  - ☐ planning region 1 of Schleswig-Holstein;
  - ☐ Hamburg;
  - ☐ Lüneburg, except the north-western part;
  - ☐ Hannover;
  - ☐ Braunschweig;
  - ☐ Osnabruck areas of Weser-Ems.
- An eastern region, which comprises the old GDR region of Mecklenburg-Western Pomerania. This is one of the study overlap areas and is not subject to detailed discussion.

The Netherlands

The Netherlands is primarily a trading nation and the strength of its economy is very much tied to the strength of its trading links with other (especially EC) partners. Thus in numerous areas of government policy a great deal of attention is devoted to the possibilities of strengthening ties with other trading nations. The thriving port of Rotterdam perhaps best epitomizes this philosophy.

A major transport and trading axis exists running from the port of Rotterdam south-east to the Ruhr. This is of long standing and reflects the industrial might of the Ruhr and the importance to it of Rotterdam as an entrepôt port for shipping its goods out to the world and bringing in raw materials. As a consequence the area around Rotterdam, the Randstad, is the most economically powerful area in the country.

A second such commercial axis can now be identified in course of development. This runs from Rotterdam through Utrecht and Appeldoorn to Hengelo and Enschede on the border with Germany and from there via Munster and Osnabruck to Berlin and beyond. Evidence for the development of this axis includes, on the Dutch side of the border, the A1 motorway and proposals for the construction of a northern branch of the Betuwe railway line between Arnhem and Hengelo, and, on the German side, the upgrading of existing motorways from Hannover to Berlin and the construction of a new high-speed rail line between the same two places, and the growing importance of places such as Hannover and Osnabruck which are at the junction of an existing north/south and the developing east/west transport axes.

Given the development of this east/west route, which will run from Rotterdam through the Netherlands and Germany to Berlin, the land corridor through which this axis runs is seen as a major development area in the future. The division of the Dutch sector of the northern seaboard study area is based on an assessment of which regions could best take advantage of the economic prospects offered by this relatively new developmental axis.

Two regions have been defined in terms of this relationship to this growth axis:

- a southern region comprising the NUTS 2 regions of South Holland, North Holland (that part of it lying to the south of the North Sea canal), Flevoland (the southern part) and Overijssel (except the extreme north western tip);
- a northern region comprising the NUTS 2 regions of North Holland (that part to the north of the North Sea canal), Flevoland (the northern part), Groningen, Friesland and Drenthe.

The assessment of the potential of the NUTS 2 regions to take advantage offered by this east/west axis was based on a comparison of characteristics including demographic trends, economic structure, urban developments and traffic and transport infrastructure.

The United Kingdom

The UK study area comprises seven NUTS 1-level regions and 20 NUTS 2-level regions, which cover 64

independent counties (in England) or regional (in Scotland) local authorities (i.e. the first tier below central government). For the purposes of this analysis, eight 'natural' regions have been defined. They are:

- Highlands and Islands;
- central belt;
- Scottish Borders;
- Northern England;
- trans-Pennine;
- West Midlands;
- East Midlands;
- rural east.

Discussion

Table 5.2 shows the 16 natural regions, by type and by country.

There is a marked affinity, for obvious reasons, between fishing, coastal and tourist regions. The Copenhagen region is coastal but has no fishing activities. The northern seaboard region's tourism is heavily dependent on the coastal resorts. However, Copenhagen, Bremen and Hamburg and several cities in the UK (Edinburgh, York, Bradford, etc.) have a significant tourism trade based partly on business visitors.

The interior regions of the North Netherlands region are popular holiday destinations for domestic visitors as are the Harz mountains in the south-eastern part of the German study area; the UK's visitor attractions are more varied than those available in the other three countries. Retirement areas also tend to be tourist areas.

The pattern of port and coastal regions is similar except that the former includes the riverine ports of Bremen and Hamburg. The northern subregion of the western region in Germany includes the many ports on both the North Sea and Baltic coasts.

Nor surprisingly, in view of the very marked difference in the settlement pattern between the UK on the one hand and the Continental members of the study area on the other, the metropolitan regions are found mainly among the English regions. The category includes areas with a single large city (Hamburg, Copenhagen), conurbations (Merseyside, South Yorkshire) and those with a dense grouping of discrete settlements (East Midlands, Hannover/Braunschweig, Hengelo/Enschede).

Similarly the areas of declining heavy industry are located mainly in the UK regions reflecting Britain's role as the cradle of the industrial revolution. The German city states of Bremen and Hamburg (steel, shipbuilding, etc.) are other regions in this category.

Agricultural activities are the mainstay of rural economies so the pattern of intensive farming and rural regions are similar. Intensive farm areas include both those under cereals cultivation (as in East Anglia and the northern subregion of the German western region) and those where livestock is the principal activity (as in Jutland and Overijssel in the southern region of the Netherlands).

Our peripheral areas are those that lie outside the sphere of influence of the development corridors identified earlier in this chapter. They include the western part of the Jutland peninsula, the coastal hinterland of northwest Germany, northern parts of the Netherlands and the North of England and Scotland. These areas tend also to be predominantly rural where agriculture and fishing are major activities, and they also suffer from deficiencies in transport infrastructure, including the 'dead-end' syndrome.

The Island regions, the Orkneys and Shetlands, Bornholm and the Frisian Islands, also suffer from peripherality.

Table 5.2. Typology of natural regions by type

	1 Fishing dependent	2 Depending on declining industry	3 Metropolitan	4 Retirement	5 Intensive agricultural	6 Island communities	7 Peripheral	8 Border	9 Coastal	10 Rural	11 Port	12 Tourism
Denmark												
Capital city			●					●			●	●
West Zealand	●				●	●	●	●	●	●		
Jutland / Fyn	●			●	●		●	●	●	●	●	●
Germany												
Western region												
North	●				●				●	●	●	●
Central	●	●	●			●	●		●	●	●	●
South					●		●			●		
Central region												
North			●								●	
South		●	●									
Other							●					
Eastern region	●				●			●		●		
Netherlands												
Northern region	●			●	●	●	●	●	●	●	●	●
Southern region		●	●		●			●		●		
United Kingdom												
Highlands and Islands	●					●	●		●	●	●	●
Central belt		●	●						●		●	●
Scottish Borders		●		●			●			●		●
Northern England	●	●	●	●			●		●	●	●	●
Trans-Pennine		●	●						●		●	●
West Midlands		●	●		●							
East Midlands		●	●		●					●		
Rural East	●			●	●				●	●	●	●

Chapter 6: Regional scenarios

Introduction

This chapter presents the regional scenarios by country in the following order: Denmark, Germany, the Netherlands and the UK. The list of natural regions identified in the previous chapter is reiterated at the beginning of each country section.

The regions mentioned in this chapter are 'natural regions' as defined in the second typology presented in Chapter 5.

The regions of Denmark

Definition of regions

The whole of Denmark comprises a NUTS 1-level region as far as EC statistics are concerned and Denmark will be treated as a single region in this study but for certain purposes it is useful to subdivide the country into three smaller regions as follows:

- the Jutland peninsula and the island of Fyn;
- the western part of the island of Zealand outside the capital city area comprising the counties of West Zealand and Storstrøms, together with the island of Bornholm;
- the capital city area comprising the three counties of Copenhagen, Roskilde and Frederiksberg plus the municipalities of Copenhagen and Frederiksberg.

Maps 6.1 shows in detail the natural regions identified in Denmark.

Population

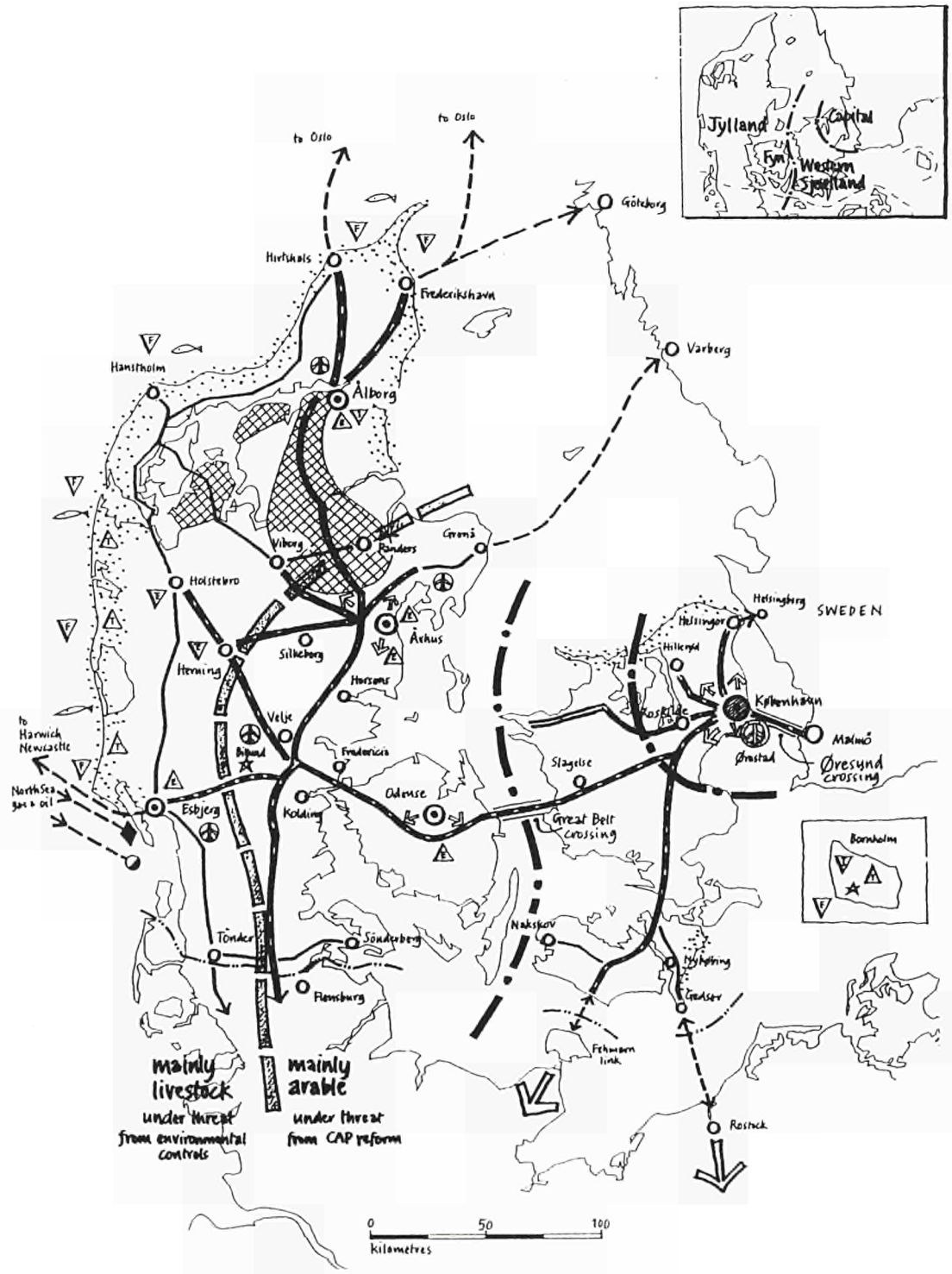
The Danish population is expected to increase slightly from its present 5.14 million to 5.2 million by the turn of the century and decline slowly thereafter.

The population in each of the three natural regions defined above will increase but their shares in the total population of the country will be roughly the same by the year 2000 as they are now, i.e. Jutland and Fyn 56%, Zealand and Bornholm 11% and the capital city area 33%.

Thereafter, the population of the capital region will fall faster than elsewhere and Jutland and Fyn will have a slightly greater share of the national population by the year 2010. By that year the population of the capital city area will have fallen to below its present level. The population of Zealand and Bornholm will be roughly the same as now while that of Jutland and Fyn will be marginally higher than at present. In Jutland and Fyn the principal urban centres such as Esbjerg, Aarhus and Odense will exhibit faster growth than the rural areas.

The age structure of the Danish population will become more biased towards the elderly. By the year 2000 the share of the 15- to 24-year olds will have fallen from 15 to 12% of the total and that of the 25- to 59-year olds will have increased from 48 to 50%. In the first decade of the next century the proportion of 60-year olds and above will increase from 20 to 23%. The share made up by people above the age of 60 will be considerably higher in Zealand and Bornholm than in the other regions.

The size of the labour force will be little changed by the year 2000 and will total just under 3 million of which over



Key

- Primary urban centres
- Secondary urban centres
- Other urban centres
- Pressure for urban expansion/overspill
- Motorways and near-motorway standard roads
- Other main roads
- Main railway links
- Main waterways
- Potential growth prospects
- Potential decline prospects

C	Coal
D	Defence industries
E	Education/research
F	Fisheries
I	Industry (general)
L	Electronics
M	Motor industry
O	Oil
S	Services
T	Tourism
E	Textiles
X	Distribution/freight

- Expanded airports
- Other airports
- Agriculture under threat (UK only)
- Sensitive environmental areas under pressure from tourism
- Groundwater with high nitrate content (Denmark only)
- Oil land terminal
- Gas land terminal
- Tourism centre

Northern Seaboard Study

Denmark

MAP 6.1

one half will be resident in Jutland and Fyn and about one third in the Capital region.

The Danish Government expects employment to increase by just over 2% by the year 2000. It aims to reduce the unemployment rate to an average of 8% by the late 1990s. Allowing for changes in the size of the labour force this implies the need for an increase in jobs of 2.2% nationally. It is considered that this target will be difficult to meet.

On the assumption that regional differences in unemployment rates remain the same then employment will need to increase by 2.9% in Jutland/Fyn, 3.1% on Zealand and Bornholm and 1.1% in the capital city area.

A major fall in the numbers engaged in agriculture and fishing is expected to be offset by increases in other sectors, especially the services sector. The geographical distribution of employment will be similar to that of the population.

As far as migratory movements are concerned, demographic trends are leading to two developments: outmigration from the metropolitan area to the outskirts of the capital city region, and a rural to urban trend in the other two subregions.

As a result of the second trend, by the end of the century the cities of Odense and Aarhus in particular, but also Esbjerg and Aalborg which are more peripheral in relation to Copenhagen, will have strengthened their position as local centres for growth. The inward movement of population to these centres will come particularly from the coastal fishing communities located on the west and northern coasts of Jutland and from the agricultural areas located more inland. Danish policies emphasize the importance of urban centres as growth poles, so this development is in line with and partly the result of these national policies.

Government and local authorities are making strong efforts to reverse the flow of population from the Copenhagen area. As part of this effort, public authorities are planning to build a 'new town' in the city. This is the 'Ørestade project' which will include conference and hotel facilities as well as residential developments.

Agriculture

The primary sector (agriculture and fisheries) is expected to account for around 5 to 6% of total employment in both Jutland/Fyn and Zealand regions by the year 2000.

Employment in agriculture is subject to long-term decline because of structural changes in the industry. This decline is likely to accelerate under the influence of CAP reforms and tighter environmental legislation and it is expected that the industry will have lost some 50 000 jobs between 1989 and the year 2000. The primary sector (agriculture and fisheries) will then account for 3.5% of total employment as compared with 5.7% in 1989.

The bulk of agricultural employment is located in Jutland, particularly in its western part, and in Fyn. This region is engaged in intensive livestock activities, dairying and arable farming. So in quantitative terms this region will be most affected by the prospective fall in employment. Even so, it will account for some 80% of all agricultural jobs in the country in the year 2000. Agriculture is important too on the island of Zealand, and is dominated by cereals, so this area is likely to be more affected by the CAP reforms than the western areas of Denmark.

We have estimated elsewhere that some 200 000 hectares of arable, around 11% of the total, will be taken out of cultivation under set-aside leading to a loss of some 8 000 jobs or around 7% of the Danish agricultural labour force.

The agriculture industry is currently subject to restrictions concerning livestock densities and the disposal of slurry as part of the action plan for the aquatic environment, which was introduced in 1987 and aimed at reducing emissions of nitrogen and phosphorous into the environment. Even so certain areas in North Jutland and southern Zealand are already experiencing problems of pollution of drinking water sources and environmental controls on the industry could well become stricter in future.

Fishing

The size of the fishing fleet has been substantially reduced, particularly since the mid 1980s. This has been due to the decline in fishing opportunities arising from over-fishing, quota limitations and pollution, and has been reinforced by favourable decommissioning schemes encouraging fishermen to leave the industry.

Fishing communities are found mainly along the west and north coast of Jutland and on the island of Bornholm. Fish processing is also mainly located in these

same areas. The employment impact of the decline in the fishing fleet has therefore been very localized.

The decline in employment in fishing communities and the increase in the attractiveness of the towns are encouraging a population flow from the west of Jutland to more eastern parts of the country.

While the fleet has been significantly reduced, most of the Danish fish quotas are still fully utilized and a wide range of additional measures are applied on a national scale in order to further restrict the fishing effort applied. Hence it appears that there is still a substantial surplus of fishing capacity in the Danish fleet. The prospect, therefore, is for a continuing decline in employment in the industry.

The development of aquaculture as a source of alternative employment for fishermen is not promising as numerous restrictions on the establishment of new production sites and on the volume of production have been introduced for environmental reasons.

The domestic supply of raw materials is currently too little to keep the processing industry working at full capacity. Until now it has been able to compensate for this by increased imports and changes in product lines and processes. However, stricter environmental controls are being imposed on the treatment of waste water and these will adversely affect the financial situation and the viability of plants.

While the processing industry should overcome the current crisis, particularly as competitors will be facing similar problems, the fishmeal industry is facing particularly difficult problems. Indeed, the fishmeal industry is much more polluting and market prices have developed unfavourably and are expected to stabilize at best, despite major restructuring and rationalization leading to industrial concentration.

If the situation of the fishmeal sector further deteriorates this will have serious implications for the Danish fishing fleet. Vessels presently fishing mainly for reduction purposes will enter other fisheries, thus increasing the pressure on other fish stocks as well as reducing the catch and the profits of the rest of the fleet.

The critical state of fish stocks – in particular cod – in the Baltic Sea presents particular problems to the fishing fleet and processing industry located on the island of Bornholm which rely heavily upon this resource. The fishing fleet is likely to be more severely affected than the processing industry, as many other Baltic countries, particularly the former members of the Eastern bloc, also land their catches on Bornholm; however the quantity and quality of these landings are declining. Even so the whole of the fishing industry on the island will probably have been reduced significantly by the year 2000 and this area is probably the one that will experience the most heavy decline through the 1990s. The situation in Bornholm is deteriorating rapidly (March 1993).

Manufacturing and services

Manufacturing

The manufacturing sector accounts for about 20% of total employment. Employment in the sector is expected to grow by about 3% between 1989 and the year 2000, but this will not lead to an increase in the sector's share of total employment.

The Jutland/Fyn region accounts for approximately two thirds of total manufacturing employment which is located in the principal towns which lie mainly in the east of the region. A surprisingly wide range of industries is represented. In Aarhus, food, beer, oils, textiles and machinery are key areas while Aalborg has shipbuilding, cement, tobacco and acquavit, a unique alcoholic drink produced in the area. Herning is a centre for clothing and textiles; and food processing, particularly of fish, is found in Esbjerg. Shipbuilding is undertaken at Odense on the island of Fyn.

The capital city area is a major manufacturing centre and accounts for about 25% of manufacturing employment. Industries in the region include shipyards, engineering, brewing, food processing, chemicals and ceramics and some newer sectors such as electronics.

Zealand accounts for most of the balance of employment in the manufacturing sector. Many of the industries there are related to agriculture such as food processing and the manufacture of agricultural machinery; ceramics are also important. There is a sugar refinery on Lolland a small island lying to the south of Zealand.

These activities are neither high growth nor particularly competitive internationally. On the contrary many of the traditional activities are both declining and very vulnerable to international competition. Such activities include shipbuilding, clothing and textiles, wooden products and furniture.

Small and medium-sized enterprises (SMEs) – defined as those enterprises with less than 50 employees – are

the commonest form of business organization. They account for 54% of employment in manufacturing and 30% of turnover. Generally they have little expertise or experience in international markets.

Danish businesses are largely in domestic ownership: only 1% of all enterprises are foreign-owned. Foreign ownership is found mainly in the wholesaling sector and to a much lesser extent in manufacturing where foreign-owned firms account for only 10% of turnover.

The small scale, insular nature of firms in the traditional manufacturing sector is a major reason for its poor growth prospects. There are however big (in the Danish context) 'locomotives', especially in industries such as food processing, measuring equipment and drugs.

Services

Employment in services will grow moderately strongly over the next decade to account for around two thirds of total employment by the year 2000.

Employment in financial and business services is expected to expand by approximately 10% between 1989 and the year 2000. The financial services sector is consolidating and restructuring at present with substantial job losses but it is expected to recover in the late 1990s. Nearly 50% of employment in financial and business services will be located in the capital area, which houses many company headquarters, but there will be a strong concentration also in Aarhus, the country's second largest city.

Employment in trade and tourism-related services is expected to show little absolute or relative change, with a strong growth in tourism employment being offset by a contraction in trade services. Over 50% of employment in these categories will be located in the Jutland subregion by 2000 and more than a third in the capital city area.

Non-market services are expected to grow by about 6% between 1989 and the year 2000; the distribution of this employment will remain roughly in line with that of population with over 50% in Jutland and over one third in the capital city region.

Tourism

Danish tourism is based on the three Cs: the coast, the countryside and Copenhagen. Some 40% of visitors come from Scandinavia with a further 20% from Germany. This basic pattern is unlikely to change by the year 2000.

Tourism is important as a foreign currency earner in a small country with limited resources but it is doubly valued in Denmark as a means of providing job opportunities and supporting the rural economy where traditional activities are in decline.

The government has recently adopted a 10-year tourism development programme which aims *inter alia* to extend the tourism season, to promote the development of new products and facilities and to improve and modernize tourist accommodation.

Tourism in the capital city region is based on business tourism, day trips by domestic visitors (and increasingly by visitors from Sweden – a trend that a fixed link across the Oeresund will encourage) and on foreign visitors from cruise ships and yacht traffic. Proposals in the action programme include:

- the modernization and improvement of hotel accommodation (the preferred type of accommodation for visitors, mainly foreigners);
- the development of convention traffic by:
  (i) developing cultural facilities and promoting Copenhagen as the 1996 cultural city of Europe;
  (ii) the development of the Ørestade complex on the island of Amager to maximize the benefit of the fixed-link connection;
- extending the tourism season.

Outside the capital city tourism is based on recreation, rented holiday accommodation and camping facilities. This type of tourism is concentrated in the high season, and is located primarily in West and North Jutland and on the island of Bornholm.

The objectives of the 10-year action programme concerning this latter type of tourism are:

- to widen the market as regards type of holiday on offer, type and origin of visitors etc.;
- to extend the season;
- to take development pressures off the coastline.

Proposals to meet these objectives include:

- upgrading and modernizing hotels, which are the most suitable type of all year accommodation;

- promoting an improvement in the quality of summer houses and holiday cottages to widen their appeal to foreign tourists;
- improving the facilities provided by campsites. These are expected to be in great demand from east German and East European visitors in future years;
- providing all-weather visitor attractions;
- promoting inland attractions and wider areas rather than just specific locations like the coastline.

Transport

The government's transport action plan for environment and development expects passenger transport to increase by 20% between 1988 and the year 2000 and freight transport to increase by 27% over the same period. These are equivalent to annual growth rates of approximately 1.5 and 2% respectively.

Over the same period road passenger transport is expected to increase by 1.8% per annum and road freight transport by 2.9% per annum. This means that for both passenger and freight transport, road traffic will gain market shares during the 1990s.

The government's policy is not to restrict demand for road transport, for this is seen to be essential for economic development, but to reduce the environmental damage caused by the transport sector, primarily by improving efficiency in the sector and ensuring full-cost recovery of all economic and environmental costs from transport users.

Roads

The Great Belt connection is already under construction. It will complete the 'Great H' motorway network which will consist of:

- an axis running north to south through Jutland, comprising two arms from Hirtschals and Frederikshavn respectively which meet at Aalborg from whence the motorway proceeds south to Randers and thence via Aarhus and Kolding to the German border;
- a similar north-south axis in Zealand running from Helsingor to Copenhagen and then to Rodby in the south;
- the crossbar of the H running from Kolding via the Great Belt to Koge just south of Copenhagen.

In west Jutland, new developments include additional motorway links running from Kolding to Esbjerg and from Aarhus to Herning.

These motorway links will provide a fast road connection between all the principal road and rail ferry ports which provide international services.

(i) The north/south axis through Jutland will improve connections between Norway and Sweden to the north and Germany in the south.
(ii) Similarly, the north/south axis in Zealand will improve transport links between Sweden and Germany.

The Great Belt link itself is primarily of domestic importance. In particular, it will speed-up road transport between east and west Denmark. This will have a negative effect on:

- domestic air transport between east and west Denmark;
- road ferry traffic, in particular between Grenaa in Jutland and Hundested (Zealand) and between Aarhus and Kalundborg (also in Zealand).

The Great Belt will also improve rail passenger connections between east and west Denmark. Together with electrification and the introduction of new locomotives (see below) the Great Belt will considerably speed up travel between Copenhagen and the cities in Jutland.

The fixed link is seen to be of only marginal significance to domestic rail freight transport.

Rail

Denmark has a 'Big H' rail network, the configuration of which will be very similar to that for roads, and, as the road network, will basically link the major rail ferry ports:

(i) there will be a north/south axis on Zealand from Helsingor to Rödby but with a branch to the ferry port of Gedser;
(ii) on Jutland the north/south axis will run from Frederikshavn to Padborg on the German border via Aarhus and Kolding but with a link from Kolding to the ferry port of Esbjerg;
(iii) the cross bar of the H across the Great Belt will link these two north/south axes.

In addition to these main lines there will be a network of other lines, principally in west and central Jutland.

The line from Helsingborg via Copenhagen to Roskilde is electrified at present. Electrification will be extended to Odense on the island of Fyn by the time the Great Belt rail link is finished. Later, probably in the late 1990s, the

line from Odense to Padborg on the German border will also be electrified.

This will complement the improvement by the German authorities of the rail line to Hamburg and it will help improve Danish access to the Central European rail network. Additionally, to increase line capacity, a second track from Vamdrup near Kolding will be laid. At present this is single track only.

The IC3, a new inter-city high-speed passenger train capable of running at speeds of up to 180 km/h was introduced in 1990 and will be progressively extended throughout the system. With the Great Belt link and electrification it will reduce travel time between Copenhagen and Aarhus from 4.5 to 5 hours to some 2.5 hours.

Air transport

Copenhagen airport will gain considerably from the fixed road and rail links and from rail electrification and the introduction of the new inter-city IC3 high-speed passenger train as these projects will considerably extend its catchment area not only into western Denmark but also into southern Sweden.

Regional airports will suffer as a result of these transport and infrastructure improvements as they will increase the attractiveness of road and rail modes for domestic travel.

Ports

By the year 2000 the ports network will be characterized by three main features:

- increased competition leading to a concentration of cargoes in the most competitive ports to the detriment of smaller ports which may suffer decay and dereliction as a result;
- a possible loss by Aarhus and Copenhagen of their container traffic which could well go by rail to Hamburg or Rotterdam;
- an increase in Danish shipping services to Eastern Europe, the CIS and the Baltic States but with the possibility of competition from east German ports when the proposed infrastructure links to improve communication between east and west Germany have been built.

The main influence on the future development of ferry routes and ferry ports will be the implementation of the fixed-link connections. (These impacts have already been examined in Part I).

Telecommunications

A new national telecommunications organization was set up at the beginning of 1992 with the aim of developing new telecommunications technologies and identifying profitable new services and products.

Two main developments in telecommunications are envisaged for the 1990s:

(i) the development of a digital mobile phone network, the GSM (group special mobile), which will complement the existing NMT (Nordic mobile telephone) system. GSM will provide communications with 18 countries and allow data transmission from mobile telephones. The network is to be completed by 1994 and it is expected that it will help increase the number of mobile telephone users to 200 000 by year 2000;
(ii) an increasing penetration of the ISBN (integrated services digital network) system which was opened for commercial use in January 1992. This system, designed to introduce a range of common standards and services to the emerging digital network, is capable of accommodating a wide range of advanced services. It is now accessible from all parts of Denmark.

Overview of spatial developments

Transport infrastructure

The major influence on spatial development in Denmark over the next 10 years or so will be the proposed transport and transport infrastructure improvements, particularly the implementation of the fixed-link projects.

The Great Belt is a significant transport barrier. For example, road traffic volumes across it by ferry are only 15% of that using the two bridges linking Jutland and Fyn. The fixed link, rail electrification and the introduction of the IC3 passenger train will substantially cut travel times between east and west Denmark.

The developments in the transport sector will have a considerable impact:

- they will make domestic air travel less attractive and adversely affect the regional airports;
- they will reduce the attractiveness of road ferry routes particularly that from Aarhus to Kalunborg

and perhaps also the more northerly routes from Grenaa to Hundested and from Grenaa to Helsingborg;
- they will increase the influence of the capital city, for example in relation to work and shopping trips.

In addition, the Great Belt project and rail electrification will encourage the use of Danish railways for international traffic between Germany and Sweden.

These trends will be reinforced by the Oeresund fixed-link project, the building of which will also have a number of other implications:

- it will extend the influence of Copenhagen, for example by facilitating shopping trips from southern Sweden;
- it will extend the catchment area of Copenhagen airport to the east in southern Sweden just as the Great Belt project will do to the west, and will enhance Copenhagen as an international airport;
- it will adversely affect ferry routes and ferry ports not only those in the immediate vicinity of the fixed link but also those presently carrying long distance traffic such as the Trelleborg-Rostock ferry route to its south and the Grenaa-Varberg and the Fredrikshavn-Göteborg routes to its north.

The Fehmarn crossing will also have a significant impact. As it will provide a more direct and faster route between east Denmark and Sweden and northern Germany than the Great Belt route the Fehmarn crossing will attract a large volume of both road and rail traffic from this latter route.

The volume of rail traffic diverted would depend on whether the line south of Koge were to be electrified or not. The link would replace the Rödby-Puttgarden and probably also the Kiel-Korsor (on West Zealand) ferry routes and thus impact severely on these two ferry ports. It could also adversely affect more distant ferry routes and ferry ports, particularly Gedser and its services to Travemünde and Rostock.

Agriculture and fishing industries

A second important influence on spatial development will be the continued structural decline in the agricultural and fishing industries, with the CAP reforms reinforcing existing trends.

The continued contraction in the size of the fishing fleet and the loss of job opportunities will severely affect fishing communities which are mainly located on the west and northern coasts of Jutland and on the island of Bornholm. Any contraction in the fish-processing industry as a result of stricter environmental regulations and declining landings will reinforce these effects.

The contraction in agricultural employment as a result of existing structural changes in the industry, CAP reforms, and stricter environmental controls will affect Jutland and Zealand particularly, as these are the main centres of livestock and arable farming. There will be a trend for population to move away from the coastal areas (location of fishing communities and those dependent upon ferry traffic) and the rural areas (location of agricultural communities) to towns where jobs in manufacturing and services are primarily located. In Jutland towns are located mostly on the eastern side of the peninsula. Therefore, there will be a tendency for a population shift from the north and the west to the east particularly to Aarhus. On Fyn and Zealand there will be a similar tendency for migration from the southern rural areas to the northern urban centres.

This trend will be part of a wider pattern for population and economic activity to migrate towards Copenhagen particularly as the latter's importance is enhanced by transport and traffic developments. The ring of towns around Copenhagen could well become much more important as will the city of Copenhagen itself. Peripheral areas in West and North Jutland would become more disadvantaged as population is lost.

Set-aside will radically alter the landscape especially in West Zealand where cereal growing is concentrated. Set-aside and the decline of agricultural and fishing communities will affect the environment and the ambience of coastal and rural areas especially in Jutland. These areas are important tourism areas. Tourism could therefore be a vehicle for regenerating these communities. Idle assets such as buildings and land could be used as a basis for developing tourist facilities and attractions. For example, houses for rental, golf-courses and camp sites.

The removal of internal borders

By the year 2000 the frontier between Denmark and Germany will have been removed for a long time as a consequence of the process of European integration. Its removal is not expected to have major impacts:

(i) there could be some commuting to work across the former land border in Jutland probably from north to south;

(ii) in West Jutland the main employment is in agriculture and fisheries which are expected to contract substantially in the 1990s; workers displaced from these activities could therefore go in search of work in the German border city of Flensburg.

The (still hypothetical) construction of the Fehmarn fixed link early in the next century might encourage similar commuting traffic. However, there is no large city within reasonable commuting distance on either side of the crossing and traffic volumes are likely to be small.

Abolition of duty-free shopping with the advent of the single European market could reduce traffic volumes on ferry routes between Germany and the south Danish islands thus adversely affecting the viability of some routes and leading to withdrawal or reduction of services and job losses both on-board and onshore.

There is at present a substantial cross-border traffic flow for shopping purposes to take advantage of differing price levels caused in part by differences in tax rates and levels of excise duty. Such traffic flows might be encouraged by the removal of border controls following the introduction of the single European market. The volume and direction of flows will depend on the extent of harmonization of German and Danish excise duties. To the extent that harmonization leads to a convergence of prices in the shops on both sides of the former border these cross-border shopping trips will diminish and domestic shops will gain from spending that might otherwise have been done in the other country.

The dismantling of border controls will not have a significant impact on the local economy.

The regions of Germany

Definition of regions

The German sector of the northern seaboard study area has been divided into three regions which have been determined on the basis of their growth potential. These are as follows:

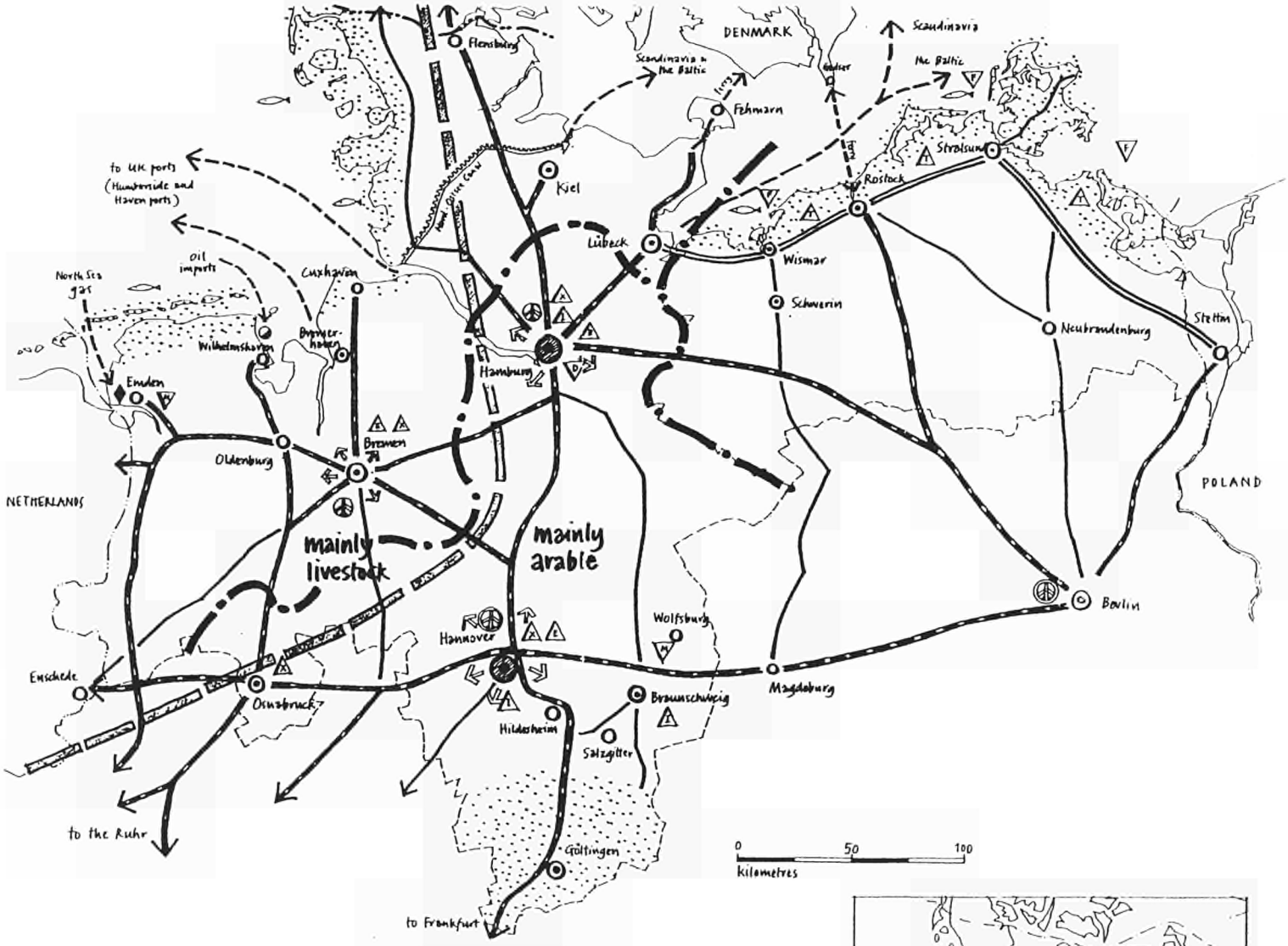
- a western region which comprises most of Schleswig-Holstein, the north-western areas of Lower Saxony and Bremen. In detail this covers the following NUTS 2 regions:
  - ☐ Weser-Ems except the extreme southern area around Osnabruck;
  - ☐ Bremen;
  - ☐ the north-western part of Lüneburg;
  - ☐ all of Schleswig-Holstein except the south-eastern corner (planning region 1);
- a central region, which comprises most of Lower Saxony and the south-east corner of Schleswig-Holstein. In detail this consists of:
  - ☐ planning region 1 of Schleswig-Holstein;
  - ☐ Hamburg;
  - ☐ Lüneburg, except the north-western part;
  - ☐ Hannover;
  - ☐ Braunschweig;
  - ☐ Osnabruck areas of Weser-Ems;
- an eastern region, which comprises the old GDR region of Mecklenburg-Western Pomerania. This is one of the study overlap areas and is not subject to detailed discussion.

