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The Wadden Sea Region: A Socio-Economic Analysis

for
Wadden Sea Forum

Contact
Dr. Olaf Arndt
Helma Dirks
Tobias Koch

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14 - 6030

Prognos AG

Geschäftsführer
Christian Böllhoff

Basel

Aeschenplatz 7
CH-4010 Basel
Telefon +41 61 32 73-200
Telefax +41 61 32 73-300
info@prognos.com
www.prognos.com

Berlin

Karl-Liebknecht-Straße 29
D-10178 Berlin
Telefon +49 30 52 00 59-200
Telefax +49 30 52 00 59-201
info-berlin@prognos.com

Düsseldorf

Kasernenstrasse 36
D-40213 Düsseldorf
Tel. +49 211 887 3131
Fax +49 211 887 3141
info@prognos.com

Bremen

Wilhelm-Herbst-Straße 5
D-28359 Bremen
Telefon +49 421 20 15-784
Telefax +49 421 20 15-789
info-bremen@prognos.com

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1 Introduction and purpose of the study

The Wadden Sea Forum is working to promote sustainable development in the Wadden Sea region. For this work, it is important to have access to a survey and assessment of the available socio-economic data for the region. The purpose of this report is to

- provide an overall socio-economic assessment of the Wadden Sea region and

- outline the strengths, weaknesses, opportunities and threats with a view to a further analysis of the socio-economic perspectives of the region.

Socio-economic inventories have been carried out in Germany (by Planco) and Denmark (by Cowi). Comparable Dutch data has been collated through a related national Dutch project (SEOW project) and supplemented with data collected by the University of Groningen.

These socio-economic national studies and other available information (national and international databases, Internet searches, scientific papers etc.) have been used for the current report. The most important results of the individual studies are presented here. The methodological constraints should be kept in mind when reading this report about data for a heterogeneous tri-national region. The report includes a large number of figures, which are partly subject to the limitations of unavailable or incompatible statistical data.

Both similarities within the tri-national region and national differences are highlighted. In addition, significant differences between developments in the Wadden Sea region and those at the national level are presented.

The national studies mentioned above and this overall view, which are of a generic nature, will be used to draw up a follow-up sector-specific analysis which identifies the most relevant economic sectors in the Wadden Sea region and analyses their development and prospects. This additional report will result in a review of the future prospects of the most important sectors in the Wadden Sea region.

The Wadden Sea Forum will use both this report and the sector-specific analysis as background material for the further development of strategies and scenarios for the region.

2 Regional analysis of the Wadden Sea region

Defining the region

This report contains a survey and assessment of data for those administrative units (municipalities, counties and regions) directly adjoining the coastline of the Wadden Sea. Due to the uneven availability of data, the regional level between countries is slightly different, and mainly oriented to the European statistical units of NUTS levels 2 and 3 (except for Denmark where more detailed data is still available at municipality level).

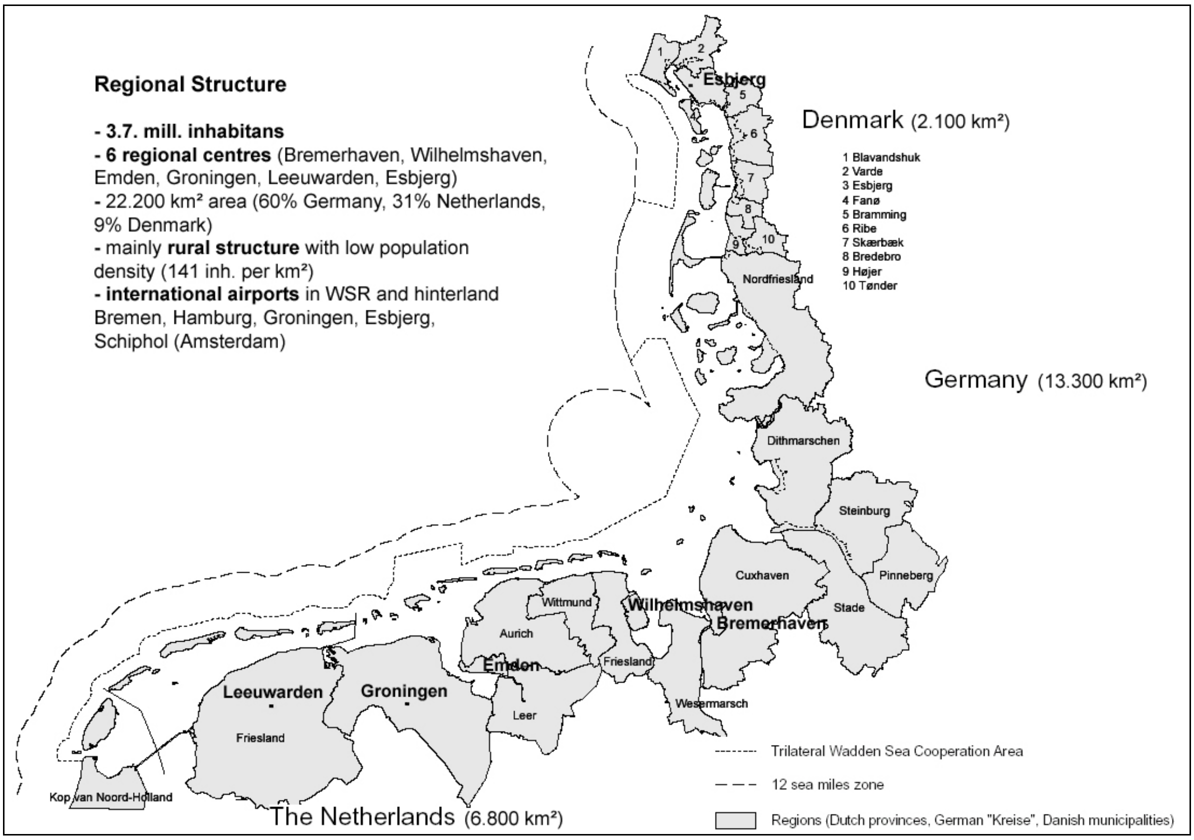
Thus, the Wadden Sea area extends from Den Helder (Netherlands) to Esbjerg (Denmark) along the North Sea coast – an extent of about 650 km. The geographical scope of investigation includes the following municipalities, provinces, districts and urban communities:

Denmark	Germany
Blavandshuk [1]	***Schleswig-Holstein***
Varde [1]	Nordfriesland [4]
Esbjerg [1]	Dithmarschen [4]
Fanø [1]	Steinburg [4]
Bramming [1]	Pinneberg [4]
Ribe [1]	***Lower Saxony***
Skærbæk [1]	Cuxhaven [4]
Bredebro [1]	Stade [4]
Højer [1]	Wesermarsch [4]
Tønder [1]	Wittmund [4]
	Friesland [4]
	Wilhelmshaven [5]
Netherlands	Aurich [4]
Groningen [2]	Emden [5]
Fryslân [2]	Leer [4]
Kop van Noord-Holland [3]	***Federal State of Bremen***
	Bremerhaven [5]

Note: 1) municipality 2) province 3) COROP level (Dutch statistical unit, distinguishing regions that are relatively homogeneous in economic terms) 4) district 5) urban community

The urban centres of Hamburg, Bremen and Oldenburg are not located directly on the coast and so may be considered as being outside the Wadden Sea region from a political and administrative point of view. Nevertheless, the Wadden Sea region is affected by the forces of attraction and spin-off effects of these large cities. This primarily relates to aspects such as population, education, employment, settlement, traffic and communications as well as important infrastructure facilities such as harbours, airports and universities. Where it is useful, this analysis includes these urban centres and their specific functional role for the Wadden Sea region. However, unless explicitly stated, the urban centres of Hamburg, Bremen and Oldenburg have not been included in the analyses.

Figure 1: Overview of the Wadden Sea Region



Prognos AG 2004 according to BBR Inkar and Cowi 2003

2.1 Demographic structure and development

The demographic development within the Wadden Sea region has a great impact on the overall development of the region. On the one hand, a growing population would put greater pressure on land use and natural resources. On the other, the development of the population – especially that of working age – is important for the development of business and income to the region.

In 2000 the Wadden Sea region had a population of 3.7 million. One in a hundred citizens of the European Union live in the Wadden Sea region. The majority of population, 2.0 million people, lives in the German part of the region (proportion of total population in Wadden Sea region: 54 %). The Dutch part of the region has a population of 1.5 million (42 %), while the Danish part has the smallest share with only 0.2 million (5 %).

The distribution of the population between urban and rural areas in the Wadden Sea region is 39 % against 61 % (see Figure 5). In the process of economic and spatial structural change, rural areas are often disadvantaged compared to conurbations. This concerns such aspects as economic power, preservation of jobs and socio-structural living conditions. In terms of sustainable development, a good balance is generally required between the development of the rural and urban areas in the Wadden Sea region. This means the rural areas need to be accorded opportunities equal to those of conurbations. In this context the decline of infrastructure in the rural areas is to be slowed down and development concerning the requirements of an diverse rural economy, the preservation of viable villages and the requirements of accessibility must be promoted.

