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Luxembourg: Office for Official Publications of the European Communities, 1996

ISBN 92-826-8808-9

Printed in Italy

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 future 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.

Foreword

Within the framework of the programme Europe 2000, the European Commission, Directorate-General for Regional Policies, commissioned Mens en Ruimte - Eriplan (Brussels), in cooperation with Kolpron (Rotterdam), with the study on the perspective development of the central and capital city (CCC) regions.

As stated in the terms of reference of the study describing the work programme, the main aim of the study is to identify the long-term prospects of the group of regions in order to arrive at a spatial picture of the year 2000. With about 90 million inhabitants, the study area covers the south-east of the United Kingdom, the western, southern and eastern parts of the Netherlands, the whole of Belgium and Luxembourg, the northern part of France, with the regions Ile-de-France, Haute-Normandy, Picardy, Nord-Pas-de-Calais, Lorraine and Champagne-Ardennes and the *Länder* North Rhine-Westphalia, Rhineland-Pfalz, Hessen and Saarland in Germany (Map 1).

Because of the strategic position of this study area in Europe, covering at the outset six capital cities, a multinational network of cooperating institutes has been involved in this study. The methodology and timing of this study is explained in Scheme 1. A larger network of sectorial and regional experts have been consulted in several Delphi rounds:

1. the first Delphi round at the end of the analytical phase and of the SWOT analysis, held in Rotterdam on 12 and 13 November 1992 at the invitation of Kolpron;

2. the second Delphi round as essential part of the prospective phase, held in Brussels on 18 and 19 May 1993 at the invitation of Mens en Ruimte;

3. a final 'mini-Delphi' round took place in Brussels on 4 February 1994 to discuss the scenarios and the structure of the draft final report.

This report contains a summary of many studies and analyses, consultations with regional and sectorial experts and authorities. It focuses mainly on two types of issues, which can be considered as the manifestation of the internationalization and the transition process.

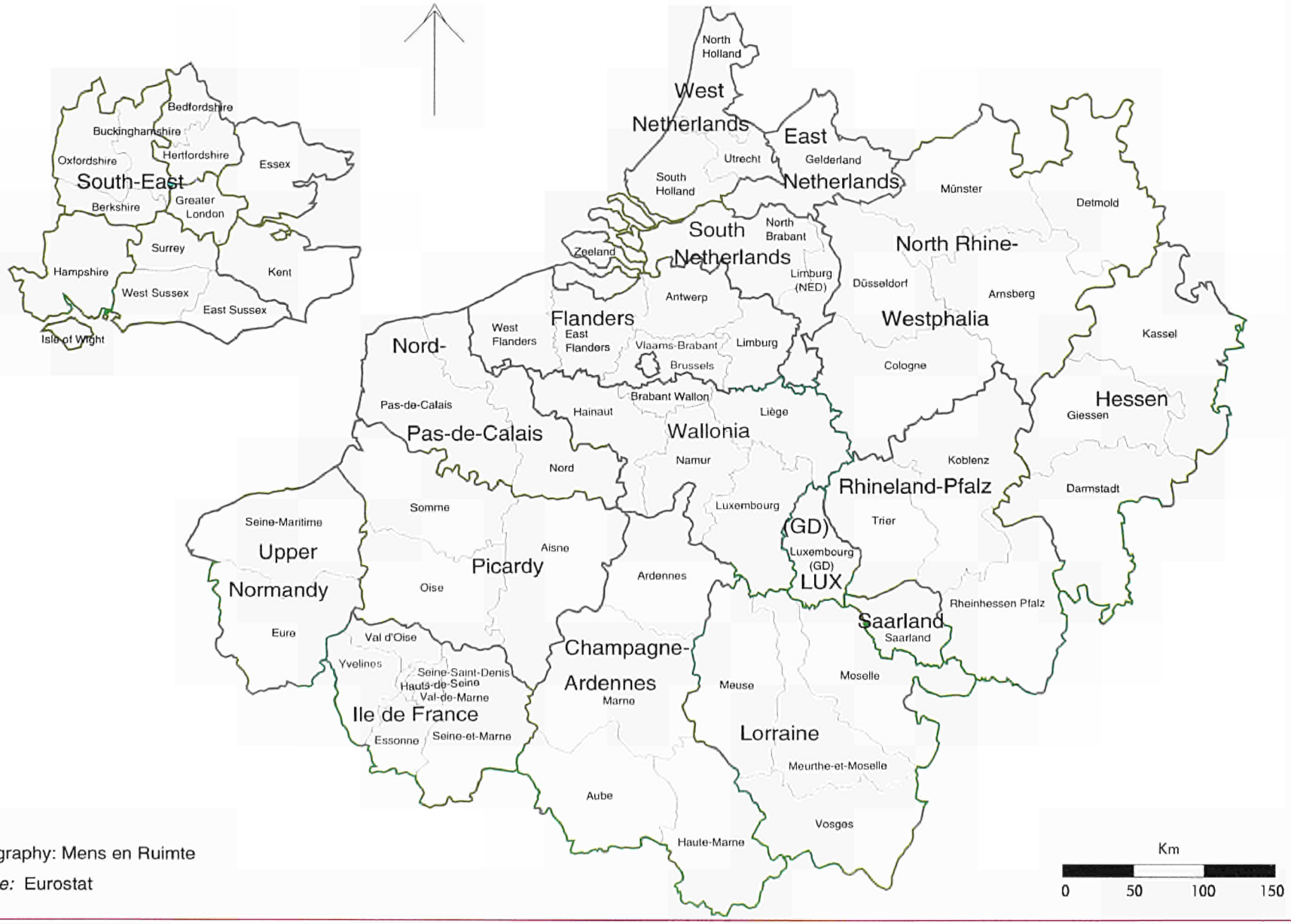
1. Common and comparable issues among countries and regions, such as congestion and environmental damages in metropolitan areas, revitalization and environmental improvement of reconversion areas, realization of the potential of other urban areas, economic and ecological challenges of rural areas, etc.

2. Transfrontier and international issues such as economic internationalization, the changing spatial context, water pollution of the main river basin system of the CCC area, air pollution and radioactivity, the aim at an ecological network, sustainable transportation and communication networks, etc.

This final report has been prepared by the central study team in Mens en Ruimte and Kolpron, who are very grateful to Serplan for the final editing of the report.