Map 6.2 shows the natural regions of Germany.

Characteristics of regions

The central region sits astride north/south (Lübeck-Hamburg-Hannover) and east/west (Osnabruck-Berlin) development axes; the junction of these two axes is located in the Hannover/Braunschweig region. It contains a number of large conurbations with strong suburbanization of the rural areas, and is dominated by manufacturing industry including future-oriented activities and research and development. It also has a strong services sector.

The western sector is mainly rural and dominated by agricultural and fishing activities but it includes the town of Bremen and accommodates a range of manufacturing activities. It contains some medium-sized towns with regional functions but in the main these are not growth poles, and has a high proportion of declining industry (shipbuilding, textiles) and some newer activities (car and aircraft manufacturing which, however, are now in decline). The region's business is dominated by small and medium-sized enterprises (SMEs) and subsidiaries of large international organizations. The region has a poor service network and services are mainly public services such as health and education. There are few business services. Overall, the region has a low growth potential and tourism is its main hope for the future.



Key

- Primary urban centres
- Secondary urban centres
- Other urban centres
- Pressure for urban expansion/overspill
- Motorways and near-motorway standard roads
- Other main roads
- Main railway links
- Main waterways
- Potential growth prospects
- Potential decline prospects
- C Coal
- D Defence industries
- E Education/research
- F Fisheries
- I Industry (general)
- L Electronics
- M Motor industry
- O Oil
- S Services
- T Tourism
- TE Textiles
- X Distribution/freight
- Expanded airports
- Other airports
- Agriculture under threat (UK only)
- Sensitive environmental areas under pressure from tourism
- Groundwater with high nitrate content (Denmark only)
- Oil land terminal
- Gas land terminal
- Tourism centre

Northern Seaboard Study

Germany

MAP 6.2

The eastern region is a former territory of the GDR. In comparison with the other two regions of the former Federal Republic it is very backward and its economic base is sorely in need of restructuring and modernization.

For certain purposes in the following narrative it is sometimes useful to refer to finer subdivisions of the first two regions. These have been distinguished on the basis of geographical criteria as follows.

The western region has three subdivisions:

- A northern subdivision which inlcudes the North Sea and the Baltic Sea coastal areas of Schleswig-Holstein. Physically this area is a rolling plain with uplands. Its principal economic activity is arable farming. Tourism is also important.
- A central region which covers the North Sea coastal areas lying in the western part of Schleswig-Holstein and the northern part of Lower Saxony including the Frisian Islands. It contains large areas of marshland which are used as pasture and the main economic activities are agriculture and fishing. Tourism is also important. This area includes the town of Bremen.
- A southern subdivision which comprises the inland area of Weser-Ems lying west of Bremen. Physically this too consists of rolling plains with uplands and the main activity here is intensive livestock farming.

The central region is similarly divided into three subregions:

- A northern subregion which comprises the Hamburg conurbation and surrounding rural areas.
- A southern subregion which comprises the urban agglomerations of Osnabruck in the west and Hannover/Wolfsberg/Braunschweig in the east.
- The third subregion comprises the rest of the region which is mainly rural in character.

Population

The western region had a population of 4.75 million at the beginning of 1992. It had an average population density of 150/km^2 but this varied from 1 500 +/km^2 in Bremen to 100/km^2 in rural areas. The central region had a population of 7 million at the beginning of 1992, of which 1.6 million were in Hamburg. Its average population density was 225 people/km^2. The eastern region had a population of 2 million.

In the west German regions the fertility rate is low (less than replacement total fertility rate) and declining, mainly because of the regions' elderly age structure. This trend is expected to continue. There will be a minimal fall in mortality rates. As a result there will be a negative rate of natural increase and the population will decline as from the mid-1990s. There will be an increasing bias towards the older age groups as fewer children are born and fewer elderly die.

There will be a greater than average fall in the populations of urban areas. For example, between 1985 and the year 2015, the population of Bremen is forecast to fall by 12%, that of Hamburg by 26%, with falls of 18% for Hannover and Braunschweig. The percentage decline will be less in the rural areas. For example, 10% in Weser-Ems, 14% in Lüneburg.

However, these NUTS 2 projections are based on the Demeter 2015 model which ignores in-migration. This could well be substantial. Hence actual population declines could be less than indicated above, particularly for the urban areas, as migrants tend to favour the cities.

The most reasonable migration scenario is that by the early years of the next century:

(i) Out-migration from Mecklenburg-Western Pomerania will have more than wiped out all the expected natural increase of the population (around 0.5 million) such that its population then will be lower than that today.
(ii) The bulk of this migration will have settled in the neighbouring towns of the western sector. This inflow will offset a large part of the expected fall in Hamburg's population due to falling fertility rates and out-migration of existing residents: the city's population will be lower than now.
(iii) Elsewhere in Lower Saxony and Schleswig-Holstein, particularly in the south-eastern cities of the former, in-migration will be sufficiently large to offset negative natural increase and produce a small net increase in population.
(iv) Out-migration from Bremen will reinforce the impact of negative natural increase so producing considerable contraction in population.

The labour force will demonstrate a greater percentage decline than the population. This decline will come about because there will be fewer young people entering the labour force and more elderly people leaving it. The age structure of the labour force will show a decline in the relative size of the 15 to 24 age group and an increase in that of the 50 to 64 year olds.

Agriculture

In the western region around 72% of the area is under agricultural usage; this percentage has tended to decline over time. The agricultural area is divided roughly 50-50 between pasture and arable. In the northern subregion the main activity is arable farming (wheat, corn, oil-seed and sugar beet); in the central subregion it is beef, dairy and pig farming. This area is also the main centre for fishing. In the southern region the main activity is intensive livestock (cattle, pigs, poultry).

The cereal growing areas, mainly in the north, will be adversely affected by set-aside, stricter environmental controls and increasing competition from the larger eastern German farms. As a result small and medium-sized farms will probably close down and there will be a switch on other farms to different products, such as the growing of vegetables and a concentration on 'green products'.

The gradual introduction of stricter environmental controls will also affect the intensive livestock farms in the south and this is likely to lead to a growth of extensification in an attempt to reduce stocking densities.

It is estimated that by the year 2000 the primary sector in the western region as a whole will account for approximately 10% of total employment as compared with the present 15%.

The central region has 58% of its area under agriculture and this area has declined both absolutely and relatively over recent years. A further 25% is under woodlands.

Some 72% of the agricultural area is under arable farming, the main crops being cereals, sugar beet and potatoes. The remaining area is given over to meat and poultry production. Forestry is important in this area too. However, employment in agriculture and forestry accounts for only between 1 to 3% of total employment in the region. There has been a growth of 'green farms' in the suburbs of Hamburg and Hannover, for example the production of free-range eggs and of chemical-free vegetables.

The continuing contraction in the farm industry over the next decade will have negligible impact in the central region. In the western region, however, it will have far-reaching effects. Farm employment is likely to fall by around one third and the number of farm holdings will also diminish in the face of falling prices and increasing competition. In a predominantly rural area alternative job opportunities are scarce. Manufacturing employment is also in decline and although no great contraction in fishing activity is expected, the Baltic coast cutter fleet is under threat from cuts in quotas. Many rural communities will find themselves under pressure. The loss of arable land as a result of set-aside (around 100-120 000 ha) will impair the landscape and could well undermine what possibilities exist for developing tourism as a source of off-farm employment.

Fishing

Little change in the industry is expected by the year 2000 for a number of reasons. These are:

- the fleet was substantially reduced in the 1970s and 1980s;
- for most major species quotas are not fully utilized;
- parts of the German quotas are taken up by chartered (mainly Dutch vessels) and licences can be withdrawn if quotas are reduced. These foreign vessels thus act as a buffer.

The processing industry has also undergone considerable restructuring, and environmental and hygienic controls are already very high and therefore the imposition of stricter controls in future will have minimal impact. The industry is very dependent upon imports but national supplies are not likely to decline very much.

In contrast the cutter fleet located on the Baltic coast will contract because it is very dependent upon species quotas and Baltic stocks are already at critical levels. The North Sea cutter fleet catches shrimp which is a non-quota species.

A substantial reduction in the number of vessels (at least 50%) and in the number of fishermen (well over 50%) is anticipated in Mecklenburg-Western Pomerania because:

- Baltic fish stocks are critically over-fished;
- bilateral fishing agreements were voided on unification and they have not been replaced; there has thus been a significant loss of fishing opportunities;
- there are too many vessels and most of these are old and inefficient;
- there is significant overmanning on board.

The processing industry will need similar restructuring:

- it is inefficient and very polluting;

- there will be supply shortages as a consequence of a reduction in fish landing;
- the processing factories will need to meet stricter environmental and hygiene standards;
- at least a 30% decline in employment in the sector is likely.

This expected contraction in the fishing and fish-processing industry in the region will have substantial local impact as fishing communities tend to be located in remote rural areas where there are few opportunities for alternative employment.

Manufacturing and services

Manufacturing accounts for between 25 and 30% of total employment in the western region. It is concentrated in the urban centres. Major activities include: engineering, the manufacture of textiles and synthetics, paper, timber and wooden furniture; chemicals; food processing; mining of gas and oil.

The manufacturing sector is expected to shrink because of the high proportion of declining industries such as shipbuilding, cars, aircraft, textiles, timber and wooden furniture.

Unemployment which is above the national average will therefore increase but the loss of jobs will be tempered by the expected fall in the size of the labour force. This is becoming more elderly therefore training in new skills to attract new jobs will be a priority.

The central region is heavily dependent upon manufacturing activities. The sector's share of total employment varies from 32% in the Hamburg region (it is lower in the city itself and much higher in the suburbs), 48% in the Hannover region and 43% elsewhere in the central region.

Dominant activities include:

- engineering (electrical engineering; mechanical engineering; car manufacturing – this is especially important in the Hannover region which accounts for some 20% of all car manufacturing in Germany; shipbuilding; and aircraft manufacturing – this is mainly located in the Hamburg region);
- chemicals especially in Hamburg but also in Hannover;
- food industry;
- metals processing and manufacturing (in the Hannover region).

The outlook for the sector over the next decade is for a modest contraction as a result of:

- a decline in traditional industries, for instance, steel manufacturing, textiles, shipbuilding;
- a contraction in motor-vehicle manufacturing for two reasons: the production is moving out to Eastern Europe and southern Europe especially Spain and Portugal, and out-sourcing is increasing;
- a contraction in aircraft manufacturing because of relocation of production units to the southern and eastern *Länder* of Germany.

Unemployment in this region is near the national average. The envisaged fall in manufacturing employment will be balanced by a fall in the size of the labour force and, therefore, unemployment rates should be about the same in 2000 as now. However, much will depend upon the level of in-migration over the next decade.

While the prognosis is for a contraction in a large number of manufacturing activities over the next decade, the foundation for new activities is being laid in the research and development work being carried out at three major technology centres in Bremen, Hamburg and Hannover.

The principal interests pursued at the Bremen and Hamburg science parks have an engineering orientation and involve computer science, automation, robotics and CAD/CAM. The Hannover centre is concerned with medical subjects, and is closely associated with the Medical School.

The location of the Hamburg and Hannover facilities are also of importance. They are major cities in close proximity to the former border between the Federal and Democratic Germanys and thus offer attractive sites from which to do business with the East.

The services sector in the western region accounts for around 60% of total employment. Service activities associated with German and allied military bases is an important component of this. There are 38 such bases in the western region and these provide work for around 10 000 civilians.

Over the next decade major changes are expected in the size and composition of this sector. The principal changes will be:

(i) a decline in employment associated with military bases. Five of the 38 are to be shut down in the near

future, and others are to be cut back. The number of military personnel is to be reduced by approximately 35% by the year 2000 and it is expected that civilian employment will be cut by 50% by the same year;

(ii) there is expected to be an increase in employment associated with tourism;

(iii) a new network of polytechnics with research and development centres and technical transfer centres is to be set up. A number of projects involving cooperation between institutions of higher education and businesses have been set up recently and have led to the establishment of small and medium-sized enterprises (SMEs) in design, business-planning and consultancy.

Service employment in the central region varies from 67% in the Hamburg subregion (this goes up to as much as 72% in the city itself), 50% in the Hannover region and 55% in other areas. The higher percentage in these other areas is accounted for by the fact that Lüneburg and Göttingen are university cities where tourism is also important.

These service employment figures do not strictly represent the actual situation because of the basis on which the statistics are compiled. For example, in some activities such as car manufacture, white-collar workers are regarded as part of the manufacturing labour force, whereas in other activities which are essentially service industries by nature, for example, in the air transport industry, manufacturing employment, as may be found in their workshops, tends to be regarded as white-collar work and listed as part of the service labour force rather than the manufacturing labour force.

Over the next 10 years the services sector in the central region will increase in importance:

(i) Hamburg and Hannover are growing increasingly important as centres of international trade between eastern and western Germany and are attracting trading firms to the area. Hamburg is based on the River Elbe and has excellent hinterland connections with north-east and southern areas of Germany and Europe. Hannover's importance arises because of its location at the junction of the north/south axis and the developing east/west axis;

(ii) the region is becoming increasingly important as a location for foreign companies interested in investing in eastern Germany and Eastern Europe;

(iii) the tourist sector is growing and will be encouraged by events such as Expo 2000 which is to be held in Hannover.

Energy

Three quarters of Germany's gas and oil production is located in the western region. It is the site of the landfall for Europipe which brings Norwegian gas ashore at Emden; this also receives German gas. The Midal gas pipeline is being built from Emden to supply establishments in central Germany. The central region contains some oil and gas resources and deposits of brown coal in the eastern part of the region.

The principal features of the energy scene over the next decade or so will be:

- a continuing improvement in energy efficiencies leading to a fall in the energy requirement per unit of output and a slower rate of increase in energy demand than would otherwise be the case;
- a big increase in the role of natural gas in both the primary energy market and that for electricity generation based on the environmental advantages of gas over other fuels, particularly coal, and the availability of supplies from Norwegian fields;
- a decline in the use of coal, and within the coal sector, a greater willingness to utilize foreign coal in preference to indigenous supplies. Generators are required to burn a specified proportion of German coal (as was the CEGB in pre-privatization and early post-privatization days in the UK) to support the domestic coal industry. As current contacts run out, however, generators may well be allowed more freedom to burn imported supplies (again, as with the British industry);
- in the longer term greater attention will be given to renewable energy, particularly wind energy, as environmental concerns grow stronger and as North Sea fuel resources are depleted.

These anticipated developments have one major spatial implication, and that is that coastal sites will be preferred for new power generation capacity on account of their ease of access to offshore gas supplies and imported coal. Coastal locations also provide better conditions for the generation of wind energy than more inland places do. It is thus only the western region of the German study area that will be affected in any degree by development in the energy sector over the coming decade.

Tourism

The western region contains three recognized holiday areas: the North Sea coast, the Baltic Sea coast and the

city of Bremen. The coastal resorts are frequented mainly by domestic visitors from the large cities. Their tourist trade is very seasonal and it is based on camping and rented self-catering accommodation. Tourism is for recreational purposes. By contrast urban tourism tends to be business-related and based on cultural attractions. It is less seasonal than coastal tourism and mainly involves the hotel sector. The proportion of foreign visitors tends to be much greater in the urban areas than in the coastal resorts.

The sector accounts for around 5% of total employment in this region which compares with an average for Germany as a whole of only 3%. It is expected to grow over the next decade despite a decline in the German population. This growth will be based on a development of all-weather activities which will help to extend the season; two different types of resort may well emerge, those offering 'action' holidays and those offering 'relaxation' holidays.

Mecklenburg-Western Pomerania will offer competition to the coastal resorts of the western region in the future as its facilities are brought up to western standards and its infrastructure is improved. It has capacity problems at high season now. Attempts will also be made in the future to develop the coastal hinterland of the western region both to ease high season pressures and to attract a new type of visitor.

The main holiday areas of the central region are the Hartz mountains in the extreme south-east corner together with Hamburg and Hannover/Braunschweig. The former area offers skiing, walking and other open air countryside activities. Tourism in the urban areas is based on their cultural attractions and on business/conference visitors; foreign visitors are a more significant component of the market here than in the former area. Both urban and rural locations offer year-round attractions and as a result there is less seasonal difference than in the coastal areas of the western region. The tourism sector accounts for some 2.5 to 3% of total employment in this region.

A steady but unspectacular growth in tourism is expected over the next decade. The growing importance of Hannover/Braunschweig due to unification-related business will increase the scale of its business/cultural tourism. This will put increasing pressure on the hotel sector to improve its quality and to become better equipped to provide business services. It will similarly require the concerned authorities to improve the range and quality of its cultural amenities. The holding of Expo 2000 in Hannover should stimulate this.

Transport

Pre-unification the dominant orientation of road traffic flows was north-south. The major routes were Hamburg-Bremen-Osnabruck-the Ruhr (A1), Hamburg-Hannover-Kassel-the south (A7), Hannover-the Ruhr (A2). From Hamburg routes led north to Denmark and north-east to Sweden via the Puttgarden ferry. The railways had a similar configuration and orientation.

On the eastern side of the border the main roads also ran principally north-south, for example, Wismar-Schwerin-Magdeburg; Rostock-Berlin, Stralsund-Berlin, as did the railways to the Baltic ports.

With unification a very strong east-west traffic orientation has swiftly developed as freight, passenger and commuter flows between the two parts of the new Germany have built up.

This rapid build-up has led to capacity problems on both the roads and railways linking east and west and a number of infrastructure projects have been proposed to alleviate the situation.

Road development projects include the construction of a four lane federal highway (A20) between Lübeck and Stettin on the Polish border via Rostock (the so-called Baltic Sea Highway); and the upgrading of the A2 federal highway from Hannover to Berlin.

Railway infrastructure improvement is also planned including:

- the Lübeck-Rostock-Stralsund line;
- the Hamburg-Berlin link;
- the Uelzen-Salzwedel-Stendal link across the former border;
- the construction of a new high-speed link between Hannover and Berlin.

Precise details concerning these projects have not yet been worked out but it is believed that they will be operative or well on the way to implementation around or slightly following the turn of the century.

A major effort will be made over the next decade to improve and modernize the transport networks of the former GDR territories. It is expected that this will be accompanied by:

- a dramatic increase in road traffic, both of passengers and freight;

- an equally dramatic fall in rail traffic, particularly of freight as eastern Germany adjusts to the new open, market-oriented, trading conditions and as the situation more closely approximates to that in the western half of the country.

Implementation of the Danish fixed-link projects will have an impact on the pattern of traffic flows through the German study regions.

Completion of the Great Belt project in the middle 1990s and an extension of Danish Railways' programme of electrification into Jutland is expected to cause a diversion of international rail freight traffic from the ferry routes between Lolland and Sweden on the one hand and the north German rail ferry ports (Puttgarden, Rostock) on the other.

The Fehmarn crossing is no more than a possibility at present, and would be unlikely to go ahead until after the year 2000 if a decision were taken to proceed with it. By then, however, the Oeresund crossing would be in place, and, if implemented, the Fehmarn link would have a powerful effect on traffic flows, both road and rail, but particularly the latter, between Sweden and eastern Denmark on the one hand and northern Germany on the other.

The link would provide a more direct and therefore quicker route to and from the northern German ports of Hamburg and Bremen. It would:

- attract international road and rail traffic using the Great Belt route;
- attract the ferry traffic utilizing the Puttgarden-Rödby, Gedser-Rostock and Lübeck-Trelleborg routes;
- take traffic away from German North Sea coast ports (and perhaps Dutch ports, such as Delfzijl) providing shipping services to Swedish and Norwegian markets.

The transport developments and infrastructure projects described above have enormously enhanced the importance of Hamburg, and to a lesser extent, Bremen, by improving hinterland access. The catchment area for the port(s) will effectively stretch to southern Sweden, eastern Germany and beyond into Eastern Europe. Unification and the new east-west links are already being reflected in traffic growth through Hamburg, particularly of containers, and considerable investment in port facilities, by way of extensions, rehabilitation and restructuring, is planned to enable it to accommodate the expected growth.

Overview of spatial developments

Unification of the two Germanys and the growing liberalization and Western orientation of the economies of Eastern Europe are encouraging the creation of a strong east-west development axis running across the southern regions of the German northern seaboard study areas. The road and rail linkages, existing and proposed, running between the Hannover area and Berlin across the former border, are/will be a physical manifestation of this axis.

This axis is being superimposed over a long-established north-south transport and development corridor, running from Hamburg to Hannover and the south. The junction of these two axes lies in the Hannover area.

A third such corridor can be defined running from the Ruhr-Osnabruck-Bremen-Hamburg and on to Scandinavia. The Danish fixed-link infrastructure projects will contribute to the importance of this corridor and Swedish membership of the European Community would further enhance it.

Our view of the future, our base scenario at year 2000, is predicated on the existence of these three axes. These axes cross each other at three locations which are considered to be key growth points.

Hamburg lies at the northern junction. Its growth potential is seen to reside in the following:

- its port facilities: it is an all-purpose and container port, the largest in Germany;
- it has a strong manufacturing base and is the location of an important technology centre specializing in advanced engineering subjects;
- it has a strong services sector, particularly trading and commercial activities;
- following unification it has attracted a number of companies interested in developing the east German market. They have tended to be marketing and service subsidiaries of large international enterprises;
- the new infrastructure projects (the fixed links, the Baltic coast highway) are extending the port's catchment area and the city's sphere of influence.

The south-eastern junction is located in the Hannover area. This area contains, in addition to the Hannover conurbation itself, other major urban centres including Braunschweig, Wolfsberg and Salzjitter. Like Hamburg,

it is a centre of manufacturing and of service activities. Hannover and Braunschweig are developing as major centres of industrial research and development, with strong support from the local technical universities. A science park specializing in medical subjects is located in Hannover. The area is the technological heartland of the north German *Länder*, which has been recognized by the decision to hold Expo 2000 in Hannover.

The location of the area, and particularly that of Braunschweig, right alongside the former boundary with the old GDR, has attracted a number of new enterprises interested in developing business links with eastern Germany. It provides a jumping-off point from which to realize new investment opportunities in the East when its industrial and transportation infrastructure has been modernized and is more on a par with that in the West.

The third junction is focused in the Osnabruck area. This is a weaker growth pole because it is more remote from the new developments taking place in the former GDR territories and because its prospects are influenced by its proximity to the Ruhr.

In contrast to the development triangle enclosed within these three axes, the coastal region of western and north-western Germany is a comparative backwater, off the main lines of communication, and in danger of becoming increasingly peripheral as these become stronger.

The region is both badly integrated with, and poorly connected to the rest of the study area. One major road route serves the region – the A1 – which runs Osnabruck, Bremen, Hamburg, Lübeck and defines its inland boundary. From the A1 a series of dead-end spur roads run north-west and terminate at the coast.

Lateral movement is seriously circumscribed and the rivers Weser and Elbe present major obstacles. Although the idea of a coastal highway running from the Dutch border in the west to the Danish frontier in the north to connect up these dead-end roads has been mooted, it remains just an idea.

The economic structure is unfavourable. Agriculture and fishing are the predominant activities even though they account for only around 15% of total employment. Both are in long-term decline. The cereal growing areas, particularly in Schleswig-Holstein, will be affected by CAP reform and by increasing competition from the larger east German holdings as they are modernized and benefit from better management. Environmental concerns will affect both the cereals sector and the intensive livestock sector in the south. Although the fishing industry has been extensively rationalized and is unlikely to contract significantly over the next decade, the Baltic Sea fleet is seriously at risk if there are any future cuts in quotas.

Perhaps because of its rural character and its enclave nature there is no discernable settlement hierarchy. Bremen apart, urban centres tend to be medium-sized towns functioning as regional centres. As a consequence the service network is poorly developed.

The area has a high proportion of declining industries both old (shipbuilding and textiles) and new (motor vehicle and aircraft manufacturing).

The North Sea ports are concerned with bulk and break bulk trades. These are low growth, low value trades which are not high employment generators. Bremen port has not gained as much as was anticipated from its recapture of its former East German hinterland.

Over the next decade we see a growing dichotomy in regional development of the German study area. The principal focus of growth will be the former border region, particularly the area of the Hannover/Braunschweig conurbation. Both the opportunities and realized growth diminish towards the west.

The North Sea coast and its hinterland is seen as a relatively disadvantaged area and peripheral to the mainstream of German economic development. It has few positive growth factors and those that have been identified, such as potential for further tourism development, or growth of traffic through Bremen port face possible competition in the future (the coastal resorts of Mecklenburg, Western Pomerania, Hamburg port).

The costs of the programme to develop the new German territories, in terms of financial resources, management effort, attention of government, etc. will mean that there will be few such resources to devote to resolving the problems of other regions. This area then can only become more disadvantaged, more remote and more peripheral.

The regions of the Netherlands

Definition of regions

The division of the Dutch sector of the northern seaboard study area is based on an assessment of which

regions could best take advantage of the economic prospects offered by the new Rotterdam-Berlin developmental axis.

The assessment of the potential of the NUTS 2 regions to take advantage of the opportunities offered by this east/west axis was based on a comparison of characteristics including demographic trends, economic structure, urban developments and traffic and transport infrastructure.

Using these criteria two regions have been defined:

- a southern region comprising the NUTS 2 regions of South Holland, North Holland (that part of it lying to the south of the North Sea canal), Flevoland (the southern part) and Overijssel (except the extreme north-western tip);
- a northern region comprising the NUTS 2 regions of North Holland (that part to the north of the North Sea canal), Flevoland (the northern part), Groningen, Friesland and Drenthe.

Maps 6.3 shows the natural regions of the Netherlands.

Population

In the 1980s the Dutch study-area regions as a whole had a high rate of population increase. This was the result of two trends:

- a high rate of natural increase, mainly because of a favourable age structure;
- high in-migration mainly from outside the area, particularly from the Randstad into Flevoland.

In the 1990s the rate of natural increase is expected to slow down mainly because of an increasingly unfavourable age structure and because of falling fertility rates, but in-migration to the area from regions outside is expected to continue.

The population of Flevoland is expected to increase by about 75% between 1985 and 2015 under the influence of factors such as a youthful age structure, and therefore, a higher than average rate of natural increase and continued in-migration.

The populations of Overijssel, North Holland and South Holland are not expected to vary significantly. Out-migration, particularly from South Holland to Flevoland, will be roughly compensated by natural increase.

Overall, the population of this southern region is forecast to rise by 15% between 1985 and 2015, but this will occur because of the overriding influence of the growth in the population of Flevoland.

In the northern region the population of Drenthe will show a moderate increase between 1985 and the year 2015 as a result of modest in-migration by retired people. The populations of Groningen and Friesland will have declined, that of the former more strongly than the latter, because a strong tide of out-migration will accentuate a negative natural increase. Overall the northern region population will be some 3% less in 2015 than it was in 1985.

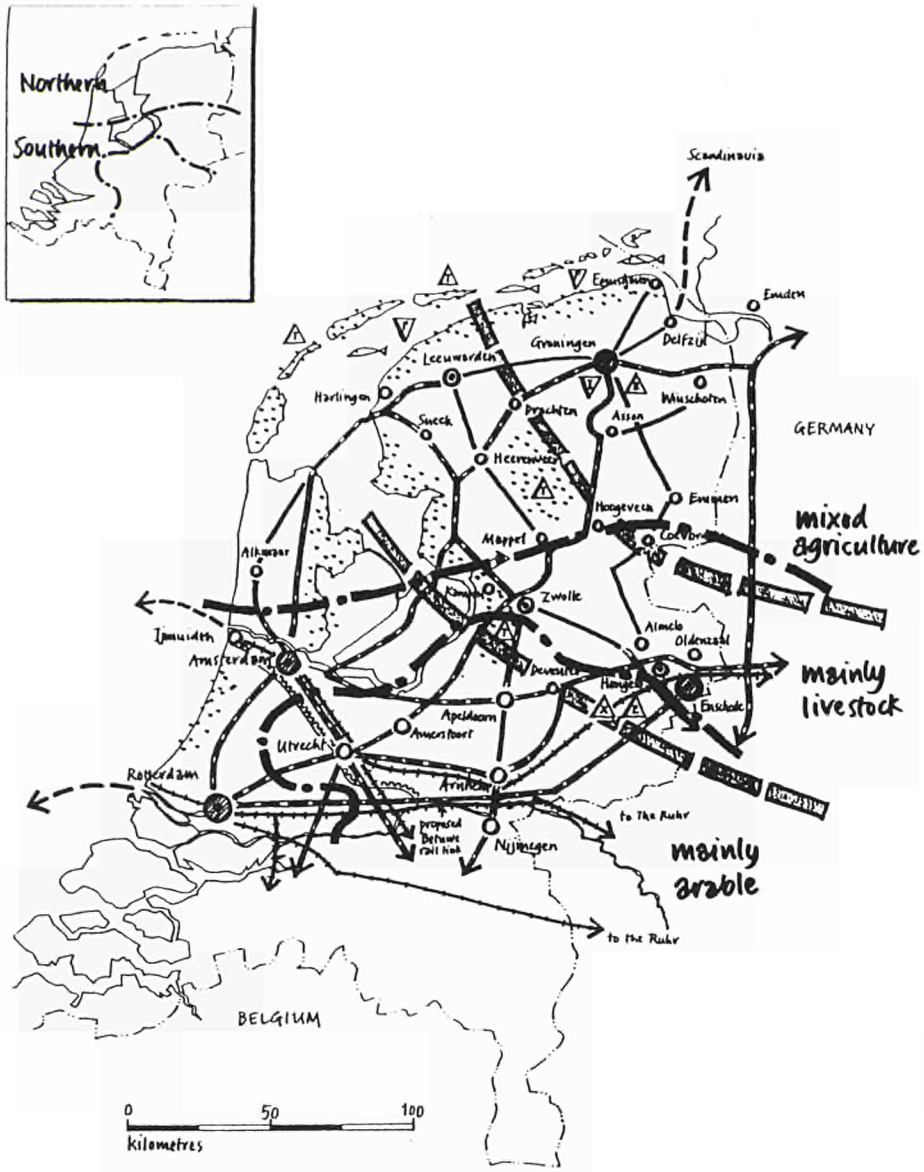
There will be an increasing share of the elderly in the population. Nationally the 60+ age group will increase from 26 to 42% of the total between 1985 and 2015 and, as natural increase falls, the size of the 0 to 14 age group will contract from 31 to 24% over the period. This ageing process will be particularly pronounced in Groningen and Drenthe, and in North and South Holland, especially in the metropolitan areas of the Randstad.

Forecast trends in the labour force mirror those in the population as a whole with a small increase expected in all regions up until the year 2000 and a fall thereafter, except in Flevoland where, by the year 2015, the labour force is expected to be over 50% higher than in 1985. Elsewhere in the southern region moderate falls of 6% are expected in North Holland and South Holland and a small decrease in Overijssel.

In the northern region a significant fall (over 10% between 1985 and 2015) is anticipated in Groningen, a modest 6% decline in Friesland and a less than 1% decline in Drenthe.

Trends in the age structure of the labour force will parallel those in the population at large. By 2015 the 50+ age group in the labour force is expected to have increased nationally to around 23% of the total as compared with only 14% in 1990, while over the same period the 15 to 24 age group is expected to fall from 18 to 15%.

Currently (in 1992) unemployment rates are around the national (8%) and EC (8.3%) averages except in Friesland and Groningen where they are higher (over 9 and 11% respectively). Unemployment is a far bigger problem in the northern region than it is in the southern.



Key

- Primary urban centres
- Secondary urban centres
- Other urban centres
- Pressure for urban expansion/overspill
- Motorways and near-motorway standard roads
- Other main roads
- Main railway links
- Main waterways
- Potential growth prospects
- Potential decline prospects

C	Coal
D	Defence industries
E	Education/research
F	Fisheries
I	Industry (general)
L	Electronics
M	Motor industry
O	Oil
S	Services
T	Tourism
E	Textiles
X	Distribution/Freight

- Expanded airports
- Other airports
- Agriculture under threat (UK only)
- Sensitive environmental areas under pressure from tourism
- Groundwater with high nitrate content (Denmark only)
- Oil land terminal
- Gas land terminal
- Tourism centre

Northern Seaboard Study

Netherlands

MAP 6.3

Over the short term the situation is expected to worsen as the labour force continues to grow but over the long term, as the labour force contracts, there will be an improvement in the unemployment situation except in Flevoland where the labour force will continue to grow strongly.

However, the Dutch Government anticipates an employment growth of 0.7% per annum over the long term to the year 2015 and this should reinforce the effect of the decline in the labour force in ameliorating the unemployment problem, even in Flevoland.

The 'European Renaissance' scenario of the Dutch Government study of the long-term development of the economy anticipates a fall in employment in the agricultural and food production sector of about 1% per annum between 1991 and 2015 and a slower decline in the industrial sector of 0.3% per annum over the same period. It expects these reductions to be more than offset by a growth in employment in tertiary services (basic services such as education and health) and especially in quaternary services (e.g. business and financial services, research activities, etc.).

As a result of these anticipated trends it is expected that the share in total employment of the agricultural and food production sector will fall from 10.1% in 1990 to 6.5% in 2015 and that of the industrial sector from 18.4 to 14.2% over the same period. The contribution of services to total employment will rise to 49.3 from 46.4% for tertiary and to 21.6 from 14.9% for quaternary services. There will be a small contraction in the construction industry over this same period.

Agriculture

The northern region has a larger agricultural area than the southern, with 50% more arable land and two thirds more grassland. Although it has fewer farm-holdings – only 60% of the number in the south – it has more large farms accounting for 12.5% of the total against only 4% in the southern region. The small percentage of large farms in the southern region is primarily due to the large number of small farms in Flevoland. The southern region has a labour force twice as large as in the north.