Immigration is a normal process and not a special case for European regions. Nevertheless, it often produces problems such as cultural conflicts, lack of integration or social segregation. In the Wadden Sea region the largest section of the population is native (approx. 96 %) and only about 4 % are foreign citizens. Compared to the countries as a whole, the proportion of foreign inhabitants is below average. The Dutch part of the region has a particularly low proportion of foreign citizens.

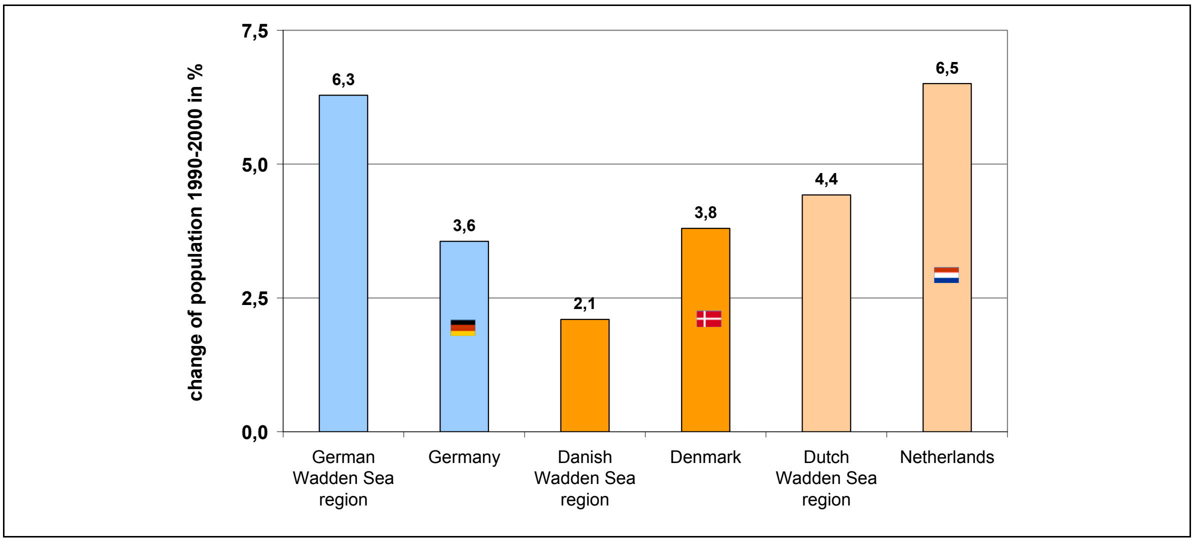
Wadden Sea Region – high population growth

In the nineties the population developed very dynamically. The total population grew by 5.3 %. Essentially it is the German part of the Wadden Sea region which is responsible for this growth (6.3 %). In Denmark (2.1 % Wadden Sea region against 3.8 % Denmark) and the Netherlands (4.4 % Wadden Sea region against 6.5 % Netherlands) the respective total national populations have grown more than the population in the Wadden Sea region.

The population development of a region is also affected by economic circumstances. In this context, some of the traditional ports show a decreasing population. The populations of Wilhelmshaven and Bremerhaven have declined by 5 %. There has been a decline in population in Delfzijl and Den Helder of nearly 7 and 2 % respectively. They have been especially affected by severe structural crises during the nineties.

The population grew in sub-regions which are tourism spots (e.g. Fanø, Ameland, Vlieland, Texel), and suburban regions of large cities (especially of Hamburg: Stade, Pinneberg) which could cope successfully with the economic structural change (Aurich, Leer, Wittmund). The latter regions in particular benefit from migration, especially of families, but also older people who return after retiring. These are signs of, for example, a reasonably good labour market, an unproblematic housing market, and high quality of life. Nevertheless, people, especially the young, still leave these sub-regions to pursue their education and careers.

Figure 2: Population growth in Wadden Sea Region during the 90s



Source: Prognos 2004, based on Prognos AG, Bundesamt für Bauwesen und Raumordnung, Statistics Netherlands, StatBank Denmark

Slow natural population development, but high migration

In general the population development can be divided into two main categories. One is the balance of natural population development, which is the difference between births and deaths; the other is the balance of migration[1], i.e. the difference between the numbers moving in and out of the area.

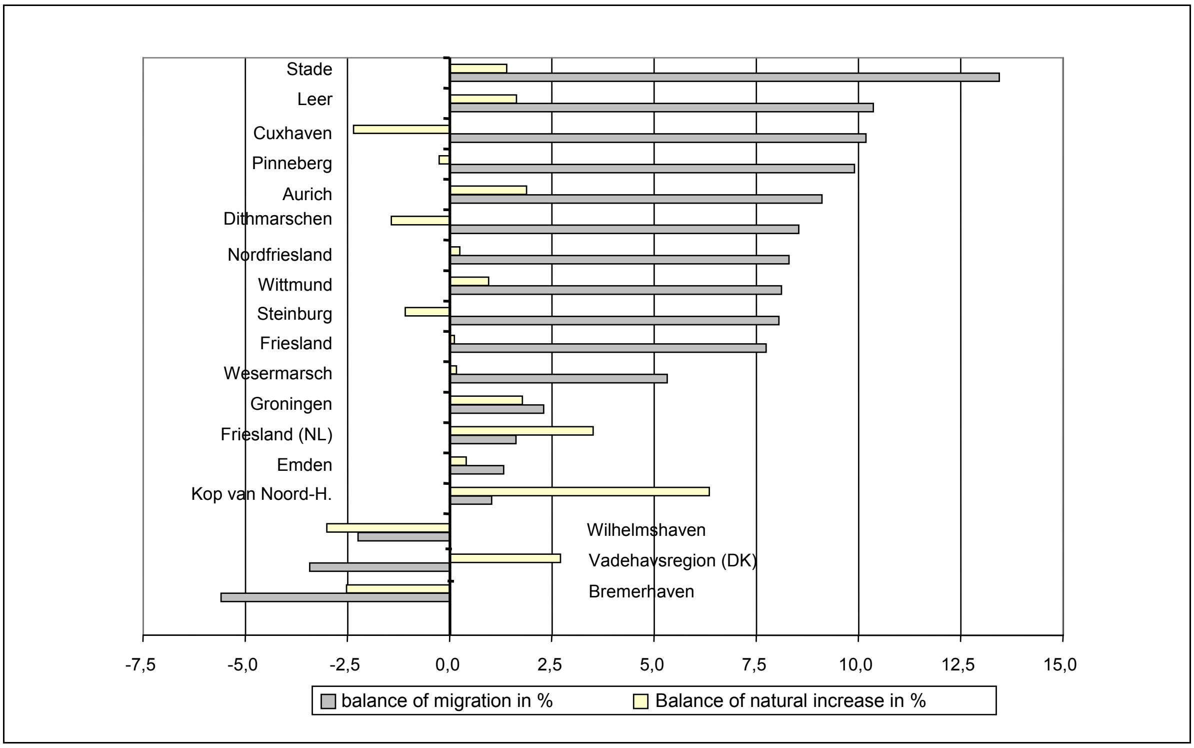
The natural population development (balance of births and deaths) in the German Wadden Sea region is particularly negative in Wilhelmshaven, Bremerhaven, Cuxhaven, Dithmarschen and Steinburg. In other German sub-regions the number of inhabitants is only marginally affected by natural population development but much more so by migration. Nevertheless, the mortality rate slows down the increase of population in general. In Emden and Wilhelmshaven the mortality rate and outward migration combine to produce a notable decrease in the number of inhabitants. Without high immigration from Eastern Germany and Europe and some suburbanisation processes, the German Wadden Sea region would have experienced a strong decline in population during the nineties. These inward migrations took place to, for example, Stade, Leer, Pinneberg, Aurich and Cuxhaven.

1 Migration is conditional on a certain number of people moving out. For a balance that is positive or in equilibrium, the same or a higher number of people moving into the region is required. Migration balance is the difference between arrivals in the region and people moving out.

The Danish region shows a positive natural balance due to high birth rates; the slow growth of population in general results from a considerable level of emigration to urban areas and conurbations in Denmark. There was a slight trend towards an increase in the number of people moving out of the Wadden Sea region. Where the projections show a tendency towards a decrease in outward migration, this is because a higher proportion of the population are elderly and there are fewer young people seeking educational opportunities elsewhere. This also means that a higher mortality rate as a result of the ageing population will be the main factor in the fall in population in the following years.

In Dutch regions the continuous growth of population is based both on a high birth level and a relatively modest balance of migration. There was a tendency towards an increase in inward migration in the nineties. Starting with a negative balance until 1991, inward migration increased up to a positive balance of 8,000 people in 2000. These figures are dominated by foreign migration. In contrast, depending on cyclical economic trends, native inhabitants moved outside the region. There are two high negative figures (Delfzijl and Den Helder). One factor in Den Helder is the reduction in the defence sector there.

Figure 3: Population development between 1990 and 2000: natural increase and migration



Source: Prognos 2004, based on Prognos AG, Bundesamt für Bauwesen und Raumordnung, Statistics Netherlands, StatBank Denmark

Forecast 2020 – population development will stagnate

The population forecast for the Wadden Sea Region indicates the start of population stagnation. Until 2010, the population will stay almost at the same level (3.3 mill. inhabitants) as in the year 2000[2]. Subsequently the population will decrease and fall below the level of 1995 until 2020. The population development in the future will be subject to large intraregional differences.