Map 1

Political division

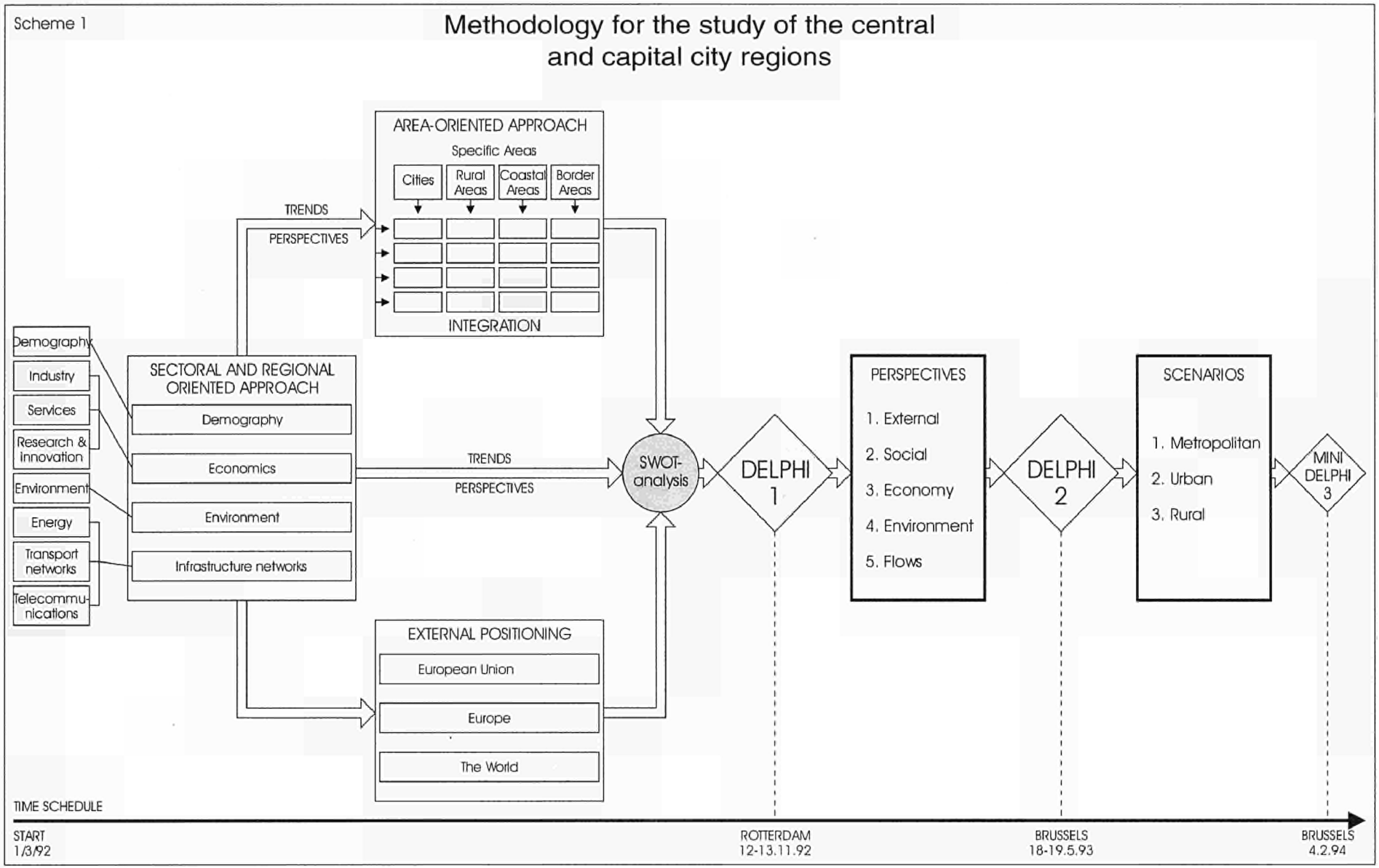


Cartography: Mens en Ruimte

Source: Eurostat

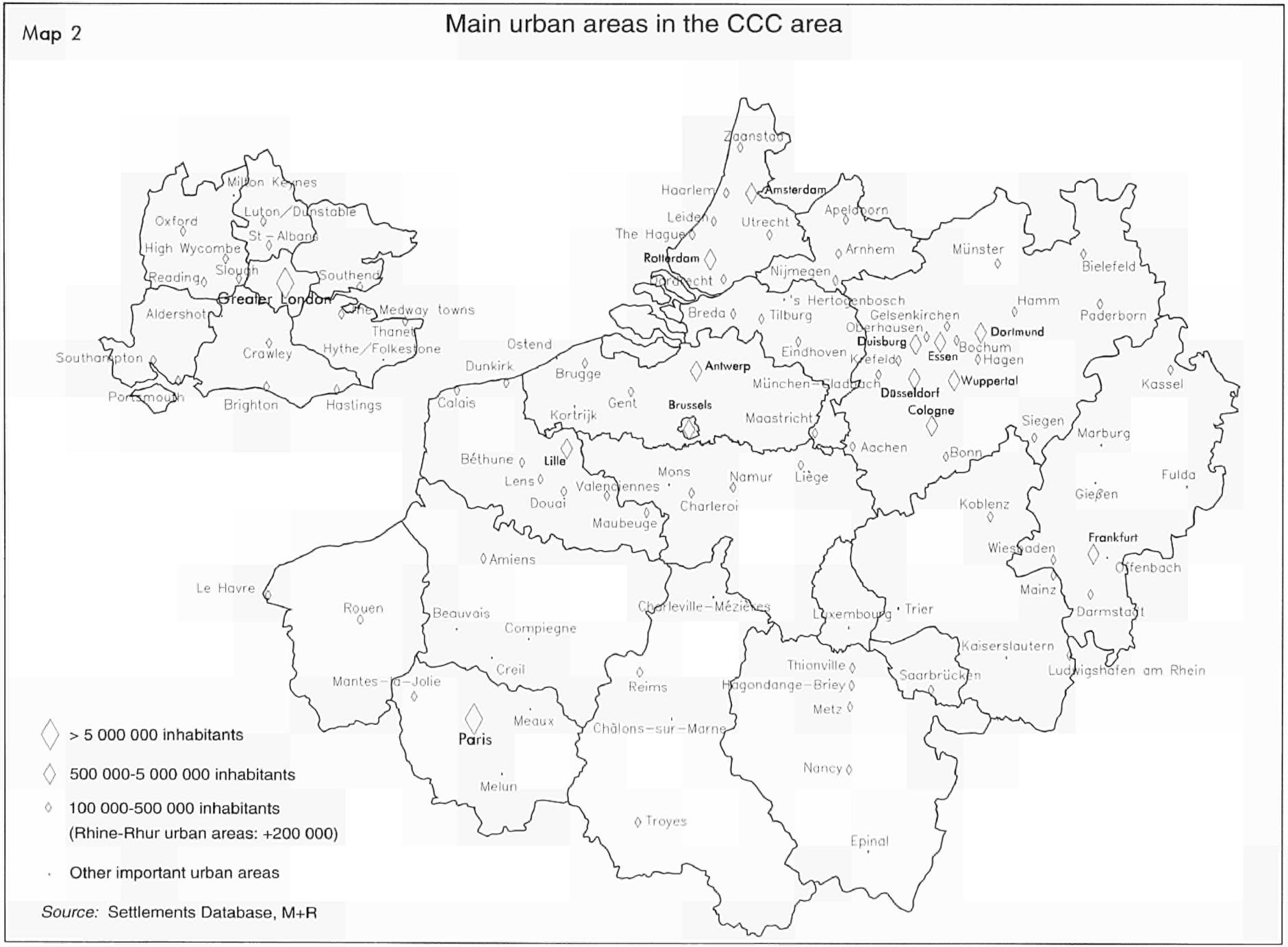
Scheme 1

Methodology for the study of the central and capital city regions



Map 2

Main urban areas in the CCC area



> 5 000 000 inhabitants

500 000-5 000 000 inhabitants

100 000-500 000 inhabitants
(Rhine-Rhur urban areas: +200 000)

Other important urban areas

Source: Settlements Database, M+R

Contents

Executive summary 17

Sectoral perspectives

1. External position of the CCC area 35
   - 1.1. Historical background 35
   - 1.2. A core area in Europe and in the European Union 36
     - 1.2.1. Centrality of the CCC area 36
     - 1.2.2. A strong position in the European Union 37
   - 1.3. New opportunities in a wider European context 37
     - 1.3.1. The EFTA countries 37
     - 1.3.2. Central and Eastern Europe 40
   - 1.4. A competitive economy on the world scale 41
     - 1.4.1. The CCC area: A major player in the world economy 41
     - 1.4.2. Competition focused on high-tech products 41
     - 1.4.3. The effect of the formation of trade blocks 43
   - 1.5. Conclusion: A strong position under pressure 44

2. Demography and social issues 47
   - 2.1. Main demographic characteristics 47
     - 2.1.1. Overall population 47
     - 2.1.2. Changing population structure 50
     - 2.1.3. Population density 55
     - 2.1.4. Activity rate 55
   - 2.2. Differences in regional economic well-being 55
     - 2.2.1. Regional differences in unemployment rates, 1985 and 1992 57
     - 2.2.2. Female unemployment, 1985 and 1992 57
     - 2.2.3. Youth unemployment, 1985 and 1992 60
   - 2.3. Conclusion 60

3. Economic issues 63
   - 3.1. General perspectives 63
     - 3.1.1. An economic structure dominated by the service sector 63
       - 3.1.1.1. A continuous decline of the share of agriculture and industry in total employment 63
       - 3.1.1.2. Industry's declining share of gross value-added 63

3.1.2. Gross regional product in the CCC area regions 64
3.1.2.1. Regional differences 64
3.1.2.2. Evolution during the 1980s 65
3.1.3. The CCC area: A concentration of regeneration areas 65
3.1.3.1. Regeneration related to old traditional industrial structures 65
3.1.3.2. Similar problems, different potentials 69
3.1.3.3. Perspectives 72
3.2. Sectoral perspectives 72
3.2.1. Financial and business services: A key sector in the economy 72
3.2.1.1. Recent developments 72
3.2.1.2. Perspectives 74
3.2.2. Transport and distribution: A sector with a major spatial impact 75
3.2.2.1. Recent developments 75
3.2.2.2. Perspectives 79
3.2.3. Research and development: A strategic sector 81
3.2.3.1. Recent developments 81
3.2.3.2. Perspectives 84
3.2.4. Manufacturing: A key sector of the economy 84
3.2.4.1. Recent developments 84
3.2.4.2. Modern and high-tech industries 87
3.2.4.3. Perspectives 90
3.2.5. Tourism 91
3.2.5.1. Economic importance of tourism 91
3.2.5.2. Tourism types 91
3.2.5.3. Perspectives 93
3.2.6. A changing future for agriculture and forestry 94
3.2.6.1. The economic importance of agriculture 94
3.2.6.2. Main characteristics of agriculture in the CCC area 94
3.2.6.3. Changing mega trends in agriculture: CAP and GATT 98
3.2.6.4. Support for agriculture as an element for regional development 100
3.2.6.5. 'Agro-tourism': A possible complement to agriculture but not an alternative 100
3.2.6.6. Forestry 100
3.3. Conclusion 101