The north has a greater area of cereal crops with Groningen alone accounting for 40% of the total hectarage in the Dutch study-area regions. Its beef and dairy herd is some 20 to 30% bigger than that in the south, although Overijssel is the major cattle centre with 30% of all beef and dairy cows in the study-area regions, but closely followed by Friesland. Overijssel is also the major centre for pigs, accounting for 65% of the study-area total.

As with the Danish regions there are two major influences for change for the coming decade, i.e. the CAP reform and stricter environmental controls.

We have estimated that the northern seaboard regions in the Netherlands will lose some 8 000 hectares as a result of set-aside. The biggest impact will be in Groningen which also has the highest proportion of larger farms (i.e. those over 50 hectares). Flevoland in the southern region is also an important cereal growing area but most holdings here are less than 20 hectares. At this size yields range around 92 tonnes, below which farmers are exempt from set-aside. This area will therefore be proportionately less affected by set-aside. Other significant cereal growing areas are South and North Holland, the latter has proportionately more large farms.

The inevitable introduction of stricter environmental controls will affect both cereal growing areas (agrochemical usage) and livestock rearing areas (disposal of slurry). The cereal growing areas have been identified above. Among livestock rearing areas Overijssel in the southern region will be most affected by any extension of environmental control measures on account of its large intensive livestock industry, especially that of pigs. However, Friesland and Drenthe in the northern region and South Holland in the south, will also be significantly affected, especially the first and last named, which have major pig herds.

Three farming strategies will dominate by the year 2000:

(i) an increase in the scale of farm operations as a means of reducing costs; because of high land prices and depressed farm incomes this strategy will be possible only for farms which are already operating on a relatively large scale. Thus in Groningen it is expected that by the end of the century the number of farms smaller than 50 hectares will be half that in 1990, and that of large farms, those of 75 hectares and over, will be much higher;
(ii) diversification into new crops, new markets and new products which will provide added-value, for example horticultural crops under glass, flowers, 'green products', non-agricultural uses of land (e.g. tourism and forestry);
(iii) extensification, for example a reduction in livestock densities, increased use of fallow in the cultivation cycle.

The spatial consequences of these strategies will vary from place to place. Two types of development can be foreseen:

(i) areas where farmers strive to become more competitive, for example by reducing operating costs to stay viable, by finding new products and new markets, etc. Such areas will be found mainly in regions with prime agricultural land, where there are large scale farms and innovative farmers;
(ii) areas where farmers cannot adapt to the changing circumstances, for example where land is insufficiently productive or unsuited for alternative agricultural usages, where production is on a small scale, where farming activities are more traditional. In these areas new non-agricultural usages will develop or small specialist niche producers will appear.

Looking ahead the geographical pattern of agricultural activities is expected to change as follows:

- an intensification of arable farming is expected in the following areas:
  - ☐ the northern tip of North Holland;
  - ☐ the northern half of Flevoland;
  - ☐ the coastal strip of Friesland and Groningen;
  - ☐ the area around the town of Emmen (east Drenthe);
- an extensification of arable farming is expected in the eastern region of Groningen and Drenthe;
- an intensification of livestock farming is expected in:
  - ☐ the northern area of North Holland;
  - ☐ east Friesland;
  - ☐ the north eastern and central areas of Overijssel;
- an extensification of livestock farming is expected in:
  - ☐ the southern area of Friesland;
  - ☐ the northern area of Drenthe;
  - ☐ the northern and the eastern areas of Overijssel.

Environmental problems caused by agriculture will not be solved by the year 2000. In the southern region, the main problems will continue to be soil and water pollution from disposal of animal wastes, including manuring of fields. In the northern region, similar problems will still arise from intensive use of agrochemicals on arable crops. The higher sandy areas of Drenthe which are particularly vulnerable on account of their soils, will continue to be of concern.

Fishing

The size of the fishing fleet was reduced in the 1980s, but it was the older, less efficient vessels that tended to be retired. As a result, and despite the imposition of limits on the number of days vessels can spend at sea, there remains substantial overcapacity in the fleet. Some vessels are currently under the UK flag and others are chartered to German fishing companies so the extent of this overcapacity is, if anything, understated.

No improvement of this situation is expected. The situation may even get worse under the influence of factors such as:

(i) the fleet is highly specialized in fishing for plaice and, to a lesser and diminishing extent, cod. As it has been estimated that mortality rates for plaice and cod are four times higher than EC target values, future reductions in the quotas for these fish seem inevitable. The Dutch fleet is particularly vulnerable to any future cuts in quotas.
(ii) In addition, those vessels fishing distant waters may be denied access in future. Access has hitherto been granted mainly because the countries concerned have been unable to fully utilize their quotas. They are increasingly able to do so now.

The prospects for the the turn of the century are:

- quotas will be reduced and restrictions on fishing effort made more stringent;
- more vessels will be permanently laid-up as fishing becomes less profitable;
- employment in the industry will continue to contract;
- the viability of fishing communities, including those at Harlingen (Friesland) and Lauwersag (Groningen), will be seriously impaired;
- the processing industry will also suffer as local landings fall in volume and as environmental controls are tightened.

Aquaculture is often presented as an alternative activity. However, its development is impeded by factors such as:

- the main areas for sea-water aquaculture are located outside the study area;
- fresh-water fish farming is still in its infancy despite a fast expansion.

Overall, the prospects of aquaculture are for much slower growth on account of environmental concerns as regards both the effect of water pollution on fish farms and their contribution to pollution of coastal waters.

Manufacturing and services

The northern region

The northern region is essentially rural in character. The settlement pattern is one of few large towns and many very small towns and rural communities with no intermediate-sized centres. As a result of this pattern the services sector is poorly developed and services tend to be of the most basic nature.

The economies of the three northern provinces – i.e. Friesland, Groningen and Drenthe – are very dependent upon agriculture – dairying, arable and mixed farming respectively – despite the fact that the employment these activities generate is very small. However, agriculture and fishing support a broad range of ancillary activities such as dairy, meat and fish products, milling and brewing.

A number of older established manufacturing activities exist, such as metals manufacturing and chemicals, and, recently, a number of more high-tech activities have been introduced, such as electronics and the manufacture of precision instruments, partly as the result of the offer of investment incentives to firms to set up in these regions.

Other activities include a science park complex in Groningen, linked to the university and hospital, which specializes in medical subjects, and a major gas extraction complex located in Groningen and a similar but smaller oil extraction complex in Drenthe.

As a general observation manufacturing becomes a more important sector of the economy from west to east.

Manufacturing enterprises are mainly SMEs; the bigger enterprises tend to be mainly branch companies of firms with headquarters elsewhere. The number of foreign-owned companies is very low.

The southern region

In the southern region, although agriculture and agro-industries are still important, manufacturing is proportionately more significant than in the northern region.

The subregion of Overijssel splits into two areas:

- a western area which is primarily rural and agricultural in nature (beef, cattle and arable); and
- an eastern area – a region known as Twente – which is more urbanized (with three major towns Enschede, Hengelo and Almelo) and industrialized.

Industrial activities include the manufacture of foodstuffs, textiles and wooden products, mechanical engineering, electronics and other high-tech sectors.

The basis for the concentration of these activities are the area's location, i.e. close to Germany and at the junction of important east/west and north/south transport and communications networks; the cheap land and the proximity of the University of Twente.

Several industrial parks and industrial zones have been created. As a result of its location and its good road and inland waterway connections, a strong services sector has developed in this area based on transport and distribution activities.

The concentration of major settlements and manufacturing firms has also encouraged the development of higher order services (quaternary services).

The economy of Flevoland is basically agricultural (cereals, vegetables and sugar beet) but the industrial sector is growing rapidly. In addition to various agro-industrial activities, industries now include chemicals, petroleum, motor vehicles and electronics.

These industries are located around the three largest towns and many are overspill developments from the Randstad where high land prices and traffic congestion now constitute a serious disincentive to further industrial development. A number of biochemical and agricultural research centres have also been established in the area.

The trends for the future are:

(i) the agricultural sector will contract and this will have a knock-on effect on all downstream agro-industrial activities;
(ii) traditional industries such as metal manufacture and textiles have poor prospects and/or are declining;
(iii) a number of branch manufacturing plants are being scaled down as their parent companies retrench and retreat to core activities.

Nevertheless, the southern region of Twente displays a number of characteristics which may, in the long term, create an environment favourable to attract modern high quality industry and services. These characteristics include:

- a relatively clean pollution-free environment and an attractive landscape;
- cheap land;
- a location from which to access the newer markets of east Germany, Eastern Europe and Scandinavia;
- a location on or accessible to strong east/west axes of development which are in process of creation.

Cities will play a key role in this process, in particular Enschede, Hengelo and Almelo in Twente (on the Rotterdam-Berlin axis). Deventer and Zwolle in west Overijssel and Emmen in south-east Drenthe will play a support role. Groningen's future will be determined by the possibilities of direct linkage with Hamburg and Bremen.

In summary, the prospects for the northern regions are that by the year 2000:

- the already weak manufacturing and services industries based in the northern region will be undermined;
- the industrial basis, heavily oriented towards food manufacture and both fishing and agriculture (including arable and livestock) will shrink;
- the settlement pattern, loss of population and declining manufacturing activities will similarly weaken an already feeble services network.

In contrast, the prospects of the southern regions are more favourable. Indeed:

- the industrial sector in the southern regions is more extensive and more broadly based than that in the north;
- it embraces a range of modern high-tech activities;
- the urban pattern of large towns in close proximity to one another helps support a wide range of higher order tertiary and quaternary services;
- many manufacturing and service activities have intrinsic growth potential and their location in or adjacent to the developing Rotterdam-Berlin transport and communication axis will allow this potential to be realized.

Thus, by the next century, although individual activities may be in decline (food processing, textiles, wood) the manufacturing and services sector in the southern regions as a whole will be buoyant, in great contrast to the expected situation in the northern regions.

Tourism

The study regions contain the country's principal resort areas. Their attraction is based on a pleasant environment and ambience – uncrowded, pollution-free, open and with scenic variety – and proximity to water – lakes and rivers, the IJsselmeer and Waddenzee.

In terms of bed-nights the domestic market is four times the size of the international market. The most important foreign markets are Germany, the UK and the United States. The Germans especially patronize the non-hotel sector (camping and rented accommodation) and this is also the preferred accommodation for domestic tourists. Foreign tourists frequent the coastal resorts of the Waddenzee and North Sea and IJsselmeer coasts of North Holland and Flevoland. By contrast domestic tourism is about evenly distributed between these same coastal areas and the sands and lakes of inland districts.

There is a lack of major man-made attractions, certainly nothing of international or even regional importance to compare, for example with Legoland in Denmark (with the possible exception of Efteling). Existing recreational facilities lack variety. These are also small-scale in nature and of indifferent quality. The hotel sector is underdeveloped.

The government aims to expand the tourism sector as a means of generating jobs and offsetting rural decline.

Tourism is one of the few growth industries and a steady increase in the volume of foreign and domestic visitors, at historic growth rates, can be expected throughout the 1990s. The nature of the tourism product – the quiet enjoyment of the coast and countryside – is unlikely to have changed very much by the turn of the century and the type of visitor – the nature and open-air lover – will be much the same as today.

With growing visitor numbers, increasing pressure will be put upon the most popular areas such as the Waddenzee and the west Frisian Islands, and sections of the west Drenthe plateau favoured by nationals. Government plans to introduce measures to limit development in these areas and to divert development pressures to other less sensitive areas should be in place well before the year 2000.

The government is keen to encourage an increase in the scale and quality of provision of recreational facilities, both land- and water-based, and has identified a number of areas where this would be suitable. These include, for water-based activities:

- IJsselmeer coast (Friesland and North Holland);

- the lake districts (south-west Friesland and north-west Overijssel);
- the river districts in Overijssel including the towns through which the IJssel passes, (e.g. Zwolle and Deventer) and Lauwersmeer in Groningen.

Areas for the development of land-based recreational facilities include:

- the Drenthe plateau in east and south Drenthe;
- the outskirts of the urban zone in Drenthe;
- the towns of Groningen, Leeuwarden and Zwolle.

Whilst it may be expected that some progress will be made by the year 2000 these are essentially long-term aims.

These facilities are intended to widen the market by attracting a new type of visitor to the area. Care will need to be taken to ensure that in providing these the character of the region is not altered for fear of driving away today's tourists. Sensitive and sensible development will be called for.

Transport

The government has elaborated a transport plan to guide development to the year 2010. The Traffic and Transport Master Plan (TTMP) has two main objectives, i.e. to restrict the growth in car traffic especially private and commuter traffic and to prioritize business transport both passenger and freight.

The government is seeking to reduce by one half the expected 72% increase by 2010 in private car traffic (measured in car kms) by promoting public transport and to divert road freight to rail and inland waterways. Both national and local measures are envisaged including pricing policies (taxes and road pricing) and coordinated regional transport plans.

The existing transport networks in the northern and southern regions are radically different: in the north they are geared to local/regional traffic flows, while in the south thay are geared to major international transit traffic between Rotterdam and its European hinterland.

The northern region

More specifically, the road and rail networks in the north have the following characteristics:

- they link the major urban centres and provide access to the ports of Harlingen in the west and Delfzijl/Eemshaven in the east;
- the major road traffic artery is the A6/A7 Amsterdam to Groningen route which continues east to Bremen and Hamburg;
- there is a rail connection from Groningen to Germany but it is for passengers only and has infrequent services;
- Groningen has close business ties with Scandinavia and the nearby port of Delfzijl provides a sea connection with the area;
- a second main road link with the south runs from Groningen to Apeldoorn;
- there are road and rail connections with Germany via south-east Drenthe. A freight terminal is located at Coevorden near Emmen; it is concerned with the dispatch of containers by rail to Italy;
- an extensive canal system operates in this area of Drenthe with links to southern Holland.

Given the poor prospects for development of the northern region, discussed earlier, this transport pattern is unlikely to change in the foreseeable future. Certainly, no major infrastructure works are envisaged in the TTMP. However, if cargoes tend to concentrate in the larger ports, such as Rotterdam and Hamburg, Harlingen, as the major regional port, could well develop as a transhipment point for goods destined for, or originating in, the north-east of the Netherlands and north-west Germany and this would increase the importance of the road running through Groningen to Bremen, which is of good quality but lightly used.

The southern region

The Rotterdam 'Port Plan 2010' envisages that throughput will grow by nearly one quarter by the year 2000 compared to that in 1989. Container traffic alone is forecast to grow by 75% over that period and by 2010 it will have risen by 150% as compared to 1989.

This expansion will depend upon the quality of the port's road, rail and inland waterway linkages with its hinterland.

The port has a number of major road links – hinterland axes, the highest category of highway distinguished in the TTMP – with Germany. That with northern Germany is the most northerly of these axes and runs via Utrecht, Apeldoorn and Hengelo to the border. It thus runs partly through and partly adjacent to the southern boundary of the northern seaboard study area.

The TTMP envisages that a significant part of the forecast increase in port traffic will have to be taken up by

rail and inland waterway transport. The major rail link runs from Rotterdam via Dordrecht, Breda, Tilburg, Eindhoven and Venlo to the Ruhr.

There are also proposals to develop the Betuwe line which will take a more northerly route to the Ruhr via Arnhem. Although the details of this project have not yet been worked out it is currently assumed that the line will be operative around the turn of the century.

The rail route to northern and eastern Europe at present runs via Hengelo but it is not a major access. To accommodate the growth in traffic expected from these areas there is a proposal to give the Betuwe line a northern branch running from Arnhem via Hengelo from whence it would continue to Berlin. This line, if built, is unlikely to be implemented until after the year 2000.

As far as inland waterways are concerned the main route to Germany is via the Waal and the Rhine which provides access to southern Germany and places beyond. Access to the east is via the Dortmund-Ems and the Mittelland canals which run from the Rhine via Osnabruck and Hannover to Berlin and provide a connection with Bremen, Hamburg and the Baltic Sea.

The possibility of providing a more direct route to the east by building the Twente-Mittelland canal (roughly between Enschede and Osnabruck) is currently under study but if proceeded with is unlikely to be in operation before the year 2000. Enschede is already linked to Rotterdam by water.

Overview of spatial developments

One of the major influences on development in the Netherlands during the 1990s, if not the major influence, will be the growth of Rotterdam port, and, to a lesser extent, Amsterdam port. The growth of Schiphol airport will also be an important factor.

Throughput through Rotterdam is expected to increase by roughly 25% between 1989 and the end of the century, that through Amsterdam at a less rapid rate. This growth is predicated upon an improvement of the ports' links with their hinterlands, particularly their rail and inland waterway connections.

The proposals for improvement in the transport infrastructure to link the ports with the north European market provides the basis for development of a major transport and communications axis running the width of the Netherlands.

Across the border in Germany the authorities have plans to improve east/west communications between western and eastern Germany. These include, for example upgrading and modernizing the road and rail links between Hannover and Berlin. The Dutch and German proposals together thus lay the foundation for a major transport corridor running from Rotterdam through to Berlin.

In the Netherlands this major transport artery passes to the south of and partly through the southern parts of the northern seaboard study area and will be a powerful catalyst in its development.

Apart from its location on a major transport corridor the southern area benefits from other positive development influences.

(i) The government's spatial planning policy is to concentrate economic growth in the cities; in this respect it is very similar to Danish policy. The aims of this policy are to maximize the benefits of the expenditure of limited public resources and to promote environmentally sensitive development. Concentration of economic activities limits transport movements and facilitates the use of public transport, and the spread of urbanization into rural areas. As part of this policy a number of 'urban junctions' have been identified and these will be favoured (e.g. in respect of public investment) over other urban centres. Two types of urban junctions have been identified, those with regional functions and those with international functions. Enschede and Hengelo, the principal towns in southern Overijssel have been designated international urban junctions, and Zwolle to the west has been designated a regional urban junction.

(ii) The Enschede/Hengelo/Almelo conurbation has developed a strong industrial base which includes a range of modern high-tech industries as well as more traditional industries such as the manufacture of foodstuffs and textiles. The town of Deventer has been identified as having potential for the development of high quality dynamic IT services. One of only two universities in the northern seaboard study area of the Netherlands, the University of Twente, is located in the southern region.

(iii) The concentration of major urban centres in this area, good transport links east and west, location on the German border, and a strong manufacturing base has encouraged the development of a strong services sector which includes a range of higher order services (such as business and financial ser-

vices) as well as the more basic transport and distribution services.

(iv) The riverine areas of the River IJssel have been identified as suitable for intensive touristic development.

(v) Further west the region of Flevoland should be minimally affected by CAP reform because its production is orientated towards vegetables and flowers. Also it will continue during the 1990s to be a population and industrial overspill area for the Randstad.

To summarize, the southern regions of the study area fringing the developing east-west transport axis demonstrate strong growth potential.

This is in marked contrast to the northern region where:

- the fishing industry is contracting;
- the agricultural industry, the principal economic activity in the region, is in a similar state of decline and is additionally threatened by CAP reform and stricter environmental controls;
- agro-industrial activities, dependent upon fishing and agriculture as both customers and suppliers are under threat;
- traditional manufacturing industries are contracting;
- the services sector is poorly developed and lacks growth potential;
- there is substantial out-migration from the area.

These trends are already affecting the viability of rural communities and have led to the establishment of a programme for the joint study of the problem by national, provincial and municipal authorities. (The regions selected for case study include north-west Friesland; north-east Friesland/north-west Groningen; Oldambt in north-east Groningen and Oostermoer in north-west Drenthe.)

A continuation of these trends will thus see a growing imbalance between the two regions and as the west-east transport corridor in the south develops the northern regions will become increasingly peripheral. Existing links between the two regions favour the Groningen area leaving the north-west and northern areas especially isolated.

The regions of the United Kingdom

Introduction

We have approached the detailed regional analysis of the UK differently from the other parts of the study area. The main reason for this is the variety and intensity of development patterns in the UK. To take one indicator, population: the UK study area accounts for 52% of the total northern seaboard study-area population, of which 54% is located in six conurbations and towns with a population greater than 100 000. At the other end of the scale, the UK has most of the least densely populated areas in the study area – for example the Highland region (8 people/km^2) and the Tayside region (52 people/km^2).

It is therefore most appropriate to analyse the regions separately, within the framework of a general overview of UK development prospects, concentrating all the time on the spatial implications of development trends, rather than on volume and scale.

Definition of regions

The UK study area comprises seven NUTS 1-level regions and twenty NUTS 2-level regions, which cover 64 independent county (in England) or regional (in Scotland) local authorities (i.e. the first tier below central government). For the purposes of this analysis, eight 'natural' regions have been defined according to the following three criteria:

- areas for which common futures can be identified, or futures different from those of neighbouring regions;
- sizeable areas where urban or rural characteristics predominate (but cities are not separated from their hinterland);
- different relationships in the core-corona-periphery debate; the boundary to mark 'where periphery begins' is of particular importance.

The natural regions are listed below. Details are given by region on Maps 6.4 to 6.11.

- Region 1: Highlands and Islands.
- Region 2: Central Belt.
- Region 3: Scottish Borders.
- Region 4: Northern England.
- Region 5: Trans-Pennine.
- Region 6: West Midlands.
- Region 7: East Midlands.
- Region 8: Rural East.

Population

The UK population is expected to increase very slightly from an estimated 57.3 million in 1990 to 58.5 to 58.6 million by the year 2000. The ECPOP projection anticipates continued but much slower growth thereafter

while the Eurostat low model expects population to go into decline after 2005. A small net immigration is expected, from both external EC and internal EC (mainly Ireland) sources.

Over the period to 2020, strong population growth is anticipated in East Anglia, and a more moderate increase in Yorkshire and Humberside, East Midlands and North West regions and in Scotland. The population of the Northern and West Midlands are expected to remain fairly stable.

The size of the labour force will increase marginally by the year 2000. An expected growth in the size of the 25 to 50 age group and an increase in female activity rates will offset an expected decline in male activity rates.

The labour force will become increasingly biased towards the higher age groups. The share of the 15 to 24 year olds is expected to fall by nearly 5 percentage points.

Agriculture

Agriculture is an important feature of the economy in all the NUTS 1 regions (there are no data available at the NUTS 2 level). The industry's contribution to total employment varies from 0.6% in the Northern region to 3.5% in East Anglia with an average of 1.3% for the study area as a whole. Its contribution to regional GDP showed a similar variation from 0.7% for the North West region to 4.4% for East Anglia, with a study-area average of 1.9%.

Employment in the sector has fallen nearly 30% since 1971, the steepest falls being recorded in Scotland, the Northern region and East Anglia (over 40%) and Yorkshire and Humberside (21%). The agricultural labour force now totals 157 000 and is fairly evenly distributed among the regions, each with 15 to 18% of the total, except for the North and North West regions which have less than 10%. This long-term structural decline in employment is expected to continue albeit at a slightly lower rate.

Over the next decade, reform of the CAP is likely to be the major factor affecting the industry. It will impact mainly on the arable sector.

This sector is important in four of the regions – Yorkshire and Humberside, East and West Midlands, and especially East Anglia – where over 50% of the agricultural area is under arable. These regions account for two thirds of the arable acreage in the study area. Scotland accounts for a further one quarter of the total but arable acreage accounts for only 19% of its agricultural area.

The reforms focus on cereal production. Land under cereals accounts for over 50% of all arable in all the study regions except North West and Scotland but as a proportion of the total agricultural area it is significant only in East Anglia (57%), East Midlands (48%), Yorkshire and Humberside (40%) and the West Midlands (31%).

We have estimated that some 10 to 11% of the cereal acreage will be set-aside with an attendant loss of jobs of around 5% of the farm labour force. High yielding farms principally located in East Anglia will not opt for set-aside. The major impact of CAP reforms therefore will be on farms on the poorer quality soils (grades 3 and 4) in those areas identified above.

Diversification into tourism would offset the impact on farm incomes and employment of CAP reforms, but only Yorkshire and Humberside of the regions likely to be most affected are recognized tourism areas. The potential for this type of diversification thus appears fairly limited.

Fishing

The UK has the largest industry of the four northern seaboard countries measured by number of fishermen – approximately one half of the study area total – and is one of the largest measured in number of vessels, gross registered tonnage or volume of landings.

The size of the fleet increased in the 1980s following a reduction in the 1970s occasioned by the loss of fishing grounds following the introduction of Exclusive Economic Zones (EEZs). As a result there is substantial overcapacity and fishing effort is currently restrained by limiting the days that can be spent at sea.

The focus of the industry has shifted north. Scotland now accounts for 75% of all UK landings by volume and 65% by value. The shift is due to the loss of fishing grounds in the North Atlantic (remember the Icelandic cod war) which affected the English fleet the most, improved fishing opportunities north-west of Scotland and a greater availability of pelagic species which both favour the Scottish fleet.

By the end of the decade the UK fleet will probably have been reduced by around one fifth. The EC has demand-

ed a 30% reduction and the UK Government is to introduce a decommissioning scheme to encourage this. The scheme is widely regarded as too under-funded to achieve more than a 5% reduction. The government is also seeking powers to order any fishing boat to stay in port for as long as the authorities dictate without compensation; fishermen who leave the industry will be allowed to sell the right to days at sea by way of compensation.

The processing industry is dominated by very small plants and the degree of processing is low. Hull, Grimsby and Aberdeen are the principal centres: the latter is now also the biggest fishing port in the UK. The industry is in financial difficulties and plants are closing down. Raw material prices are rising as landings diminish and as many plants have long-term contracts with supermarket chains the scope for passing on these price increases is limited. The industry is responding by buying frozen inputs of lower quality from suppliers outside the UK. EC insistence on higher hygienic standards will further depress profits.

Aquaculture production has expanded rapidly, particularly in Scotland, which is now the largest producer in the EC, mainly of salmon. Any major expansion of this sector is unlikely.

Manufacturing and services

The UK regions account for around three quarters of all manufacturing employment in the study area and nearly one half of employment in market sector services.

The share of the manufacturing sector in total employment averages around one third in the UK study regions. It is slightly less than this in East Anglia and Scotland and greater in the East and West Midlands. The services sector accounts for approximately two thirds of employment on average and the share ranges from 61% in the East Midlands to 70% in Scotland.

The UK is the chief recipient of foreign direct investment flows to the EC and accounted for around 45% of total investment made in 1989. The implementation of the SEM could conceivably alter the prevailing pattern of investment but it is believed that the UK will continue to be the main target country.

Manufacturing

Manufacturing employment is in long-term decline. It has fallen by over 40% since 1971 in all regions except the East Midlands and East Anglia which have recorded smaller falls of 30 and 20% respectively. In contrast service employment has expanded by 35% on average since 1971 with a wide variation from 17% for the North West region to 75% for East Anglia. These long-term structural trends will continue over the next decade.

The government has recently announced the proposed closure of 31 pits which will cut employment in coal mining by some 30 000. Jobs in upstream and downstream activities, estimated at twice the number of coal-mining jobs, will also be lost. This drastic contraction in the industry is the direct result of coal privatization which has given generators freedom to buy fuel from the cheapest source, resulting in their switch to gas. Implementation of the colliery closures has been suspended to allow for an inquiry. The threatened pits lie principally in the East Midlands and Yorkshire and Humberside regions. The coal industry is due to be privatized and it is estimated that a privatized industry will comprise only 14 pits and a workforce of 11 000 as compared with 169 pits and 150 000 workers in 1985.

The ending of the cold war has adversely affected the defence industry. Jobs have been lost in aerospace, naval shipbuilding, military vehicle manufacture and related equipment manufacture, and these are likely to be permanent. Attempts will be made to offset this decline by increasing sales to overseas governments, particularly in the Middle East. The retention of the European fighter aircraft project and the Trident programme will safeguard some jobs. The naval dockyard at Rosyth is threatened with closure.

Another peace dividend from the ending of the cold war will be a run-down of military bases, particularly those occupied by US military personnel. Two of the six USAF bases – Bentwaters and Woodbridge, both in Suffolk – will be closed in 1994; and Burtonwood in Cheshire which houses US army personnel will be shut down in 1995. A number of US navy bases, located outside the study area in West Scotland, and Cornwall will also close in the mid-1990s. These will have severe local impact on employment and incomes in essentially rural areas.

The motor car industry is threatened with further job losses as a result of falling demand, increasingly onerous tax treatment on company cars; tighter environment controls on car exhaust emissions which will raise car prices; increasing out-sourcing of components; and relocation of manufacturing units to lower labour-cost

centres. The manufacture of other transport equipment is also subject to contraction as rail freight declines and the parlous state of the finances of airlines reduces their ability to replace their fleets, although the Channel Tunnel has given a temporary fillip to manufacturers of railway rolling stock and the rationalization of the airline industry and the promised liberalization of European air-transport markets may help aircraft manufacturers.

Traditional industries such as textiles and clothing, footwear, furniture, etc. will continue to decline in the face of increased competition from within the Community as a result of the single European market and will be particularly hard hit by any future GATT agreement.

The UK's extensive mechanical and electrical engineering industries have been hard hit by the present recession but should recover when this lifts. They will face increased competition as a result of the single European market and from West European manufacturers. However, they should have an edge over their competitors in leading-edge technologies by virtue of the UK's greater number of science parks and technology centres. The UK study regions have two in Scotland (Edinburgh and the west of Scotland) and four in England (Nottingham, Birmingham, Cambridge and Warwick), which number advanced engineering technologies amongst their several specialisms. The UK is one of the Community's major investors in R&D but a significant proportion of expenditure is defence-related and this may tend to decline in future years as the defence industry contracts.

Services

The relative size of the services sector will continue to increase over the next decade. Some part of this will not be real growth but merely the externalizing, by hiving off, of activities hitherto carried out within the organization.

Non-market services will continue to grow slowly, partly through the increasing adoption of compulsory competitive tendering (CCT) practices in central and local government which will put into the private (market) sector activities previously carried out in-house. Real growth in this sector will be slow as government attempts to reduce the size of the public sector *per se* and restrain the growth in expenditures on essential public services such as health, education and social security.

The market services sector can be expected to resume its strong growth once the current recession is over. Financial services, consultancy, and advertising are among several activities which have been hard hit, leading to retrenchment and restructuring. They should emerge leaner and fitter and better able to take advantage of opportunities as they arrive later in the decade.

Energy

The growth in the demand for energy over the next decade will be offset by increasing energy efficiency, particularly as a result of technological progress in control systems. Total demand should therefore grow by no more than 2 to 3% per annum, roughly paralleling that of GDP.

The principal feature of the energy market over the coming years, the switch in emphasis from coal to natural gas for electricity generation, has been referred to above. This switch is due in part to the removal this year of the obligation on power generators to burn British coal and in part to the perception of the generators (challenged by critics) that gas generation was cheaper than coal-fired.

The contraction of the coal industry will have significant and long-lasting impacts on local employment at inland colliery sites. Gas generation will tend to favour coastal sites. Initial planning applications have been made for some 10 GW of new gas-fired generating capacity to be built along the North Sea coast by 2000; it is unlikely that all this capacity will be built.

Environmental concerns are one of the factors behind the switch from coal to gas for power generation. The UK's environmental policy is becoming stricter and more comprehensive. Elements relevant to the energy sector include:

- the exploitation and development of renewable energy sources wherever they have prospects of being economically attractive and environmentally acceptable;
- compulsory environmental assessment for most new or substantially changed energy projects, even ones which generate energy from renewable sources;
- the need since April 1991 for all existing and new fuel and power and associated processes to obtain authorization under Part 1 of the Environmental Protection Act 1991 (the recent controversy over the use of Orimulsion was in relation to EPA authorization);
- the promotion of energy efficiency in use (e.g. through building regulations) as well as in generation;

- a programme to reduce SO_2 and NO_x emissions from combustion plants;
- plans to limit the emission of other greenhouse gases.

Tourism

The analysis of UK tourism takes place against a background of likely depression in demand resulting from reduced spending power in most world economies.

Recent figures for visitors to the UK show a decline in the number of visitors from overseas, both from within the EC and the rest of the world. Overseas visitors represent only 8% of all tourist trips but account for over 25% of expenditure, showing their critical importance to the future of the industry: a drop in the number of foreign visitors has a disproportionate negative impact on the economic health of the industry.

The corollary is that domestic tourism trips will increase, as British people choose to holiday in Britain rather than going overseas. Thus it is expected that the absolute numbers of domestic tourist trips will increase but they will not compensate for the drop in higher spending foreign tourists. There is likely to be an increase in short-break holidays, either as an addition to or as a replacement for main summer holidays.

The economic prospects are therefore not very promising. Investment will be needed to improve and augment facilities to cope with increasing numbers; but income will fall putting a double strain on the tourism industry.

There will be two main spatial impacts:

- Increased numbers of visitors to new 'modern' tourist attractions: these will draw visitors away from traditional coastal and historic resorts, although some of these will absorb modern attractions and repackage their product through aggressive marketing techniques.
- Increased numbers of visitors to remote, wilderness areas as domestic tourists seek out distinctive, untypical environments: this will place a strain on resources, facilities and, most important, the environment, raising the classic tourist dichotomy of how to absorb increasing numbers without changing the essential character of a place, which might result in reduced attraction.

Transport

The government's transport policy is heavily biased towards roads and future policy places emphasis on:

- the relief of congestion on interurban roads: the focus is on relieving congestion on the broad routes followed by the present motorways (which have by far the heaviest flows of traffic, especially lorries) and the construction of bypasses to remove unsuitable traffic from towns and villages;
- the introduction of traffic-management measures, parking controls and driver information systems to make better use of existing roads, especially in urban areas;
- the promotion of public transport systems, including light rail or light rapid transport systems and buses, to attract passengers from cars especially in urban areas where road capacity cannot be increased;
- the improvement of road access to ports: coastal shipping and short-sea freight routes have the potential to take some long-distance traffic off the increasingly congested road system;
- the reduction of vehicle emissions, by a range of initiatives including tighter emission standards, both for new cars and old cars (via the MOT test) as part of a programme to stabilize CO_2 emissions by 2005.

The government is keen to promote private sector investment in transport:

- by encouraging private sector contributions to specific projects, such as local authority airports;
- by turning over complete projects to the private sector such as the Birmingham northern relief road;
- by privatization: currently some of the major port trusts are being privatized and government is encouraging the privatization of local authority public transport companies and proposes to privatize British Rail.

Major road schemes in the study area include:

- completion of orbital routes around Birmingham and Manchester;
- widening and junction improvement on the M1 between the M25 and M18 in South Yorkshire, the M6 between the M1 and Manchester and the M62 between Manchester and Huddersfield;
- new motorways to the west and north of Manchester between the M6 and the M66;
- upgrading to motorway standard part of the A1 in Yorkshire;
- dualling of the A11 between the M11 and Norwich and of the A47 between Peterborough and Norwich; improvements to the A59 in Lancashire and the A628 between Manchester and Sheffield;

- improvement to roads serving ports, including Lowestoft, Felixstowe and Harwich.

Environment

The multitude of environmental problems with which the study-area regions now have to contend have accumulated gradually over very many years. They will not be resolved overnight and will be as pressing for a solution in the year 2000 as they are today.

The problems are many and varied and have been referred to in other sections of this report. They are not unique to the UK and exist in varying degrees of severity and importance in other regions of the northern seaboard. They are not revisited here.

The government has adopted a new holistic approach to tackling problems of pollution. This is known as integrated pollution control (IPC) and was introduced on 1 April 1991 under part 1 of the Environmental Protection Act of 1990. Under IPC the environment is to be viewed as a whole as each element is inextricably linked. IPC recognizes this by adopting a cross-media approach, based on the total impact of releases to air, water and land. It is intended to ensure that one problem is not cured at the expense of another by requiring that the best practicable total environmental option is identified.

It is hoped that IPC will promote advanced technical solutions incorporating the principle of best available techniques not entailing excessive cost (Batneec) and thus prevent and minimize the potential for environmental damage and encourage investment in new cleaner technologies. It is intended that the costs of operating IPC will be recovered from charges made on polluters. Implementation of environmental policy envisages both regulatory and market-based controls.