In the German part of the Wadden Sea region the hinterland of Hamburg will continuously increase in population due to further suburbanisation (in particular in Stade). In addition Leer, Aurich and Wittmund rank among the gainers (see Figure 4). It is anticipated that the positive economic development (in the automotive and engineering supply industry in Emsland and Emden) of recent years will continue. The forecast suggests that these three districts will remain attractive as housing locations for families. Therefore the age composition of the population will be rather young, in turn giving rise to more favourable birth rates. Due to an anticipated weak economic development, the ports of Wilhelmshaven and Bremerhaven will be particularly strongly affected by the decline and ageing of the population. The population of both cities will decrease by 20 % up to 2020. However, the jobs arising from the construction of the Jade-Weser-port might slow down or reverse this population development.

The Danish Wadden Sea region has experienced a growth in population over the last 20 years, but now the level is falling gradually, mainly because people are moving away. After 2010 the fall-off is expected to accelerate because there will be more deaths than births. This fall in population means that the number of people of working age will also decline in the future. The decline is expected to affect the Wadden Sea municipalities in Southern Jutland more than in the County of Ribe. The continued outward migration means that a higher mortality rate as a result of the ageing population will be the main factor in the fall in population over the period in question.

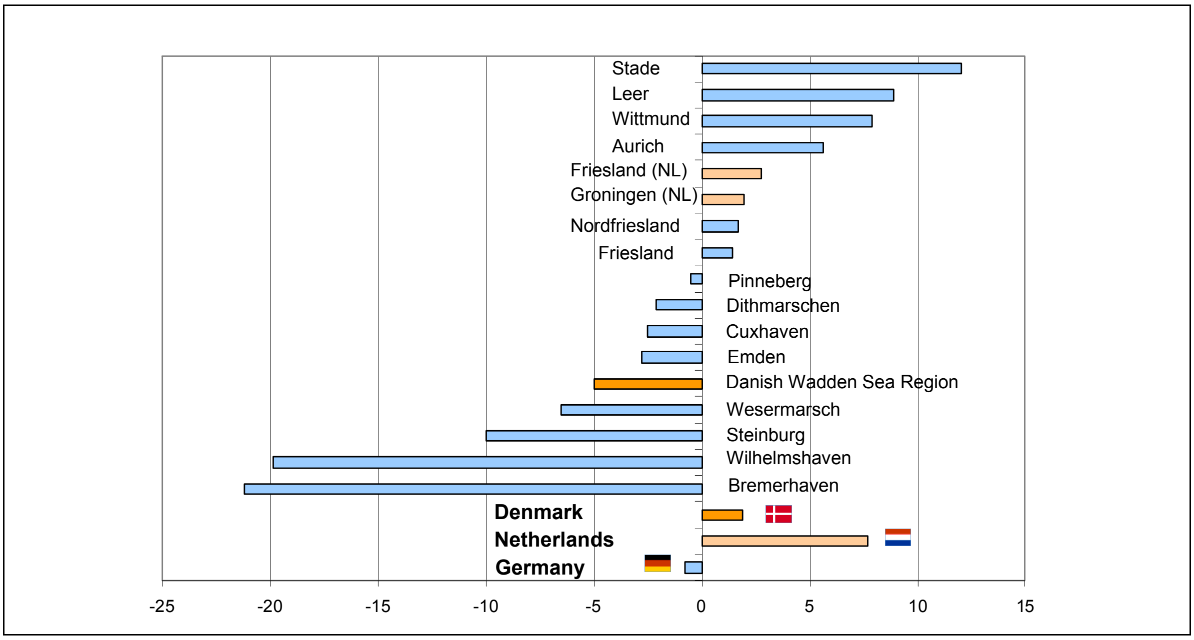
The Dutch part of the Wadden Sea region will experience a growth in population. There are several reasons for this development: De Kop van Noord Holland has a high inward migration due to suburbanisation processes in case of the Randstad; the City of Groningen is economically successful as a science and service centre; in addition there are some smaller industrial towns where new jobs have been created. As a result, the region benefits from high inward migration and a positive natural population development due to high birth rates.

2 Based on projections of the Bundesamt für Bauwesen und Raumordnung (BBR) for Germany, Prognos AG, Prognos World-Report, Statistics Netherlands for Dutch regions and StatBank Denmark.

In general the Wadden Sea region will experience a slight decrease in population until 2020. The population will especially decline in peripheral rural areas furthest from regional centres in the Wadden Sea region as well as in old industrialised cities (ports) such as Den Helder, Delfzijl, Wilhelmshaven and Bremerhaven. However, the population in regional centres which cope successfully with the structural economic changes is expected to increase. Groningen is the best example of this trend. There will be an overall increase in population due to suburbanisation processes in the surroundings of the Randstad, Bremen, Hamburg and, to some extent, Emden and Esbjerg.

This development will naturally have significant consequences for municipalities as regards public infrastructure funding, for example. The demographic changes currently underway will be a defining feature of socio-economic life for the foreseeable future. Since the prolonged decline in fertility rate and the rapidly aging society are trends that are almost certain to continue, population will follow a steady downward trend. This massive demographic shift will have a deep social and economic impact on the region, which will consequently experience a much lower rate of economic growth for a considerable period of time. The current high public debt combined with latent adverse population dynamics will increasingly restrict the government's room for manoeuvre. It has to be expected that tough policy adjustments will have to be implemented in order to put public finances back on a sustainable track.

Figure 4: Population projection in Wadden Sea Region 2000 to 2020



Source: Prognos 2004, based on Prognos AG, Bundesamt für Bauwesen und Raumordnung, Statistics Netherlands, StatBank Denmark
** Note: Regional projections of Dutch provinces only until 2010*

2.2 Regional Classification and economic weight

The socio-economic significance of the three parts of the Wadden Sea Region is different for the respective national economies. In this context the Dutch region has the relatively highest importance for the national economy. Nearly every tenth Dutch person lives in the Wadden Sea Region. In Germany and Denmark the relevance of the region is significantly lower than in the Netherlands. In Denmark every thirteenth citizen comes from the Danish Wadden Sea Region, in Germany only every fortieth German citizen lives in this area.

Looking for similarities and differences - out of 18 sub-regions - three different main groups in the Wadden Sea Region have been identified. This classification is based on social and economic indicators which describe the socio-economic structure of the regions. The criteria **density of population**, total **number of population** and closeness to **European metropolises** (such as Hamburg and Amsterdam) characterise the regional economic function of regions and their condition of centralised supply with goods, services, jobs, culture, etc. (see Figure 5).

Figure 5: Classification of homogeneous groups of sub-regions

Category	Name of region		Population	Employment	Dominating functions of regional categories
Regional centre	Leeuwarden Groningen (only city)	Emden Wilhelmshaven Bremerhaven Esbjerg	16.4 %	22.6 %	shopping, culture, education, service industry, administration, urban living
suburban area	Kop van Noord-Holland Stade Pinneberg		22.6 %	22.5 %	horticulture, manufacturing industry, living (esp. for commuters)
Rural area	Fryslân without Leeuwarden Groningen without City of Groningen Leer Friesland Aurich	Wittmund Wesermarsch Cuxhaven Steinburg Dithmarschen Nordfriesland Danish WSR without Esbjerg	61.0 %	54.9 %	rural living, manufacturing industry, agriculture/fishery, tourism, recreation
Total Wadden Sea region			**3.7 mill = 100 %**	**1.5 mill. = 100 %**	

Source: Prognos 2004 according to Statistisches Landesamt Baden-Württemberg, Arbeitskreis VGR, Statistics Netherlands, StatBank Denmark. The regional centres are significantly larger than 50.000 residents, the suburban areas have a population density below the average of WSR (141 inhab./sqkm) and are close to the metropolises of Hamburg and Amsterdam. The peripheral areas have a population density below the regional average. Showing GDP at the level of communities (such as Esbjerg, Leeuwarden) is not possible because of statistical unavailability.

The main groups are characterised in the following:

- Six **regional centres** were identified. The cities of Emden, Bremerhaven, Wilhelmshaven, Esbjerg, the City of Groningen and Leeuwarden have a central local and regional function in terms of culture and shopping, education and the labour market. About 16 % of the population lives in these regional centres but about 23 % of the total employment in the Wadden Sea area is concentrated in these centres. These figures show the function of these centres in supplying the peripheral areas.

- **Suburban areas** close to the metropolises of Hamburg and Amsterdam characterise the second group. The areas of Pinneberg, Stade and Kop van Noord-Holland are typical areas with high commuting flows to their metropolis. The labour markets are strongly affected by the conurbation. Regions of this category are new business locations with positive perspectives for the future favoured by the trend towards sub-urbanisation.

- The third group comprises **rural regions** with a population density below the average (141 inhabitants per km^2). About 61 % of the population in the Wadden Sea Region lives in a region in this category, while at the same time they represent only 55 % of total employment. The population of these regions is characterised by higher levels of commuting towards the regional centres. The basic economic structure suffers from a lack of diversity in employment and is mainly characterised by traditional manufacturing industries, agriculture, fishery and tourism.