4. The CCC flow system 105
4.1. Efficient passenger transport systems 105
4.1.1. The actual situation 105
4.1.2. Nodality and Eurocorridors 107
4.1.3. Major projects and their effects 109
4.1.4. Nodality and Eurocorridors 111
4.2. Goods transport 113
4.2.1. The regional pattern 113
4.2.2. Seaports and airports 114
4.2.3. Perspectives for seaports and airports 115
4.2.4. The Channel Tunnel 117
4.3. Emerging uniformity in the transmission of information 118
4.3.1. Present state of the telecommunications sector 118
4.3.2. Future trends and spatial evolution 122
4.4. Towards an integrated energy transmission network 124
4.4.1. Supply and transmission 124

4.4.2. Energy dependency and emissions 125
4.4.3. Integrating the transmission networks 125
4.5. Conclusion 129

5. Environmental potentials and threats 131
5.1. Environmental issues 131
5.1.1. Rivers as a basic structure of the CCC area 131
5.1.2. Groundwater, soil and vegetation 133
5.1.3. Global change 138
5.1.4. Air pollution 138
5.1.5. Radioactivity 141
5.2. Spatial impacts: A pollution ranking per region 143
5.3. Conclusion 143
5.3.1. The importance of new technologies 143
5.3.2. Reducing SO_2/NO_x emissions 143
5.3.3. Environmental policies on a global, European and national level 145
5.3.4. Environmental policy elements focused on the individual regions 147
5.3.5. Policy elements focused on interregional and transnational cooperation 150

Key findings of the sectoral perspectives 151

Spatial perspectives

Introduction to the spatial perspectives 153
6. The CCC metropolitan systems 155
6.1. General perspectives 158
6.1.1. General characteristics 158
6.1.2. Population dynamics in the metropolitan systems 159
6.1.3. The functions and hierarchies of the metropolitan systems 164
6.1.4. Emerging networks between metropolitan systems 168
6.2. Key elements of a trend scenario 170
6.2.1. Social trends 172
6.2.2. Economic trends 173
6.2.3. Trends in traffic systems 176
6.2.4. Environmental trends 178
6.2.5. Spatial trends 180
6.3. Key elements of a policy scenario 182
6.3.1. Social issues 183
6.3.2. Economic issues 183
6.3.3. Issues in traffic 183
6.3.4. Environmental issues 186
6.3.5. Spatial issues 186

7. The CCC urban areas outside the metropolitan systems 191
7.1. General perspectives 191
7.1.1. Population 191
7.1.2. Complementarity between metropolitan systems and the non-metropolitan urban areas 193
7.1.3. Functions: Networks, links to metropolitan systems 194
7.1.4. A favourable situation given their positive environmental qualities 196

7.2. Key elements of a trend scenario ... 197
7.2.1. General trends: Other urban areas having diverse development perspectives 197
7.2.2. Developments in specific areas ... 198
7.2.2.1. Urban areas in the neighbourhood of metropolitan systems: Overflow 199
7.2.2.2. Other free-standing urban areas ... 200
7.2.2.3. Urban parts of regeneration areas: The transition process ... 200
7.2.2.4. Coastal urban areas ... 201
7.2.2.5. Urban areas in border regions ... 202
7.2.3. Conclusions on the trend scenario ... 203
7.3. Key elements of a policy scenario ... 204
7.3.1. Urban areas outside the metropolitan systems realize their specific development potentials ... 204
7.3.2. Policy scenario for urban areas in specific areas ... 205
7.3.2.1. Urban areas in the vicinity of the metropolitan systems: Protecting their identity ... 205
7.3.2.2. The free-standing urban areas ... 206
7.3.2.3. Urban areas in specific regeneration areas ... 208
7.3.2.4. In coastal areas: The ports outside the metropolitan areas ... 208
7.3.2.5. Urban areas in Continental border areas ... 209
7.3.3. The three potential transnational metropolitan systems ... 210
7.3.3.1. The MHAL metropolitan system: A laboratory for international cooperation ... 210
7.3.3.2. The Lille metropolitan system ... 212
7.3.3.3. The Saar-Lor-Lux metropolitan system ... 213
7.4. Conclusions ... 215

8. The CCC rural areas ... 217
8.1. The rural areas under urban pressure ... 222
8.1.1. General perspectives ... 222
8.1.1.1. Spatial characteristics ... 222
8.1.1.2. Functions ... 223
8.1.2. Key elements of a trend scenario ... 224
8.1.3. Key elements of a policy scenario ... 225
8.2. Rural areas with a high level of human exploitation ... 226
8.2.1. General perspectives ... 226
8.2.1.1. Spatial characteristics ... 226
8.2.1.2. Functions ... 227
8.2.2. Key elements of a trend scenario ... 228
8.2.3. Key elements of a policy scenario ... 230
8.3. Rural areas with a low level of human exploitation ... 233
8.3.1. General perspectives ... 233
8.3.1.1. Spatial characteristics ... 233
8.3.1.2. Functions ... 234
8.3.2. Key elements of a trend scenario ... 235
8.3.3. Key elements of a policy scenario ... 235
8.4. Rural areas in specific locations ... 238
8.4.1. The specific border areas ... 238
8.4.1.1. Key elements of a trend scenario ... 238
8.4.1.2. Key elements of a policy scenario ... 239
8.4.2. The coastal zones ... 239
8.4.2.1. Key elements of a trend scenario ... 239
8.4.2.2. Key elements of a policy scenario ... 240

9. Relationships and contrasts in the trend and policy scenarios 241
9.1. The trend scenarios 241
9.2. Vision for the policy scenarios 242
9.3. The approaches adopted in the policy scenarios 243

General conclusions 249

Bibliography 251

Annexes 259

List of maps

1. Political division 6
2. Main urban areas in the CCC area 9

1.1. European centrality 38
1.2. Possible external developments dominantly influencing the central and capital city regions 45

2.1. Typology of population structure and dynamics 49
2.2. Senility rate, 1985 51
2.3. Senility rate, 2000 52
2.4. Implicit positive migration balance, 1980-89, per thousand 53
2.5. Implicit negative migration balance, 1980-89, per thousand 53
2.6. Resident population of foreign nationality, 1990 54
2.7. Population densities 56
2.8. Evolution of unemployment, 1985-92 (%) 58
2.9. Evolution of female unemployment, 1985-92 (%) 59
2.10. Evolution of youth unemployment, 1985-92 (%) 61

3.1. Annual growth of employment 1980/81 to 1990/91 66
3.2. Socioeconomic situation, 1983: regions with low scores on unemployment and GRP . 67
3.3. Socioeconomic situation, 1990/92: regions with low scores on unemployment and GRP 68
3.4. Regional development of employment in transport and distribution, 1980-90 average annual growth 77
3.5. Share of total employment in transport and distribution by NUTS 2 regions 78
3.6. Research and development 83
3.7. Change in industrial employment, 1975-89 85
3.8. Share of industries, 1989 (percentage of total employment) 86
3.9. Share of industrial GVA, 1989 (percentage of total GVA) 88
3.10. Basic structure of tourism in the CCC area 92
3.11. Part of agriculture in GRP, 1982 95
3.12. Part of agriculture in GRP, 1991 96

4.1. Motorway network, CCC regions 106
4.2. Infrastructure networks: missing links and bottlenecks 108
4.3. High-speed rail network — passenger flows (forecast 2010) 110

4.4. Eurocorridors — nodality (future situation) 112
4.5. Density of the basic telecommunications network, end 1990 119
4.6. Telecommunication nodes for telephone, teleconferencing, and videoconferencing.... 121
4.7. Electronic highways (ISDN) — situation 2000 123
4.8. Map of oil supply in the CCC regions in 1991 126
4.9. Map of gas supply in the CCC regions in 1991 127
4.10. Map of electricity supply in the CCC regions in 1991 128