Urban centres

Although the large urban areas will continue to exhibit decline, decay and congestion, they contain the facilities that advanced industrial socioeconomies require for successful growth:

- physical infrastructure;
- social and cultural infrastructure;
- labour supply and skills, producer and financial services research and higher education facilities;
- administrative systems that can be effective and responsive to demand;
- scale and proximity which promote the interaction of ideas, people and projects.

It is therefore expected that the existing large urban centres will be the main focus for development activities, and are 'the places to watch' for indications of changes in the spatial structure.

Notwithstanding this view, new economic nodes will emerge outside major urban centres to reflect new spatial relationships. These could include:

- strategic peripheral urban centres based on 'honeypot' activities, for example science parks;
- transport corridor interchanges, for example location of an inland freight depot, or motorway intersections;
- key infrastructure investment decisions such as the selection of ports for upgrading.

Overview of spatial developments

This section presents an overview of spatial developments for the coming decade. Spatial developments are presented for each of the eight natural regions, under two main headings, followed by a brief summary. The two main headings are:

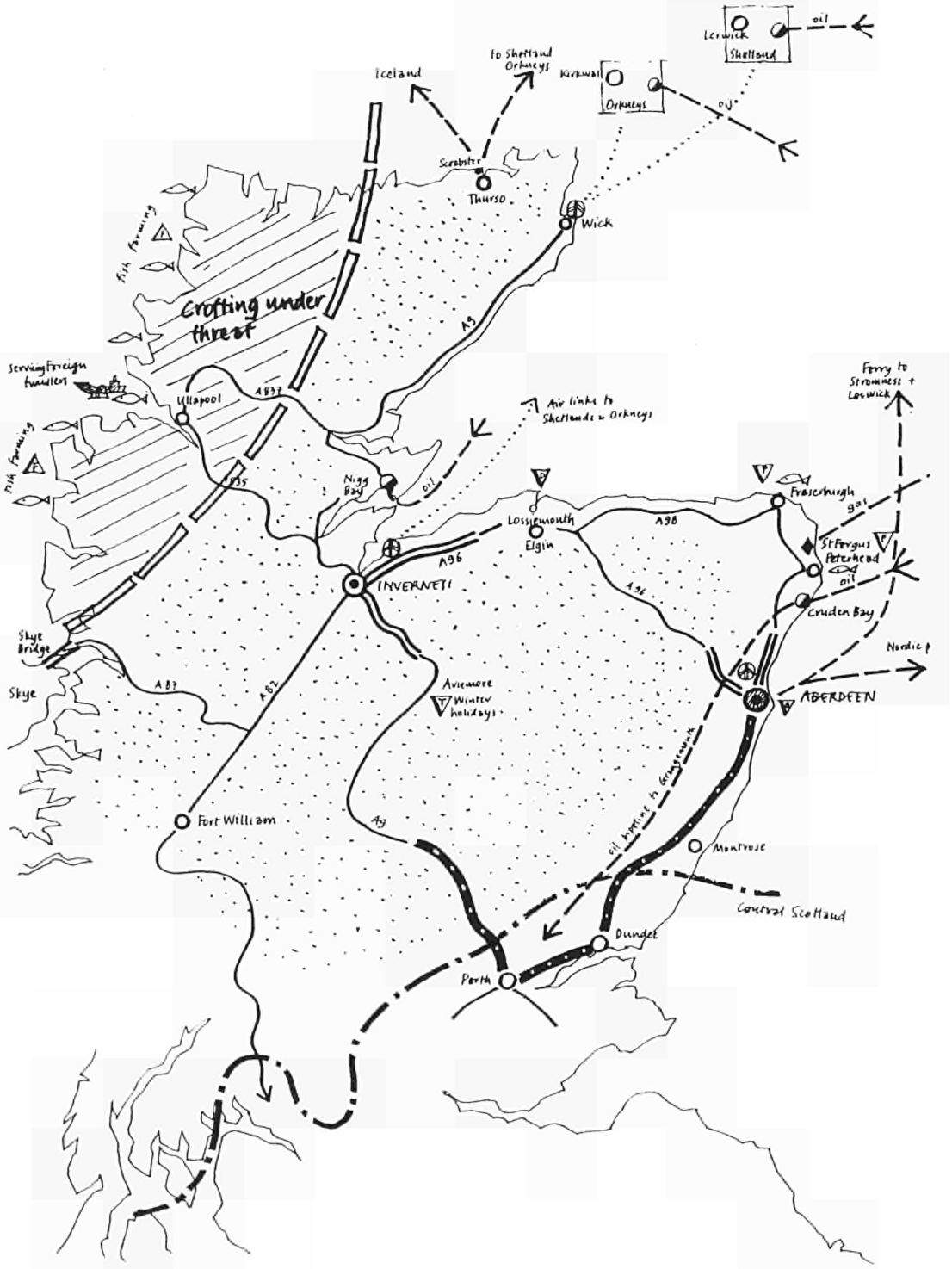
- economic base;
- spatial implications.

Region 1: Highlands and Islands

Economic base

This region is characterized by a small population thinly spread over a wide area which gives rise to social and economic problems associated with dispersal and isolation. A particular concern is the potential loss of the Highlands and Islands cultural lifestyle and the self-reliant values of small isolated communities. A progressive regional development policy will seek to sustain and encourage this lifestyle.

Significant population growth occurred throughout the region during the 1980s (except in the Shetlands), as a result of development associated with the oil industry but also as a result of people seeking a better quality of life and in association with small tourist developments, for example craft and other enterprises. The pattern of growth in the industry has stabilized in recent years due



Key

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- Tourism centre

Northern Seaboard Study

Highlands and Islands

MAP 6.4

to the drop in the price of oil on world markets and the consequent cut-back on investment and exploration. In the long term, both upstream and downstream industries are likely to be affected with consequent reduction in employment. But over the next 10 years, the industry is likely to operate at the same level as at present and employment levels will be maintained.

The city of Aberdeen and the various onshore terminals (Sullom Voe, Flotta, Nigg Bay, St Fergus and Cruden Bay) will therefore remain important employment centres, feeding a network of local dependent industries.

The economies of the Shetlands and Orkneys have been effectively distorted by the impact of oil and will find it hard to restore an economic equilibrium when the inevitable contraction occurs; but this is likely to be well into the next century, beyond the time-scale of this study.

Future exploration activity is likely to be in the northern basin of the North Sea reserves and it is likely that Norway will be the principal beneficiary. However it is possible that the Shetlands and Orkneys could derive some benefit which prolongs support to the local economies.

An important element of the regional economy is the high level of financial, business development and training support that comes from the EC and the UK Government. However, EC assistance is likely to be reduced as the area is now classified as a rural Objective 5b region instead of a lagging Objective 1 region. The Islands' fishing, agriculture and knitwear industries were rejuvenated in the 1960s and 1970s by the HIDB (Highlands and Islands Development Board). Fishing and agriculture are expected to suffer as a result of structural adjustments to the industry. The oil industry has affected the fishing grounds, and the knitwear industry will have to contend with increased international competition if it is to secure further growth.

UK Government public spending constraints will have an adverse affect upon the level of support for enterprises, and the provision of infrastructure services, with a probable consequent decline in employment.

EC agricultural policies are likely to have adverse affects upon agriculture; this is highly marginal and the crofting areas have little scope to adapt. Regional agricultural produce can only compete by offering high quality products, due to the high transport costs required to reach the mass markets. This is likely to be affected by general decline in UK spending power and consequent reduced demand for high cost produce.

The scale of deep-sea fishing is likely to be reduced by EC fishing policy, which will have its greatest effect on the Islands and the coastal fishing ports such as Peterhead, Fraserburgh and Ullapool. Attempts are being made to increase the added-value by development of processing which provides alternative jobs onshore. Fish farming is important in the lochs along the west coast, but concerns are being expressed about the environmental impact resulting from the build up of nutrients. There is unlikely to be significant growth in this industry.

Tourism, and the range of economic elements linked to it, are locally significant but small in scale overall. Reduced spending power and the distance of the region from the major population centres in the UK and mainland Europe, will mean that there is limited scope for the expansion based on domestic visitors and the small overall growth in foreign visitors.

The decommissioning of Dounreay nuclear power station will cause direct and indirect job losses on a scale that is unlikely to be replaced by tourism-related developments in the immediate area. Similar severe localized impacts will be felt with the closure of the military bases at Lossiemouth and Elgin.

Spatial implications

The existing development pattern – small, scattered settlements – will be costly to support but the social and cultural factors will be a strong drive to maintain this pattern. Limited investment in the improvement of main roads will have little impact one way or the other on the pattern of development. The expected reduction in public investment will increase the burden of isolation of the more northerly and westerly settlements, and private investment is likely to be concentrated in the more favourable east coast areas around Inverness and Aberdeen.

The growth of Aberdeen is likely to level off resulting in the general contraction of the oil industry. It will retain its role as the primary urban centre in the region; but the great distances and remoteness of many settlements will mean that its influence is less than it would be in a more compact, densely populated region. The smaller district centres (such as Thurso, Wick, Fort William and Ullapool) will perform a commensurately more important

function as service centres to settlements in their immediate hinterlands.

Region 2: the central belt

Economic base

Although this region has been growing and performing well in recent years, there are indications of problems ahead. The traditional heavy industries are likely to show continuing decline. Despite high quality coal reserves, a decline in output and employment is inevitable following recent decisions about the restructuring of the British coal industry. EC policy in relation to reducing steel output has already been felt with the announced closure of the Ravenscraig steel works. Oil and petrochemicals are important and still buoyant but the relatively high costs of production could affect competitiveness compared with world sources. Manufacturing, including high-tech manufacturing and electronics, is important and the region currently has a relatively high proportion of growing industries. However the expected decline in defence spending will affect both the electronics sectors and defence establishments particularly on the Clyde and the Fife coast and Rosyth.

Many of the sectors, e.g. food, drink and textiles, are likely to be adversely affected by increased competition and sectoral structural changes after the implementation of the SEM. With a larger market to serve throughout the European mainland, producers will be better located close to the main market area, which will mitigate Scottish locations.

Edinburgh has established a significant role as a banking, finance and insurance service centre, and business services have developed to support local firms. This was encouraged by the city's distance from other large city centres and Scotland's distinctive legislative background and relatively independent status. However, decline in demand, increase in competition after SEM, and possible moves towards some form of Scottish independence, could have negative effects on the scale of growth. There will be little increase in consumer service employment because of the low absolute levels of domestic income and income growth.

The central part of the region has a network of urban centres based around Glasgow and Edinburgh, which offers a strong pattern for future development. Major employment centres have been consolidated, avoiding the need for extensive commuting. They have many of the infrastructure social and educational facilities required of advanced industrial cities that will continue to encourage growth. Employment opportunities will depend in part upon skills and levels of education. Unskilled labour and lack of technical education will reduce opportunities and tend to perpetuate high unemployment levels.

In contrast, more peripheral areas, such as Fife, have many small towns not well connected to each other or to the motorway network. It is difficult to attract investment to Fife because it is not an 'Intermediate Assisted Area' with regional enterprise grants.

The region is well endowed with universities and higher education establishments and there is strong local recognition of the value of education and training. This will be a valuable resource for attracting growth industries, but there remains a large pool of relatively unskilled labour.

Spatial implications

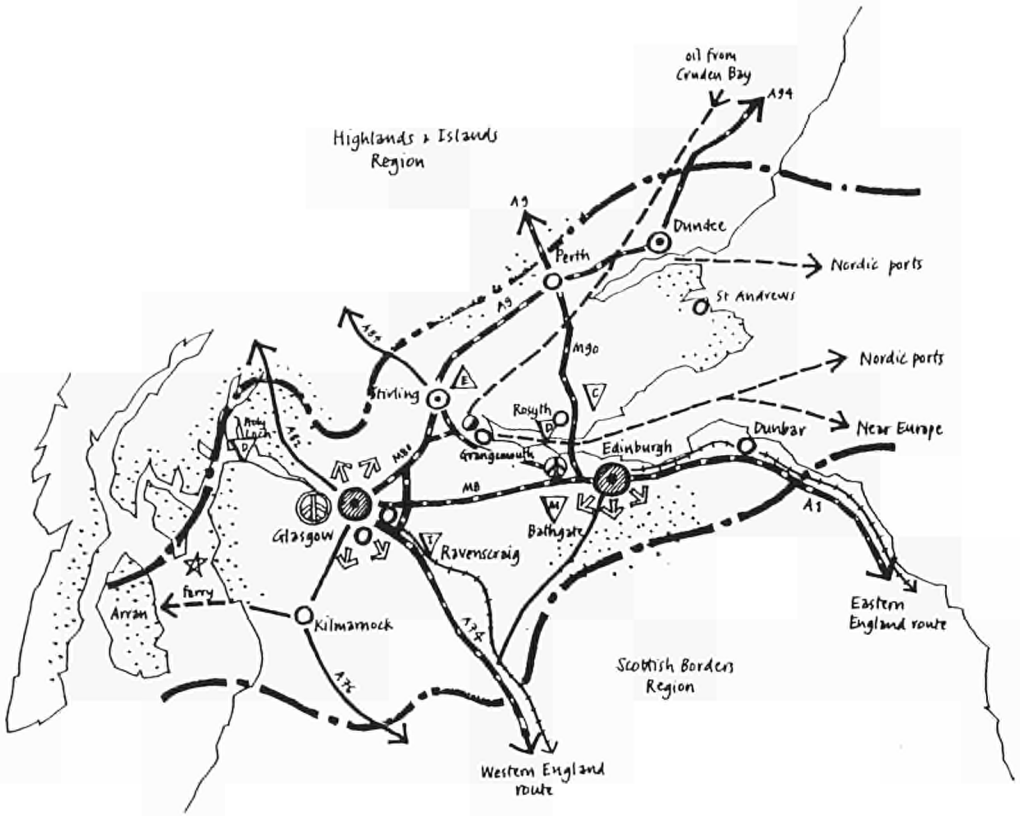
Edinburgh and Glasgow will remain the key focuses for employment and population growth, and will continue to act as the poles of a major urban region. The current port at Grangemouth is not considered suitable for long-term needs. Alternatives are being examined at Dunbar and Rosyth (the naval shipyard), to be developed as a regional relay port to complement the main hub ports and overcome the distance from English and European mainland ports, and the overall lack of competitive modern facilities.

The choice will have significant influence on the form of development of the urban region. If Dunbar is chosen, the main development axis will be along the southern side of the Forth estuary, down towards the English border. If Rosyth is chosen, this will encourage development on the northern shore of the Forth estuary and tend to promote development in Fife and the probability of a more-balanced spatial development.

Region 3: Scottish Borders

Economic base

This is an area of marginal upland agriculture, mostly dairy grazing. Much of this land will be lost to agriculture



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T	Tourism
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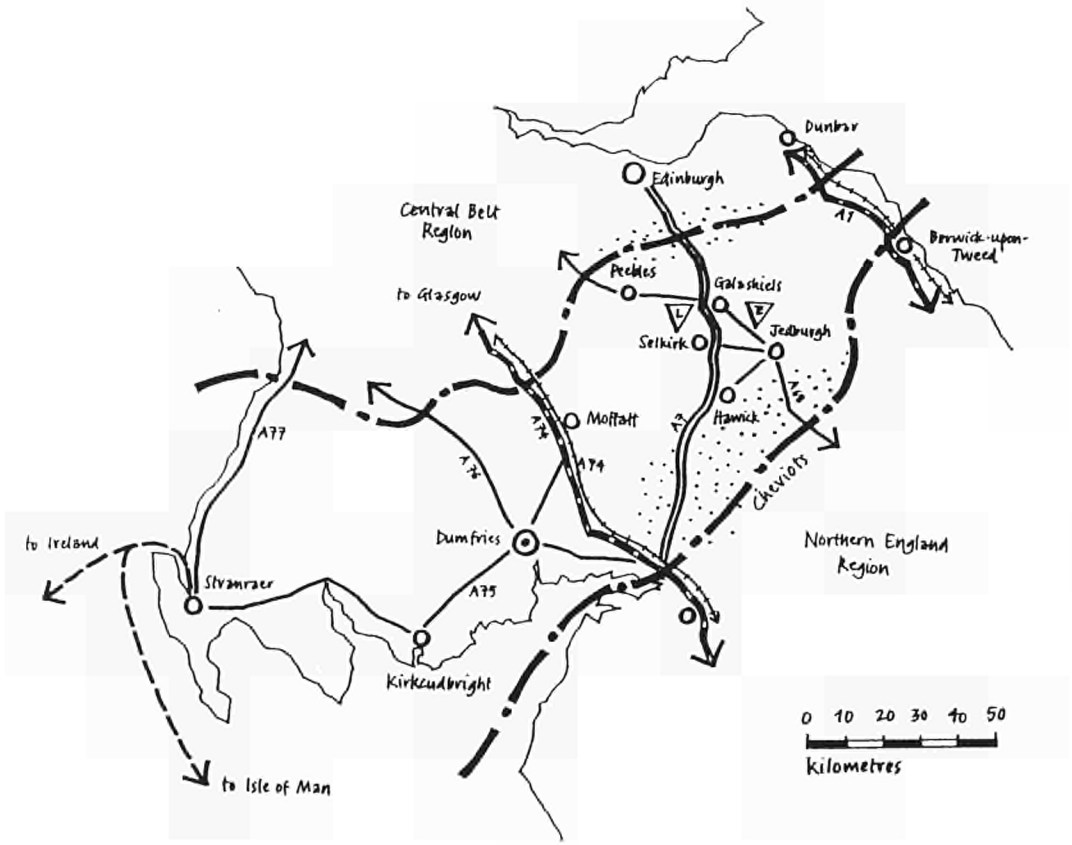
- Expanded airports
- Other airports
- Agriculture under threat (UK only)
- Sensitive environmental areas under pressure from tourism
- Groundwater with high nitrate content (Denmark only)
- Oil land terminal
- Gas land terminal
- Tourism centre

Northern Seaboard Study

UK Central Belt

MAP 6.5



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Northern Seaboard Study

UK Scottish Borders

MAP 6.6

over the next 10 years due to general pressure on marginal farmland. The urban areas – small, market-towns, with a historic and industrial base – will retain their market town functions, but will lose their industrial base. The decline in textile industry faces the double threat of competition with the world market and the single European market (SEM).

The region boasts a strong educational infrastructure. There is a long tradition of high quality values based on education which has resulted in the creation of a relatively skilled labour force. The problem is that there is little prospect of new industries to absorb the available skills.

There is great tourism potential in the region, based on the blend of the natural landscape resources combined with a strong heritage features.

Spatial implications

This region will exhibit little change over the next decade. The general decline of the industrial base in the urban centres will in some degree be compensated by the growth in tourism, which will bring some investment into the small towns and rural settlements. However, as in all areas, the pressure of tourism and the likelihood of investment and forestry will of themselves pose threats to the quality of the natural environment.

The urban areas are likely to exhibit limited signs of urban dereliction resulting from the loss of the industrial base. This will need to be tackled in order to ensure that the urban settlements retain their potential as centres for local tourism.

The structure of communications will remain unchanged. The strong north-south axis will remain, formed by the main roads along the east and west coasts into England, the A6 and the A74 respectively. The cross link from Edinburgh down to the Solway Firth, the A7, will be upgraded to dual carriageway status and will provide an important link through the main border towns.

Region 4: Northern England

Economic base

This is a region of contrasts: a predominantly rural, upland area, comprising the high quality amenity areas of the North York Moors, the Pennine chain, the Lake District and the Cheviot Hills, dominated by the two major conurbations of Tyne and Wear and Teesside. The conurbations are undergoing a significant transformation from centres of traditional heavy industry (shipbuilding, mining, steel and engineering, etc.) to more broadly based economies. Newcastle, the main centre of Tyne and Wear, will be the most successful, emerging as the dominant service centre and reinforcing its political and administrative role as the focus for the region. In contrast, Teesside will remain more dependent on its manufacturing base (petrochemicals and engineering) and will become less dominant in the regional context.

The economic diversification towards consumer goods (e.g. clothing and food), manufacture of motor cars (Nissan at Washington) and general services, will come under increasing threat from the SEM and Third World markets, so prospects are not entirely favourable. The decline in domestic markets is likely to be paralleled by similar decline in world demand. Some of the new jobs created are related to specialist tourist and domestic demand for example, clothing for Burberry and Marks and Spencer. Suppliers are therefore likely to be adversely effected by declining demand.

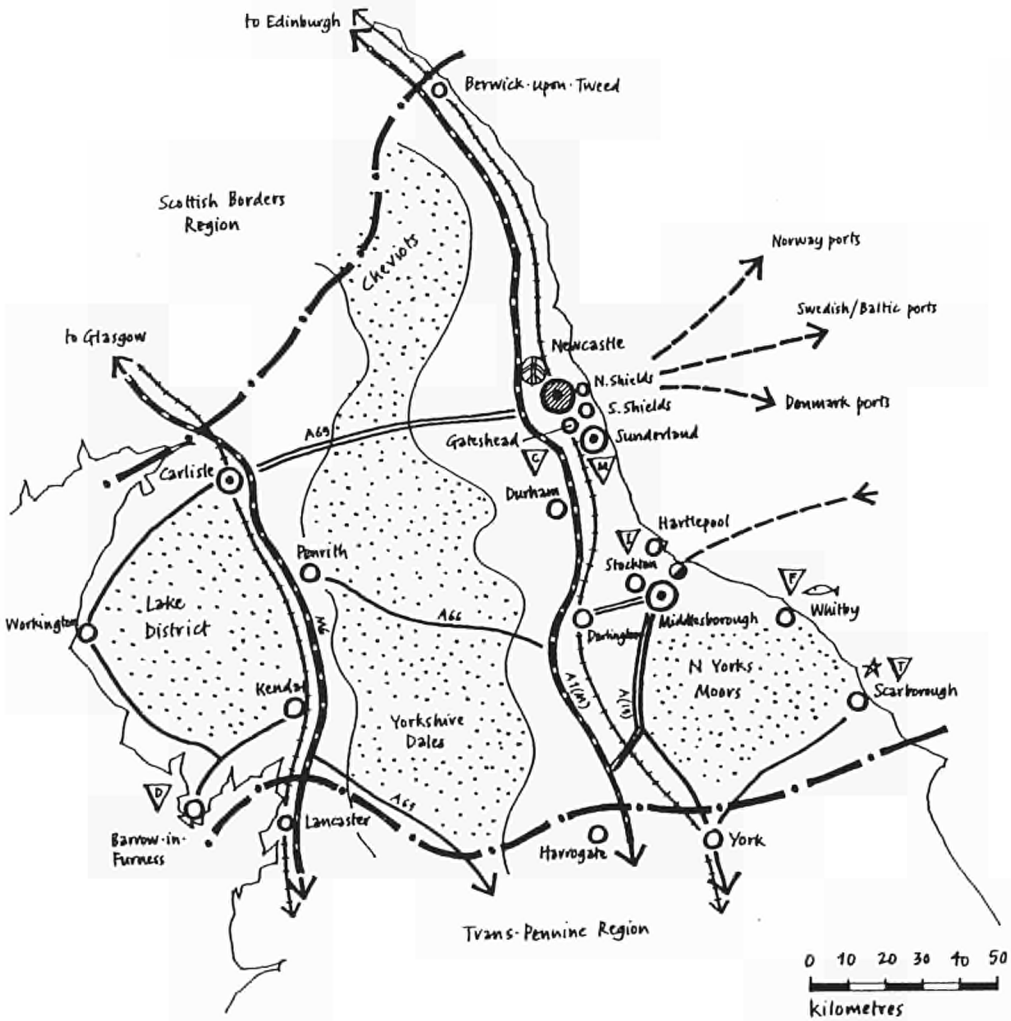
The agriculture is predominantly sheep and cattle on marginal uplands. It is expected that much of the arable hill-farm land will be released from agricultural use under set-aside schemes. This poses uncertainty about the nature and scale of landscape change.

The region contains major areas of natural landscape value and, in the Lake District, one of the major natural tourist attractions in the United Kingdom. Pressure on marginal farming activity will encourage diversification into tourism. The scale of tourism development will be seriously limited by a combination of two factors: the effect of market demand, and the application of strict planning controls in order to preserve environment.

Spatial implications

Within an overall pattern of decline, such urban-based growth as does occur will tend to be in the Newcastle area rather than on Teesside. Symptomatic of this is a recent decision to cut the high-speed railway link to Middlesborough from the main east-coast line.

The broad pattern of communications will reinforce strong A6-M6 and A1-M1 corridors, running in parallel up the west and east coasts. Some improvements of the trans-Pennine routes such as the A69, A66 and the



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- Pressure for urban expansion/overspill
- Motorways and near-motorway standard roads
- Other main roads
- Main railway links
- Main waterways
- Potential growth prospects
- Potential decline prospects

C	Coal
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L	Electronics
M	Motor industry
O	Oil
S	Services
T	Tourism
E	Textiles
X	Distribution/freight

- Expanded airports
- Other airports
- Agriculture under threat (UK only)
- Sensitive environmental areas under pressure from tourism
- Groundwater with high nitrate content (Denmark only)
- Oil land terminal
- Gas land terminal
- Tourism centre

Northern Seaboard Study

UK Northern England

MAP 6.7

A65, will effect some improvement in the east-west links; but these are not expected to be very important, nor very significant in regional development terms.

The west-coast industries are likely to experience continued decline with a consequent depressive effect on the local economies. Barrow-in-Furness will lose its naval shipyards as a result of contraction of the defence industries; British Nuclear Fuel's power station and reprocessing plants at Sellafield are unlikely to expand, given recent decisions to peg the level of contribution of nuclear power to overall UK electricity needs and limit the extent of reprocessing capacity.

There are many serious questions about the likely impact of the rationalization of British Rail services on the Northern region. The financial constraints imposed by the government on British Rail operations and uncertainty about privatization proposals means that investment in long-haul routes between major centres will be paralleled by cutting back on services to branch routes of the main lines. This will have a very direct impact on towns like Middlesborough and Sunderland which are lobbying to remain on the high-speed network. While connection to the intercity routes is not, in itself, a prerequisite for prosperity, removal from the network can be yet one further factor affecting the image of the area to reduce the attraction to possible incoming investors.

Region 5: trans-Pennine region

Economic base

This is the most intensively urbanized region in the northern seaboard study area, its economic base has undergone – and continues to undergo – a transformation. Formerly a centre for traditional industries (coalmining, textiles, clothing and footwear, heavy engineering, etc.), rooted in the 19th century industrial revolution, its economy is now based on a range of modern, high-tech industries (e.g. electronics, aviation and defence) and expansion of service industries, although some traditional sectors especially in the textile-related trades remain.

Structural changes in the local economies have been complemented by physical changes, involving regeneration of declining inner-city areas and the creation of a wide range of high quality residential and working environments. This has been possible, for the most part, because of the strength and momentum of the urban structure which offers excellent communications, varied and concentrated markets, and a large pool of labour. The cities of Manchester and Leeds in particular have expanded their business and service functions to emerge as the dominant urban centres in the region.

The Humberside ports (Hull, Grimsby and Immingham) provide an important anchor on the northern seaboard. These will perform an increasingly important role as the main UK ports for freight shipments between the UK and mainland Europe and Scandinavia. Their strategic location, close to the main population concentrations of England (some 20 million people – 40% of the UK population – live within a four hour road journey), and at the northernmost limit of an overnight ferry service to mainland Europe provide the bases for confidence in future prospects.

There is a strong pluralistic and vibrant urban culture and identity found in both the large and small cities, which is reflected in a tradition of civic pride, and manifested in the proliferation of local cultural and social facilities (theatres, football teams, etc.) and a healthy rivalry between towns. The higher birth rate of the recent immigrant communities will ensure that there will be a good supply of young people in the labour-market.

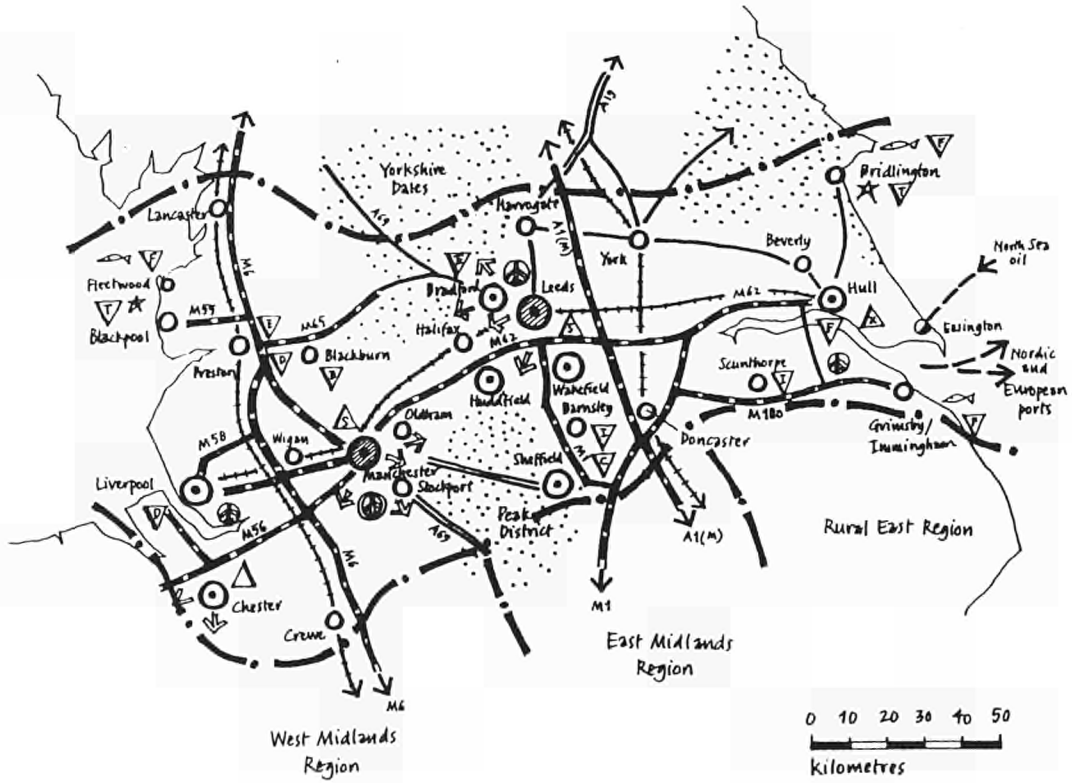
Manchester airport will reinforce its position as the major UK international airport outside the South-East. This will be based on an expansion of European and intercontinental destinations.

Manchester's bid to host the 2000 Olympics could, if successful, be a significant boost to economic regeneration, always assuming that it does not end up as a drain on local resources and taxpayers.

Spatial implications

Given the general proposition that the larger urban centres will continue to act as the main motors of economic growth, the urban concentration in the trans-Pennine region offers a strong anchor for sustained regional development.

However, the present intensity of development suggests that there will not be any significant change or development of the spatial structure over the next 10 years. The main infrastructure networks are in place: strong north-south links (the M6 corridor in the west and the A1/M1 corridor in the east) are complemented by the east-west M62 corridor from Liverpool to Hull, with branches to



Key

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- Secondary urban centres
- Other urban centres
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- Other main roads
- Main railway links
- Main waterways
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- Expanded airports
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- Agriculture under threat (UK only)
- Sensitive environmental areas under pressure from tourism
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- Oil land terminal
- Gas land terminal
- Tourism centre

Northern Seaboard Study

UK Trans-Pennine

MAP 6.8

Chester and the Wirral (M53/M56) and Immingham/Grimsby (M180).

The spatial structure will therefore be reinforced, with Manchester and Leeds confirming their dominance. The centre of gravity is likely to shift to the east, as the Humberside ports grow while Liverpool continues to decline.

There are serious environmental issues which will need to be addressed on three fronts:

(i) In spite of important initiatives in urban regeneration, the problems of urban dereliction and industrial pollution – the legacy of 19th century development – are likely to exceed the impact of remedial measures.
(ii) The Mersey and Humber estuaries are seriously polluted and will need strong control to meet increasingly tight EC environmental standards. Both coastlines contain sensitive environments which are threatened by industrial pollution and tourism.
(iii) The non-urban areas are under pressure from periurban development and from recreational demand. The upland areas of the Pennine Chain between Lancashire and Yorkshire are under severe pressure as the demand for quality residential and working environments encroaches on the lower slopes. The upland areas provide important recreational resources for the urban population and many areas suffer from congestion and consequent wear and tear on the fabric of the natural environment.

Region 6: the West Midlands

Economic base

This region presents an interesting comparison with the trans-Pennine region: its traditional economic base of metal goods and engineering, supplemented with 'swarming' of related industrial activity has undergone a similar transformation towards a broader range of manufacturing activity in the growth sectors, although there has been overall decline in the demand for labour.

The region is heavily urbanized, with the seven cities comprising the West Midlands conurbation totalling a population of 2.5 million. However the spatial structure is more dispersed than that of the trans-Pennine region. Birmingham, at the apex, is surrounded by a ring of six large urban centres (the West Midlands conurbation) and, further out, by a number of smaller market towns (Shrewsbury, Ludlow, Hereford, Stratford, Stafford, etc.).

There have been similar initiatives for urban regeneration, most notably in Birmingham, where recent development has aimed to remedy the perceived poor quality central area redevelopment of the 1960s. The city has made strong efforts to sell itself as Britain's second commercial city, with a strong emphasis on diversifying the economic base into growth-sector manufacturing and service industries. The economic future of the urban economy is inextricably linked to that of the British economy and then is likely to be under severe pressure over the next 10 years.

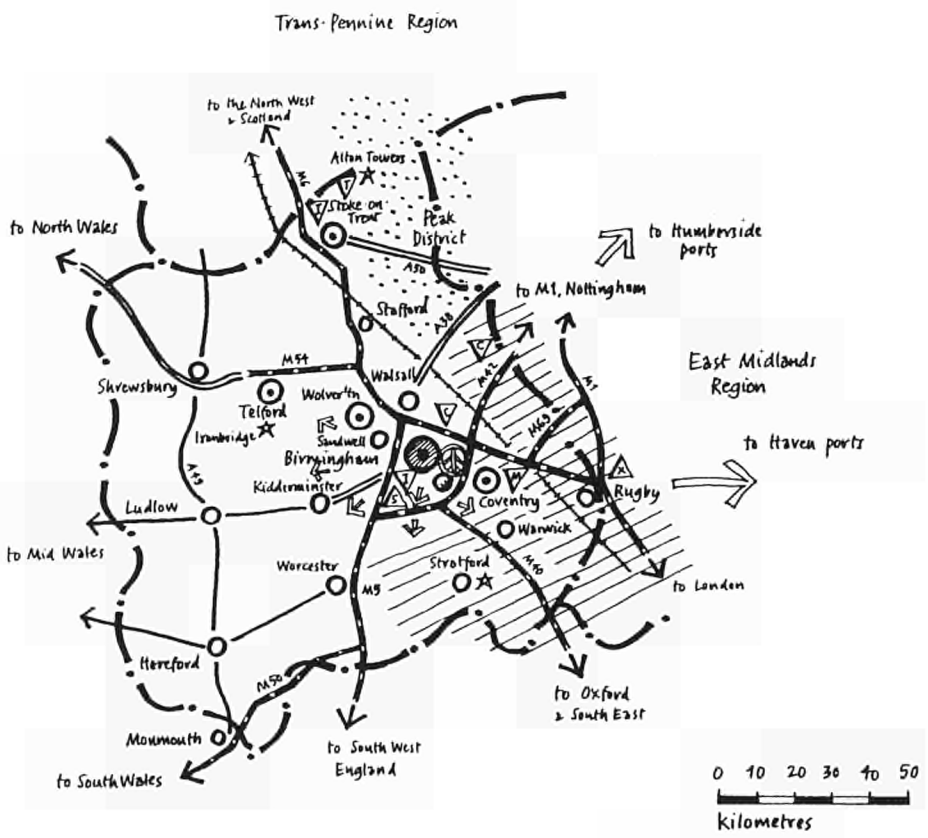
The rural areas around the conurbation will face contrasting fortunes. Even the high quality (Grade 1 and 2) areas to the west, in Shropshire, Worcestershire and Herefordshire, could experience reduced levels of activity, with greater pressure on more marginal land in the extreme west, along the Welsh border. The area in the east of the region, predominantly Grade 3, is less productive and is likely to suffer pressure from EC agricultural reforms. There remains uncertainty of the physical impact that set-aside policy will have on a 'traditional' landscape of small fields and mixed farms.