In this context we wish to highlight the special significance of Hamburg for the Wadden Sea region, although it is not part of the region in a narrower sense. Hamburg is a metropolis with 1.7 million inhabitants. The city has an international importance both for northern Germany and Europe. In addition the city has an overwhelming importance for its near hinterland, especially for labour markets and retailing. If we include Hamburg in the analysis, its strength becomes apparent in the result that 30 % of the inhabitants generate about 50 % of the total GPD in the Wadden Sea region.

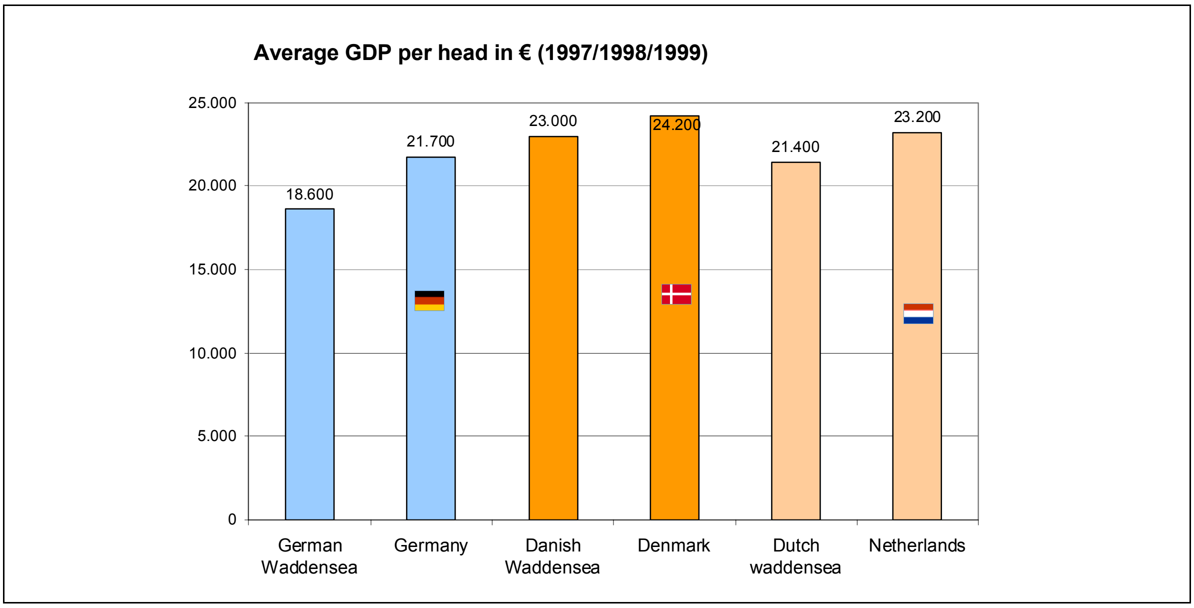
Income below average of respective countries

Comparing the three parts of the Wadden Sea region, Danish households have the highest income, followed by Dutch and then German households. The German Wadden Sea region shows the biggest difference when compared to the average of national prosperity (approx. 15 %). This fact indicates that there might be financial disadvantages in comparison with the population of other German regions, caused by a high level of unemployment and lower wages.

But income is not in itself necessarily a good measure of purchasing power and economic status. Differences in house prices can mean that two families with the same income and a comparable standard of housing have a different disposable income, i.e. money available to buy food, clothes, travel etc., after making adjustments for house prices, tax and different public services.

The Denmark study by COWI suggests that the true purchasing power in the Wadden Sea region is increased significantly because house prices are appreciably lower. The labour costs and earnings of employees in the Wadden Sea region are below the average of the respective country. However, lower levels of earnings do not automatically mean that disposable income is also correspondingly lower. In general, the Wadden Sea region benefits from a relatively low level of prices. The prices for food, rent and living in general (except in popular tourist areas) are lower than in other parts of Germany, Denmark or the Netherlands. It cannot immediately be concluded that the inhabitants of the Wadden Sea region are better or worse off than people in the other regions simply because the income level is below the national average.

Figure 6: Personal income in Wadden Sea region in GDP per head



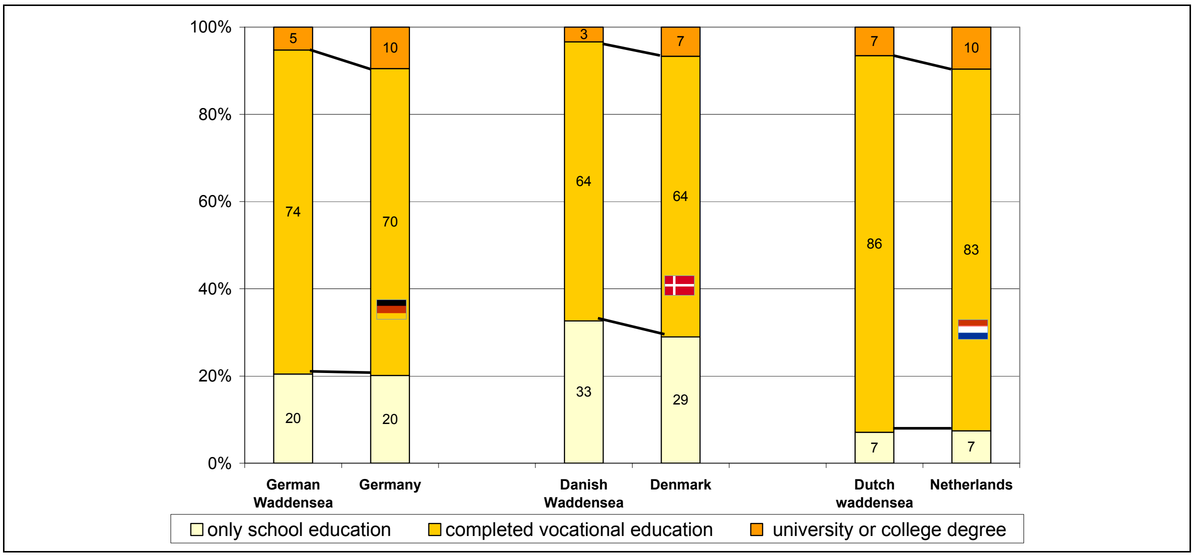
Source: Bundesamt für Bauwesen und Raumordnung, Danish Waddensea is the average value of South Jutland and Ribe County. © Prognos 2004

2.3 Human resources

There is a vital link between education and the prosperity of regions. Highly industrialised countries such as the Netherlands, Germany and Denmark have entered a new age of the knowledge-based economy. At its most fundamental level, the knowledge base of an economy can be defined as 'the capacity and capability to create and innovate new ideas, thoughts, processes and products, and to translate these into economic value and wealth'.

In other words, knowledge is the element that underlies the competitiveness of regions, nations, sectors and firms. The knowledge economy especially includes the skills of employees. It is very obvious that future knowledge capital is currently embodied within education and human capital availability and quality. An international study[3] analysed the cohesion between the level of employment and qualification. For a highly developed country it is essential: the better educated the population, the higher the economic tertiarisation. In principle, this also applies to the Wadden Sea region.

Figure 7: Labour force by level of education in 2000



© Prognos 2004 according to Statistisches Bundesamt, Statistics Netherlands, StatBank Denmark, Value of German Waddensea without counties of Schleswig-Holstein because of lacking data. Limited comparability between the three nations because of different national vocational educational systems and different statistical registration.

[3] IW Köln, Dokumentation Bildung und Wirtschaftlicher Strukturwandel im internationalen Vergleich, 1/2002

In general, the level of education in the Wadden Sea region is comparable to that in the respective country (see Figure 7). There are differences, however, primarily concerning highly qualified employees (those with a college or university degree). In the Dutch sub-region this share is around one third lower than the national average. However, it is around half the national average in Germany and Denmark. Against this the share of employees who have completed vocational training is slightly higher. The proportion of unqualified employees is above the average only in Denmark, but is especially problematic in Germany and Denmark because of its extent, since there are few chances of these people finding a job with a promising future. In addition:

- The qualification level is connected closely with the economic structure of the Wadden Sea region. The proportion of highly-qualified people is very different in the individual economic sectors. It is low in the strongly represented sectors of manufacturing, transport and logistics, tourism, trade, construction and household-oriented services. It is high in those sectors which are not strongly represented in the Wadden Sea region: Science, education and business-orientated services.

- Based on the university and the business-oriented services of the City of Groningen, the Dutch Wadden Sea Region is characterised by the high level of an academic labour force (6.5 % of the total labour force). On urban job markets the demand for higher qualifications is usually larger than in rural municipalities.

- Due to a relatively low density of intra-regional universities[4], a lot of young people with university-level qualifications leave the region for training and study purposes. After their education only some of them return (see the migration trends described above). Even if there are some important universities in the hinterland, such as Bremen, Oldenburg and Hamburg, the relatively few academic job opportunities in the Wadden Sea region prevent them from returning. On the other hand it is difficult for businesses in rural and/or peripheral regions to recruit highly qualified employees.

For the economic and social future of the Wadden Sea region schooling and vocational education play a substantial role. The personal qualifications of individuals greatly determine their career opportunities as well as incomes and standard of living. The workforce requirements for simple activities will decrease further over

4 The following universities, colleges and universities of applied sciences could be identified: Hochschule Bremerhaven, University of Applied Science Ostfriesland with locations in Emden and Wilhelmshaven, University of Applied Science in Heide, FH Nordakademie, Hochschule der Wirtschaft in Elmshorn, University of Groningen, Noordelijke Hogeschool Leeuwarden, University of Aalborg campus in Esbjerg, University of Southern Denmark campus in Esbjerg.