5.1. River catchment areas: the base of the environmental structure 132
5.2. Concentration of nitrate in the groundwater 134
5.3. Pesticide leaching in arable soils in Europe 135
5.4. Overdevelopment of groundwater resources 137
5.5. Estimated surface area (as a fraction of the total area per region) 139
5.6. Excess ozone, i.e. the sum of all ozone concentrations over 75 ppb during a summer season 140
5.7. SO_2 concentrations during a winter smog episode in Europe January 1987 142
5.8. Ranking of the CCC regions by general pollution 144
5.9. Share of carbon/energy-tax sensitive sectors in total employment, 1988-89 146
5.10. Areas with indications of noise pollution 148
5.11. Number of Seveso plants (Council Directive 82/501/EEC) 149

6.1. Population of the urban areas 157
6.2. Population growth and decline in urban areas, 1970-90 161
6.3. Main intercity relations, 1990 169
6.4. Main intercity relations, 2000 171

8.1. Land use in CCC 218
8.2. Population in the rural areas 220
8.3. Tentative ecological structure with regard to typology of rural areas 231
8.4. Main woodlands 236

Trend scenario 244

Policy scenario 246

Executive summary

1. Sectoral perspectives

1.1. External position of the CCC area

The CCC area not only includes parts of six countries, including the capitals of all of them, but accommodates 27% of the EU population (89.2 million people) on 12% of its territory. The CCC area enjoys high accessibility and centrality. These assets give it a key role and it contributes 35% of value-added in the EU as well as holding, in many respects, a leading position as far as economic production and landscape are concerned. This is a situation it has enjoyed over a long period.

Recent tendencies, for example that value-added per capita and purchasing power are actually higher in the Alpine Arc than in the CCC area, indicate that this leading position is under threat. A number of contributory factors may be identified: internally there are problems, for example of organization; congestion and pollution; externally there is increasing competition from within the EU and from the USA and Japan; and finally, adjustment to the disappearance of the concentration of national borders makes the CCC area sensitive to changes within the EU itself.

The EU is one of the world's three economic power blocks and the CCC area is its core. The GDP per head is comparable to that of the USA, but is lower than in Japan. The economic structure is comparable to the USA, with a clear emphasis on the tertiary sector. The unemployment figures are much higher in the CCC area than in the USA and especially higher than in Japan. The trade balances of industrial products in the three regions show a concentration on high-tech products. In this context, R&D is of vital importance. Compared to Japan and the USA, the CCC area does not have a strong specialization in R&D. However, international competition will increasingly be directed towards services and the CCC area is better placed in this field.

The CCC area is a collection of regions in transition as a consequence of evolution within the EU and of internationalization both at the European as at the global level. The paragraphs that follow give more detail on the nature and implications of that transition.

1.2. Demography and social issues

Between 1980 and 1990, population in the CCC area rose by 2.7%. The population density (325 persons/km^2) is more than double the EU average (145 persons/km^2). In the northern regions the density is often higher than 500 inhabitants/km^2; while in the southern regions (France, Wallonia, the Grand Duchy of Luxembourg, Hessen and Rhineland Pfalz) the density rarely exceeds 250 inhabitants/km^2. According to the settlement database (Eurostat), an estimated 66.5% of the CCC population live in urban areas, which is higher than the EU figure of 55.7%.

Towards the year 2000, the CCC area population will stay relatively stable. However, the demogra-

phic structure of the CCC area population will alter substantially: though no more marked than in the EU as a whole, ageing will be the notable demographic development. Movement, especially of people with relatively low skills to urban areas, is expected to be an important element in the changing social characteristics of the CCC area; high concentrations, namely in a number of metropolitan areas, could pose a threat to social integration. Otherwise generally decreasing household size may prove significant in creating extra dwelling requirements.

1.3. Economic issues

General observations

- Economic transition: Towards a 'modern' economic structure, increasingly dominated by services

The CCC area has declining shares of agricultural and industrial employment, while the share of services in the total number of jobs is still increasing. Compared to the EU average, there are fewer jobs in agriculture but more jobs in services. The share of industries in the total gross value-added (GVA) is also declining in favour of the services, although the share held by industry in gross regional product (GRP) is still well above the share of the number of jobs in this sector. In general, the presence and dynamics of manufacturing activities decreases from east to west. The presence and dynamics of service activities decreases from north to south of the CCC area.

- Unequal spread of economic developments in the recent past

In 1990, GRP varied at between 78 and 166% of the Union average. In the evolution of the economy in the CCC area during the 1980s four sectors can be distinguished. The eastern regions (Germany and the Grand Duchy of Luxembourg) scored positive during the whole decade, although some German regions had difficulties in maintaining the standard. The northern parts (the Netherlands and Flanders) scored negative in the first part of the decade but were able to alter their performance completely towards a positive situation. The southern parts (France and Wallonia) generally scored weakly and, except for Ile-de-France, tended to lose ground. The South-East of England, though it could look to improve in some criteria, generally has a rather positive position.

Generally it can be said that high GRP rates are concentrated in the larger metropolitan areas; that industrial employment continues to hold a strong position in the economies of the eastern and central regions; and that unemployment increasingly affects regions in the south-western part of the CCC area, as well as in central parts of larger urban areas.

- Concentration of regeneration areas

For a number of reasons, among them the age of its urban areas and industries and given a concentration in some parts of coal and steel production, the CCC area contains more than its share of EU regeneration areas. The regeneration processes in the Ruhr area are concentrated in the northern part. However, its economy functions rather well, as, through large-scale rationalization and attention to innovation, it has been able to remain competitive. The Ruhr area, as a result of the strength of its mutually dependent economies and its high-tech industry is well placed to continue the regeneration process. In this it contrasts with Saarland. In Wallonia, the traditional industries have declined in the post-war period. There are few contemporary industries to compensate for this and the tertiary sector is still poorly developed. In Limburg, mines closed down over a short period, leaving the areas in need of regeneration. Current programmes try to encourage the development of services, tourism, innovation and technology transfer. In the South-East of England, regeneration areas are present in the East Thames corridor, and efforts are being made to achieve a more balanced spread of development potentials. Given the fact that there is a strong overrepresentation of declining industries in Nord- Pas-de-Calais and Lorraine, these regions have been badly hit by a decline in the traditional production activities. The activities which are planned or expected to take place in relation with the Channel Tunnel and the port activities offer opportunities for the contemporary development of Nord-Pas-de-Calais while the future of Lorraine seems more uncertain.

Trends in specific economic sectors

The following sections identify relevant findings about the economy and its spatial characteristics:

- **Financial and business services**

With 68.5% of all CCC area jobs (1989) in the tertiary sector, the CCC area can be characterized as a service centre, containing not only the main EU service centres of London (one of the world's top three), Paris and Frankfurt; but also other financial centres such as Amsterdam, Brussels and Luxembourg and other business centres such as Brussels, Amsterdam, The Hague, Düsseldorf and Cologne.

In the private sector, there is a remarkable concentration of economic decision centres in the CCC area. Most of the headquarters of European firms are located in this area, with a tendency to concentrate in London, Paris and Brussels; while the Netherlands and Germany are tending to lose attractiveness for such activities.

For the near future, no major changes in this economic activity is to be expected, the global picture of the CCC area will remain unchanged. The tendency to concentrate in a few centres will continue; and inside these centres, an internal shift is occurring already in London and Paris. Inner cities will remain the main decision centres, but back-office functions are tending to move towards the peri-urban area around the centre.

The service sector will continue to require additional space. Regional differences occur according to the presence of an international airport, telecommunication facilities and the labour market. More than for other sectors, accessibility and spatial quality are important factors in the location and growth of the service sector.

- **Transport and distribution**

This sector represents 12% of the total number of jobs in the CCC area, equally spread between transport and wholesale. The sector is concentrated in Randstad Holland and ABG-Stad, with secondary centres in Rhine-Main, Rhine-Ruhr, Ile-de-France and Greater London.

The creation of the internal market is expected to have a positive impact on this sector, which is already growing strongly. Highest growth rates are found in the Netherlands, some parts of South-East England and Limburg (Flanders). The growth of the wholesale sector is strongly related to the growth of the economy as a whole, and will be the strongest in the urbanized regions. The growth of the transport sector is strongly related to cities with a high accessibility and the areas in which Eurocorridors are located. In particular locations will increasingly attract this type of activity.

This will be translated into increased traffic. Road transport takes 50% of all intra-regional traffic. Transport using inland waterways is important only in West Netherlands and North Rhine-Westphalia and, to a lesser degree in Flanders. This is mainly due to the intense freight traffic flow via the Rhine between the Dutch and Belgian North Sea ports (mainly Rotterdam) and the Rhine-Ruhr area. Freight is increasingly carried by air but remains limited. Freight transport by rail has lost importance. The largest part of freight is handled through a limited number of main seaports (Rotterdam, Antwerp).