Spatial implications

The current spatial structure of the region has a strong radial form. Motorway connections are excellent with the M1, M40, M5, M54, M6 and M42, radiating out in all directions from Birmingham (the M1 and M6 were the first links in the British motorway network). It is worth noting that the complex motorway interchanges within the combination have a very significant environmental impact (e.g. the M5/M6 interchange, the so-called Spaghetti Junction).

The historic radial pattern has been modified by more recent motorway investment which promotes east-west links: the M54 towards Shrewsbury and North Wales; the M42 linking the M5, south of Birmingham with Nottingham; and the M69 linking the M6 at Coventry with the M1 at Leicester. These links will be important in facilitating transport to/from the Humberside and haven (Felixstowe and Harwich) ports.

The confluence of motorways will continue to promote this region as a centre for the distribution industries. Rugby, near the junction of the M1 and M6, is a prime site for warehousing and distributive trades developments due to its key location at the geographical centre



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Northern Seaboard Study

UK West Midlands

MAP 6.9

of England. About 75% of the population of mainland Britain live within a 200 km radius, representing a four hour road journey. This development pressure in the east of the region will continue over the next 10 years, in scale with performance of the overall UK economy.

There will be strong pressure for expansion of urban development into the areas around the conurbation. The legacy of urban decay in many of the older inner-city areas, in both residential and industrial areas, encourages 'leap-frogging' onto greenfield sites, particularly those with good transport connections and appropriate supporting infrastructure (e.g. training-research support and business services) which offer lower development costs and more attractive living and working environments.

Region 7: the East Midlands

Economic base

This region has many similarities with the West Midlands region. Its manufacturing base was built on coalmining during the 18th and 19th centuries and developed around the network of established market towns. Coal, steel manufacturing and engineering were the traditional basis of the region but it has also developed a specialization in consumer products (food, textiles, clothing, etc.) rather than on heavy engineering. There has been little growth in the service-sector industries.

Individual towns acquired strong product identity: Nottingham – lace, Leicester – hosiery, Northampton – shoes. These traditional industries have been carried through to the present day, although the nature and scale of the activities have been transformed beyond recognition. All these industries face severe pressure from the SEM and competition from low-cost Third World producers although innovation in design and manufacturing processes which are evident in the region could maintain its competiveness. It is probable that there will be a shift away from product manufacture to distribution of foreign-made goods.

The recent decision by Toyota to construct their main European plant at Derby was a major boost to the area and may stimulate upstream component manufacturers and suppliers. However, these will not necessarily be located in the East Midlands; the region's excellent road communications mean that local suppliers will enjoy little relative advantage and competitive suppliers may well emerge from the West Midlands or trans-Pennine regions, or even other parts of Europe.

Agriculture is mostly mixed farming on Grade 3 land. This will face severe pressure from EC agricultural reforms and it is expected that significant areas of farmland will be set aside, as production is concentrated in the more productive areas in the West Midlands and East Anglia. There remains uncertainty of exactly how this will emerge and what will be the resultant impact on the landscape.

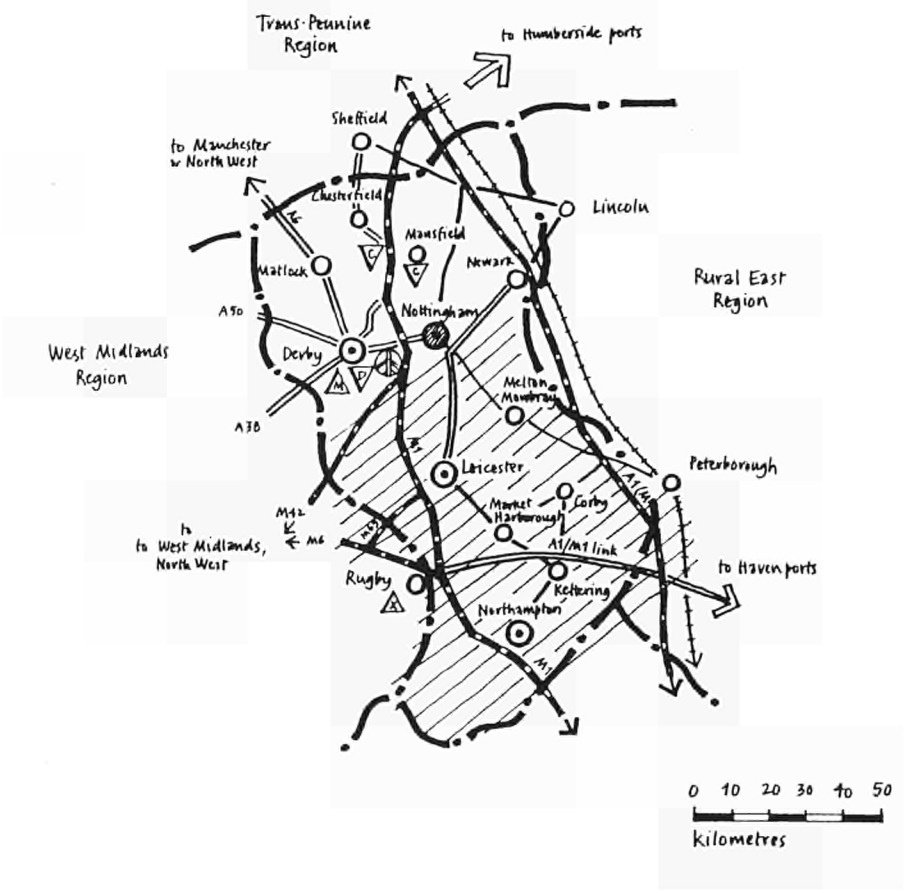
Some of the newest, most cost-effective coalmines are found in this region. Six months ago it would have been reasonable to predict a secure future for the industry over the next 10 years, with increased output and commitment to investment in modernization and expansion. However, recent government policy statements on the industry, and its planned contribution to power generation in particular, have changed the picture dramatically. This region will certainly fare much better than most other traditional coalmining areas. Even so the general prospect is for a sharp decline in output and employment and closure of many pits together with the resultant downward spiral of the local economy.

Spatial implications

The region is significantly less urbanized than the West Midlands, resulting from a more dispersed traditional industrial base. There is no conurbation as such, and the pattern of individual cities remains. Nottingham and Derby, for example, the main regional centres, retain their clear separate physical identity, even though their centres are only 20 km apart.

The spatial structure of the region is linear, the strong north-south axis being defined by the A1(m) and the M1 motorways. Recent highways investment has concentrated on east-west routes: the M42 to the West Midlands, the M69 linking the M1 at Leicester with the M6 at Coventry. These will be complemented by the new A1/M1 link, from the Rugby M1/M6 junction, through Kettering to the upgraded A45 at Huntingdon. This road will improve access to the haven ports.

The southern part of the region will continue to be a preferred location for warehousing and distribution developments, based on its excellent road links, (this parallels



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Northern Seaboard Study

UK East Midlands

MAP 6.10

the similar attraction of the southern West Midlands). This part of the region will be increasingly influenced by the South-East region of the UK (part of the centre capitals Euro-region). There are obvious strong links derived from proximity to the South-East. These are manifested in a more formal way through the Northamptonshire/Bedfordshire/Hertfordshire/Buckinghamshire Economic Forum, an association of local authorities, which addresses the development issues concerning the counties immediately north of London. Of the four, only Northamptonshire is in the East Midlands region, but it is perceived to face similar problems to the others: how to structure their development to capitalize on their proximity to the London metropolitan area and yet retain their distinctive identities and avoid becoming extended suburbs.

Region 8: rural east

Economic base

This region is the most productive agricultural area of the UK. Large swathes of Grade 1 and 2 land run through the Lincolnshire Wolds, the low lying Fens and into Norfolk, and this region is generally regarded as the bread basket of the UK.

The agricultural industry will face severe pressure from EC reforms. The large, high yielding farms are unlikely to opt for set-aside, and the Eastern region is likely to cope better than many other UK regions due to its relative efficiency and consequent high productivity. Indeed it is important that it does, since the share of total employment in agriculture is higher than any other region in England, and similar to that of Scotland. Agricultural employment has been seriously affected over the past 20 years or so as investment in mechanization and intensive fertilizer application has enabled increased output with lower employment to give yields above the EC average. There is unlikely to be significant decline in farm employment over the next decade since labour requirements have already been reduced to minimal levels.

The region enjoys a concentration of high-tech industries, notably in Cambridge and Peterborough. Cambridge has successfully exploited its university, both as a resource of skills and technological advance and as a marketing image, in order to attract research and development operations. These will not show the same levels of growth beyond the year 2000 because of their dependence on exports which will be threatened by the general decline in world trade, and the relative disadvantages of the UK as a high-tech manufacturing area, both in the context of the EC and worldwide.

Furthermore, R&D operations depend on a high level of funding from both public and private sources in order to maintain their technological competitive edge. These will be jeopardized by public spending constraints and by retrenchment in private sector investment. The development of competitive spin-off high-tech manufacturing industries based on the transfer of R&D will be constrained as a result. Nevertheless, the region will perform more robustly than other regions due to its proportionately greater share of employment in growth-sector industries.

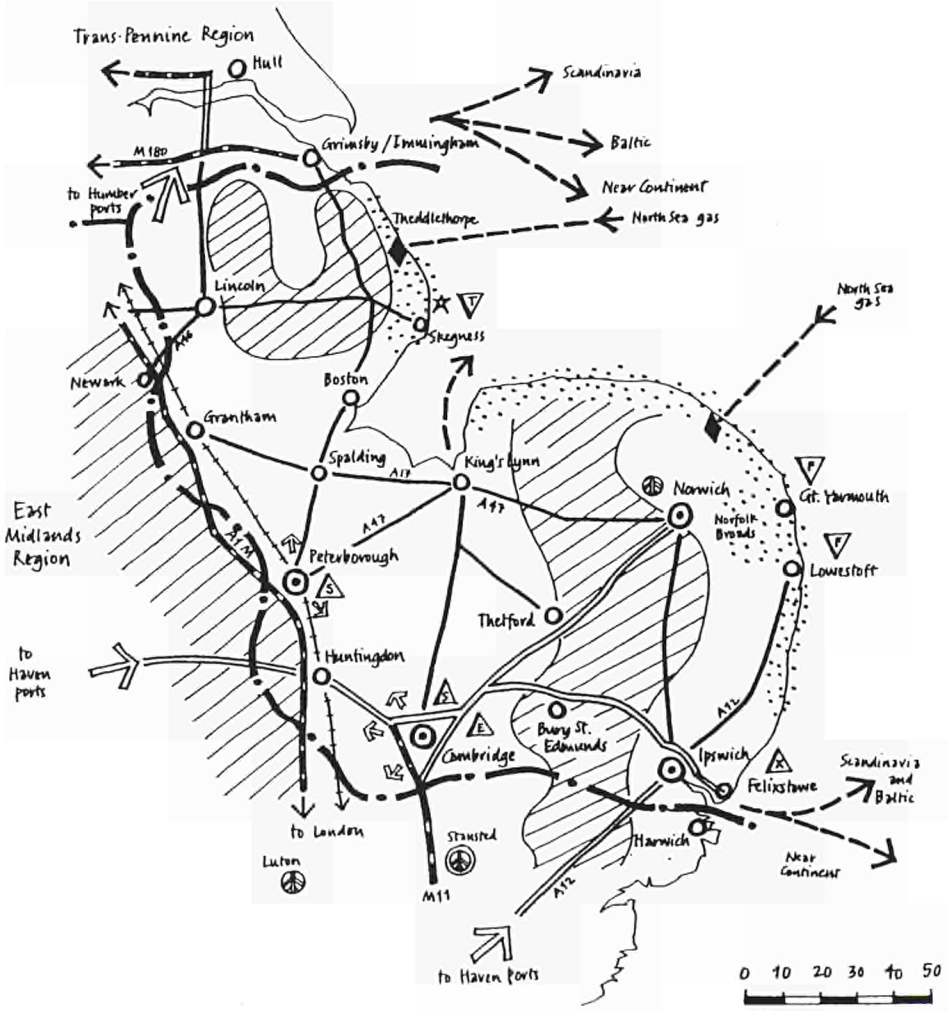
The peace dividend will have a major impact on this region. Over 70 000 US residents lived in the region in 1987 associated with USAF bases, about 2% of the population. These were estimated to support up to 4% of the regional employment and to contribute in the order of UKL 50 million with the local economy in consumer expenditure and supply services.

The planned withdrawal of US forces from Europe and the reduction of UK military bases will be felt very badly in this region. The impact will be hardest in the small towns and villages near the bases, rather than the larger towns, though these will also be affected. The removal of income from local services and the loss of on-base job opportunities will have a very damaging effect on the rural economy and threaten the existence of economic services in small village communities.

Spatial implications

The most significant spatial development will be the strengthening of the east-west axis in the south of the region (Huntingdon-Cambridge-Bury St Edmunds-Ipswich-Felixstowe) through the upgrading of the A45 and construction of the A1/M1 link from Huntingdon to Rugby. This will not have any major influence on development since its purpose is to provide access to/from the haven ports, rather than to open up the region. So any beneficial impact will be incidental and localized.

The southern fringes of the region will continue to be influenced by their proximity to London; this effect will be most noticeable in Cambridge and Peterborough, two of the fastest-growing towns in Britain during the 1980s.



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Northern Seaboard Study

UK Rural East

MAP 6.11

Cambridge, with its educational and R&D base, is linked by the M11 motorway (although it has no high-speed rail link) and is close to Stansted, the third London airport which will expand significantly over the next 10 years; Peterborough is on the A1(M) motorway and the electrified main east coast railway.

Elsewhere in the fringe there will be continued pressure for high quality commuter residential development. The main pressure for growth will be on the Ipswich-Cambridge-Peterborough axis, but always dependent on the actual level of employment growth.

For the rest, the spatial structure will change little due to the relatively poor intraregional road and rail communications and the fact that most of the region is off the main lines of transport. Indeed these factors will be crucial in conserving the essential 'backwater' character of the region which will continue to make it attractive as an area favoured for retirement, tourism and recreation.

Growth in tourism demand will be moderate but will nevertheless pose problems of absorption, particularly on the coast given that the region attracts a larger proportion of its tourists from outside the region than any other.

The Norfolk Broads will continue to be one of England's major tourist attractions but environmental management problems will continue to influence development policy in the area and exert restraint on growth.

Summary

Compared with the other parts of the study area, the UK regions are characterized by:

- their great variety
- the intensity of development.

The natural regions range from the most sparsely populated and remote – and hence most peripheral – region in the northern seaboard (Highlands and Islands) to the most densely populated urban region (trans-Pennine). The urban settlement patterns vary from polynuclear conurbations (trans-Pennine), mononuclear conurbations (West Midlands) to conventional city regions (Northern England). Agricultural activities range from crofting in the Highlands (a form of subsistence agriculture), through marginal upland farming (Scottish Borders, Northern England), to intensive arable farming (rural east) and intensive market gardening (rural east, West Midlands). They also contain upland and wilderness areas with a rugged, desolate character unparalleled throughout the study area.

The intensity of development has been discussed elsewhere and is one of the main reasons for the subdivision of the UK into so many regions. A less sensitive regional definition, particularly in central and northern England, would fail to reflect the true variety of the development pattern and would mask the fine grain of different development prospects.

If one looks at the eight regions in order to identify a broader pattern, four regions can be identified which are clearly dominated by a strong urban base, i.e.:

- Region 2: Central Belt.
- Region 5: Trans-Pennine.
- Region 6: West Midlands.
- Region 7: East Midlands.

The central belt falls into this category by virtue of the inclusion of Glasgow, not strictly within the northern seaboard study area but unquestionably a crucial component of the Central Scotland socioeconomic system.

The Northern England region has at its centre one of the great British cities, Newcastle, which forms the heart of a real conurbation. Yet it is not included in the first category because of its extensive rural hinterland, which makes it more comparable with some of the German subregions (e.g. Bremen or Hannover).

The rural east region also has parallels on the European mainland, particularly the regions in the Netherlands and Germany along the North Sea coast. Intensive agriculture supports a network of relatively prosperous historic market towns/cities and surrounding villages, displaying an almost classical geometric pattern. It shares with these Continental areas the characteristic of relative isolation, best described by qualitative terms such as 'off the beaten track', 'a backwater', or 'on the road to nowhere', which reflects both the relatively poor transport infrastructure and the slow pace of life. This factor constrains economic activity in some degree, but is also responsible for making it a desirable residential location (for long-distance commuters or second homes) and tourist destination.

The Scottish Borders share this quality: the influence of Edinburgh and Glasgow may be compared with the influence on the rural east region of the East Midlands and the South-East. Apart from obvious differences in

the physical characteristics (landscape, agriculture), there are similarities in the pattern of settlements and poor intraregional communications.

The Highlands and Islands region has no parallel, either in the UK or in the whole study area. Its location 'at the end' of the UK poses real problems in terms of economic development and is at the root of the issue of peripherality. North Sea oil and gas have introduced an important boost to the regional economies; but there remain uncertainties about the long-term effects. A balance has to be struck which exploits the advantages of the oil/gas economy for long-term, sustainable benefits, and uses these to support smaller scale, local enterprises which can flourish on a low input-low demand basis, and can offer an effective counterpoint to peripherality.

Chapter 7: Regional synthesis
The base scenario metastructure

Introduction

In Chapter 6 we have described, for each region, our vision of the future given the continuation of existing trends. In this chapter we provide an overview for the study area as a whole. We pull together the key elements of the sectoral analysis and of the base scenario for each region, and present a regional synthesis.

The first section summarizes the spatial manifestations of the base scenario; the second section introduces our concept of the core-corona-periphery metastructure, and presents and discusses our base scenario metastructure; the third and last section introduces a rough division of the study area into regions with much and little growth potential respectively.

The spatial manifestations of the base scenario

In this section, we summarize the main spatial manifestations of the base scenario aggregating the information contained in the regional scenarios described in Chapter 6. For reasons of clarity, we look at the study area in a clockwise direction, starting with Denmark, through Germany, the Netherlands to the United Kingdom. In order to demonstrate the commitment to a transnational approach we deliberately avoid treating the four countries as discrete socioeconomic spaces.

It is nevertheless important to recognize that many activities are still significantly contained within national boundaries. And it is equally important not to exaggerate the importance of international factors in determining spatial characteristics. Whilst certain places (e.g. ports, border towns) clearly derive much of their sense of place from their role in international movements, and international flows of goods and capital are critical to economic well-being, it is nevertheless true that most of the physical characteristics of most places are derived from local factors, not international factors.

Thus, in summarizing the spatial manifestations of the base scenario, we must achieve a sound balance between local and transnational factors. The important point is that national boundaries will tend to become less relevant in the near future, as regionally-based socioeconomic activities operate in a looser, more international realm.

In Denmark, we have identified an eastern subsidiary axis which will tend to strengthen the spatial dominance of the eastern part of the country, in particular of Copenhagen and the capital city region. Major infrastructure investment projects, notably the Great Belt and Oeresund crossings, will reinforce the 'corridor' effect of eastern Denmark as the link between the Nordic countries and mainland Europe.

These developments will make domestic air travel less attractive and adversely affect the regional airports, and they will reduce the attractiveness of road ferry routes. They will also increase the influence of the capital city

region. The Great Belt project and rail electrification will encourage the use of Danish railways for international traffic between Germany and Sweden.

These trends will be reinforced by the Oeresund fixed-link project: it will extend the influence of Copenhagen into southern Sweden, for example by facilitating shopping trips, and it will also enhance the status of its international airport.

The Fehmarn fixed-link, when constructed, will also have a significant impact. (This is not expected within the time horizon of this study.) It will provide a more direct route between eastern Denmark and Sweden and northern Germany than the Great Belt route, and is likely to attract a large volume of both road and rail traffic.

The continued contraction in the size of the fishing fleet and the loss of job opportunities will severely affect fishing communities which are mainly located on the west and northern coasts of Jutland and on the island of Bornholm. Contraction in the fish-processing industry as a result of stricter environmental regulations and declining landings will reinforce these effects.

The contraction in agricultural employment as a result of current structural changes in the industry, CAP reforms, and stricter environmental controls will affect Jutland and Zealand particularly, as these are the main centres of livestock and arable farming. Population will tend to move away from the coastal areas (fishing communities and those dependent upon ferry traffic) and the rural areas (agricultural communities) to towns where jobs in manufacturing and services are located.

Towns in Jutland are located mostly on the eastern side of the peninsula. Therefore, there will be a tendency for a population shift from the north and the west to the east, particularly to Aarhus. On Fyn and Zealand there will be a similar tendency for migration from the southern rural areas to the northern urban centres.

This trend will be part of a wider pattern for population and economic activity to migrate towards Copenhagen, particularly as the latter's importance is enhanced by transport and traffic developments. The ring of towns around Copenhagen could well become much more important as will the city of Copenhagen itself. Peripheral areas in west and north Jutland will become more disadvantaged as population is lost.

Set-aside will radically alter the landscape especially in West Zealand where cereal growing is concentrated. Set-aside and the decline of agricultural and fishing communities will affect the environment and the ambience of coastal and rural areas especially in Jutland. These areas are important tourist areas. Tourism could therefore be a vehicle for regenerating these communities. Idle assets such as buildings and land could be used as a basis for developing tourist facilities and attractions. For example, houses for rental, golf-courses and camp-sites.

The unification of Germany and the growing liberalization and Western orientation of the economies of Eastern Europe are encouraging the creation of a strong east-west development axis running across the southern regions of the German northern seaboard study area, stretching from Rotterdam in the west to Berlin in the east. The road and rail links, existing and proposed, running between the Hannover area and Berlin across the former border, will be a physical manifestation of this axis.

This axis is being superimposed over a long-established north-south transport and development corridor, running from Hamburg to Hannover and the south. The junction of these two axes lies in the Hannover area, an area exhibiting real signs of growth, with significant inward investment, and a possibility of overheating.

A third corridor can be defined running from the Ruhr-Osnabruck-Bremen-Hamburg and on to Scandinavia. The Danish fixed-link infrastructure projects will contribute to the importance of this corridor and Swedish membership of the European Community would further enhance it.

Our view of the future, our base scenario, is predicated upon the existence of these three axes. These axes cross each other at three locations which are considered to be key growth points: Hamburg, Hannover and Osnabruck.

In contrast to the development triangle enclosed within these three axes, the coastal region of western and north-western Germany is a comparative backwater, off the main lines of communication, and in danger of becoming increasingly peripheral as these become stronger. These areas have the relative comfort of being able to tap into the growth axis in a way which the more remote northern seaboard regions (e.g. Scotland, northern Jutland) are unable to do.

The eastern parts of Mecklenburg-Western Pomerania are expected to remain relatively undeveloped. The

problems of integration of the new *Länder* into the single Germany, and of the former Eastern bloc States with Western Europe will tend to leave these areas very isolated, in a more exaggerated form than the similar coastal areas lying west of Hamburg. Even the exploitation of tourism resources and the expected increase in transport flows between Scandinavia and Central Europe are likely to have a very marginal beneficial economic impact and an insignificant spatial impact at the regional level. The major spatial development impact will be exhibited in the south and the west.

Moving west, towards the Germany/Netherlands border, the intensity of development along the main axis increases. The pattern of settlement becomes increasingly more concentrated, exhibiting the characteristics of the Benelux countries of a large number of clusters of urban centres.

Passing into the Netherlands, the observed characteristics of physical development highlight the point made earlier that spatial development is still very clearly influenced by national factors. While many of the border towns derive economic benefits from trans-border economic activities, the regional level character of development remains characteristically German or Dutch.

The continuation of the main axis to its western end at Rotterdam passes through the Dutch 'engine room', the Randstad. The southern region of the study area fringing the developing east-west transport axis demonstrates strong growth potential. The cities of Enschede, Utrecht, Arnhem and Nijmegen are particularly well placed to take advantage.

This is in marked contrast with the northern regions of Friesland and Drenthe which mirror the problems of relative isolation experienced in the German coastal regions: the fishing industry is contracting; the agricultural industry is declining and is threatened by CAP reform and stricter environmental controls; agro-industrial activities, dependent on fishing and agriculture as both customers and suppliers, are under threat; traditional manufacturing industries are contracting; the services sector is poorly developed and lacks growth potential; and there is substantial out-migration.

A continuation of these trends will thus see a growing imbalance between the northern and southern region: and as the east-west transport corridor in the south develops, the northern region will become increasingly peripheral. Existing links between the two regions favour the Groningen area, leaving the north-west and northern areas especially isolated.

Passing across the North Sea to the United Kingdom, the spatial continuity is broken. In the continental part of the study area, for all the real differences between regions and countries, there is a continuity of spatial development which facilitates – even promotes – integration and transnational development objectives. The physical barrier formed by the sea affects economic activities, social characteristics and, inevitably, the resulting pattern of spatial development. Apart from the obvious maritime links across the North Sea with Continental study-area ports, the UK can be treated as a completely separate spatial system.

The most significant spatial development in the rural east will be the strengthening of the east-west axis in the south of the region through improved transport links to the haven ports serving the Midlands and the North; but any beneficial impact will be incidental and localized. The southern fringes of the region will continue to be influenced by their proximity to London; this effect will be most noticeable in Cambridge and Peterborough, two of the fastest-growing towns in Britain during the 1980s. Elsewhere in the fringe there will be continued pressure for high quality commuter residential development.

For the rest, the spatial structure will change little, due to the relatively poor infraregional road and rail communications and the fact that most of the region is off the main lines of transport.

The East and West Midlands regions are closely tied in with the trans-Pennine region by a dense motorway network providing excellent movement within the three regions and further north, either side of the Pennine hills, and south-east towards London.

The East Midlands region is significantly less urbanized than the West Midlands, resulting from a more dispersed traditional industrial base. There is no conurbation as such, and the pattern of individual cities remains. The spatial structure of the region is linear, with its strong north-south axis of motorways, even though recent highway investment has concentrated on east-west routes.

The southern part of the region will continue to be a preferred location for warehousing and distribution developments, based on its excellent road links (this parallels the similar attraction of the southern West Midlands). This part of the region will be increasingly influenced by the South-East region of the UK.

The spatial structure of the West Midlands region has a strong radial form, with motorway connections radiating out in all directions from Birmingham. This historic pattern has been modified by more recent motorway investment which promotes east-west links. This confluence of motorways will continue to promote the area around Rugby, on the boundary of the West and East Midlands, as a centre for distribution industries.

There will be strong pressure for expansion of urban development into the areas around the conurbation. The legacy of urban decay in many of the older inner-city areas, in both residential and industrial areas, encourages 'leap-frogging' onto greenfield sites, particularly those with good transport connections and appropriate supporting infrastructure (e.g. training-research support and business services) which offer lower development costs and more attractive living and working environments.

Given the general proposition that the larger urban centres will continue to act as the main motors of economic growth, the urban concentration in the trans-Pennine region offers a strong anchor for sustained regional development.

However, the present intensity of development suggests that there will not be any significant change or development of the spatial structure over the next 10 years. The main infrastructure networks are in place. The spatial structure will therefore be reinforced, with Manchester and Leeds confirming their dominance. The centre of gravity is likely to shift to the east, as the Humberside ports grow while Liverpool continues to decline.

Within an overall pattern of decline predicted for the northern region, urban-based growth will occur in the Newcastle area rather than on Teesside. The broad pattern of communications will reinforce the strong existing corridors which run in parallel up the west and east coasts. Some improvements of the trans-Pennine routes will effect some improvement in the east-west links, but will not be very significant in regional development terms.

The west-coast Cumbrian industries are likely to experience continued decline with a consequent depressive effect on the local economies.

The Scottish Borders region will exhibit little change over the next decade. The structure of communications will remain unchanged. The general decline of the industrial base in the urban centres will in some degree be compensated by the growth in tourism, which will bring some investment into the small towns and rural settlements. However, as in all areas, the pressure of tourism and the likelihood of investment and forestry will themselves pose threats on the quality of the natural environment.

The urban areas are likely to exhibit some signs of physical decline, resulting from the loss of the industrial base. This will need to be tackled in order to ensure that the urban settlements retain their potential as centres for local tourism.

Edinburgh and Glasgow will remain the key focuses for employment and population growth in the central belt of Scotland and will continue to act as the poles of a major urban region. The current port at Grangemouth is not considered suitable for long-term needs. Alternatives are being examined at Dunbar and Rosyth (the naval shipyard) to be developed as a regional relay port to complement the main hub ports and overcome the disadvantages of distance from English and European mainland ports, and the overall lack of competitive modern facilities.

The choice will have significant influence on the form of development of the urban region. If Dunbar is chosen, the main development axis will be along the southern side of the Forth estuary, down towards the English border. If Rosyth is chosen, this will encourage development on the northern shore of the Forth estuary and tend to promote development in Fife and the probability of a more balanced spatial development.

The existing development pattern in the Highlands and Islands – small scattered settlements – will be costly to support but social and cultural factors will be a strong drive to maintain this pattern. The expected reduction in public investment will increase the burden of isolation of the more northerly and westerly settlements, and private investment is likely to be concentrated in the more favourable east-coast areas around Inverness and Aberdeen.

The growth of Aberdeen is likely to level off, resulting from the general contraction of the oil industry. It will retain its role as the primary urban centre in the region; but the great distances and remoteness of many settlements will mean that its influence is less than it would be in a more compact, densely populated region. The smaller district centres (such as Thurso, Wick, Fort Wil-

liam and Ullapool) will perform a commensurately more important function as service centres to settlements in their immediate hinterlands.

The base scenario core-corona-periphery metastructure

The concept

To address generation of the base scenario and consideration of possible variations, we formulated a conceptual framework with two specific objectives in mind:

- to provide methodological rigour to the base scenario generation process;
- to give an overall spatial context, wider than that of the study area, within which to place the analysis of natural regions.

The starting point for this thinking was the practical relationship between areas at the economic heartland of Europe and the more remote areas. How do the remote areas interact with the heartland? What is the spatial dimension to this relationship? Is it a continuum, or are there identifiable steps between the heartland and the remote areas? What will be the impact of this relationship on future spatial development?

The four individual country analyses carried out in the early phases of the study highlighted the importance of the relationship between the study-area regions and the undefined 'centre' of Europe, the heartland, both in terms of physical and economic links. The view emerged that an important factor for successful spatial integration is – and will become increasingly important in the future, with the creation of the single European market and the enlargement of the community – the ability of northern seaboard regions to tap into the heartland regions.

In deliberating on these ideas, it became evident the concept would benefit from a simple refinement, in the recognition that some regions could tap into the heartland much more easily than others. There was a strong case for drawing the distinction, since it was likely to have a significant effect on assessment of development potential and, hence, the resulting spatial form.

This led to the definition of a metastructure containing three elements – core, corona and periphery. Map 7.1 illustrates the metastructure superimposed on the map of Europe.

The core represents the traditional industrial and commercial heartland of Europe and stretches from south-east England to north-east Italy, encompassing the Randstad, the Ruhr, Belgium and north-east France. It contains the major cities of London, Paris, Brussels, Amsterdam, Rotterdam, Munich and Milan.

The corona is the surrounding area which has strong functional links with the core; it is able to participate in its economic activities and in its potential for wealth creation; it is strongly influenced by developments within the core.

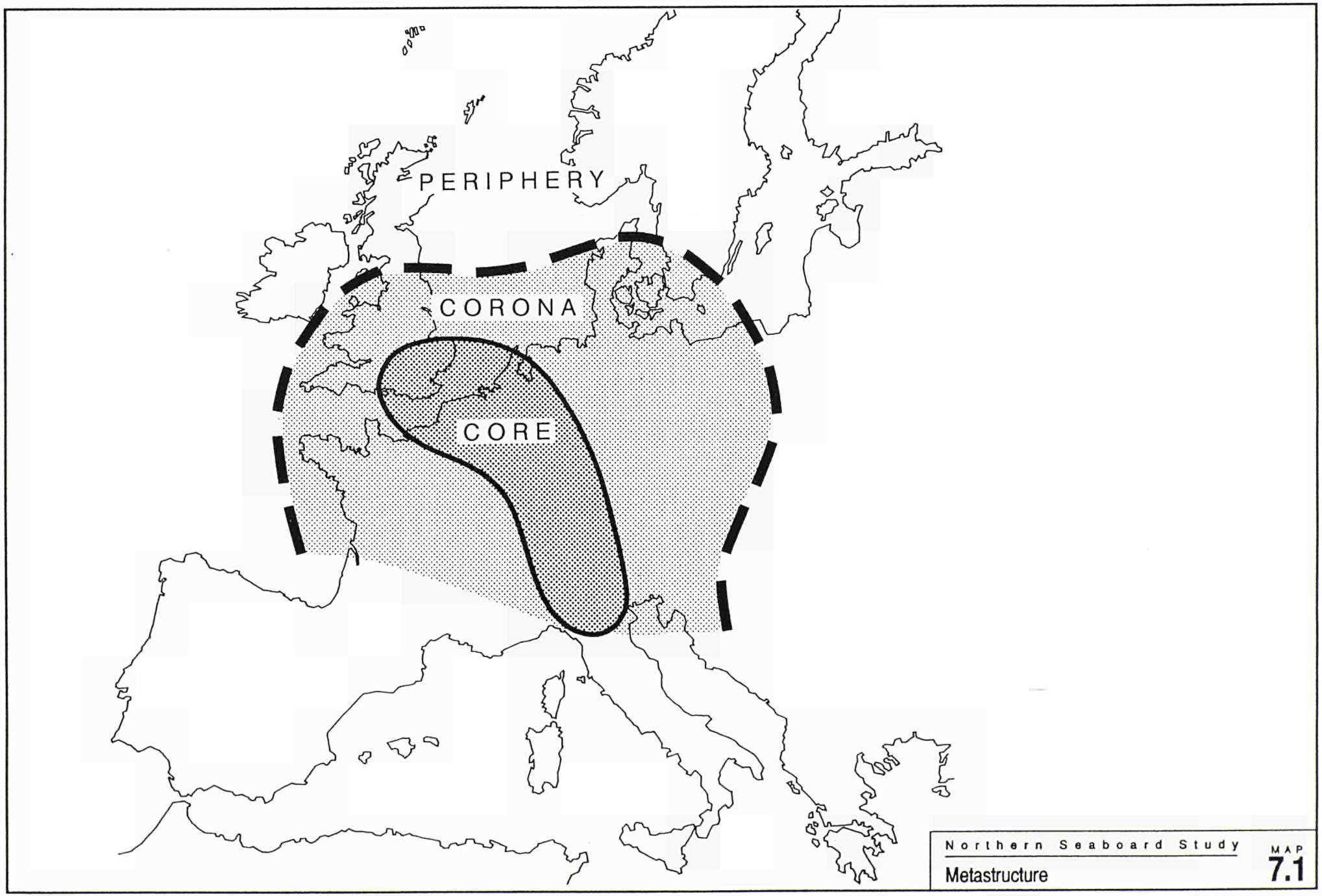
The periphery is the area beyond the corona, the boundary between the two being the point at which distance or ease of access becomes a key factor in determining the area's ability to participate in core-area activities.

This concept has empirical validity in the sense that it describes in very simple terms the observed development pattern, and provides a useful framework for considering the relationship of northern seaboard region to the rest of Europe and possible future inflexions to the spatial development pattern.