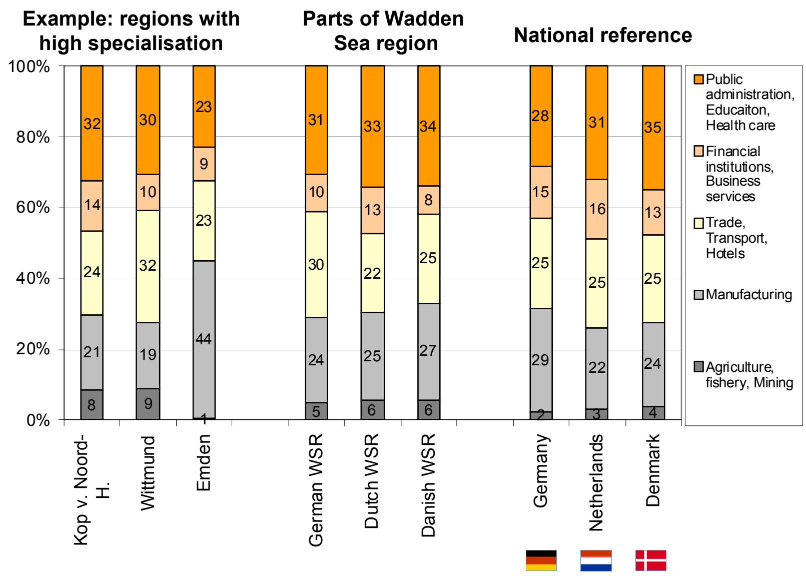
the next twenty years, as the need for more highly skilled activities will rise. Employees lacking qualifications will have an even larger professional disadvantage in future.

Currently there is no overall sign of a poor qualification structure in the Wadden Sea region. It corresponds, apart from individual matching problems, to the economic structure. However the lack of highly qualified people is a comparatively poor starting point for the projection that jobs will become ever more knowledge-intensive. In addition the sectors considered to offer the most growth in the future are those requiring a high proportion of highly qualified employees. In this context the Wadden Sea region is not optimally prepared for the coming knowledge-oriented structural change of the economy.

2.4 Economic sectors

The economy of the Wadden Sea region, like the rest of the respective countries, is dominated by industry and service. Around two-thirds of those employed in the Wadden Sea region work in the service sector, which includes the entire public sector. However, agriculture, fisheries and transport play a somewhat more important role in the region than in the rest of the countries. In addition, the public sector, comprising public administration, education and health care is more important for employment in the Wadden Sea region than it is nationally.

Figure 8: Share of labour force by sectors in 2000



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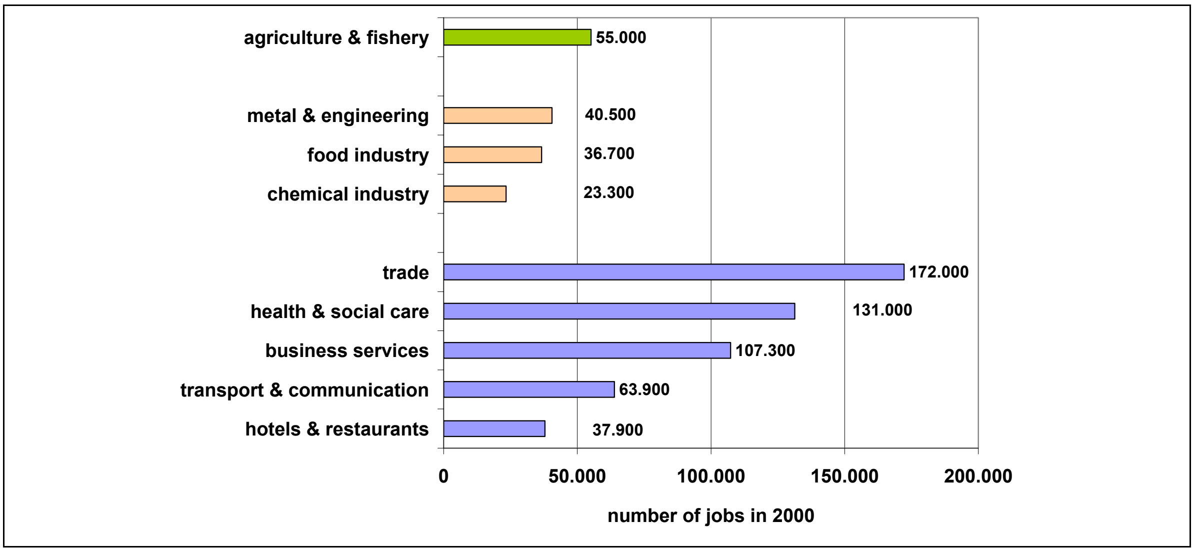
The Wadden Sea region is characterised by a relatively high proportion of agricultural land use. There is a relatively large amount of cattle farming in the Wadden Sea region, but also crop farming (cereals, potatoes, sugar beet) and horticulture (mushrooms, tomatoes, apples) are important. Agriculture, horticulture and forestry account for around 53,000 employees. In relative terms, agriculture has seen its share of GDP decrease over recent decades. This does not mean, however, that agriculture is doomed to play a secondary role in the process of economic and social cohesion, especially in rural areas of the Wadden Sea region. Even as a minority in the countryside, farmers are still the main managers of the land and agricultural work largely determines the degree of attractiveness of these regions, particularly where the landscape is concerned. In addition the sector often provides employment where other job opportunities are limited.

Figure 9: Key-economic sectors in Wadden Sea Region by number of jobs in 2000



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Fishery is an integrated part of the region, as regards catching grounds (inshore fishery), sales and processing, the region's cultural expression and as a tourist attraction. Cutter and coastal fishery, though mostly operated as a combined fishery, mainly specialises in shrimp and shellfish fishery. In 2000 about 1,500 employees worked in the fishery sector of the Wadden Sea region. Although the economic relevance of the fishery sector in the region as a whole is relatively low, as indicated by its 0.2 % share of total employment in the Wadden Sea region, the fish-processing sector in particular is of higher local relevance in certain locations, such as Cuxhaven (labour force in fishery & processing: 4 %), Bremerhaven (6 %) or Esbjerg (3 %). Key locations for shrimp and shellfish processing are Zoutkamp and Emmelsbühl.

Although the manufacturing sector has become less important in the structural change of recent decades, it is still of substantial importance for the Wadden Sea region. In 2000 about every fourth job was in the industrial sector. The highest proportion of industrial employment is in the Danish Wadden Sea region (27.5 %). The metal and engineering industry is the most important sector (approx 40,500 employees) followed by the food industry (36,700 employees) and the chemical industry (23,300 employees). These three key industrial sectors comprise two-thirds of the manufacturing labour force in the Wadden Sea region.

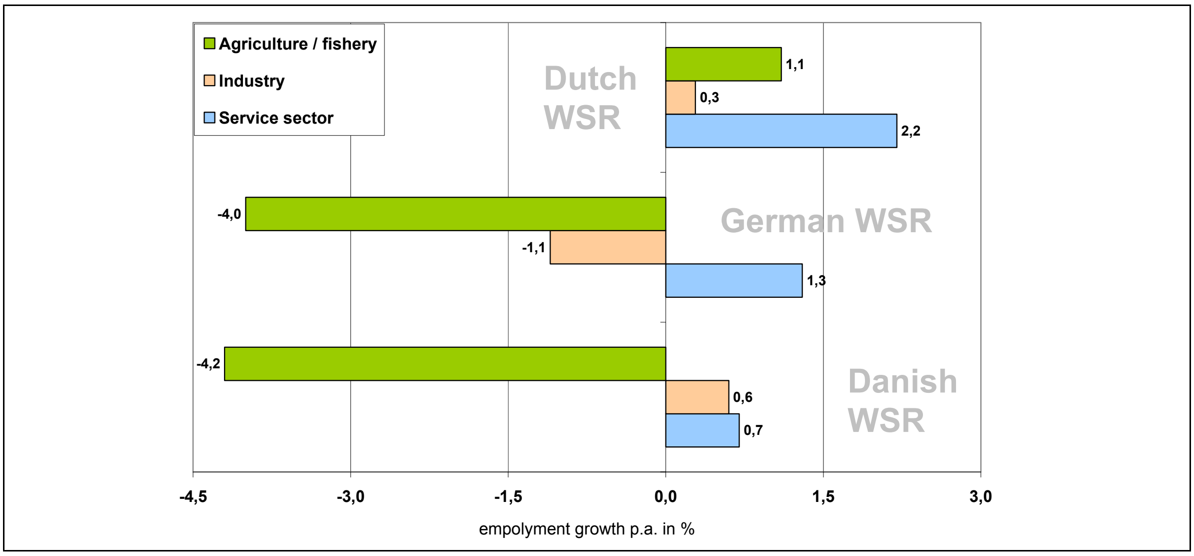
The cross-sectional harbour sector, comprising manufacturing, trade and other service industries, is of significant economic importance for the Wadden Sea region. About 100,000 jobs in the region are dependent directly on the harbours and shipping industry. Additionally about 100,000 jobs in other preliminary and downstream maritime sectors could be counted as indirect jobs in the Wadden Sea Region. Every twentieth job in the Wadden Sea region depends directly or indirectly on the harbour industry. If Hamburg is included, then every twelfth job in the region is harbour based. In 2002 the main harbours of the Wadden Sea region moved 55 million tons of cargo. During the last ten years the volume turnover increased by 36 %. The Wadden Sea ports grew faster than their key competitors such as Amsterdam, Rotterdam, and Antwerp. With the increase of world trade the turnover of goods at the Wadden Sea ports will continue to increase in the coming years. The container segment in particular will continue to grow rapidly, at an annual rate of 4 % up to 2015.