Ports are expected to be able to provide the space needed by the extra activities they generate (mainly manufacturing, but also some services), but this is not always the case around airports. Quality is becoming more important as a location factor. This contains both infrastructural (speed, intermodality) and environmental aspects.

- **Research and development**

R&D is increasingly important for the economic development of a region because products and production processes have a growing 'knowledge intensity'.

In Germany, 2.8% of GNP is spent on R&D, which is comparable to figures for the USA and Japan. In the Netherlands, France and United Kingdom this figure fluctuates around 2.25%, while Belgium reaches 1.6%. R&D is a heterogeneous activity. In all countries, companies rather than governments are responsible for most of the R&D activities. In the Netherlands, the share of the universities is remarkably high. In France, the share of governmental institutions is higher than elsewhere, while the Belgian institu-

tions hardly put any effort in R&D, explaining in large part the lower overall figure in that country.

Ten 'islands of innovation' (with a concentration of R&D activities) exist in the EU. Five of them are found in the CCC area, mostly in the metropolitan areas, and the other five in the Alpine Arc.

- **Manufacturing**

With 34.7% of the GVA (1989) and 28.8% of jobs in the CCC area, industry is still an important activity, although its importance is decreasing. Within the CCC area exist old industrial regions (Wallonia, North Rhine-Westphalia (Ruhr area), Nord-Pas-de-Calais, parts of Lorraine and the Grand Duchy of Luxembourg) as well as modern industrial areas (South East, Hessen, Rhineland-Pfalz, Netherlands, Flanders, Ile-de-France, Upper Normandy).

Several main trends are relevant in relation to spatial policy. Industrial activities tend to relocate from the urban areas towards specially designated areas in periurban or rural areas close to urban areas. Regeneration of old industrial areas due to public and private initiatives, attracts new activities and changes the spatial organization of the area. There is a tendency towards high-quality environments for new and modern industrial activities, in urban as well as in rural locations.

- **Tourism**

Notwithstanding its relatively low importance for the overall economy (about 4% of the jobs in the CCC area), tourism is becoming more and more relevant because of its rapid real growth rate (between 3.9 and 4.4%). Tourism is most developed in economic terms in the coastal areas (the Netherlands, Flanders, France, South-East England). The tourist infrastructure is concentrated on a small strip along the coast and activity equally concentrated in the summer period. Urban areas attract all kinds of visitors, mainly concentrated in the historic cores and/or business districts, but more spread over the year. In hilly rural areas (Ardennes, Sauerland, Eifel) the tourist infrastructure is dispersed over the area rather than concentrated.

In future, environmental quality is expected to become more and more of a determinant for growth of tourist activities. The following main trends can be described: coastal tourism is not expected to grow unless more all-weather facilities can be provided; in urban areas, growth is expected to be high, both for recreational and business purposes, no matter the size of the urban area involved; though often not exactly apparent, rural areas have the greatest tourism potentials in the CCC area.

In coastal areas, quality improvement is becoming essential to keep tourist activity alive. In urban areas, quality is related to the conservation of historic monuments, to accessibility and to parking facilities, to hotel accommodation and the cultural facilities offered. In rural areas, quality depends on accommodation and the environment.

- **Agriculture and forestry**

In general, agriculture is becoming less and less important in the economic structure of the CCC area. Only in some French and Dutch regions does the economic importance of agriculture exceed the EU average. In general, agricultural productivity levels are high, although the CCC area has an unbalanced food production.

Employment in agriculture is below the EU average and is expected to decrease even further, although in varying degrees according to the rundown already experienced. The future evolution of many rural CCC areas will depend on the CAP and GATT. As agriculture increasingly becomes dependent imported fodder and fertilizers, and exportation of its products, accessibility to ports and to the large consumer markets (e.g. the metropolitan areas) are of increasing competitive importance.

Forestry is of very limited importance to the economy of the CCC area. However, its strategic importance should not be neglected, as they produce raw materials and bio-energy. The CCC area is not self-sufficient for the production of timber, which makes the CCC area sensitive to the increasing stress on the global timber market.

1.4. The CCC area flow system

The density of all types of passenger transport infrastructure networks is high, as is the accessi-

bility of the main economic centres. More peripheral are small parts of Wallonia, Champagne-Ardennes, Lorraine and North Rhine-Westphalia. Eurocorridors which link the metropolitan systems are becoming increasingly evident in the CCC area. In future, Lille will use its increased nodality to 'bundle' corridors which at present are located elsewhere. The introduction of new transport facilities will alter the hierarchy of nodes, and a distinct group of very well equipped cities is being formed. Given the growing mobility and the internal market, congestion is increasingly becoming a relevant topic for spatial policy. Most congestion problems are detected on the roads in metropolitan systems and in air traffic.

The modal split for goods traffic reveals significant regional differences, although transport by road is the most important mode in all CCC regions. In the Netherlands and Flanders, inland waterways transport a considerable amount of the total freight. Most important shares for rail transport are found in Wallonia, Nord Pas-de-Calais, Lorraine, North Rhine-Westphalia and Saarland.

The CCC area has the largest goods air and seaports in Europe. During the 1980s, the goods volume handled in the CCC ports increased by 8% to 797 074 million tonnes (1990). Rotterdam and Antwerp handled more than half of the total volume.

During the 1980s, the goods volume handled in CCC airports increased by 62%, and reached 4 049 million tonnes in 1989. Frankfurt, London and Paris handled more than 70% of the total volume. For the future, a certain limited number of main air and seaports will remain important, assisted by feeder ports. Potential for European distribution centres is found especially in Randstad and ABG-stad, related to the seaports. Logistics and office development potential are found in all metropolitan systems. The physical proximity of ports in the Netherlands and Flanders offers prospects for the construction of the 'Rijn Schelde Delta' concept.

Traditional telecommunication services are widespread, and accessibility within the CCC area through the more advanced services is guaranteed via major urban areas. Gradually, a network of 'electronic highways' (ISDN) is being established. However, border effects due to incompatibilities between different national systems continue to hamper the potential to create more internal cohesion within the CCC area. It should be noted that the gateway of the CCC area to the rest of the world in this field (London) is rather poorly connected to the rest of the CCC area, so that London does not use all its potential in its expanded home market.

The energy transmission network is very dense, which enables the exchange of energy between the countries. However, high dependency rates for the supply of energy are seen as a strategic threat, and the presence of nuclear plants as environmental and safety threats.

1.5. Environmental potentials and threats

The river basins of the Rhine, Seine, Meuse, Schelde and Thames determine the natural structure of the CCC area. However, the river water quality is not the same in every basin or region, with concentrated problems in the Seine, Schelde and Mosel basins.

Although the soil and climate is favourable for agriculture, this activity is an important source for a diffuse contamination of soil and groundwater with nitrates, pesticides and persistent pollutants, especially in the northern parts of the CCC area. Lowering of groundwater levels and changing groundwater flows caused by overexploitation, regulation of surface waters, intensified drainage or expanding built-up areas, may have negative economic and ecological impacts. Landfills, due to their operation, their extent and large number, represent a significant threat to groundwater resources (quality) in the CCC area, through leaching.

Environmental impacts of activities are not always limited to the region in which they are generated. Climate change (global warming) negatively influences water availability, natural terrestrial ecosystems, coastal areas (through sea-level rise) and ground water systems. High tropospheric ozone concentrations, acid rain and winter smog

are among other forms of transregional pollution, as are the risks related to nuclear-energy production. Urban areas are concentration areas for all types of pollution.

The availability and application of new technological achievements are of major importance for any serious environmental policy. The last two decades have been characterized by significant progress in environmental protection on global, European and national levels. The study proposes some environmental policy elements which are focused on the individual regions and which are at the junction of environmental and regional development, such as sanctuaries, soil protection areas, etc. The study also introduces some policy elements focused on interregional cooperation as well. Besides the inventory and protection of individual areas, a coordinated policy of nature protection includes the establishment of a coherent transborder structure of sites of ecological importance. The sponge (quantity of water) and filter (quality of water) function of some CCC regions needs to be recognized as strategically important for the future of the CCC itself.

1.6. Conclusions on the sectoral perspectives

Given its history and the intensity of its physical and economic development, inertia is a feature of the CCC area. Its fixed investment in infrastructure and buildings, its form and circumstances, including pollution and other effects of past activity, will undoubtedly persist well into the future.