However, the metastructure concept has its limitations. It is not an end in itself; merely a stepping-stone towards an understanding of the forces which will shape and determine the spatial structure of the northern seaboard region.

We have given no indicators to define precise boundaries in the core-corona-periphery; nor have we examined the detailed dynamics of the metastructure. The map does not pretend to show precise planning boundaries; they are notional lines, drawn to illustrate the conceptual elements. They do not delimit specific geographical areas, but identify broad zones which have a different functional relationship with each other. The map does not pretend to offer an accurate definition of the core.

The three zones do not represent common levels of development: the core does not necessarily equate with prosperity, nor the periphery with poverty. Having said that, there is a clear assumption that the core is, as a whole, more prosperous than the periphery – this is implicit in the notion of the heartland. But there are pockets of poverty in the core; and, similarly, areas of poverty in the periphery. There is no suggestion that Scotland, let alone Norway or Sweden, is impoverished.



Northern Seaboard Study

Metastructure

MAP 7.1

The purpose of defining the metastructure is not to define precise geographical areas. The concept is useful because of its flexibility and its illustrative power. It gives a helpful framework on which to hang visions of the future and policy options. There are a number of ways to alter the metastructure and thus generate different spatial development futures. These are:

- to relocate the core without changing the position of the corona and periphery;
- to relocate the core and the corona and/or periphery;
- to modify the strength of influence of the axes on the surrounding areas;
- to modify the direction and/or location of the axes.

The base scenario metastructure

Map 7.2 shows the core-corona-periphery metastructure for the base scenario of the northern seaboard region. Its characteristics are derived from the sectoral and regional analyses of the previous chapters.

The most powerful element influencing the pattern of development over the next decade will be the emerging Rotterdam-Berlin axis, which touches the southern fringes of the study area. The strength of this axis lies in the two major growth poles which lie at either end: Rotterdam, the premier port in Europe and the international heart of the Randstad, an established and thriving industrial, commercial and financial centre; and Berlin, capital city of the unified German State, ready to resume its position as the gateway to north-eastern Europe.

This axis is already manifest in the form of actual and proposed infrastructure development projects in Germany and the Netherlands, which define a major east-west corridor, and in the development pressures building up at key points along its route, notably at Enschede/Hengelo on the Dutch/German border, and in the Hannover region, located at the critical junction of east-west and north-south transport routes, and on the former border between east and west Germany.

There is an inevitable element of speculation in this scenario. The German Government has stated its intention to restore Berlin as the capital of the unified State. Nevertheless, there will have to be significant investment in the city of Berlin itself and in transport links to forge connections with regions to the west for the scenario to be realized. The statement of intent, coupled with showpiece urban development schemes, will not be sufficient in themselves to ensure the emergence of the axis as a major factor in trans-national spatial development.

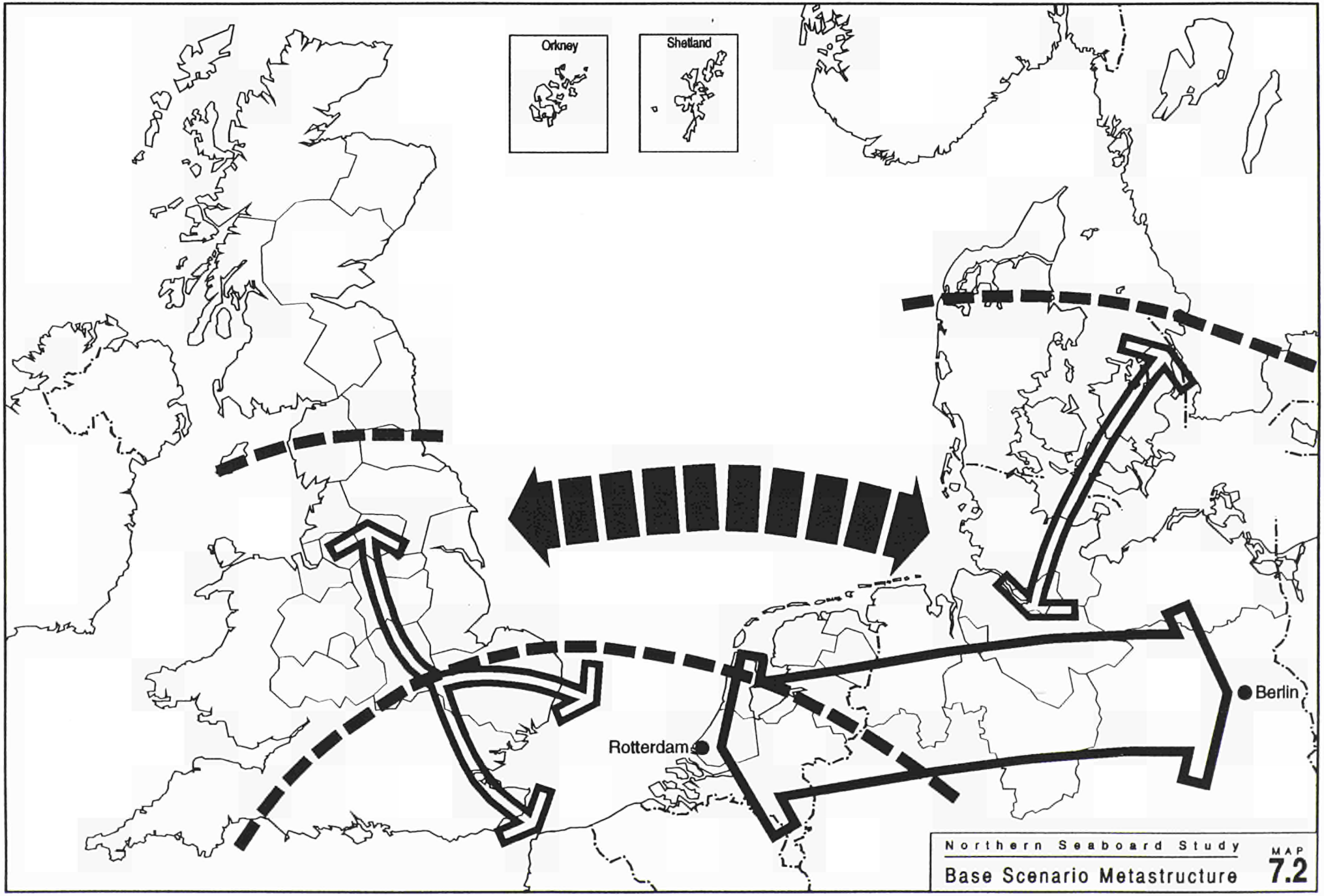
It is worth noting that, following presentation of this scenario at meetings connected with the study, some reservations have been expressed about the likelihood of the axis emerging within the time horizon of the study, whilst not denying that it remains a valid long-term vision.

Two subsidiary axes are identified: one runs north/north-east through Hamburg, up through north-west Germany and Denmark to Copenhagen and beyond; the other runs from the Channel ports of south-east England, north-east to the industrial heartland of England in the West Midlands, with a spur branching in from the haven ports on the east coast, opposite Rotterdam.

At some point along these subaxes peripherality starts to become an issue. There is a need to try to define where periphery starts and what it means in practical terms. At the conceptual level, a clear problem is the axis 'leading nowhere'. An instinctive view suggests that peripherality will be less of an issue in Denmark, with Sweden and Norway beyond, than in Scotland which can form socioeconomic linkages only to the south.

Maritime links across the North Sea are shown by a broken line. The variety and complexity of shipping links across the North Sea, described in Chapter 3, defy any simple representation which will convey the true pattern. The regular ferry services operating between east-coast UK ports south of the Tees and the near Continental ports (principally Rotterdam) reinforce the notion of the North Sea as a bridge between the UK and the Continent. But further north, the variety of destinations and irregularity of service present the North Sea as more of a barrier. This difference between north and south is reinforced by the practice of moving freight by road from northern regions to English east-coast ports offering regular scheduled ferry services to the near Continent.

In a broader environmental sense, the North Sea is the matrix of the study area; it is the single element which binds together the disparate coastal/hinterlands regions which are given the name northern seaboard. The expanse of water is much more important than simply a maritime highway. It covers about 80% of the surface of the study area and contains resources (notably oil/gas and fisheries) which are crucial; to the economic health of many of the terrestrial regions, in terms of both supporting dependent economies (fishing towns, energy landfall stations, industrial suppliers, etc.) and, in the


Orkney
Shetland
Rotterdam
Berlin
Northern Seaboard Study
Base Scenario Metastructure
MAP
7.2

wider sense, serving consumers throughout the study area and beyond.

The relationship between the North Sea and the terrestrial seaboard is discussed further in Chapter 9.

Pattern of development potential

Map 7.3 shows the broad pattern of development which is expected to follow from the base scenario metastructure. It moves from the diagrammatic (in Map 7.2) towards the thematic – yet it is clearly impressionistic and is not intended to be read as a land use plan. The idea of this map is in effect to pose the question: what will the future northern seaboard look like from a satellite?

The map locates primary and secondary urban centres and defines the corridor of development which they will support, consistent with the general view that urban centres will continue to act as the main generators of growth and agents for change.

The Rotterdam-Berlin axis is clearly visible, linking a string of important urban centres: Utrecht, Nijmegen, Arnhem, Enschede/Hengelo, Osnabruck, Hannover and the cluster of towns in Braunschweig and, finally, Berlin. The corridor based on the Nordic axis incorporates the urban centres of Bremen, Hamburg, the Baltic ports of Lübeck and Kiel, Odense, Aarhus and, finally, Copenhagen.

The British corridor effectively merges into the South-East region of the UK, reflecting the dominance of Greater London on the pattern of development in the South-Eastern quadrant of the UK. The links are illustrated by the arrows. The influence of the haven ports (Felixstowe, Harwich and Ipswich) on the east coast, offering alternative maritime links to the Continent avoiding the congestion of the South-East, pulls the corridor boundary slightly north to include Cambridge. Continuing north, the corridor encompasses the three main conurbations (West Midlands, Greater Manchester and West Yorkshire) and the three secondary conurbations (East Midlands, South Yorkshire and Merseyside).

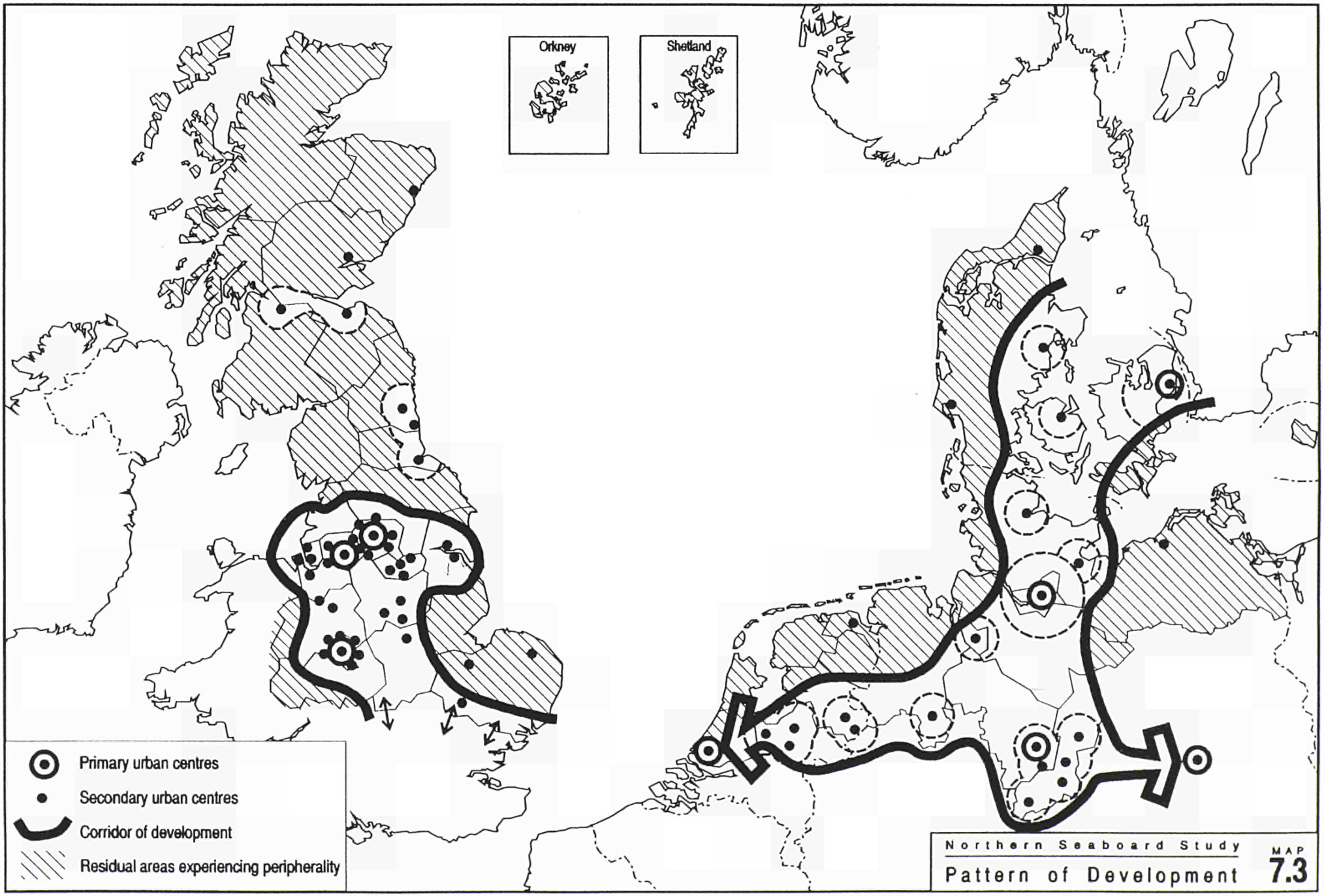
The British corridor finishes at the trans-Pennine natural region, highlighting the relative isolation of areas of population concentration to the north. This is a reflection of the notion of the axis 'leading nowhere', and is in sharp contrast to the open-ended Danish corridor, which reflects the development potential offered by the Nordic countries further north.

The residual areas, shown in a hatched line, will have to deal with the issue of peripherality and will face problems tapping into the growth in the development corridors. The scale and nature of the problems will vary according to distance from the core and the socioeconomic structure of each region/subregion.

The urban centres outside the development corridors, some illustrated with hinterlands representing clusters of proximate towns or mini-conurbations, offer the potential seeds for economic regeneration; but they will have to overcome the structural problems of disadvantageous location and, in some cases, a weak socioeconomic base in order to realize that potential.

Viewed at this level, the trend base scenario will not result in any dramatic change to the overall spatial system of the northern seaboard. The main structure, represented by urban nodes and transport links, is in place. The few major development projects which are expected to be implemented during the next decade or so are relatively minor in terms of the structure of the northern seaboard as a whole.

Elements such as the Great Belt and Oeresund fixed links (as well as the Channel Tunnel, which is outside the study area) will have a significant local and subregional impact. But they will not result in any transformation of the metastructure. Indeed, it is implicit in the notion of a trend-based scenario that it will tend to reinforce the existing spatial pattern rather than to create a different, modified pattern.


Orkney
Shetland
Primary urban centres
Secondary urban centres
Corridor of development
Residual areas experiencing peripherality
Northern Seaboard Study
Pattern of Development
MAP
7.3

Part III – Alternative development scenarios

Our base scenario represents our considered view of the most likely outcome of development over the next 10 years or so. While of interest in its own right its purpose is to act as a point of reference for alternative development scenarios. Comparison of the scenarios will provide the Commission with a basis for recommendations intended to inform and enhance regional policies, promote better balanced regional development and encourage a more internationally-minded approach to regional and strategic planning.

The methodology for this last phase was developed during several internal workshops and discussions with DG XVI. The discussion centred on the practicality of generating a series of discrete alternatives 'scenario A emphasis X, scenario B emphasis Y...', etc. The difficulty with such an approach is the presumption that the broad scope of the study, the generalized level of detail and the relatively short time scale would allow the identification of comprehensive scenarios which are in the realm of probability. The Commission has asked that we concentrate on alternatives within the limits of 'reasonable' probability.

It was agreed that we should focus on a thematic analysis: an examination of the possibility/probability and implications of deviation away from the base scenario for a number of themes or elements of spatial development. This involved an investigation of the possible extent of deviation away from the base scenario; a review of the spatial implications of such deviations; and an analysis of the scope for mitigation of negative prospects and promotion of positive prospects.

Chapter 8 contains the results of the analysis for each of the themes selected. In selecting our themes our main consideration was their relevance to spatial planning, particularly at a regional scale. The themes are: the resources of the North Sea, the environment, maritime transport, land transport, rural land use change, economic growth.

Chapter 9 presents a supraregional synthesis. The first section pulls together the spatial implications of our analysis and examines the study area as an integrated spatial unit focused on the binding common factor, the North Sea itself. This approach enables us to consider a number of policy issues common to regions throughout the study area. The second section of Chapter 9 presents a supraregional synthesis in the form of variations of the core-corona-periphery metastructure presented in Chapter 4. Moving away from the base scenario we outline alternative 'visions' of the study area for, say, the first decade of the next millennium.

Chapter 10 contains our concluding remarks.

Chapter 8: Thematic analysis

Introduction

The following themes are analysed in this chapter:

- the resources of the North Sea;
- the environment;
- maritime transport;
- land transport;
- rural land-use change;
- economic growth.

Each theme is discussed under three headings:

- variations from the base scenario;
- policy options;
- spatial implications.

The resources of the North Sea

The use of the resources of the North Sea is of great importance to the economies of the study area, mainly in terms of fishing and the extraction of oil and gas. The North Sea constitutes the basis for an extensive tourist industry while the coastline also comprises an important recreational zone. The North Sea is a busy maritime route. Both the marine and coastal environments offer important wildlife habitats. These resources are under pressure; overexploitation (fisheries, tourism) and conflicts between different uses of the North Sea (oil, fisheries and maritime transport; tourism and wildlife conservation) threaten the very basis of the region's future prosperity.

Fishing and fish processing

Variations from the base scenario

The critical state of the fish stocks in the North Sea is generally recognized. Furthermore, it is a general perception that the present level of TACs (total allowable catches) and quotas must be further reduced in order to allow fish stocks to recover. Therefore, landings may decline further than anticipated in the base scenario, if quotas are further reduced, or if the availability of fish stocks becomes reduced to an extent which implies that quotas cannot even be caught.

However, overfishing is not the only cause for the present critical state of fish stocks. The living conditions for flora and fauna are also estimated to be substantially affected by environmental conditions (decompositions from the air, discharges from land-based activities, oil-spills and the dumping of waste), maritime transport and other sea-based activities such as oil extraction.

Furthermore, prices may have reached their maximum, partly because of the increase in low-price fish imports. Any further increase in prices may encourage consumers to move towards other products such as meat. High prices also encourage fish-processing plants to seek to reduce the cost of their raw material in order to remain competitive, for example to use Alaskan pollack instead of cod.

In brief, the level of catches may decline further than the base scenario indicates, and prices are likely to have stabilized – or maybe even declined. In this event earnings of the fishing fleet would be further reduced, which

will cause additional vessels to cease fishing. Fishing capacity may thus be reduced further than the base scenario indicated, and the number of fishermen becoming correspondingly lower.

The processing industry may experience environmental requirements which are stricter than those anticipated in the base scenario. This is likely to affect competitiveness most within the fish-meal industry: this industry is subject to severe pressure: declining world market prices, increased environmental controls and the current discussions of the impact of fisheries upon the biological balance.

The industrial fisheries sector is currently subject to very few regulations. If this is changed – for example if binding EC quotas are introduced – this will negatively affect the industrial fishing fleets and the fish-meal plants.

Policy options

To the extent that the trend of declining earnings and reduced fishing opportunities prevails, the necessity of measures to support communities dependent on fishing will become more urgent. Such measures might include actions to support the process of reconversion to other industries in fishing-dependent areas, to speed up the necessary adjustments in the fishing fleet and to counteract the negative socioeconomic impact upon the areas in question in terms of unemployment, declining incomes, emigration, etc.

The development of the fish-processing industry depends on supplies of raw material (including fish) and on the raw material price. The direction and the magnitude of these parameters are heavily dependent on trade policies of the Member States, and in particular on the attitude towards cheap fish imports from outside the EC and on the extent to which it is decided to protect EC fishermen from competition from third country supplies.

Although anti-dumping initiatives are likely to be introduced, the most probable outcome is that the EC fishing fleet will only be partly protected from third country imports. Besides there is a clear conflict of interest between the fishing industry and the fish-processing industry, as the latter benefits from cheap imports.

As explained, the state of the fish stocks is critical, and therefore further regulations and reductions in quotas may be envisaged such as measures to reduce the incentives to the throwing overboard of by-catches and undersized fish.

Spatial implications

The rapid decline in the fishing industry postulated in this alternative scenario will have the most devastating effects on the west and north coast of Jutland in Denmark, where fishing and fish processing form the cornerstones of the economy. The outcome of decisions on the control of imports of fish from outside the Community for processing, and environmental controls on processing, will have a particularly significant impact here.

The absolute numbers of jobs lost are however likely to be greatest in the UK, in east-coast fishing ports such as Peterhead, Fraserburgh, Bridlington, Whitby, Grimsby.

In the Netherlands, the impact will be much smaller in scale and more localized, but nevertheless the viability of fishing communities such as Harlingen and Lauwersoog will be seriously threatened.

Oil and gas

Variations from the base scenario

The base scenario has assumed increased extraction of gas and oil until the mid-1990s, after which it will decline. Significant variations from the base scenario are considered unlikely. However, two intertwined variations may be envisaged:

(i) The rate of extraction of oil and gas may be reduced due to factors such as increased environmental control and initiatives to limit or slow the depletion of non-renewable resources (supply side).
(ii) The level and the structure of demand may change (demand side).

For example, demand for natural gas may be reduced if tough action is taken by the competition authorities, including the Commission, to tackle existing industrial and ownership structures which may be deemed to distort competition. The situation in Denmark provides an illustration. The Danish Government currently fixes the price of gas at a level equal to the price of oil. The EC however has criticized this policy on the grounds of its distorting effects on competition. If this right of the Danish State is repealed and the price of gas rises to free-market levels, the rate of increase in the extraction of gas may be lower than anticipated in the base scenario. However, the period until the possible change in demand takes its full effect may be longer than the perspective applied in these scenarios.

Policy options

An alternative energy policy which stresses the use of renewable resources (wind and tidal power) and of resources which are less scarce than oil and gas (coal) would have significant implications for some parts of the study region:

(i) There would be important environmental implications for the largely coastal areas suitable for the development of renewable resources, with possible conflicts with tourism development and wildlife conservation. These conflicts would require careful management.
(ii) The coalmining areas of the UK at present threatened with severe loss of employment would be given a (more) assured future.

Spatial implications

Any reduction in the rate of extraction of oil and gas would have some negative impact on the ports which service the oil and gas fields, notably along the east coast of England and Scotland, and the onshore Groningen field in the Netherlands. Some of these areas (notably the Shetlands and Aberdeen) have become highly dependent on the oil industry and will be badly affected when the oil eventually runs out. However it seems unlikely that in the time horizon of this study any such impact would be significant.

A decision to conserve gas resources by restricting further development of gas-fired power stations would affect the same areas; again the employment implications are unlikely to be significant since this is a capital-intensive industry.

The potential for wind power lies mainly along the west coast in the UK, and the North Sea coasts of Denmark, Germany and the Netherlands.

The major spatial impact of a shift in energy use away from oil and gas would be felt in the UK coalfields, which in the base scenario will face devastating job losses which will leave many communities with no economic base.

Tourism and recreation

Variations from the base scenario

Our base scenario for the next decade features a likely increase in tourism, in particular along the coastline. Tourism policies aim at extending the season in order to reduce the pressure on coastal areas. Efforts are devoted to improving accommodation and indoor facilities together with the promotion of inland attractions.

The base scenario anticipated that the efforts aimed at extending the tourist season would to some extent succeed. If however, it proves to be more difficult than assumed to change the preferences of tourists, further pressure would be put on coastal areas because of the construction of holiday centres and hotels near the coast.

In parts of the study area there are already laws regulating – and even banning – foreign purchases of summer residences. Denmark for example, maintains a ban against foreign purchase of summer houses and weekend cottages, and has been awarded the right to sustain this ban by the EC. If such legislation were however to be repealed, the ownership structure might change, because in particular Germans and inhabitants of Norway and Sweden might take over some of the summer residences.

A high quality of bathing-water is a parameter of utmost importance to the future prospects of the tourist industry. It is to be expected that efforts will still be devoted to maintaining and improving the existing quality of bathing-water. Increased pressure for improving the quality of bathing-water may be put on the 'dirtiest' coastlines of the northern seaboard.

In brief, pressures on coastal areas may well become higher than assumed in our base scenario. These additional pressures may lead not only to ecological problems, but also to social tensions. These social tensions may be caused by a hostile reaction of local residents to phenomena often linked to the development of tourist activities, such as the purchase of summer houses by foreigners.

Policy options

As explained elsewhere in this report, the decline of the fishing industry and of many small ports and the unfavourable prospects for agriculture in many areas mean that many coastal areas badly need an economic reconversion. The development of tourism is often quoted as a major element of the solution. However, tourism is at the same time likely to dramatically increase the pressures on these fragile coastal ecosystems. Environmental concerns need to be balanced against economic ones.

One possible strategy would be a zoning plan designating certain areas for the development of intensive tourism, whereas others would be given stringent protection. Existing long-term plans for increasing the scale and quality of recreational facilities and for developing inland and urban attractions may need to be speeded up.

Another and complementary strategy is to move upmarket, in an attempt to generate as much income as possible for a given number of tourists. Improving accommodation and other facilities would be a key part of such a strategy. The economic benefits of tourism developments which need extensive uses of land but do not generate significant amounts of revenue (e.g. campsites) would need to be evaluated critically.

In extreme cases physical restrictions on access to fragile areas may be necessary (for instance bans on access by private vehicles and/or daily visit quotas).

The conflict between the development of tourism and protecting the environment will be most keenly felt in the coastal regions of West Jutland, and the islands and mainland bordering the Waddenzee. Here the coastal ecosystem is particularly fragile, yet there are few other employment opportunities and the further development of tourism is thus a priority.

In the UK, while there will continue to be some pressure on the coast, the major conflicts are likely to be felt, as now, in the countryside particularly in upland areas close to major population centres such as the Peak District and the Lake District.

The environment

Underlying much of the discussion elsewhere in the thematic analysis is the conflict between development and the environment. In this section we focus more closely on these conflicts, and on the developmental and spatial implications of more stringent measures to protect the environment.

Variations from the base scenario

It is easy to imagine substantial variations from the base scenario such as a major toughening of environmental controls or increased ecological problems as the targets set are not achieved. We consider that major variations are unlikely. In this section we present a synthesis of the main environmental themes and issues. We use as a starting-point data collected in the Netherlands, and consider the policy implications of each theme, highlighting measures that could be taken in each sector and the spatial implications of such measures.

Policy options

Table 8.1 below summarizes the main environmental threats and the contribution of the different sectors. The

Table 8.1. Contribution of sectors to environmental hazards (%)

	Agriculture	Transport	Industry	Energy	Residential and commercial	Construction	Others
Greenhouse effect	9	11	42	20	14	–	4
Depletion of ozone layer	–	5	40	:	20	20	15
Acidification	36	25	16	11	12	–	–
Eutrophication	69	3	13	1	6	–	8
Pollution with toxic chemicals	25	54	8	3	2	–	8
Solid waste	23	2	6	1	9	13	46
Gross environmental effects	162 (27%)	100 (17%)	125 (21%)	36 (6%)	63 (10%)	33 (6%)	81 (13%)

Source: Haskoning.

data suggests which sectors should be considered as targets to reduce environmental hazards. This table shows that the agricultural sector contributes by far the most to the adverse environmental effects. The last row adds the percentages by sector, and gives in brackets the total percentage contribution of the sector to environmental hazards.

It should be noted that the figures presented in the table are indicative only. They are based on figures for the Netherlands where such are available. We can assume that a similar contribution to the environmental effects is observed in the other countries covered by the study.

This table provides an indication of the sectors which should in theory be targeted in order to reduce environmental hazards. Political and other socioeconomic considerations may alter the priorities.

Variations from the base scenario consist of tightening pressures on specific sectors in order to meet agreed targets, or to improve upon them. It would appear that the agricultural sector, already under much pressure, is likely to be designated as a primary target for tougher controls.

The greenhouse effect, climate change and depletion of the ozone layer

The main 'culprit' for these two forms of environmental hazards is industry, and in particular the chemical industry. The commercial and residential sector and construction should also be given high priority in any policy measures to restrict greenhouse emissions.

Production of CFCs must end in the year 2000 at the latest. The aim is that this branch of industry will have developed alternatives by 1994 for CFCs in propellants, cleansing-agents and coolants. The chemical industry will also have to develop methods for the recovery of ozone-depleting substances. The use of CFCs in propellants can, with a few exceptions, be ended in 1993. The ban on the use and production of CFCs is thus well under way. The timing of the ban is of importance for the sector.

National and/or international authorities may decide to set more demanding targets and deadlines. Tougher measures would then be taken in the areas such as:

- agriculture: reforestation and energy savings (greenhouse horticulture);
- transport: limitations on car use;
- energy: technological modifications;
- building: energy efficiency.

Acidification and eutrophication

Agriculture is the main contributor to the emission of acidifying substances – SO_2 and NO_x – causing acidification, and of phosphates and nitrogen, causing eutrophication. The commercial and residential and construction sectors should also be given high priority in measures to reduce emissions.

The cornerstones of the policy towards agriculture are:

- to reduce the emission of acidifying substances – in particular ammonia;
- to achieve balanced fertilization, i.e. use of chemicals as benign as possible, to reduce the presence of phosphates and nitrogens.

It is possible to envisage that much tougher measures are implemented such as:

- restrictions on the number and operation of livestock farms;
- total bans on the use of fertilizers in sensitive areas.

Toxic and hazardous substances

Agriculture is the major contributor to pesticide emissions. The transport sector produces the largest share (more than 85% in the Netherlands) of benzene emissions. These are thus two priority targets.

As for the other forms of pollution, a host of measures are being implemented or drawn up. Authorities try to strike a delicate balance between ecological objectives and socioeconomic realities, such as powerful lobbying.

Tougher measures, more controls and earlier bans are possible. They are however, as for the other forms of pollution control, not all considered realistic within the timescale of this study given the powerful interests involved and the apparent lack of political will. Examples are: drastic reductions in heavy metals in animal fodder, in the use of pesticides, in the emissions of cadmium, benzene and copper (chemical industry), in the emissions of benzene (transport) and in the use of solvents in paints and of PVC in packaging material; the imposition of a ban on asbestos in braking materials and in buildings and/or of some pesticides.

Disposal of solid waste

The highest contribution to the problem of solid waste is made by the category 'others' which includes industrial,

office and shop waste, i.e. it includes a large part of the sectors 'industry' and 'commercial and residential'. Agriculture comes second, with about 25% of the total.

Trends identified may be amplified and accelerated. These include stricter emission guidelines for incinerators, tough control of dump sites, more clean-up of contaminated land, an increase in the number of liability suits against polluters as the principle 'the polluter pays' receives more emphasis.

Threats to the terrestrial environment

The discussion above has largely focused on the aquatic and atmospheric environment. Earlier in this report we identified a wide range of threats to the terrestrial environment. These arise on the one hand from urban and industrial change, and on the other from changes in agriculture.

If a significant improvement is to be achieved in the environment of the study area much greater effort will need to be devoted to resolving these problems. The measures required are well understood. What is needed is the political will and resources to implement them, implying a major shift in values and priorities.

Realistic measures to resolve the problems of urban and industrial change would include:

- much more stringent controls on new development in sensitive rural areas;
- increased resources applied to resolving the problems of urban decay and industrial dereliction.

Measures to counter the threats to the rural landscape are discussed in detail below.

Spatial implications

Most aspects of environmental protection are not location-specific, and it is difficult to single out areas which will be particularly affected. However, certain sectoral policies will impact more on some areas than on others.

Requirements on industry to reduce pollution levels will impose a burden particularly on areas of older heavy industry in the UK. At the same time the need for new less-polluting technology provides a market opportunity; industries in countries which are quick to impose stricter controls will have a head start.

Problems of the disposal of solid waste and domestic and industrial effluent are particularly acute in the UK, with its large urban agglomerations and densely settled countryside. An immediate problem will be finding alternatives to the dumping of sewage sludge at sea (which is planned to cease by 1998).

Turning to controls on agriculture, further limitations on the use of nitrogenous fertilizers will particularly affect the areas of intensive arable farming in the rural east of England, the east of Jutland and the northern region of the Netherlands. Limitations on livestock farming will particularly affect areas of intensive cattle and pig production such as the west and north of Jutland, Overijssel, Friesland and South Holland.

Limitations on car use fall into two categories:

- location-specific ones, such as road pricing; these are likely to be introduced first in the study area's major metropolitan areas; this seems unlikely in the time horizon of this study;
- general ones such as a carbon tax; these could have a significant impact on sparsely populated rural areas such as the Highlands and Islands of Scotland which are highly dependent on the use of private road transport.

Maritime transport

There appears to be a substantial opportunity to make greater use of the North Sea as a freight highway in the unit load field. The EC combined transport principles would assist in developing such an approach. There is also a case for investing or intervening in the ports sector to reduce cargo handling rates. Direct intervention in shipping itself is less attractive. Shipping itself is highly competitive and efficient, and direct subsidy of services would badly distort markets which currently operate very efficiently.

Variations from the base scenario

The earlier stages of the study included an analysis of broad levels of cargo traffic. In this section we consider maritime transport from another important perspective: does the North Sea itself constitute a maritime resource which is not being fully exploited?

In order to address this question, we need to consider the following issues:

- What flows of traffic exist within or around the North Sea basin?

- Do these flows currently make a substantial use of the maritime mode?
- Would a greater use of the sea mode reduce transport resource costs?
- What factors inhibit the use of maritime transport?

Existing trade flows

For the purposes of this analysis, we distinguish between trade flows in two ways: cargo which is passing within the North Sea basin area – including here the study area, Belgium and Norway – and trade with other areas, and cargo which is unitized or carried in shipload quantities. We also distinguish between 'non-liner' bulk cargoes (generally in shiploads) and 'liner cargoes'.

Non-liner traffic

The great majority of the traffic of non-liner shipload cargoes between the North Sea basin and other areas uses local ports, either directly – e.g. iron ore from Australia to Teesport – or through transhipment, such as coal from South Africa to Scotland via Rotterdam. The value of transhipment is that it allows the economies of large ships to be exploited over the longer voyage and minimizes the tonnage which an individual company needs to receive at a given time, i.e. it reduces inventory costs.

The market of shipload cargoes within the North Sea basin uses much smaller ships, some of less than 1000 tonnes deadweight. Transhipment is rarely an issue. The great majority of cargo generators are now located at, or close to, ports or inland waterways. Relatively little cargo uses road transport. Where cargo is not bound for a port location, receivers generally choose to use a nearby port.

Where cargoes have a relatively low value, then inventory costs are not a serious constraint; a receiver will be able to take 2 000 or 3 000 tonnes of product every few weeks and store the cargo at a quayside location.

Liner traffic

Liner (generally unitized) traffic is organized on an entirely different basis. Utilization has reduced the effective consignment to the maximum load which a road vehicle can carry. On average, a container or trailer will carry some 13.5 tonnes in the liner trades, and trade imbalances may lead to about 20% of units moving empty. As a rule of thumb, one can therefore anticipate approximately 11 tonnes of cargo per unit.