In almost every part of the region, tourism is an important economic activity. On most of the islands and at some of the mainland locations it is actually the most important economic activity. In the hotel and restaurant sector alone. about 38,000 people (3.5 % of the labour force) are employed. The Wadden Sea region is visited by 8 - 10 million tourists annually (44 million overnight stays). Key target groups of tourists are families and seniors. The turnover and employment created by tourism helps to secure the economic basis of many smaller rural municipalities. Tourists secure jobs in the region through their expenditure and at the same time contribute to securing the economic basis for retailing to the benefit of the permanent residents. Thus tourism plays a central role in ensuring the economic sustainability of rural districts.

Service industries represent a large and expanding sector of the economy. Indeed, since at least 1980 they have been the only area of activity in which there has been net job creation of any substance. Even so, in all sub-regions of the Wadden Sea region the proportion of employees in the tertiary sector is below the national level. The following industries are of special importance for the regional labour force: trade (approx 15 % share of total employees), health & social services (11-16 %), transport & communication (6-7%) and business services (7-14 %). These four key sectors provide about two-thirds of the total employment in service sectors and about half the total employment in the Wadden Sea region. Within the service sector there were key performers that accounted for much of the net increase in local jobs. Foremost amongst these were business services, health and social services and tourism. On the downside, there were job losses in public administration and to some extent in the transport sector.

All in all, the basic economic structure of many sub-regions in the Wadden Sea region, and its immediate hinterland, suffers from a shortage of growth industries. Manufacturing is mainly based on port locations and traditional heavy industries, which are generally in decline. Very few growth industries, such as high technology computer and other electronics businesses, or industries independent of the coastal location have been attracted to the area. The primary activities of agriculture and fisheries are experiencing a fall in total employment and the transfer of employment from primary activities and industry to service is continuing.

Figure 10: Development of employment growth in main sectors during the 90s



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Traffic infrastructure

Traffic infrastructure is an important precondition for the production and exchange of goods, provision of services and transport of people. In highly developed industrial countries, such as the Wadden Sea countries, a modern traffic infrastructure (in terms of flight connections, maritime traffic, roads and railways) plays an important role for business cycles. Good travel and transport connections add value through reducing costs in terms of saving time for travel, increasing the flexibility of production and enlarging market reach.

The three biggest German ports are located in or near the Wadden Sea region (Bremerhaven, Wilhelmshaven and Hamburg). In addition, there are some smaller and medium-sized ports which have specialised in certain market niches or product categories according to the economic structure of their region (e.g. Eemshaven and Delzijl – chemicals; Emden – automobiles; Harlingen – fish, salt, bulk goods or Esbjerg - roll-on-roll-off and fish). For a rural region, the Wadden Sea region has a relatively dense network of international airports and flight connections. The airports of Esbjerg, Groningen and the nearby major airports of Hamburg, Bremen and Amsterdam are important infrastructure facilities for the Wadden Sea-region's economy and population.

The neighbouring metropolitan areas of Hamburg, Bremen and Amsterdam are relatively well connected to the sub-regions of the Wadden Sea region by light rail vehicles and motorways. But there are considerable deficiencies in the accessibility of long distance transport in the region. It is also somewhat problematic to cross the main rivers (Elbe, Ems, Weser) and to travel parallel to the coast. This is particularly a problem caused by increasing traffic delays in the greater area of Hamburg as well as the development of the Jade-Weser Port in Wilhelmshaven. These deficiencies, especially in the surroundings of the main logistic locations of Bremerhaven, Wilhelmshaven and Hamburg, have to be remedied in the medium term to avoid endangering the economic development of the Wadden Sea region.

Sectoral specialisation of the regional economy

In terms of division of labour and specialisation the Wadden Sea Region has occupied different sectors and sub-sectors. The following analysis indicates the degree of specialisation and concentration. The *ratio of localisation* expresses the proportion of regional sector-specific employment in comparison to the national employment share of each sector. Figure 11 shows selected economic sectors in the Wadden Sea region with a significantly high ratio of location (ratio > 110)[5].

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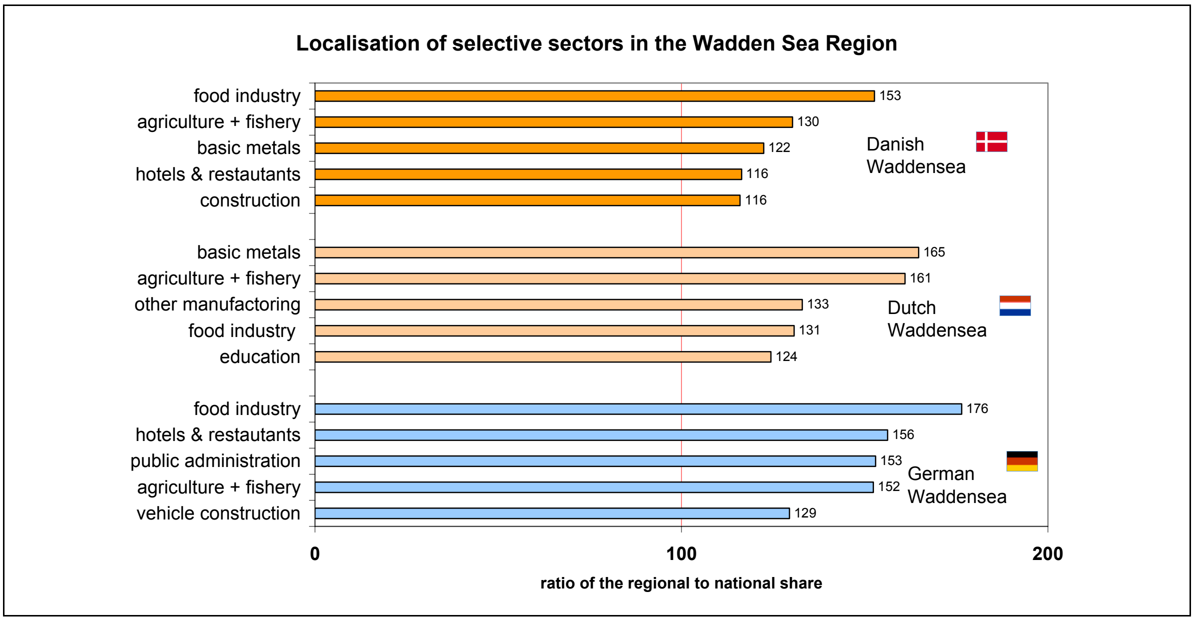
5 This means that if a sector represents a ratio of 150 it indicates that its regional importance is 1.5 times higher than the national average.

Figure 11: Dominant sectors in Wadden Sea region in comparison with respective country 2000



© Prognos 2004, according to Statistisches Bundesamt, Statistisches Landesamt Niedersachsen, Landesarbeitsamt Schleswig-Holstein, Statistics Netherlands, StatBank Denmark. Note: Documentation of sectors with significant employment share and localisation ratio > 110. The quotient represented expresses the concentration of an economic sector related to the employee share in proportion to the national level at the regional level. Different delimitations of the sectors arise from differences in the national recording of the employment and industry statistics.

Transnationally, the Wadden Sea Region exhibits a strong specialisation both in the agriculture and fishery sector and in the food industry. The concentration in these sectors is between one-third and two-thirds higher than in Germany, Denmark or the Netherlands as a whole. Also the Danish Wadden Sea Region specialises in metal and engineering as well as in hotels and restaurants. In comparison to the Netherlands, the Dutch Wadden Sea region has high location ratios in the construction and metal sector, which specialises in supplying the international offshore companies engaged in oil and natural gas exploration in the North Sea.

The German Wadden Sea Region differs from the Dutch and Danish parts in the type of sector-specific specialisation. The hotel and restaurant, public administration and vehicle construction sectors are very important segments in the German areas. The high proportion of public administration is due to the high concentration of German army and navy forces in the Wadden Sea region.