However, the key words that might be taken to characterize the area as it has emerged from the sectoral perspectives, are transitional change and internationalization. Change is endemic to all features of the CCC area structure.

In economic terms, there have been striking and significant transitions from manufacturing to service sector activities; in the decrease of agricultural employment; and through the emergence and growth of wholly new activities, for example in the leisure and personal service fields.

Transition in the economy is marked not only by decline in some industries and areas but by the evolution of sophisticated activity in R&D, in 'technopoles' and in modern industry/services generally. It is also reflected in clear signs of recovery, with obsolete activities, buildings and reconversion areas beginning to be replaced by new activities, including the emergence of environmentally friendly production techniques.

Transition is also reflected in the environmental issues: environmental damage is the consequence of the persistence and intensity of activity. However, the CCC area is still characterized by high environmental experience and potential; moreover, with rising awareness of environmental issues and with improved private and public sector responses, transition to limit further damage and towards positive enhancement is in prospect.

There is of course an international and indeed global aspect to much of the current environmental concern. There is also, however, a more general sense in which internationalization in one form or another is promoting or driving change in the CCC area as elsewhere.

Significant economic sectors now operate at a global, rather than local, regional or national scale. Companies operating at this global scale are not localized in either their activities or their investment patterns. Accordingly, individual regions, even one as diverse and expansive as the CCC area, must adapt to an increasing degree of specialization in the functions it performs. Such global-scale internationalization is reflected, for example, in the threatened loss of industrial activity and its decreasing importance in recent decades, in the expected growth of service functions, in the increasing importance of financial services, in the decreasing importance of agricultural employment and in the threatened position of those, dependent on the export of final products.

The GATT agreement is a clear manifestation of this worldwide economic interdependence as it affects the world's trade blocks.

The central position of the CCC area, together with the related presence of a number of globally important decision centres, makes the CCC area particularly sensitive to worldwide economic fluctuations.

On a very different scale, the opening of the internal borders in the EU, in part by way of response to the global challenges, is also having marked effects in the CCC area, where there happens to be a high concentration of former national borders.

The changing flow system, and especially the strengthening of the most important transnational connections, has already led to the appearance of 'Eurocorridors' encompassing multimodal transport/communications axes relevant at a European scale.

In general, it is clear that not all areas profit in a similar way from this internationalization, and some areas will feel the effects more strongly than others. In this respect, internationalization may be seen as the stimulant of a particular form of change characterized by spatial unevenness. The most direct influences can be expected in the urban border areas and in the urban areas connected by Eurocorridors, but in principle all CCC area regions can expect to find their linkages and relative positions affected in due course.

To summarize, the overall transition process, consisting of secular change, spurred on by internationalization, is producing a remarkable degree of internal differentiation in the CCC area, characterized by diverse and complex economic, social and developmental patterns.

2. Spatial perspectives

As sectoral developments and trends are being translated in spatial developments, they are visualized in specific spatial patterns. As such, it is important, if one wants to take action to alter some foreseeable future situations, to support sectoral policy with appropriate spatial policies. Therefore, in this second part, the focus is on the spatial perspectives, after which policy scenarios will be developed, to prevent unwanted evolutions on the one hand and to stimulate the desired evolutions on the other.

2.1. A division of the space into three main parts

In the CCC area three main spatial types are to be distinguished: the six metropolitan systems comprising the most important CCC area urban areas, the urban areas outside the metropolitan systems, and the rural areas.

2.1.1. The metropolitan systems

With 48.2 million inhabitants, the six metropolitan systems (London, Paris, Rhine-Ruhr, Rhine-Main, Randstad and ABG-stad) account for more than half (54%) of the total CCC area population. The metropolitan population, living in urban areas of 50 000 or more inhabitants, accounts for 39.3% of the total CCC area population. The three largest metropolises, London (12.1 million), Paris (10.7 million) and Rhine-Ruhr (11.7 million), are almost twice as large as the fourth ranking metropolis, Randstad (6.4 million), and are about three times the size of ABG-stad (3.9 million) and Rhine-Main (3.5 million).

The metropolises are not only the largest population concentrations in the CCC area, but they are also the main gateways to the world economy for the CCC area. Most of the top level functions are situated here, and, in the CCC part of every CCC area country, the regions within the metropolitan systems have the highest GRP per capita.

Two main metropolitan spatial patterns can be observed: whereas Paris and London show a rather mononuclear spatial pattern, the other metropolitan systems have a clear polynuclear pattern. Although, especially in the London metropolitan system, their secondary urban areas are often of a high vitality, the mononuclear metropolises are dominated by one central urban area, concentrating the bulk of the population and most of the high level functions. Both population and functions are more spread over the urban areas in the polynuclear metropolises, leading to a less clear urban hierarchy within the metropolis. The Rhine-Ruhr metropolitan system is the best example.

2.1.2. The urban areas outside the metropolitan systems

Some 27.3% of the CCC population of urban areas of 50 000 or more inhabitants live in urban areas outside the metropolitan systems, accounting for 14.8% of the total CCC area population. This relatively low figure is partly due to the fact that there is only one very large urban area

(+ 500 000 inhabitants) outside the metropolitan systems, namely Lille.

In general there was a growth in the last two decades in the population of these urban areas. The smaller urban areas in particular experienced significant growth. This, however, did not threaten the economic position of the metropolitan systems, as the top level functions remained there.

The attractiveness of the urban areas outside the metropolitan systems is due to a variety of factors, of which environmental quality is a very important one: the smaller urban areas suffer less from traffic congestion, there are fewer derelict areas, pollution levels are mostly lower, while the presence of more or less natural landscapes and scenic beauty makes them all the more attractive.

There is a large diversity in these urban areas, each having specific potentials and challenges. Five groups of urban areas, based on common characteristics were selected for the purpose of this study:

(i) the urban areas in the vicinity of the metropolitan systems;
(ii) the 'freestanding' urban areas;
(iii) the coastal urban areas;
(iv) the urban areas in reconversion zones;
(v) the urban areas in border regions;

2.1.3. The rural areas

In the rural areas three main types can be distinguished:

(i) the rural areas under urban pressure;
(ii) the rural areas with a high level of human exploitation;
(iii) the rural areas with a low level of human exploitation;

Despite its relatively low economic importance, 74.3% of the CCC area still remains open countryside and no less than 33.5% of the total CCC area population lives in rural areas. There are three types of specific rural land use in open areas: agriculture, woodlands and other semi-natural open land.

Traditionally, agriculture and forestry have been seen as the basic functions of the CCC rural areas, also being important resource functions for the CCC area as a whole.

The rural areas under urban pressure are mainly situated within and in the vicinity of the metropolitan systems and are themselves, to a significant extent, affected by urban dynamics. They are characterized by specific types of agriculture, oriented towards export as well as to the consumption markets in the nearby metropolitan systems.

Agriculture is economically less important in these rural areas, given the economic dominance of other activities, but they are characterized by an intensive use of space and very high productivity levels.

The rural areas with a high level of human exploitation mainly surround the rural areas under urban pressure. However, they are not characterized by urban pressures, as are the former group. This makes their situation different: they also have a rather high amount of human exploitation, but agriculture tends not to be threatened as in the rural areas in the urban vicinity. In these areas, agriculture is more important to the rural economy than in the CCC area as a whole.

The rural areas with a low level of human exploitation are generally situated in the eastern (German) parts of the CCC area, but also parts of Lorraine, Wallonia and Luxembourg are categorized under this group. These rural areas are characterized by the relatively high proportion of woodlands, and by the limited economic importance of agriculture. The profitability of agriculture in these areas is rather low.

2.2. General approaches in the trend and policy scenarios

2.2.1. The trend scenarios

The trend scenarios shows the metropolitan areas, which have tended to experience population and physical decline, at least in their inner

cores, in recent decades, now facing the prospect of a new growth phase as a result of their advantages arising from implementation of the single market, and of prospective developments in transport and telecommunication networks. Their abilities to benefit fully, however, are threatened by inertia, the failure of their fabric and people to adapt; and by congestion, not only the physical consequences of movement but the economic results in terms of the price of land, buildings and labour. Current policies, even where desirable in themselves or specifically devised to meet some of these threats, may be seen as only variably helpful. Lacking inter-policy and inter-area coordination both global approaches ('environment first') and area specific (e.g. road pricing) measures may either work against each other or do no more than move investment or problems from one place to another.