In the exceptional case where a deep sea liner service operates from a single hub port (e.g. Antwerp), then containers will usually be moved from local ports such as Grangemouth or Oslo on 'all water' services in an approach similar to that for bulk cargoes. However, deep-sea container traffic is generally carried by vessels which collect cargo around the North Sea basin from several major ports (e.g. Felixstowe, Hamburg, Rotterdam) on the same voyage, and then sail to, say, North America or the Far East. In that case, containers will normally be moved overland to the deep-water port, by either road or rail.

Liner traffic volumes within the North Sea basin exceed those moving in and out of the basin. It is this group of traffic which offers the greatest opportunity to divert traffic towards the maritime mode.

Existing use of the maritime mode

We have argued above that bulk cargoes generally make the maximum use of the maritime mode. We therefore concentrate on liner cargoes.

In so far as deep-sea traffic is concerned, the primary weakness of existing transport systems is the shift of deep-sea container ships away from the regional ports which used to serve conventional liners towards eight or nine major ports serving the whole of north-west Europe. The result is that cargo moves over long distances overland between, for example, Scotland and Felixstowe or even northern Italy and Rotterdam. A relatively high proportion of these long distance movements are by rail, but nevertheless it does lead to excessive use of the road haulage mode. In the UK, this pattern has led to deep-sea services abandoning the west-coast ports.

There are larger volumes of traffic moving within the North Sea area. This traffic is concentrated on a handful of short maritime crossings, such as between Sweden, Denmark and Germany and across the Dover Straits. For trade to and from the UK, or between Sweden and Medway and the EC countries, the maritime distance is often minimized, despite the low costs of sea transport. For trade within the UK or continental land mass, opportunities to use the maritime mode are spurned in favour of long distance road haulage.

The results of a survey in the UK in 1991 show that a substantial proportion of northern cargo used southern ports, and some southern cargo used northern ports. A very large proportion of Scottish traffic used English ports.

The most straightforward lesson must be that for some reason, the services on offer at the local ports did not satisfy user requirements. This could be an issue of route (no suitable service), frequency, price or vessel type (no roll-on roll-off service from Scotland).

Resource costs

The argument for using the shorter ferry or container services will not be based on cost. The sea mode is far cheaper than road haulage and normally lower than rail.

A comparison of the costs of moving freight over different distances by different modes shows clearly that costs are minimized by maximizing the length of the maritime leg, if a maritime leg is essential. This is however not reflected in actual observed behaviour.

Resource costs are clearly minimized by using local services. Transport contractors, however, appear to have other objectives.

The case for shipping is much weaker when we consider 'coastal' shipping, where the ship has to contend (like rail) with a collection and distribution charge. Shipping is probably not competitive against rail for a journey such as that from Glasgow to London, unless the ship is considerably larger than the typical vessel or the railway system inefficient. Alternatively, if the railway system cannot handle piggyback trailers, then there may be a case for roll-on roll-off shipping if transport contractors prefer to use trailers.

Small container ships are relatively slow. Even so, roll-on roll-off vessels are actually able to accomplish longer distances per 24 hours than a truck. Fast vessels are now being designed which would have the advantage of offering a next day delivery. However, an efficient rail service would still offer a much lower unit cost.

The principal opportunity in the maritime field is therefore to lengthen the passage of existing ferries. To increase the time spent on board the ship has a relatively small impact on time taken; to use a service which substitutes (say) 300 km of sea for 300 km of road will probably add only five hours to a journey which would at best involve delivery the next day.

Ship operators have demonstrated that it is possible to design schedules which will suit hauliers' logistics. For example, North Sea Ferries will be introducing new ships onto the Humber-Rotterdam route to sail in the late evening to delivery anywhere in the Low Countries before noon the next day. This will be done without the need to drive long distances to use the short crossings. However, this is relatively unusual, and we examine why below.

Factors inhibiting the use of maritime transport

We have argued above that transport contractors apparently behave 'irrationally': why should companies choose a more expensive way of transporting goods if only a few hours can be saved?

However, that would be to presume that the shipping and road haulage industry operates independently. It does not. The very considerable economies of scale of operating a larger ship; indeed, the risk of not achieving a high load factor, dictate otherwise.

Briefly, the industry operates in one of two ways. Several of the larger door-to-door operators charter their own ships, and may also operate exclusive port terminals. This allows them to optimize their own operations and to achieve high load factors. However, given that no company in the UK-Low Countries ferry market controls more than about 5% of the market, it is impossible for a single company to operate from every port. In order to operate an economic size of ship, it will probably operate from no more than two ports in the UK, and probably one on the Continent.

The majority of roll-on roll-off traffic moves, however, on a non-integrated basis. This would appear to offer the opportunity to use the nearest service. However, the market does not operate in that fashion. Instead, the ferry operators seek to stabilize their load factors by offering road hauliers incentive arrangements which encourage loyalty to a given ferry service. This is achieved by offering a tariff with discounts depending on the annual business offered. It follows that the haulier has an incentive to use the same ferry service regardless of origin or destination. In that event, he is encouraged to use the cheapest (i.e. shortest) and fastest (i.e. shortest), which is normally a Dover Straits ferry; the common denominator routeing which tends to maximize road haulage lengths. It is frequently said that the Dover routes also offer the benefit of frequency; a ferry missed is not a disaster as another soon follows. However, the hauliers who patronize once daily services such as those from Humber do not appear to have any difficulty. Indeed, the shorter the road journey to a port, the less the risk of unforeseen delay.

In fact, there is an example on the North Sea in which behaviour is very different and where it would be difficult to improve upon. Over 90% of traffic between Denmark and the UK takes the 'long crossing' approach (i.e. leaves Denmark from a Danish port), and moves on different regional routes to the Tyne, Humber or the haven ports, depending on the UK trip end. This is largely based on the services operated by the shipping company DFDS. That company dominates the market and offers door-to-door services. As a (near) monopolist, it obviously attempts to minimize the total systems cost of transportation. It is noteworthy that the company chooses to operate regional service two or three times per week rather than only a national service with big ships daily. DFDS behaviour does suggest that the optimum approach is to maximize the use of the maritime leg. The challenge is to identify a regime in which that approach can take place in a highly competitive environment.

Policy options – opportunity for longer sea ferry services

Under the appropriate circumstances, the maritime mode offers important attractions. It offers the lowest costs per tonne-kilometre for bulk cargoes. It is the cheapest means of carrying containers, and cheaper than road transport for carrying trailers. A freight ferry can travel further in 24 hours than a lorry driver. Dry cargo shipping has minimal environmental impact.

Generally, market forces dictate that bulk shipping serves local ports. Intermediate storage facilities are often located on the quayside so that cargo can be delivered direct by ship. However, this is not the case for unit load freight (trailers and containers). Market forces have tended to encourage short-sea crossings complemented by long haul road haulage. This is unfortunate from three points of view: it adds to environmental damage; it tends to create heavy congestion by concentrating traffic on a few nodes; it adds to the 'peripherality' of remote regions.

This pattern is a consequence of the commercial relationships which have developed within the shipping and freight industry, and despite the fact that it is cheaper to substitute an extra 100 km by sea for 100 km less by road.

The freight industry is highly competitive. No individual forwarder in the UK-Continental market controls 5% of the overall market. Surveys have identified several thousands of different haulage companies entering the UK in a single week. A significant proportion of the market requires rapid transit times, sometimes overnight, and typically within 36 to 60 hours. There is, therefore, a pressure to provide high frequency shipping services which nevertheless achieve competitive economies of scale.

For 'common-user' ferry operators who target the individual road haulage companies the most straightforward solution is to operate ferries on short crossings which can address the entire UK-Continental market; common-denominator routes which can serve a cargo from London to Düsseldorf and from Scotland to Bordeaux. An even more elegant solution is available if freight vehicles can be carried on car ferries. That adds to the economies of scale and assists in combating seasonality. The ferry operator can share those economies of scale with the haulier by offering him volume discounts. That adds to the haulier's incentive to use the short ferry crossing even when it involves a significant diversion overland.

There are a handful of larger forwarding companies which have the scale to operate or charter their own vessels. Such companies will offer door-to-door services by trailer or container. However, in order to achieve competitive economies of scale, they will restrict the number of routes operated. The result can be similar, companies will prefer to pay for long road haulage legs to add marginal traffic to fill a ship which is already paid for. The result is broadly similar to that of the common-user ferry.

The advantages of scale are restricted to the ship. A port which caters for a short ferry crossing may be able to use a single berth a dozen times a day, as ships shuttle across narrow straits. On longer crossings, ships may make a round trip once in every 24 or 48 hours. In those circumstances, not only will volumes be lower, but market forces will dictate that ships sail at a particular time of day. For example, all the ferries operating from the Humber sail in the early evening to allow cargo collected on one day to sail overnight for delivery the next day to the Continent. While that provides for competitive transit times, it means that a roll-on roll-off berth is used only once per day.

It is important to recognize that the public sector policy-makers may have little influence on these matters. Unlike road or rail networks, shipping does not rely on fixed track provided through the public sector. Shipping operates within the private sector and will optimize according to the individual interests of each company.

Ferry operators cannot be forced to serve routes which may lose them money. The subsidization of a given route would create market distortions which would be alien to Community policies. Indeed, there is now some resistance to public sector intervention (e.g. in the UK) in the ports industry, which is also now expected to operate within a competitive framework.

Nevertheless, policies which are being introduced by DG VII may be able to address the challenge. On the one hand, international road vehicles will be restricted in their maximum allowable speed to 90 km/h by the installation of governors. On the other hand, DG VII has developed the concept of combined transport. This was initially restricted to rail and inland waterways. It has (through Directive 92/106/EEC) been extended to short-sea shipping. Effectively, combined transport is defined as the carriage of goods in containers, swap-bodies or trailers where rail, waterway or shipping is used for a trunk haul of at least 100 km and the length of road haul at either end of the journey is limited to a maximum of 150 km.

This definition would, for example, define traffic from Manchester to Hannover via the Humber and Hamburg ports as combined transport. A routeing via Rotterdam or Felixstowe would exclude it. Similarly, if Scottish traffic was to fall within the definition, it would have to use a port at least as far north as the Tyne.

The key issue, therefore, is whether the commercial incentives are sufficient for operators to wish to fall within the umbrella of combined transport. The principal incentive to date appears to be that of permitting heavier lorry weights within France and Germany. Combined transport traffic is allowed to operate at 44 tonnes gross vehicle weight instead of the normal 40 tonnes. In the UK, there are government proposals to allow 44 tonne vehicle weights for rail-related traffic provided that the vehicles use air suspension and six axles.

However, there are no plans to extend the provision to short-sea shipping. This is unfortunate. The weight incentive is a powerful policy, and in the UK would add 6 tonnes to the cargo a forwarder is to carry. If that incentive was available, it would provide an incentive for hauliers to use a long-distance ferry for the majority of their traffic because of the benefits to the heavy traffic. That would assist in developing the critical mass that leads to a competitive frequency and so creates a virtuous circle.

It is important to recognize that the freight industry will willingly use long distance ferries if they offer adequate levels of service. In the case of the UK-Denmark market, in which one company controls a large proportion of the market, it has been possible to develop direct services from Esbjerg to the Tyne, Humber and the haven ports. Less than 10% of all unit load freight using the short haul ferries cross the southern North Sea. An analysis of the origins and destinations of cargo across the North Sea basin demonstrates that there is sufficient cargo volume to sustain a large number of regional services, providing there is some policy device to unlock the inertia that supports the short crossing services in the Dover Straits. While there are some regional services, they are limited and do not generally offer frequency and transit times which could attract the fast moving end of the market. The virtue of following a long-crossing strategy is that the regions will enjoy their own direct services, reducing the peripherality they suffer from. It may make a considerable difference to the saleability of a region such as Scotland if it has an efficient service from and to the Continent.

Furthermore, once a market for such services is developed, the maritime industries may invest in faster freight ferries. Feasibility studies for services between Sweden and the Netherlands have indicated the practicability of 27 knot (50 km/h) monohull vessels. Such ships would cut transits from Scotland to Rotterdam to 14 to 15 hours, which is significantly quicker than can be achieved by long-distance road haulage.

This analysis does suggest that there is scope to buck the trend and to develop a more environmentally friendly maritime network which can address problems of economic peripherality. The potential is not limited to freight. Long distance ferries can also introduce new passenger markets. Little public sector investment is required. The required port developments needed are modest. Objectives can probably be achieved through offering incentives based on the regulation of road haulage.

The consequences of shifting transport from land to sea for sea traffic must be carefully studied.

Spatial implications

If the EC combined transport policy is effective in encouraging the short-sea shipping industry to make greater use of the maritime mode, this would have the following spatial implications:

- A boost to the ports on the Scottish east coast and the Tyne-Tees and Humber area, at the expense of ports further south.

- Support for Rotterdam and Zeebrugge at the expense of Hamburg and Bremerhaven.

Land transport

Land transport is generally seen as a key factor affecting the spatial structure of development, and in particular a means of overcoming peripherality. It is also a major environmental threat. This section focuses on possible variations from the base scenario as they affect these two elements of spatial planning.

Variations from the base scenario

Realistic variations from the base scenario of land transport infrastructure are mostly related to changes in the timetable of the major infrastructure projects already under way, or proposed. In addition one can envisage that uncertain projects – such as the fixed connection between Germany and Denmark – are accepted and carried out.

The recent trend in transport demand towards higher growth rates of road transport for both passenger and freight traffic than for rail transport will continue as foreseen in the base scenario, unless drastic measures are taken to prevent it. A major change in modal shares is difficult to envisage in spite of measures to increase the competitiveness of rail transport and to discourage the use of road transport for freight and passenger traffic. The latter type of traffic is, however, more price sensitive than freight transport. A host of measures are currently being envisaged and experiments with measures such as road pricing are being carried out.

Policy options

Overcoming peripherality through new infrastructure?

On the basis of existing research on the relation between development of transport infrastructure and economic growth it is our opinion that infrastructure projects in the study area will seldom influence economic development in a region unless complemented by other measures. Infrastructure projects can, however, act as catalysts for other activities which can influence economic growth. We develop this theme in more detail in this section.

It is a widespread hypothesis that infrastructure development has a large impact on economic development in a region: in the short term, so goes the hypothesis, construction works will increase employment and promote economic growth (attracting new companies, opening new markets); in the longer term, local firms will benefit from reductions in transport costs and improved access to raw materials, labour and markets.

This voluntarist hypothesis should be qualified, as infrastructure developments may also have a disruptive effect on the region: as barriers are removed, the intensity of competition is increased. Indeed, the impact of infrastructure development depends on the characteristics of the peripheral region and the extent to which these developments lead to an increase in competitive forces, as improved transport infrastructure will not only benefit local enterprises but also facilitate access by competitors from other regions. Furthermore, competition for raw materials and labour may also be intensified. Infrastructure bottlenecks between regions may have the same function as customs barriers.

There are two areas in which infrastructure has importance for regional development:

- differences in infrastructure quality between regions are important for the composition of the population and the supply of labour;
- the competitive position of enterprises is influenced by wage levels and transport costs.

As far as the latter is concerned, it must be underlined that for most manufactured products total transport costs represent only 5 to 10% of the value of the product, so marginal improvements in transport infrastructure will on average have only a limited impact on the competitiveness of enterprises. Infrastructure developments which improve the regularity of transport may, on the other hand, be very important for a number of enterprises, even though the reduction in average transport costs is very small.

In addition, a better infrastructure will foster new goodwill for the region, as its 'perceived remoteness' is reduced. This may lead to positive changes in the behaviour of regional enterprises – for example the search for new markets – and also attract new investors.

Environmental policy and changes in modal shares

In all four countries of the study area it is the policy of the governments to reduce the environmental impacts from transport in coming years. Modern rail systems with

high utilization rates may be environmentally superior to road haulage today, but the technological development of lorry engines has been accelerating in recent years, and emission levels from lorries and trains 10 years from now are difficult to predict.

Freight transport

We explore below the reasons why a major shift away from road transport to rail (or sea) transport is difficult to envisage.

For freight transport the majority of transports are carried out over short distances and these transports cannot be substituted by rail or sea transport. Modern logistic concepts are based on the idea that stocks should be kept to a minimum and shipments should be small and frequent. These concepts do not necessarily increase the total number of tonne-km performed but they are suited to road transport and they increase the number of total vehicle-km performed by lorries.

In addition, the quality of the transport service offered in terms of short transit times, flexibility and regularity is more important than the transport price for many types of commodities. If rail transport is going to increase its modal share it has to be able to provide efficient door-to-door transport services, as it has to provide a competitive transport service with regard to both price and quality.

The most important measures which can be taken to increase the competitiveness of rail freight transport include:

- to improve the quality of rail transport, especially by improving cooperation between national rail companies;
- to impose more restrictions on road haulage through for example driving bans and the use of 'emissions quotas';
- to increase taxes paid by heavy goods vehicles.

However, it should be kept in mind that the capacity of the existing rail system, at least in some areas, is almost fully utilized today. A major shift from road to rail cannot take place without improving the capacity of the rail system. If for instance 10% of the present road haulage (measured in tonne-km) in the four study countries were assigned to the rail system, rail freight would increase by 40 to 50%. This would require major investments in improving the rail infrastructure.

In a 10 year perspective it is not likely that the volume of road haulage in the study countries can be reduced, but the growth rate of road haulage can be slowed down if strong and appropriate measures are taken to increase the attractiveness of rail transport.

Passenger transport

The volume of passenger transport, especially by car, is very dependent on macroeconomic conditions, the age and income distribution and the cost of transport in the form of energy price and purchase price of cars.

Public transport in cities and between major cities and towns is a means of transport with a low per capita usage of energy, whereas public transport in rural areas often has a high per capita usage of energy, because of a low utilization rate.

Even though the economic recession in northern Europe is severe at present it is not likely that the volume of car traffic will be significantly reduced in coming years, unless drastic actions are taken. Our way of life and settlement pattern, etc. are based on a high level of transport, which cannot be changed within a short span of years.

Measures to reduce or halt the growth of road traffic may include:

- increasing the cost of car transport;
- improving the quality and comfort of public transport.

In order not to threaten car manufacturers, it is of interest to study schemes which discourage the use of the car but not car ownership. Measures aiming at this include

- increases in petrol taxes;
- introduction of road pricing.

A significant shift from car to public transport may have positive impacts on the environment, especially in city and inner-city traffic. A shift of 10% from car traffic to public transport, expressed in passenger-km, will approximately double the volume of public transport in the study-area countries. Such an increase in demand is only possible if very large investments in public transport are made.

Spatial implications

Appraisal of the following projects already under consideration, with a view to possibly bringing them forward, should be considered as a priority:

- the Fehmarn connection between Rödby in Denmark and Puttgarden in Germany;
- upgrading parts of the rail network in Denmark and Germany to feed into the northern axis of the European high-speed network;
- the construction of high-speed rail links and improved road links from Hannover and Hamburg to Berlin, to strengthen the east-west development axis which is developing;
- the rail route Arnhem-Hengelo-Berlin.

Potential rail bottlenecks where investment would be required to handle any significant shift of freight from road include:

- the link between Sweden and Denmark (which will be eased by the Oeresund crossing, but not before the year 2000; although this would benefit Sweden, eastern Denmark and Germany, but the existing ferry ports would be adversely affected); this would need to be coupled with electrification of the line south of Koge;
- the link between the Netherlands and northern Germany, providing access from the German parts of the study area to Rotterdam, and strengthening the east-west development axis;
- lines on the UK side of the Channel Tunnel;
- new freight terminals.

Possible additional road improvements include:

- a coastal highway through Germany from the Danish border to the Dutch frontier, to link up what are at present a series of dead-end roads and so improve the integration of the coastal zone which in our base scenario was identified as an increasingly disadvantaged area;
- an east-coast motorway linking Newcastle and Edinburgh.

Rural land-use change

Changes in rural land use are mainly concerned with the agricultural sector, in particular with the changes to physical and spatial patterns of agricultural activities likely to result from restructuring of the economic base of the sector. There is also a subsidiary issue relating to the management of recreation and leisure activities where these impact on high quality environments, mainly in coastal and upland areas. This theme therefore combines practical issues of agricultural economics and the less tangible issue of landscape quality.

Variations from the base scenario

Changes in agricultural activities will be driven by two factors:

- the pressure to reduce output;
- environmental pressures.

Pressure to reduce output

The main drive will be the predicted fall in market prices for agricultural produce which will put farmers under increasing financial pressure. This will favour the more efficient farmers and place increasing – possibly terminal – pressure on those who are less efficient or who farm in areas with in-built disadvantages (for example poor quality land, distance from markets).

In terms of land use, the reduction in output will be manifested in two ways:

- lower intensity of production;
- reduced land area in agricultural use.

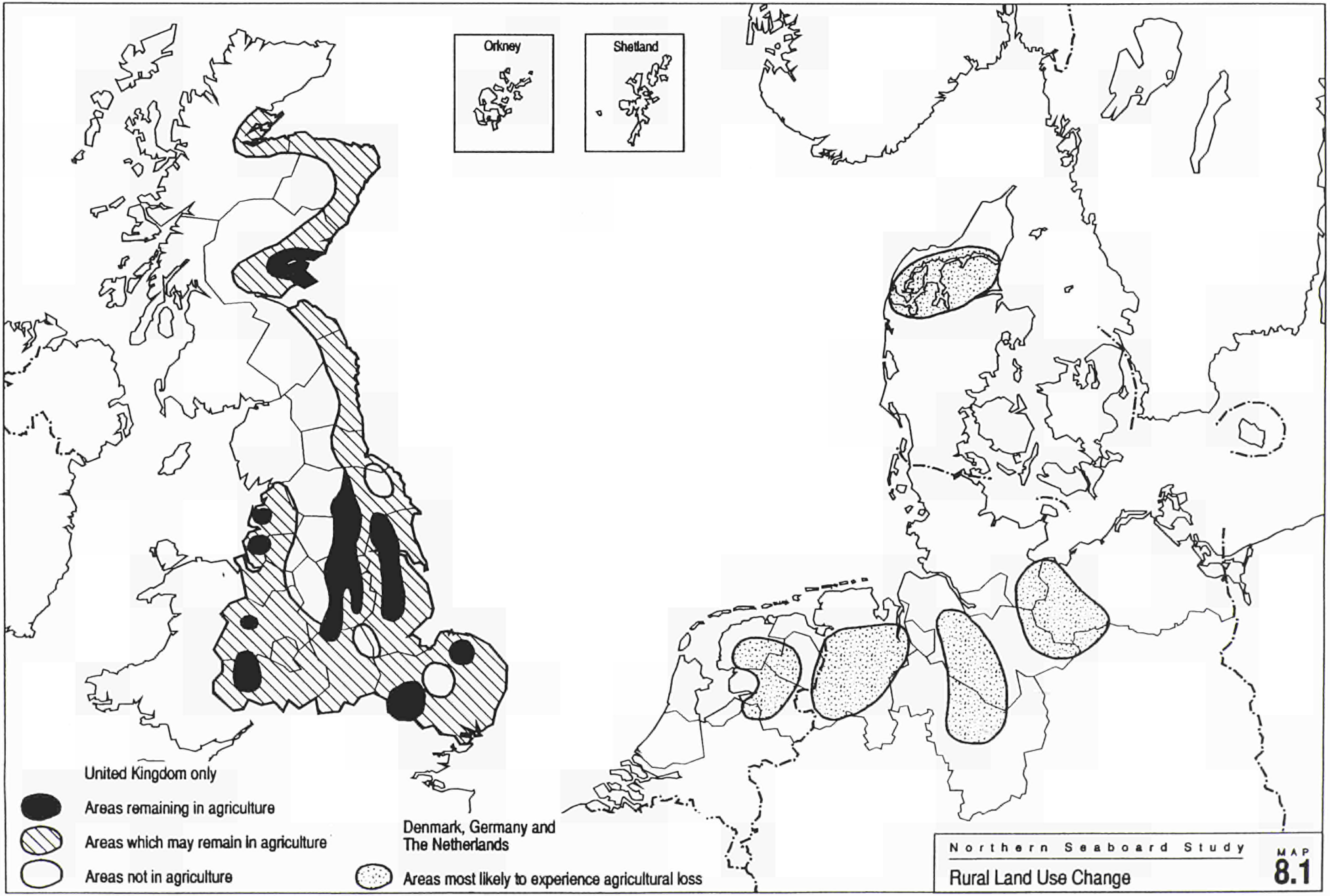
It is unclear exactly what pattern will emerge since this will depend on the aggregate decisions of thousands of individual farmers responding to particular circumstances. However, it is most unlikely that there will be an evenly distributed reduction in output throughout the study area. It is more likely that highly productive areas will continue at similar output levels and that the fall in output will be 'absorbed' by land falling out of agricultural use in less productive, marginal areas.

The local economic impact of these changes, whatever their land use impact, will be critical. The loss of jobs in agriculture will be very small in terms of regional or national employment figures, but the local impact will be very great in those rural communities which are dependent on them. Rural poverty is likely to be an increasing problem over the next decade.

Environmental pressures

Environmental pressures will derive from two factors:

- reduction in permitted levels of chemical use and discharge;
- the 'humane farming' lobby.


Orkney
Shetland
United Kingdom only
Areas remaining in agriculture
Areas which may remain in agriculture
Areas not in agriculture
Denmark, Germany and
The Netherlands
Areas most likely to experience agricultural loss
Northern Seaboard Study
Rural Land Use Change
MAP
8.1

Both these factors are concerned with the desire to reverse the industrialization of agriculture and to establish more sustainable methods which achieve an acceptable balance between market needs and the demands on the environment. As explained elsewhere, the agricultural sector is a major contributor to adverse environmental effects and it is reasonable to assume that pressures for more stringent controls are likely to increase rather than decrease from the base scenario.

These will impose increased financial constraints on producers, who will have to adopt 'less efficient' production methods and invest in cleaning-up technologies to meet stricter discharge controls. These will increase market prices and come up against consumer resistance: there is already evidence of this in the failure of 'organic' produce to make significant headway in competition with 'industrial' produce.

These apparently negative impacts are compensated by positive ones. Apart from the perceived overall environmental benefits, adoption of 'less efficient' methods will imply more labour-intensive methods which will counter the loss in employment derived from reduced agricultural activity.

Policy options

One of the key issues which spatial planning must contend with is the destruction of traditional rural landscapes as a result of agricultural policy. Examples are:

- the destruction of hedgerows and drainage of wetlands;
- potential dereliction as a result of set-aside;
- the loss of man-made landscapes as a result of agricultural decline especially in upland areas of northern England.

The first of these problems requires more stringent controls over agricultural development, especially in environmentally sensitive areas. All three would benefit from a recognition of the role of farmers as guardians of the landscape, a role which must be adequately financially compensated in recognition of the value which society puts on the rural landscape.

A key message of this section is that the pressures on the agricultural sector are more likely to increase than to decrease compared with the base scenario. The effect on farming communities would then be very disruptive, forcing changes in production methods.

The challenge is immense because the environmental threats created by the sector must be tackled quickly and drastically.

Areas for possible policy inflexions include:

- the promotion of alternative farming processes such as:
  - ☐ organic farming
  - ☐ benign use of pesticides
  - ☐ free-range animal farms
  - ☐ 'closed' production systems aiming at a more self-sustained development;
- the market promotion of 'green' products with high value-added;
- income support schemes, possibly combined with a redefinition of the status and function of the farmers as guardians of the rural ecosystems.

Calls for more agricultural protectionism may become irresistible if cheap and massive imports, in particular from East and Central European countries, add further pressures on the EC farming communities. Such calls should be resisted, but credible development alternatives presented to the farming communities.

Spatial implications

At the local level, there remains uncertainty about the precise impact of land falling out of agricultural use. What will happen to land that is taken out of beneficial use and simply left unused? Land previously used for intensive agriculture, subjected to heavy application of fertilizers, poses a particular problem arising from the reaction of residual chemicals.

Other issues are:

- Loss of hedgerows is an issue throughout lowland Britain with the exception of parts of the rural east where they have already been destroyed.
- Dereliction as a result of set-aside – East Jutland, northern Netherlands, rural east of England.
- Loss of marginal farms in uplands – a problem peculiar to the UK: Lake District, Pennines, Scottish Borders.

Initiatives currently being implemented in Denmark and the Netherlands to restore natural drainage patterns are one way in which land can be taken out of agricultural use and returned to the natural environment. Rivers are allowed to flood and recreate natural wetland habitats

on former agricultural land; with proper management these areas can then become part of the amenity landscape resource.

In certain areas, reduction in agricultural activity can be compensated by combining landscape management with conventional agricultural operations. This will be particularly relevant in coastal and upland areas where there is a natural pressure for increased leisure/amenity areas. An example of such a scheme is a pilot project in the North York Moors National Park, in England, where farmers are paid to carry out a range of works to maintain the quality of the landscape.

On the larger scale, we can identify broad areas of likely rural land use change. A distinction is drawn between the UK and the other three countries. In the UK, it is possible to identify clear variations in land quality and consequent productivity. In general terms it is expected that the productive areas will remain in agriculture and marginal upland areas will fall out; the uncertainty covers the areas in between. Map 8.1 shows these zones:

- areas which will remain in agricultural use under any foreseeable circumstances;
- areas which will fall out of agriculture under any foreseeable circumstances (and areas which are not in agricultural use);
- areas currently in agricultural use which could go either way, depending on circumstances.

In the other three countries there is much greater consistency of land quality and productivity and it is less possible to discern any clear pattern of land use change. Areas under arable are likely to succumb to the pressure of falling market prices; while areas where livestock predominates will come under increased environmental pressures. The map shows areas of relatively low agricultural land quality and with potential for development of amenity landscape which are likely to experience some loss of agricultural land.

Economic growth

In previous sections of this chapter we have examined variations from the base scenario for a selection of themes of spatial development.

In this section we focus on manufacturing and services. These are and will remain the primary sources of employment and income throughout the study area, and the main determinants of economic growth. The future prosperity of these sectors is therefore fundamental to any strategy for improving the economic performance of the study area and increasing the well-being of those who live there.

In a report such as this the treatment of such a major topic is necessarily very selective. The major determinants of economic growth are undoubtedly externally driven as far as the regions are concerned, notably:

- national macroeconomic conditions;
- markets and competition within the Community including the impact of enlargement of the Community;
- the world trading environment including the outcome of the GATT negotiations.

In line with our brief from DG XVI, we have concentrated on the scope for variations in regional policy and the spatial implications of such variations, rather than examining variations in external factors and their implications for sectoral output and employment in the regions.

Variations from the base scenario

The key policy issues identified in the base scenario were:

- How to ease the process of structural adjustment in regions still dependent on declining heavy industry?
- How to increase the capacity of the regions' manufacturing and services sectors to survive in an increasingly competitive environment?

Our base scenario assumes that current regional policies aimed at generating new employment in declining regions will continue. The measures suggested below are intended to complement existing policies. They also complement the infrastructure improvements dealt with elsewhere in this chapter.

We believe that one of the most important factors underlying the problems of many parts of the study area is a lack of creativity and problem solving ability, that renders the region's businesses unable to cope with new challenges. The policies suggested below are aimed at remedying this deficit.

Policy options

We suggest increased investment in a number of measures which might simultaneously increase the competi-

tiveness of the study area's existing businesses, encourage the development of new indigenous growth industries and provide a significant attraction for mobile businesses. The options we indicate fall into three groups.

We give first priority to measures to improve the region's human capital, with measures such as:

- improved technical education and training;
- more widely available continuing education;
- support for R&D;
- support for SMEs;
- support for cooperative ventures.

The rationale for this emphasis is that investment in human capital has a quicker return than capital investment such as regional investment subsidies, and lower leakages to other parts of the economy since labour is relatively immobile.

The second element we suggest includes:

- expert finance and marketing advice;
- marketing strategy;
- regional investment resources.

The third element we suggest is support for key sectors in specific areas:

- the textile/clothing sector;
- railway and light railway products;
- the electronics industry;
- the aerospace industry.

These are all industries which we believe have long-term potential but which are facing fierce international competition, and where some short-term assistance at a local or Community level would be helpful.

Improved technical education and training

The future of the regions will be critically dependent on a skilled and flexible workforce, to provide the basis for both indigenous growth and the attraction of mobile investment. This implies investment in technical and vocational education and training at all levels, both on the job and full time. SMEs in particular will need support in the provision of on the job training.

More widely available continuing education

Education is a service industry in its own right, and a potentially significant generator of employment. Many parts of the study area have large retired populations with the time and disposable income to pay for education. More generally the trend towards multiple careers will generate a demand for access to further and higher education throughout peoples' working lives.

Support for R&D

Adequate support for R&D will be important to ensure that leading edge competitiveness is maintained. Potential measures include support for pre-market research, support for joint ventures between universities and the private sector or between firms and the establishment of science parks involving the participation of a university.

Support for SMEs

Support should be focused on the development of a more skilled and flexible labour force, and on businesses with growth and export potential. Examples of possible measures are:

- on the job training;
- consultancy and technical advice;
- wage subsidies for firms taking on graduates;
- R&D start-up help;
- incubation centres;
- technology training centres;
- information centres;
- market analysis and export assistance.

Cooperation

There is scope for EC regional policy to support intra- and interregional cooperation, for example between:

- regional authorities in planning and project finance;
- SMEs (e.g. purchase cooperation) or SMEs and large businesses (e.g. on the job training cooperation);
- institutions of higher education (research and course development cooperation) or education institutions and business (training and R&D).

EC export finance and marketing advice

In many regions of the study area, there are small firms which have operated only within their own country and have neither the financial resources nor the experience to market their products more widely. Some of these firms may be those which produce distinctive products, for example Danish textiles, Scottish specialist hand-produced knitwear. This could have particularly impor-

tant benefits for the economic future of rural and peripheral areas.

EC marketing strategy for EC goods

The application of strict environmentally acceptable production methods and strict specifications could be used as a marketing device with the application of an EC quality assurance mark. This would particularly benefit those regions with the distinctive consumer oriented products, for example foods.

Regional investment resources

The main sources of investment are concentrated in the hands of national governments and central banking and financial institutions. Decisions are therefore taken at some distance from the regions that require it. Many regional enterprises may be squeezed out as 'conservative' decisions to invest are made.

The decentralization of investment capacity including the European Investment Bank and possibly the European Central Bank and the retention of regional public funds could represent valuable pump-priming investment for the regions. This would benefit many of the regions of the study area which have distinctive investment characteristics and are perceived to lack adequate investment.

Support for the textile and clothing sectors

This is a sector well represented in many parts of the study area but it is threatened by cheaper imports from outside the EC in all price ranges. Some parts of the study area will also be exposed to increased competition from within the EC. However, many of the products have a distinctive character or cachet. Danish textiles, Scottish woollens, English brogues, the Loden coat and the Burberry could, with better market identification and technical development, design and production enlarge their market share in the face of Italian and worldwide products.

Development of a strategy to support the electronics industry

The electronics sectors have been a major growth sector worldwide in the past. The Esprit and Eureka programmes have improved the competitive capability of the EC electronics industry. Defence needs have in the past ensured that R&D investment was maintained. Reduction in defence spending will mean that the shortfall in R&D investment will need to be made good and the alternative markets for the product enlarged if growth is to be maintained. The improved performance of this sector will be particularly important for some parts of the study area as it was introduced to replace other employment lost and to others it represents support for development, for example communication networks in Denmark and eastern Germany.

Support for railway and light rail products

There is likely to be a rising demand for railway systems in the EC and in the rest of the world. EC support for technical development in terms of the trains, control systems and associated technologies, encouraging cooperation and knowledge-sharing among the firms currently engaged in the sector could ensure an EC technical superiority, reduce costs and enlarge markets. This would benefit regions in the study area which currently build trains and make equipment as well as the electronics (control systems) and other sectors such as materials technology.

Support to retain a capability in aerospace

This sector includes aspects such as engines and airframes and is represented in several regions of the study area. An EC strategy to maintain and support a future capability in the sector will be important in the light of reduced defence spending.

Chapter 9: Alternative visions of the northern seaboard

Introduction

In Chapter 7 we described the core-corona-periphery concept (we called it the metastructure) which provides the framework for our vision of the likely future spatial development of the northern seaboard region.