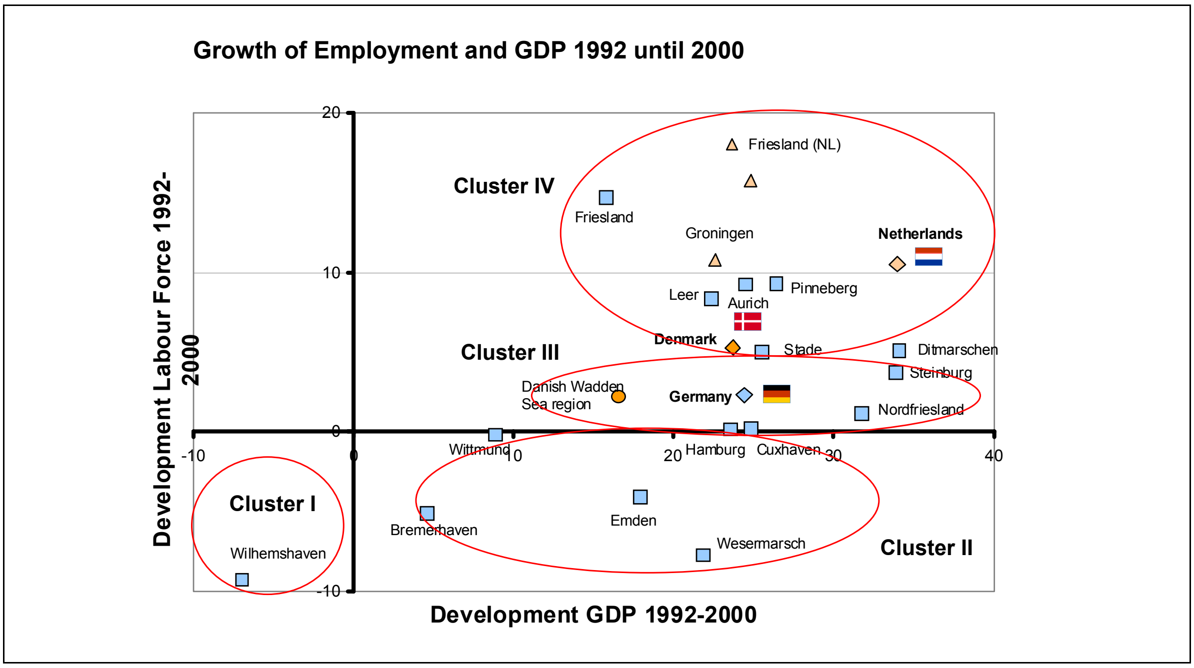
In conclusion, with regard to specialisation, all three parts of the Wadden Sea region share one central problem. They strongly specialise in typical traditional industry sectors, which are characterised by low growth rates in future, and specialise little in new and innovative sectors with high growth prospects.
Previously strong sectors, such as shipyards, have reduced their

workforce because of international competition and survive only in niche markets. The regional economy of the Wadden Sea region is handicapped by this pattern of specialisation, which indicates total future growth prospects (for employment and GDP) below the national average.

Intra-regional growth differences are considerable in Wadden Sea region

During the 1990s economic growth went through various phases of growth. Generally speaking, the economy in Wadden Sea region has grown by 20 % in GDP and 4 % in employment. On a national level GDP has grown by rates between 25 % and 35 %. Due to different labour market policies the pattern of creating new jobs was very different between the countries. In the Dutch Wadden Sea region particularly, economic growth was converted into new jobs (see Figure 12). The following figure gives an overview of the interrelationship between Gross Domestic Product and the employment trends in the nineties. We have used a comparison of the x and y axes to produce regional growth profiles and to suggest paths of development.

Figure 12: Economic growth and employment 1992 to 2000



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The national growth differences are reflected at the regional level. The Dutch regions, such as Fryslân (NL) and Kop van Noord-Holland, achieved the highest economic growth. These regions are followed by some German districts such as Friesland, Pinneberg and Aurich, which represent a cluster of rapidly-growing locations.

Most German districts achieved average growth rates of GDP, but could merely consolidate their employment level. Few German regions can be characterised as structurally weak with special growth problems. Four German structurally weak regions with a high proportion of an industrial labour force in traditional sectors (e.g. steel, shipyards) perform badly in interregional terms and economic regeneration. The districts of Wesermarsch, Emden and Bremerhaven showed poor economic growth and high job losses. There was a dramatic decline in GDP and employment in Wilhelmshaven, of about 10 %, during the 1990s.

The Dutch Wadden Sea region is part of the cluster of fast-growing locations and has a high potential for growth of GDP and employment in comparison to the Wadden Sea region in general. The Dutch region specialises less in industrial sectors which are expected to offer less employment. The proportion of industrial and agricultural jobs will largely hold in the future. Three service sectors with good growth prospects up to 2020 are strongly represented in the Dutch region: business services, health and social services and trade/retail.

The Danish Wadden Sea region is part of Cluster III, which indicates a balance of job gains and losses. The region will maintain a stable employment level. The Danish Wadden Sea region is strongly focussed on the food industry, metal and engineering, agriculture and fishery. These sectors will probably cut their workforce. On the other hand large growth prospects are expected for the hotel & restaurants sector, health care and social services and business service. The business structure of the region is in the final phase of the transformation from a society based on agriculture and fisheries to one based on industry and high added-value services.

In this context we consider that the four types of clustered subregions in Figure 12 predict the pattern of growth, the reduction in regional wealth, and poverty in the future.

2.5 Labour market

Comparing the Dutch and Danish Wadden Sea region with the German sub-region, the labour market situation is considerably more favourable than in Germany, especially in the Netherlands. In the second half of the 1990s, the Dutch economy as a whole grew dynamically. Supported by strong, cyclical economic growth, the unemployment rate fell. In addition, due to political interventions in the labour market, there was an increase in total employment, due to an increase in female employment, especially in part-time jobs. In Denmark too, reforms were responsible for a good performance since the middle of the 1990s. In contrast to Denmark and the Netherlands the German labour market could be described as cumbersome and inactive. During the 1990s the unemployment rate remained high. Due to the cyclical slowdown in 1993/1994 and the continuing process of de-industrialisation the number of unemployed increased steadily. Unlike the Netherlands and Denmark, Germany has failed to initiate reforms on the labour market.

Changes in economic structure strongly affect the Wadden Sea region

In comparison with each national state, the Wadden Sea region is structurally weak in terms of the labour market. The unemployment rates in most areas (except Nordfriesland and Stade) are higher than the national average. “Ostfriesland” and the “Unterweser" area in particular are structurally weak in economic terms and the unemployment rates in the single administrative districts are high – between 9 % and 11 % in 2000. As a result of crises at the dockyards and economies in cargo handling, fishery and the food-industry, Bremerhaven is the region with the highest unemployment rate (13.5 %) in the Wadden Sea region. [6]

During the 1990s the rates of unemployment in the Danish and Dutch areas fell by about 3-4 percentage points. In Denmark it appears that while unemployment at the end of the eighties was higher in the Wadden Sea region than in the rest of the country, this was not the case in the nineties. At the beginning of the nineties unemployment was around 10 %. In 2000, unemployment had fallen to 5.2 %. As opposed to this trend, the unemployment rates in the German Wadden Sea region could not be reduced, except in Emden and Wilhelmshaven, where unemployment decreased from a very high level. Certainly, at the beginning of the new millennium Denmark and the Netherlands have been affected by the cyclical decline in economic activities and unemployment rates have increased.

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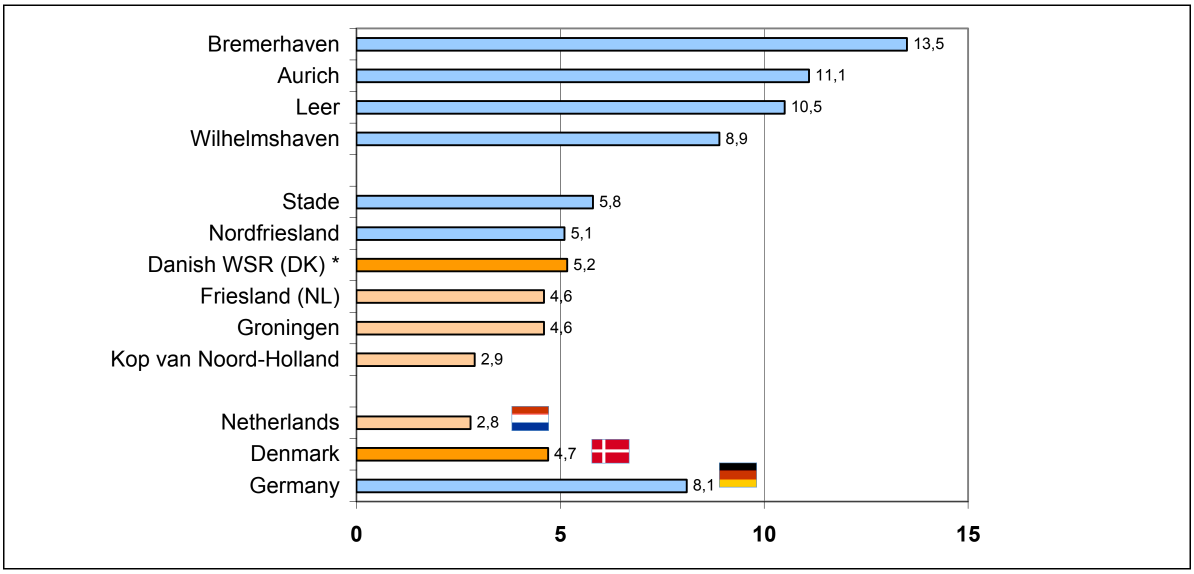
6 International comparison standard of Eurostat

Unemployment, particularly in the Danish and Dutch areas, has fallen in recent decades and is relatively low in the Wadden Sea region. On the whole, this is positive, even though it increases the risks of bottlenecks in the labour market for certain sectors and skills. At the same time, unemployment may be considered as a potential resource for the region – especially if there are training opportunities to meet the current and future needs of the companies in the region. This seems to be the greatest challenge for the labour market of the entire Wadden Sea region.