While the metropolitan systems have been experiencing some problems of growth or even actual decline, many smaller settlements, trading on their accessibility and the quality of life they can offer, have been improving their position. What the spatial studies in particular have shown very clearly is that, unless steps are taken to prevent it, these could be the losers in the coming phase of change. They will tend, unless fortunate enough to be situated in a Eurocorridor, to be isolated from the new flow patterns and will be left to compete with each other for local or niche roles.

For the two more developed rural types, the desirable future might be described as seeing an enhanced degree of sharing of opportunities and experiences, so promoting a synergy between the need of the areas under urban-related pressures to have those pressures eased and of the currently well-exploited but still distinctly rural areas to diversify their economies and to replace some of the jobs lost from agriculture. However, in the event, the trend scenario offers yet further polarization. The areas already under metropolitan/urban pressures are precisely those whose location close to markets and within easy reach of the ports, means that they are expected to remain competitive under the new GATT and CAP regimes, while the currently well-exploited areas, reliant on the quality of their infrastructure and landscape, are more likely to experience disinvestment, the abandonment of agricultural land and an overall loss of income and jobs.

Only for the least-exploited areas with their crucial future ecological roles do trend and a desirable future seem to be altogether compatible, and even here, for such areas to fulfil those roles adequately and to fit fully into an EU ecological network, much remains to be done to coordinate policy and applicable measures from region to region and state to state.

2.2.2. Vision for the policy scenarios

Consideration of the trend scenarios leads naturally to views about what a developed set of policy scenarios should be seeking to achieve.

In the first place, for its own sustenance and as a contribution to wider interests, the CCC area needs to focus on how it is to earn itself a living in the future. It can no longer simply look to the combination of its productive and consumer capacities, backed up by availability of raw materials and other resources from elsewhere, to give it an unquestioned and dominant position. Instead it must seek to sell its political and financial stability and its organizational skills in a global marketplace, buttressing this by maintaining its roles in fields such as culture and tourism. This will require attention both to its external positioning and to the environmental and other qualities it can offer.

The six current metropolitan systems are, to varying degrees, crucial to achievement of such goals. Their successful restructuring and economic revitalization will certainly require that full use be made of the reserves of land and labour that are currently under-utilized in their core areas. In turn, that should allow some easing of the pressures towards peri- and suburbanization with benefits both for such built-up areas and for the most pressured rural areas around them.

A successful policy scenario needs also to have identified suitable economic and other conditions to ensure the vitality of the urban areas away from the metropolitan systems and of the hitherto important but now threatened 'exploited' rural

areas, which need to be seen neither as simply food producers nor just as green backdrops for towns, but in their own right as constituting a thriving, multi-purpose countryside, catering in part for food production but also for other activities such as timber growing; for associated sustainable and generally small-scale industries; and for a wide range of leisure and ecological projects.

The context for all this change, which again must be fully reflected in an adequate policy scenario, must be a concentration on environmental and ecological quality. This obviously confirms the role already assumed by the important upland areas and heads of river basins. It needs to be supported by improvement of environmental conditions, for example air and water quality right across the CCC area; by establishment of an ecological network enabling conservation of habitat and wildlife diversity; and by preservation and improvement of specific landscapes and uses, for example semi-natural and coastal regimes.

2.3. Spatial consequences of the confrontation of the trend scenario with the policy scenario

The confrontation of the two scenarios (trend and policy) leads towards conclusions on the main issues for spatial policy, from a transnational viewpoint, for the three main spatial types.

2.3.1. Metropolitan systems

Concerning the metropolitan systems, the following main points schould be mentioned.

- **Inner city revitalization**

The city centres should be revitalized, whilst urbanization at the fringes should be stopped, or at least controlled. Restrictive measures could be enclosed in a general 'green belt' policy, in which the open areas around the urban areas are protected. At the same time the 'non-metropolitan' functions could be localized in the urban areas in the vicinity of the metropolitan systems, or even in 'freestanding' urban areas (see below).

This calls for a comprehensive policy in which, in the metropolitan systems, inner city revitalization, environmental quality improvement and protection of open areas around the urban areas, and the growth of the urban areas outside the metropolitan systems, are interconnected.

- **Aiming at social integration**

Inner city revitalization includes inner city renewal, and this can only be successful when social problems are tackled and social inequalities are decreased. Most of the migrant workers, political and economic refugees, and foreigners in general, are concentrated in the urban areas of the metropolitan systems. As many of the social problems are comparable in all the metropolitan systems, it is recommended that cooperation should be organized between them in the field of social planning.

- **Intra-metropolitan cohesion**

The improvement of internal quality (social, environmental and spatial) depends on a better balance of development between parts of each metropolitan system, and on concentration on functions requiring a metropolitan location. There is a particular problem for the polycentric metropolitan systems in this respect, where not only the core/suburbs but separate centres within the system tend to exist in a state of unconstructive competition with each other. The development of complementarity and cohesion are especially important in such circumstances and crucially depend on internal accessibility arrangements. Top-level traffic infrastructure must be in reach of the whole metropolitan area, which implies excellent intra-metropolitan links with e.g. HST (high-speed train) stations or airports.

- **Inter-metropolitan cooperation**

Sustainable development and strengthened cohesion imply, in the first place, international cooperation and a recognition of some degree of complementarity among the metropolises. They will need, for example, to address the question of reducing or managing their vehicle traffic: it is difficult to see how this can be achieved if say road pricing in one area is merely seen as an opportunity for a 'rival' to try to poach investment or activity.

Furthermore, inter-metropolitan cooperation would strengthen the competitiveness of the CCC metropolises on the world market, and allow them to develop in the functions where the CCC area excels already: services (financial and business services, recreation, tourism). Manufacturing, however, must not be neglected, as it is needed as a strong basis for the service sector.

Besides the common strengthening of service functions for the world market, every metropolis could specialize in the functions in which it currently performs best. However, complementarity should not lead to the total exclusion of inter-metropolitan competition, so here, generally speaking, the policy scenario foresees a selective development for the metropolitan systems.

In this respect, actions should be taken to enhance the top-level traffic infrastructures to strengthen the connections between the metropolitan systems by 'sustainable' transport modes (congestion-free and environmentally friendly) such as HST lines.

2.3.2. Urban areas outside the metropolitan systems

- **The urban areas in the vicinity of the metropolitan systems**

The main potential for the urban areas in the vicinity of the metropolises is precisely their proximity to the metropolises, giving them the opportunity to attract overspill functions from the metropolitan systems. These urban areas are well suited to host those functions which need to be in reach of a metropolis, but which do not need a location in a metropolis, e.g. high-tech and research. As quality of life is becoming ever-more important, the environmental quality (both natural and 'urban') of these urban areas increasingly becomes a locational motive for these functions. An additional advantage of these urban areas hosting metropolitan overspill functions is that the extension pressure on the metropolitan systems, caused by 'non-metropolitan' functions can be diverted to precisely those urban areas where they fit best, giving space to the metropolises to concentrate on providing for metropolitan functions.

The main challenges are to develop the opportunities to host the metropolitan overspill functions, whilst preserving the typical small urban areas advantages. At the same time identity must be preserved and developed: these urban areas should by no means become a nameless appendix of the nearby metropolis but should function independently and relate with the metropolis on a basis of equality.

- **The 'freestanding' urban areas**

The potentials for further development are, in a trend scenario, rather limited in this case. The strongest advantages are environmental quality, which is the highest of all CCC urban areas, and the presence of often well-preserved heritage infrastructure. These urban areas could function best as regional economic and service centres.

The challenge for these urban areas is to develop into regional centres and to host functions on the regional level, which do not need a location in metropolitan areas, thus becoming the 'stepping stones' for regional development. A main issue here will be the development of traffic infrastructure to link these urban areas with each other and with metropolitan urban areas.

In Germany, this is encouraged by designating most of these urban areas as *Oberzentrum*, and by policies foreseeing the development of urban networks. In France, DATAR has devised an ambitious trend-breaking scenario to combat the overconcentration of activities in Ile-de-France, by encouraging development in (among others) such freestanding urban areas outside Ile-de-France.

- **The coastal urban areas**

The potentials of these urban areas are linked to their coastal situation. The two main functions to be developed or protected here are tourism and seaport-related traffic. The opening of the Channel Tunnel, however, will lead to a decrease of traffic through the urban areas of the Channel coasts.

The challenges here are to cope with and to decrease pollution, linked to the port-related industries and heavy traffic flows caused both by industry and tourism, especially as environmental

quality is vital for tourism. The danger exists that some urban areas, given their coastal location, tend to neglect non-sea-related potentials specifically linked to the urban areas, and to concentrate exclusively on sea-related activities.