Chapter 8 examined the possibility and probability of deviation away from the base scenario for a number of key themes of particular relevance for spatial planning. We also analysed the scope for changes in policy to mitigate negative prospects and promote positive ones. We indicated specific areas within the northern seaboard where the implications of such variations will be most marked.

In this chapter we present a supraregional synthesis. The first section pulls together the spatial implications of our analysis and examines the study area as an integrated spatial unit focused on the binding common factor, the North Sea itself. This approach enables us to consider a number of policy issues common to regions throughout the study area.

The second section presents a supraregional synthesis in the form of variations of the core-corona-periphery metastructure presented in Chapter 7. Moving away from the base scenario we outline alternative 'visions' of the study area for, say, the first decade of the next millennium.

The North Sea basin

The analysis presented so far has tended towards a terrestrial bias: it looks at characteristics, problems and issues mostly from the point of view of land-based activities.

It is useful to analyse the study area as an integrated spatial unit, focused on the binding common factor, the North Sea itself. The North Sea covers about 80% of the total surface of the study area. As we explained the North Sea system as a whole is of primary importance. Viewing the sea as the centre of the spatial system offers a powerful rationale for 'catchment-area thinking' in order to develop a multisectoral and multiregional policy approach. This integrated approach enables us to consider a number of policy issues common to the whole study area.

There are five key elements of the North Sea system, each of which is presented in two steps: first, the main issues identified; second, the scope for policy inflexion is discussed. These are:

- open seas;
- coastal waters;
- coastal lands;
- river catchment areas;
- urban concentrations.

Map 9.1 illustrates these elements in diagrammatic form.

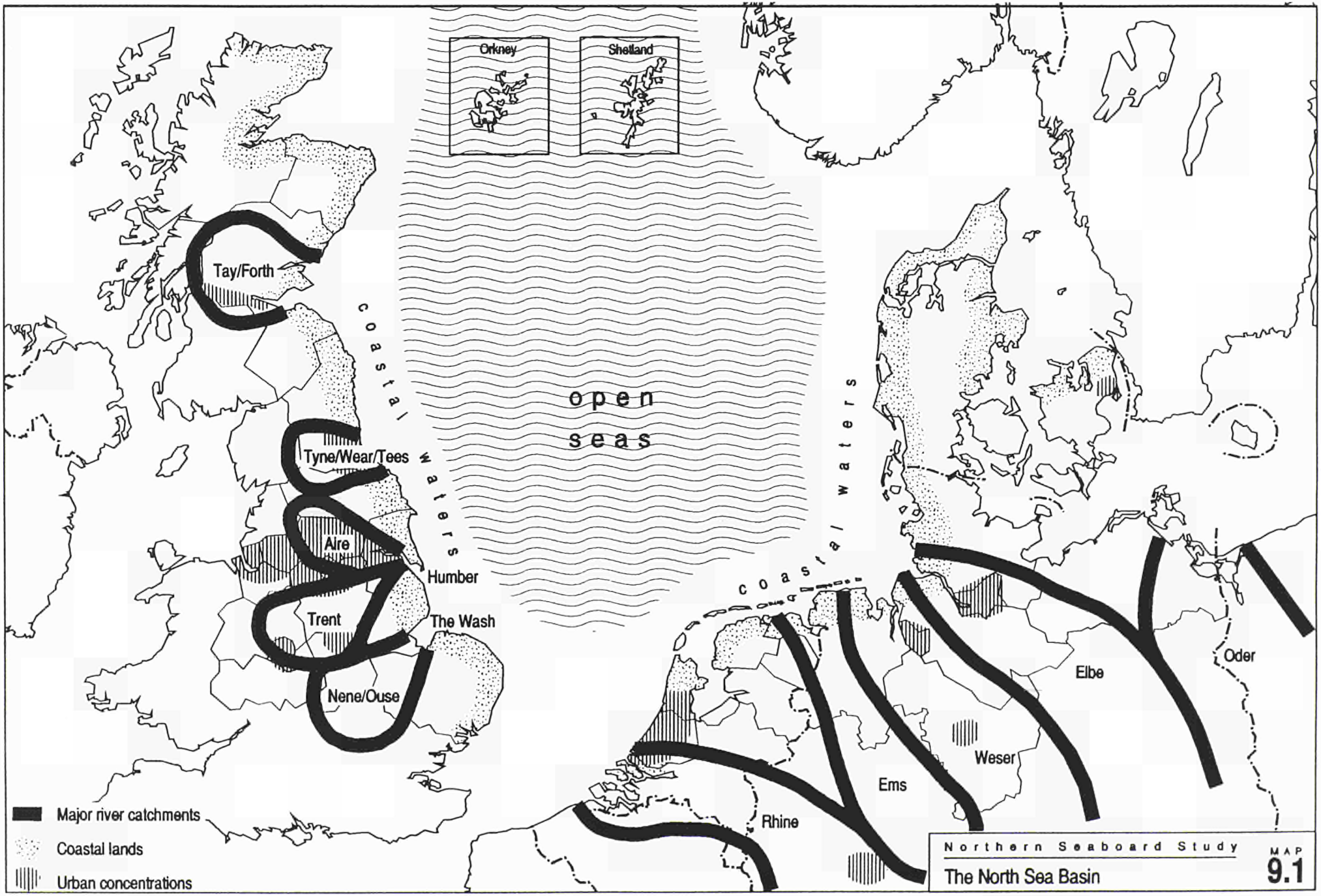

Orkney
Shetland
Tay/Forth
Tyne/Wear/Tees
Aire
Humber
Trent
The Wash
Nene/Ouse
coastal waters
open seas
coastal waters
Rhine
Ems
Weser
Elbe
Oder
Major river catchments
Coastal lands
Urban concentrations
Northern Seaboard Study
The North Sea Basin
MAP 9.1

Table 9.1 is a matrix which records the five elements of the North Sea system on the vertical axis, against the 16 natural regions identified in Part II of this report. Each element is divided into a number of issues for which policies are required in order to promote positive tendencies and/or to mitigate negative ones. By reading along the horizontal axis, the matrix highlights the regions in which a particular policy issue is relevant and presents a simplified picture of the range of necessary actions. On the vertical axis, the matrix gives a picture of the characteristics of each region and suggests the scope of policies required.

Note that the purpose is to show which relationships are particularly significant and to indicate where policy initiatives will be of importance. Many issues will be relevant to all regions at a lower level of analysis.

Open seas

Issues

The open sea represents the basic maritime resource and the mortar which binds together the lands of the northern seaboard. The relationships shown in Table 9.1 indicate indirect links to the named policy issues since there are clearly no direct impacts due to physical separation.

Energy and fish are the two main North Sea resources.

Oil and gas deposits find their way by pipeline from deep sea platforms to land terminals in all four study-area countries, as well as Norway. Pollution is not considered a major hazard. It is however noted that oil run-off from offshore platforms is a greater source of pollution of sea waters than spills and discharges from vessels.

Contrary to energy deposits, fish stocks are infinitely renewable if they are properly conserved and managed in order to ensure a sustainable fishing industry. The North Sea supplies the vast majority of landings at northern seaboard ports. In Denmark, for example, such landings represent approximately 90% of the total volume of landings, and about 75% of the total value.

While the overall numbers employed in fishing are relatively low in the context of national employment, they are critical for the local communities which depend on fishing as their main economic activity.

Another important function of the North Sea is maritime transport. Concerns are expressed by members of the North Sea Conference about congestion. The notion of 'free space' is deceptive as the volume of shipping traffic combines with the hazard of off-shore oil and gas platforms to create real threats of a major ecological disaster.

Scope for policy inflexion

All these issues point to the need for a maritime management plan which would address competing claims for exploitation of resources and use of surface areas.

The European Commission could explore with the International Maritime Organization (IMO) the preparation of a zoning plan which would, for example:

- allocate areas for specific function(s) such as energy exploration, fishing, military exercises;
- define shipping lanes.

Coastal waters

Issues

Coastal waters form the buffer between the open seas and the surrounding land areas. These shallower waters accommodate more concentrated activities than the open seas including long-haul shipping manoeuvring to and from ports, coastal shipping, water-based recreational activities, and military uses. These activities are in potential conflict with each other, and with the natural environment.

Coastal waters receive domestic and industrial waste from upstream urban concentrations via the main river systems and directly from coastal settlements and industries. Surface water run-off in some areas contains high concentrations of agricultural nutrients (phosphates and nitrates) which can cause eutrophication, the stimulation of algal growth.

The coastal waters of the European mainland – and particularly the Waddenzee – exemplify these problems. Concentrates of nutrients from intensive agricultural production areas are washed into sheltered coastal waters. Physical conditions prevent dilution of the concentration in the open seas and eutrophication occurs. In excessive measure this has a damaging effect on marine life, reducing oxygen levels in the water and effectively suffocating the fish spawning grounds. Anticlockwise currents carry increasing concentrations along the coast in a northerly direction. These currents slow as they reach the deeper waters of the Skaggerak where they deposit

Table 9.1. Policy issues by natural region

Policy issues	Natural regions															
	Denmark			Germany			Nether-lands		United Kingdom							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A. Open seas																
A.1. Oil/gas exploitation			●	●				●	●	●			●			●
A.2. Fish resources		●	●	●		●	●	●	●			●	●			●
A.3. Shipping	●		●	●		●		●	●	●		●	●			●
A.4. Zonal management	●	●	●	●		●	●	●	●	●	●	●	●			●
B. Coastal waters																
B.1. Pollution		●	●	●		●	●	●		●		●	●			●
B.2. Tourism activities	●	●	●	●		●	●		●	●						●
B.3. Fisheries (aquaculture)		●	●	●		●	●		●							
B.4. Shipping	●	●	●	●		●	●		●	●		●	●			●
B.5. Military uses							●			●						
C. Coastline																
C.1. Coastal defences			●				●	●								●
C.2. Coastal erosion			●	●			●	●				●	●			●
C.3. Tourism			●	●		●	●		●	●		●				●
C.4. Quality environments			●	●		●			●	●	●	●				●
C.5. Land-use management	●	●	●	●		●	●	●	●	●	●	●	●			●

Table 9.1. (continued)

Policy issues	Natural regions															
	Denmark			Germany			Nether-lands		United Kingdom							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
D. River catchments																
D.1. Fluvial shipping				•	•		•	•					•			
D.2. Major pollution				•	•	•		•		•		•	•	•	•	
D.3. Catchment management				•	•	•	•	•		•		•	•	•	•	•
E. Settlement patterns																
E.1. Urban / industrial concentration	•			•	•			•		•		•	•	•	•	

List of natural regions:

Denmark

1. Capital city area
2. West Zealand
3. Jutland / Fyn

Germany

4. Western region
5. Central region
6. Eastern region

Netherlands

7. Northern region
8. Southern region

United Kingdom

9. Highlands and Islands
10. Central belt
11. Scottish Borders
12. Northern England
13. Trans-Pennine
14. West Midlands
15. East Midlands
16. Rural East

heavy concentrations of nutrients, which are the cause of the regular occurrence of algal blooms.

Scope for policy inflexion

The growth in maritime transport and increasing sensitivity about environment will encourage a stronger management of coastal shipping. Vessels need to get to ports and high-risk cargoes have to be transported. These lead to inevitable congestion problems and thus to increasing risk of accidents.

Northern seaboard countries should be encouraged to standardize the control and management of coastal shipping in order to minimize the risk of accidents and to avoid disturbance to significant coastal maritime environments, while promoting benign leisure and recreational activities.

Coastal lands

Issues

Coastal lands represent areas of great opportunities but also of major threats. As an environmental resource, they offer potential for the development of tourism and coastal leisure activities which can bring real economic benefits in terms of employment growth and stimulus to the local economy.

The threat lies in uncontrolled physical development and poor management of recreational activities which devalue the natural resources which are the object of the pressure.

Measures to control the sea's impact on the natural coastline derive from two objectives:

- the protection or reclamation of land for beneficial uses (usually agriculture);
- the prevention of coastal erosion in order to safeguard high quality environmental and landscape resources.

The former objective is particularly significant in the Netherlands – 60% of this country is situated below sea level – whose history has involved a continued struggle to hold back the encroaching sea. Dutch engineers were also responsible for helping drain lowland in eastern England (the Fens) which now constitutes some of the richest arable land in the UK. This process has driven significant technological advances in hydrology and drainage and has, until recently, not been seriously questioned.

However, recent developments have forced a reappraisal of the principle of spending vast resources on taming the natural balance between land and water. Economic forces moving towards a reduction in agricultural output make the financial equation ever more unbalanced. In all the study-area countries there is now open discussion of effectively allowing certain areas to flood and in consequence lose their value as agricultural land. This will also affect low-lying coastal residential areas. In both the Netherlands and Denmark, for example, schemes are being carried out to restore natural drainage systems, and to allow river flooding to recreate natural wetland habitats on former agricultural land. Similar schemes could be applied to coastal areas: the British Minister for Agriculture has recently spoken of 'managed retreat' with reference to flooding along the East Anglian coastline (this is not possible in the Netherlands).

Scope for policy inflexion

It is essential to protect high quality coastal environments as important habitats for flora and fauna, as amenity areas for recreation, and, in the long term, as irreplaceable environmental resources. Sensitive measures are required to protect endangered coastlines which are both effective, visually unobtrusive, and sensitive to the ecosystem. Full recognition is needed of the importance of the processes of change that take place in the landscape.

Such schemes will use conventional technical solutions to dissipate the destructive power of waves and prevent the scouring of longshore drift. More imaginative schemes are also needed: an idea under discussion in the Netherlands is to construct an artificial sandbank off the coast in order to protect the natural sand-dune coast.

Pressures from tourism and recreation on fragile environments force the need for land-use planning policies which achieve a sensitive balance between demand and ecological capacity.

As with many other issues, this has a transnational dimension. The interpenetration of tourism means that much of the pressure is created by the influx of foreign tourists, particularly on the mainland seaboard resorts. There is scope for a comparative analysis of environmental capacity of the coastal areas of the northern seaboard with particular emphasis on tourism and recreational activities.

River catchment areas

Issues

Some experts consider the destruction of the catchment areas of rivers as one of the main environmental problems of the world and call for the implementation of integrated planning and development.

River catchments are the terrestrial space which 'feed' the maritime space. The North Sea is fed by a large number of rivers from all parts of the seaboard, with the exception of Denmark where there are few rivers and where the drainage pattern predominantly flows towards the east. The major catchments are those of the large navigable rivers flowing north from mainland Europe – Oder, Elbe, Weser, Ems and Rhine – reaching far beyond the southern boundary of the study area. These waterways are important arteries of communication, navigable deep into the Continental land mass and supplemented by a connecting network of canals.

These waterways are also vectors of pollution, acting as the main drains for domestic and industrial waste created by human activity within the catchments. Pollution occurring on the coast or in coastal waters may originate from sources hundreds of kilometres from the sea. This underlines the importance of transnational cooperation to solve the problems facing the study area.

British river systems are different: although major rivers in British terms, they are necessarily much shorter and have much smaller catchments due to the physical structure of the country. Yet the concentration of urban and industrial settlements makes the main catchments just as potent threats to pollution as the larger catchments on the European mainland, especially those that flow into estuaries, i.e. the Wash, Humber, Tees, Tyne/Wear, Forth/Tay.

Scope for policy inflexion

Instruments of policy analysis combined with an integrated water-systems approach will be essential for both the long and the short term.

Where carried out, planning and management of catchment areas tends to focus on the internal balance between the competing uses, aiming for sustainable relationships between development needs and environmental capacity. It is however also important to consider the external relationships, that is to assess the impact of intra-catchment factors – typically concerned with transport links – and the downstream environmental impact on the North Sea.

The transnational dimension suggests the need for collaborative initiatives aimed at policies and standards applied around the whole North Sea basin, which recognize the complex network and hierarchy of development decisions influencing changes in the North Sea ecosystem.

Urban concentrations

Issues

The final link in this chain is the concentration of population represented by the large conurbations. These are the motors of the development activities which cause the downstream impacts on land within the catchment (e.g. urban settlement, industrial development, agriculture), along the coast (tourism), into coastal waters and finaly the open seas.

Scope for policy inflexion

Land-use planning carried out by local governments throughout the northern seaboard is mostly concerned with the local issues and local impacts. Yet an understanding of the North Sea basin system as a whole, and of the cumulative impact of the aggregation of decisions taken by individual authorities will be an important stimulus to a broader outlook on the contribution of small units to the larger environmental space. Increasing collaboration between local authorities through international forums such as the North Sea Conference, fostered by institutions such as the European Commission, will play an important role ensuring physical development which is in harmony with large scale ecosystems.

Alternative metastructures

In this section we present a synthesis of the northern seaboard under alternative development scenarios in the form of variations of the core-corona-periphery metastructure presented in Chapter 7. Moving away from the base scenario we develop two alternative 'visions' of the study area for, say, the first decade of the next millennium.

We outline the key spatial characteristics of the visions and the policy measures and external factors conducive to their development. But we do not 'tell a story' about

how the study area will change in the coming years and progressively take the shape described by the metastructures, i.e. we do not construct scenarios in the strict sense of the word.

Concept

In order to place our study area in a wider European context we have formulated a core-corona-periphery concept. This concept describes in simple terms the observed development pattern and provides a useful framework for looking at how the northern seaboard region relates to the rest of Europe. The boundaries of the three zones are national. They are not meant to delimit specific geographical areas but rather to identify broad zones which stand in different functional relationships to each other.

The core represents the traditional industrial heartland of Europe and stretches from south-east England to north-east Italy encompassing the Randstad in the Netherlands, the Ruhr, Belgium and north-east France. It contains the major cities of London, Paris, Brussels, Amsterdam, Rotterdam, Munich and Milan.

The corona is the surrounding area which has strong functional links with the core. The corona is able to participate in the economic activities of the core and in its potential for wealth creation. It is strongly influenced by developments within the core.

The periphery is the area beyond the corona, the boundary between the two being the point at which distance or ease of access becomes a key factor in determining the area's ability to participate in core-area activities.

Base scenario metastructure

Map 7.2 in Chapter 7 showed the core-corona-periphery metastructure of the base scenario, describing what we consider to be the most likely future spatial development of the northern seaboard region over the next 10 to 20 years.

We argued that the most powerful element influencing the pattern of development over future years will be an emerging Rotterdam-Berlin axis, which touches the southern fringes of the study area. The strength of this axis lies in the two major growth poles which it connects: Rotterdam, the premier port in Europe and the heart of the Randstad, an established and thriving industrial, commercial and financial centre; and Berlin, capital of the unified German State, gateway to the East.

We also identified two subsidiary axes, one running through Hamburg north/north-east through north-west Germany and Denmark to Copenhagen and beyond; the other running from the Channel ports of south-east England north-east to the industrial heartland of England in the West Midlands, but with a spur to haven ports opposite Rotterdam.

Map 7.3 provided a rough division of the study area into regions with much and little growth potential respectively.

Possible alterations – the 'rules of the game'

The concept of metastructure has limitations. For example, we have deliberately not provided indicators which could be used to define the precise boundaries of the core-corona-periphery, nor have we examined the dynamics of the metastructure.

However, the concept is useful because of its flexibility and its illustrative power. It also gives a helpful framework within which to discuss alternative visions of the future and to examine policy options.

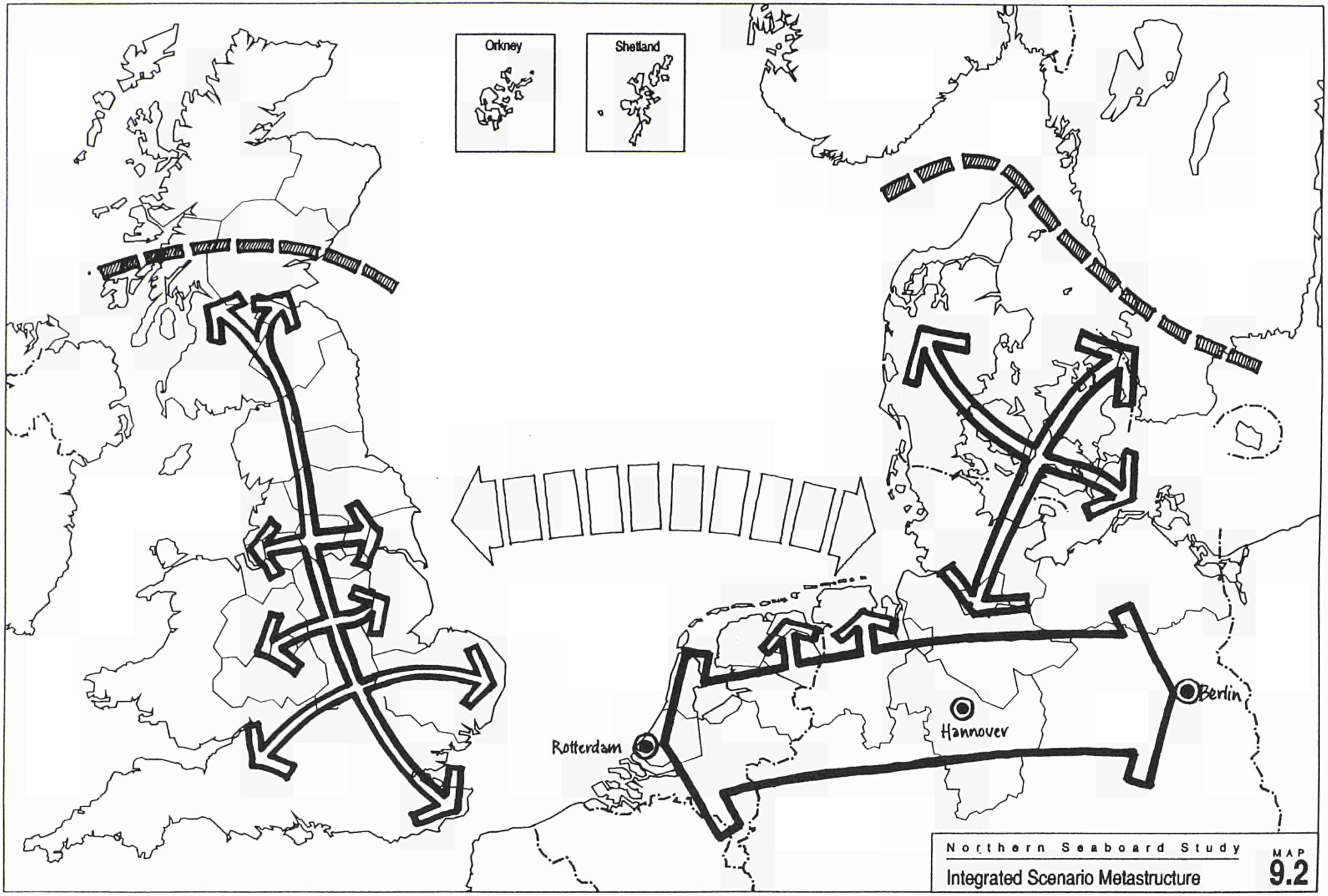
Let us first describe the 'rules of the game'. There are many possible ways to alter the metastructure. Examples of such alterations – not all mutually exclusive – are:

- to change the position of the core without modifying the position of the corona and of the periphery;
- to change the position of both the core and changing corona and/or periphery;
- to modify the size of the arrows which indicate the strength of influence of the axes on the surrounding area;
- to modify the direction and/or the position of these arrows.

On illustration of these 'rules of the game' is given below.

The core of Western Europe could shift southwards and/or eastwards. This alteration of the metastructure seems quite likely to happen in the coming decade due to the combined actions of a number of factors. These could include:

- After a painful transition to a market economy, former centrally-planned economies of Eastern and Central Europe experience a significant economic growth (shift eastwards).
- These countries, particularly in Central Europe, strengthen their economic and political links with the



Northern Seaboard Study

Integrated Scenario Metastructure

MAP 9.2

European Community countries; transport infrastructure is significantly improved (shift eastwards).
- Austria, Switzerland, Hungary and the Czech and Slovak Republics become full members of the European Community; ths leads to the strengthening of an 'axis', or rather a new regional core, including the cities of Prague, Geneva, Vienna and Budapest (shift eastwards).
- Spain overcomes the economic recession of the early 1990s, and succeeds in catching up with the strongest EC economies; Spain thus acquires the status of major power in Europe (shift southwards).
- Economic development takes place in the North African and Middle-Eastern countries (shift southwards).
- European an non-European countries surrounding the Mediterranean Sea become more and more integrated (shift soufthwards).

There are however countervailing forces which may prevent the shift of the core eastwards and/or southwards. Examples of such countervailing forces are:

- The Nordic countries join the European Community (shift northwards).
- The Baltic region experiences a significant economic growth; the Baltic countries take significant steps towards closer integration (shift northwards).
- The main institutions of the European Community are established in cities of the current core, and their location is unlikely to be modified because of the political turmoil this would create (no shift).
- France, Germany, Benelux (and possibly the UK if it follows a pro-European policy) are the main powers and driving forces of the European countries (no shift).

The uniqueness of the core in Europe may thus be a realistic assumption for the end of the 1990s, but this situation may not persist. In the year 2010 Europe may well be characterized by the coexistence of several regional cores, leading to a multicentric development pattern which is difficult to ascertain. Examples of possible new regional cores are:

- a Central European core, including the cities of Prague, Geneva, Vienna and Budapest;
- Berlin will become the centre of a new pole of development; it may become the centre of a major banana-shaped core including Warsaw in Poland and the Randstad in the Netherlands;
- a Nordic European core, including the capital cities Oslo, Copenhagen and Stockholm.

At the level of the northern seaboard region, new growth centres may develop and progressively gain importance and status. Factors increasing the likelihood of such new growth poles include:

- heavy investment in the periphery to encourage development of sectors which do not suffer from being at a distance from the market;
- measures to restrict development in the major cities of the core, and to direct it towards medium-sized towns operating as local growth poles.

The integrated scenario

We shall now move away from the base scenario and outline two alternative 'visions' of the northern seaboard using the framework we described in the previous section. These alternative metastructures depict how the study area may look, in terms of core-corona-periphery, during the first decade of the next millennium.

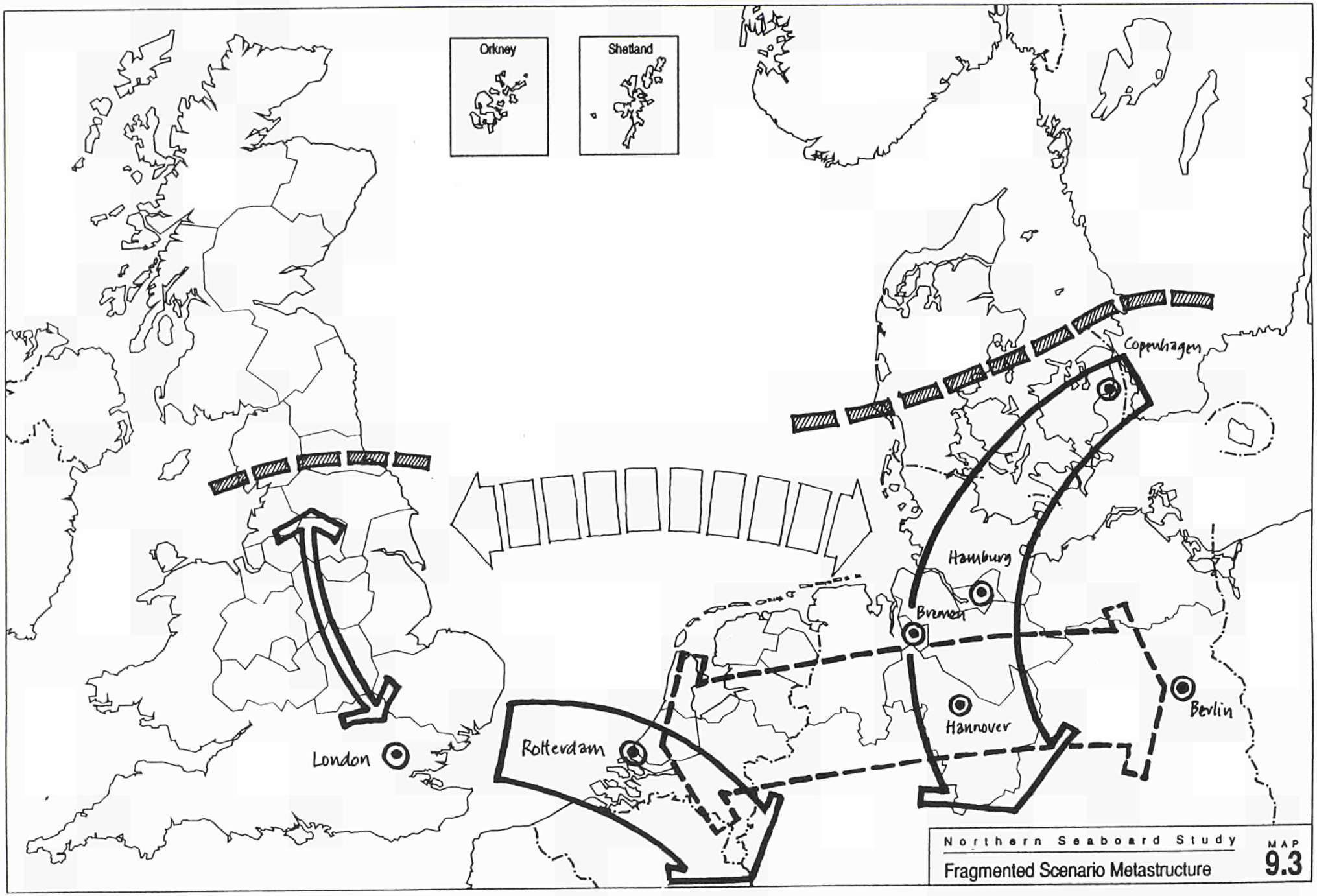
The core-corona-periphery metastructure shown by Map 9.2 is the outcome of a scenario of integrated regional development. The structural characteristics of this metastructure are:

- a core firmly anchored in the north-west of the Community; the size of the core may increase and encompass regionas previously in the corona;
- The corona is wider than under the base scenario and the area covered by the periphery shrinks; this indicates an improvement of the situation of the most underdeveloped regions.

This integrated development is not the most likely; it differs substantially from our base scenario metastructure; it involves a massive success of the Commission's regional policies. The achievement of a more integrated pattern of development across the Community constitutes a key objective of EC regional policy.

Put in terms of our core-corona-periphery metastructure, various measures can be taken to increase the likelihood of a more integrated development of the northern seaboard. Examples of such initiatives are:

- infrastructure investment to strengthen north-south secondary axes and to integrate the rest of the corona into the main axes;
- measures to develop (secondary) centres in the corona and/or in the periphery such as cities in the central belt of Scotland, and the establishment of new economic poles of development (e.g. science parks);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Northern Seaboard Study
Fragmented Scenario Metastructure
MAP
9.3

- a proactive policy of private and public authorities to attract investment and visitors into the periphery;
- measures to mitigate any adverse impact of the CAP and CFP on incomes, especially in areas of marginal agriculture and areas where fishing is the mainstay of the economy;
- an improvement of telecommunication links (including advanced services) and transport infrastructure in the corona and periphery;
- the development of radial (east-west) axes through better infrastructure, more opportunities for communication and increased trade;
- the development of maritime traffic through the North Sea between the regions of the study area;
- increased cooperation between the authorities of the study area to implement sustainable management and exploitation of the resources of the North Sea.

Some exogenous factors are conducive to an integrated scenario. For example, the population living in the periphery may increase due to retirement migration; the trend towards employment decentralization may increase; the Nordic countries may join the European Community, which would boost the development of a Nordic regional core.

The fragmented scenario

In Map 9.3 the core-corona-periphery metastructure is the outcome of a scenario of fragmented regional development.

The main core of Europe is the same as in our base scenario. However, more fragmentation can be envisaged if there is a major shift of the core southwards and/or eastwards, which would place London in the corona, although it would remain a major local centre with a large hinterland.

Factors conducive to such a shift has been described above. The main features of this scenario are:

- The size of the area covered by underdeveloped regions increases. Pressure on the regions in the corona intensifies, for example in north Germany and North-Holland.
- North-south links are dominant with two major axes plunging into the heart of Europe.
- Radial (east-west) links weaken. The Rotterdam-Berlin exis does not materialize. Maritime traffic, and in particular long-sea ferry services, fail to develop.

From the point of view of the regions of the northern seaboard, this is a pessimistic scenario, which regional policy should aim to prevent.

Chapter 10: Concluding remarks

In Part III of this report, we have moved away from the most likely scenario. The previous chapter outlined two alternative visions of the northern seaboard, the spatial implications of which translate into two alternative meta-structures. In 20 years the northern seaboard will look very different and there is inevitably a great deal of uncertainty about the relative strength and timing of different factors affecting spatial development. While the base scenario represents a picture of the most probable scenario, we think that some elements of these alternative development prospects may well materialize, bringing alterations to the base scenario.

This study has demonstrated both the limitation and the potential of spatial planning at the level of transnational super-regions such as the northern seaboard.

The main limitations, in our view, have been:

- the huge variations in the characteristics and problems of regions spanning such a large area, which has made it difficult in a study of this scope to carry out anything but a superficial analysis at the level of individual regions;
- the difficulty of ignoring the national perspective, since national policies and conditions are such a key element in the development of any region;
- the difficulty of moving away from a sectoral framework, since it is sectoral issues, trends and policies which provide the unifying elements across the regions.

The difficulty we have found in making suggestions for specific spatial policies or projects is symptomatic of these limitations. It is relatively easy to have a vision at this scale, less easy to define new but practical ways in which this vision might be made to materialize. In short, we found this an uncomfortable scale at which to carry out spatial planning.

Nevertheless, the exercise will in our view have proved well worthwhile if it enables those concerned with development in the regions to place their regions in a wider context. This is particularly so in the mainland part ot the study area, where there is much in common between the regions on opposite sides of political frontiers. Our work will have been justified if it forms the starting point for a debate between neighbouring regions, and regions with common interests.

The other outcome which we feel justifies this study is that it has highlighted the spatial implications of sectoral policies, in particular those of the European Community. We hope that this prompts further, in-depth study of the regional impact of specific policies, and leads to sectoral policies more sensitive to the needs of specific regions.

Many sections of this report have examined possible policy options for mitigation of negative prospects and promotion of positive ones.

We hope that this study will help policy-makers in formulating strategies and implementing programmes which will be effective in achieving a sustainable development of all the regions of the northern seaboard and in reducing undesirable disparities.

Spatial analysis at the level of transnational regions should be a major building block of any development strategy. Adequate institutional arrangements should be

set up for ensuring that the spatial development plans of individual regions are coordinated. This is particulary needed to solve the environmental problems from which the North Sea is currently suffering, and which have been once again underlined by the conference of ministers and experts held in Copenhagen in December 1993.

An in-depth understanding of the current situation and trends is a necessary condition for a reliable prospective analysis. Although this study has considerably improved the knowledge of both the existing and possible future of the northern seaboard, there remains a host of unexplored themes and 'grey areas'. These, in our view, justify additional research.

Examples of areas where we think further research would be justified include:

- an analysis of the regional impact on incomes, landscape and socioeconomic conditions of reform of the common agricultural policy;
- the preparation of a tourism strategy for the North Sea coasts of the Netherlands, Germany and Denmark based on an analysis of the environmental capacity of each part of the coast;
- cross-Channel region: analysis of development capacity in South-East England and the near Continent (France, Belgium and the Netherlands) in the context of the Channel Tunnel;
- 'north' North Sea basin: analysis of links between Scotland and the Nordic bloc to identify investment opportunities to mitigate peripherality.

The future is uncertain; it is also risky because pressures on many regions are building up. There is a growing consensus that new and radical policy initiatives are needed. In such an uncertain and risky world, policies should be constantly monitored and evaluated. This also justifies, in our view, additional research.

European Commission

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