Figure 13: Unemployment rates in Wadden Sea Region 2000[7]



*Prognos 2004 according to Bundesamt für Bauwesen und Raumordnung and Eurostat * Danish WSR national source and defintion of employment*

Self-employment – regional entrepreneurial potential

Entrepreneurial activity is a relevant indicator in terms of job opportunities and new growth processes. As well as creating new jobs, entrepreneurship promotes innovation and acceleration of structural changes. The most significant indicator of entrepreneurial activity is the proportion of self-employment within the total labour force.

In general the self-employment rates in the Netherlands (11 % of labour force) are slightly higher than in Germany or Denmark (10 % in each case). The self-employment rates of sub-regions in the Wadden

7 The comparison of labour markets indicators has to consider different frameworks and different kinds of statistical measurements used in Denmark, Germany and the Netherlands. Due to different national labour market data, comparable indicators of Eurostat has been used for the analysis.

Sea region vary from 7.5 % to 14 % and the average is about 10 %. In a regional comparison the Dutch regions of Fryslân (14 %) and Kop van Noord-Holland (13.5 %) have the highest self-employment rates in the Wadden Sea region. In Germany only the regions (Bundesländer) of Hamburg (12.8 %) and Schleswig-Holstein (11.2 %) show above average rates of self-employment. The self-employment rate in the Danish region is below average (7.5 %).

It is also the case that entrepreneurship in the Wadden Sea region expresses the sector specific high self-employment rates in agriculture, fishing, trade and tourism. These are all sectors in which the future for individual firms is often uncertain and not associated with growth sectors. Thus, self-employment is not necessarily an indicator of new economic growth associated with the ability to and activity of creating new jobs. Nevertheless, municipalities continuously need new businesses to provide long-term location development and create future-oriented employment.

3 Summary and conclusions

The Wadden Sea is the largest coastal wetland in Europe. It is the largest unbroken stretch of mudflats in the world. There are few, if any, coastal zones in Europe with as many potential fields of conflict between nature and mankind. One of the reasons is that the International Wadden Sea region is a natural area of worldwide importance, but also has a vital commercial significance. This context gives rise to a range of challenges.

The demographic changes currently in progress will be a defining feature of socio-economic life for the foreseeable future. Since both the prolonged decline in the fertility rate and a the rapid ageing of the population are almost certain to continue, the population will steadily decline. This massive demographic shift will have a deep social and economic impact on the region, which will consequently experience a much slower rate of economic growth for a considerable period of time. Rural areas with low population density in particular will face the problem that the capacity utilization of infrastructure facilities is too small and thus the costs are too high. In addition, businesses must be made aware of this pattern of demographic change, because they are affected in various ways, such as changes in markets, entrepreneurial successors, and requirements for specific qualifications.

The structural change of the economy has for a long time favoured service industries at the expense of the manufacturing sector. The individual manufacturing industries have developed quite differently.

Companies engaged in research and development and employing highly qualified personnel, such as broad parts of aircraft industry, mechanical engineering, and electrical industry, will be able to hold their position in the future. They should be able to offer competitive, technologically high-quality products.

The main beneficiary of the economic structural change is the service sector, because new and additional jobs will be created almost exclusively here in the future. However, the service sector is also itself exposed to rapid structural change. The prospects for the individual segments within the service sector are different. Above all, the business-orientated services may rank among the absolute winners. However, employment is expected to continue to fall in agriculture and fishery. Nevertheless, along with tourism, they provide employment often where other job opportunities are limited and also represent a substantial part of the cultural landscape of the Wadden Sea region.

Given the background of the intensification of international competition and the increasing knowledge-orientation of economic activities, the qualifications of employees will become increasingly important. They will be a precondition for the development, production and marketing of high-quality goods and services. The regional human resources will be the most important factor for fruitful economic activities and a competitive economy which will ensure a high income on a long-term basis. The supply of efficient vocational institutions and training mechanisms as well as strategies to promote the improvement of qualifications are thus a condition for the successful accomplishment of economic structural change.

Overall, international competition with regions where the availability of qualified work forces with very low wages is a central location advantage will increasingly affect the rural areas of the Wadden Sea Region. The regional development policy has the difficult task of moving the economy towards innovation and qualification-oriented structural change. Therefore rural areas, with their predominantly medium-sized and rather traditional structures, need to undergo a process of adjustment which will protect them and prevent them from falling further behind.

The Wadden Sea region is heterogeneous in its three national countries and different sub-regions with a local focus. Future strategies have to include the regional differences between the sub-regions, because future-oriented regional development can only be achieved through an efficient co-ordination and on the principle of the division of labour between the different regional political levels. For regional development strategies in particular, the broad integration of all stakeholders relevant for regional policy must be a basic principle.

Strengths, weaknesses, opportunities and threats in the WSR

The following table is a summary of the SWOT-analysis for the Wadden Sea region.

Strengths	Weaknesses
▪ **Nature potential** and landscape are the basis for sustainable development and a positive image of the region. The Wadden Sea is an area with world wide recognition and a high profile. ▪ High quality of life, good housing market situation, proximity to regional centres and conurbations have ensured **constant population development** and utilisation of infrastructure capacities. ▪ The **diversified economy** with different main pillars (agriculture, logistics/harbour, industry, health care and tourism etc.) is less susceptible to risk (risk mix of sectors) and offers a range of opportunities of synergetic development. ▪ Based on harbours with good access to the sea the **maritime sector** is a natural and individual strength of the region. ▪ **Tourism** in particular helps to ensure the economic and social basis of many smaller rural municipalities. ▪ Exceptional position of **shellfish fishery**. ▪ Relatively high level of **entrepreneurship** gives the potential for strong economic growth, favours a stable, SME-sized economy and promotes the mentality of independent management and decision-making.	▪ The economic structure is mainly aimed towards **low and medium tech-markets** (metal products, the food industry, agriculture). High-tech-markets are under-represented. Due to the economic structure of traditional industry sectors the Wadden Sea region is handicapped by **a weak sector-specific growth** ▪ **Innovative activities** by companies are relatively low, new products and processes are under-represented. ▪ High unemployment in several sub-regions ▪ There is a lack of **highly qualified people** (especially academics), which is a comparatively poor starting point for the projection that jobs will become more and more knowledge-intensive. ▪ **Brain drain:** Young people in particular still leave the region for their further education and careers. ▪ In some sub-regions with a concentration of capital intensive industries (energy, chemicals, automotive, harbour) there is a relatively high dependency on single large-scale enterprises ▪ There are **infrastructure (traffic) deficiencies** in costal areas, especially in traffic parallel to the coasts (road and rail). Therefore, often relatively long journeys to economic centres.

Opportunities	Threats
▪ **New markets**, such as wind energy and maritime biotechnology, have been entered. Thus opportunities for new economic clusters exist. ▪ Good prospects for benefiting from demographic ageing: (coastal) regions with high living standard and recreation are preferred as retirement areas. **"Older people as economic factor"**. ▪ Exceptional landscape attractive for housing. Attractiveness as **housing location** for families should be highlighted, not least in order to keep the age composition of the population young and vital. ▪ There are new perspectives for the WSR in utilising **renewable energy** sources (i.e. off-shore wind energy, biomass, biodiesel). ▪ The **tourism** and **recreation** sector benefits from overall trends: inland journeys, wellness/health care, further growth of cultural and agro tourism, increasing importance of elderly people as a main target group. ▪ The value-added chains in the **logistics and harbour sector** should be improved. There will be good prospects for maritime traffic with containers. ▪ Good opportunity to use CAP to reconcile nature, landscape and agriculture. ▪ Promoting cross-border cooperation can trigger **synergies** and possibly open new markets. Political collaboration at all levels could help to solve the inherent problems of the region.	▪ The forthcoming period until 2020 will generate **demographic problems,** such as declining population and obsolescence. This particularly relates to the mature cities in Germany. Problems are to be expected in types of supply and financing infrastructure and supply of skilled employees. ▪ It is important that the villages and rural districts remain or can be made **attractive**. ("rural depopulation") ▪ **Structurally weak regions**, e.g. Bremerhaven and Ostfriesland will have further problems with the **labour market**. These problems will accelerate the decline in population. There are huge challenges in reskilling the workforce and creating new job opportunities as employment in traditional sectors falls. ▪ The primary activities of **agriculture and fisheries** are experiencing a fall in total employment, especially due to the cut off of subsidies. ▪ The processes of **de-industrialisation** and reduction of jobs in industrial sectors will continue. Large adaptations can be expected for high industrially specialised locations (such as Emden). ▪ (Inter)national policy especially aimed at conserving and protecting nature and landscape also represents also a number of potential conflicts. Wadden Sea as Europe´s largest consecutive Natura 2000 Area, conflict resolution is essential. ▪ **Lack of cooperation**: The land and sea interface has to be managed better.

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