- **Urban areas in specific regeneration areas**

The potentials of these urban areas are very much linked to national and European policy incentives, as these areas are facing regeneration. Some of the regenerating areas will be able to establish an identity and role through their relationship with a metropolitan system, (this includes Bielefeld and the East Thames corridor) and others (Hagondange-Thionville, Béthune, Douai, Valenciennes, Liège, Hasselt-Genk) will be able to become part of one of the 'new style' transborder metropolitan systems (more on this follows later). The 'Walloon axis' could take advantage of the relative vicinity of ABG-stad and of the Lille 'new style' transborder metropolitan system on the one side and of the MHAL 'new style' transborder metropolitan system on the other.

The challenges is in the first place the economic regeneration of these areas. Since they cannot do this on a stand-alone basis, they need assistance through national and European policy measures. Moreover, they should cooperate, in common actions, aiming at a common goal, to give much greater chance of success. These actions should include combating pollution and improvement of environmental quality, which is often poor in these areas, as well as incentives for the amelioration of traffic problems.

- **Urban areas in border regions**

Several parts of the CCC region which are outside the classic metropolitan systems are characterized by a denser than average pattern of smaller urban systems. Three such constellations can be recognized:

(i) the MHAL area with Liège (Wallonia), Hasselt-Genk (Flanders), Maastricht (south Netherlands) and Aachen (North Rhine-Westphalia);

(ii) the Lille region with Béthune, Lens, Douai, Valenciennes (Nord-Pas-de-Calais), Tournai (Wallonia) and Kortrijk (Flanders);

(iii) the Saar-Lor-Lux region with Saarbrücken (Saarland), Nancy, Hagondange-Thionville, Metz (Lorraine), Luxembourg (Grand Duchy of Luxembourg), Arlon (Wallonia) and Trier (Rhineland- Pfalz).

All three of these constellations are transnational, and comprise prosperous as well as run-down (and in need of regeneration) urban areas.

These integrated systems could function as metropolitan systems, however, in a different way compared to the existing metropolitan systems. They should be oriented towards development of new activities and aim to maintain and to improve spatial and environmental quality.

The creation of these integrated systems is both a potential and a challenge, and would help the urban areas in these systems to take full advantage of their central position in the common market, to overcome their restructuring problems, to overcome their relatively small individual scale, and would reduce the domination of the CCC area by the six established metropolitan systems.

To summarize, for the non-metropolitan urban areas, in the light of the two policy guidelines, the focus is placed on cooperation between centres, based on common interests but complementary capabilities; amelioration of inequalities and potential environmental problems through coordinated approaches to development; and in appropriate circumstances, the formalization of these approaches through the emergence of new style, cross-border groupings of towns amounting in the most important instances to recognition of the effective definition of additional 'new style' metropolitan systems.

2.3.3. The rural areas

- **Rural areas under urban pressure**

To an increasing degree agriculture is becoming independent of the quality of the soil, and in so far as production is 'footloose', its location is influenced by land prices and competition with other forms of land use, caused by increasing urban pressure from the nearby urban areas. The attractiveness of these areas for overspill from the

nearby urban centres is a determining factor. This evolution is to be seen as a threat to environmental and landscape qualities, and causes marked change in the functioning of the rural areas themselves, including the small villages.

Agriculture in these areas is more resistant to the impact of the GATT agreement, because of the proximity of the large consumer markets and to the ports which offer competitive advantage for exports.

Given the sometimes enormous pressure on these areas, the tendency to achieve maximum benefits on a minimum of space causes specific environmental damages, as for example the overproduction of manure by the extremely intensive rearing of livestock.

The challenges for the rural areas under urban pressure include an aim to maintain and improve environmental and spatial quality; to formulate effective policy measures bearing on urban sprawl, related to policies to revitalize the urban areas themselves; and to find ways to limit new transport infrastructure provision in such areas.

Application of 'green buffer' policies in one form or another around the metropolitan systems is the principal hope.

In relation to that, specific attention should be paid to the support of 'sustainable' functions in these areas, among them environment-friendly forms of agriculture, but also the conservation of multi-purpose woodlands for recreation, ecological improvement and landscape protection.

- **The rural areas with a high level of human exploitation**

Within these rural areas, the following distinctions can be drawn:

1. Rural areas facing significant transition, not least as a result of the CAP and GATT agreements. Moreover, in most of these areas, agriculture is still a significant element in the regional economy. The combination of these two factors makes these areas vulnerable. This type is mostly present in the rural areas of the Paris basin.
2. The rural areas away from urban pressures in Flanders, Hainaut and the Netherlands and parts of North Rhine-Westphalia are seen as being in a full transition process, and the expected outcome is a spatial mosaic and a general enlargement of scale in agricultural activities.
3. The rural areas away from urban pressures in South-East England are expected to have a relatively stable structure, compared to the other two categories. However, loss of agricultural land is still expected and is tending towards a bi-modal system, with a limited number of highly productive farms and extensively used rural areas, where landscape protection can be developed.

From the environmental point of view, significant threats can be identified in these areas, mostly in those belonging to the northern part of the CCC area, because of the accumulation of pesticide and fertilizer residues.

- **The rural areas with a low level of human exploitation**

For the future, the farmed area will continue to shrink, accentuated by the GATT agreement. In this context, remoteness from the ports is a competitive disadvantage. Decreasing forest vitality is becoming a threat for the future, as also is the significant pollution of some rivers, such as the Moselle.

For rural areas away from urban pressures, the main challenges are the development of a sustainable development basis, to make them more resistant to growing global competition; and the protection and improvement of environmental quality.

Without claiming to provide an answer to all the challenges ahead, the economies of both the rural areas with a high level of human exploitation and the ones with a low level of human exploitation would be strengthened by enhanced cooperation and integration between these two types of rural areas. Increased cooperation could enhance the internal cohesion and, to the extent that it promotes closer links between complementary producer regions, might reduce depen-

dency on world markets and provide the CCC area with a more balanced food budget.

Turning to the environmental challenges, two main elements are selected as extremely relevant for regional development. The first is the aim to contribute to the elaboration of a common European ecological network, with relevant parts of the CCC area making a significant contribution. This network should be improved and supported by the linking of existing parts, the identification of new nature protection areas and the improvement of their environmental qualities. This should lead towards a more coherent policy at the regional level for the protection of natural areas, in the broader European context. The loss of agricultural land in the future offers an opportunity to realize such an ecological network, also implying the extension of nature protection areas.

The second environmental challenge is the development of coherent policies towards water resources, provision and quality. The rural areas with a low level of human exploitation, by virtue of their situation in the river structures and possession of large woodlands and other collecting areas, have what can be characterized as 'sponge' and 'filter' functions. These are vital to the quantities and quality of water available to the large population concentrations downstream, and represent resource functions which should be conserved and, so far as possible, strengthened. It is clear though that such policies cannot be developed region by region but will need to be accompanied by intense interregional cooperation, aiming at sustainable development and cohesion in the CCC area, and indeed in the EU as a whole.

To summarize, the guidelines to optimizing CCC area quality and contribution, are to be found in transborder cooperation between rural areas, aiming at better balanced developments and objectives for maintenance and improvement of specific qualities and resource functions.

2.4. Main conclusions

The main challenges for policy scenarios are motivated, as described earlier, by transitional change aggravated by internationalization at the global or international cross-border scale. Two broad policy solutions, both of them with spatial effects, have been applied in the development of the various policy scenario approaches. They are applicable because there are many common problems across the very different areas and circumstances evident in the CCC area, so offering opportunities for international and interregional cooperation; and because the nature of the problems, which are to do with restructuring of an already developed area rather than guiding initial investment, encourage the optimal use of complementary opportunities. The suggested solutions lie in attempting to:

(i) strengthen cohesion between the regions as well as between the urban areas, both within and outside the metropolitan systems, leading to coordinated policies and a better cooperation, and

(ii) seek sustainable development both in sectoral issues and in spatial issues.

Spatial policy contains many significant opportunities to support the development goals set out above, and the main agenda is:

(i) exchange and improvement of knowledge and experience in order to combat common problems, in line with the general aim of sustainability and based on improvement of cooperation networks between different regions and urban areas;

(ii) further coordination of spatial development strategies between regions and areas of similar or complementary character, not least through extension of cross-border initiatives;

(iii) improving relations between places in the whole CCC area 'space' in order to take full advantage not just of similarity of experience but of diversity of capacity and culture.

A very clear comment should be made at this point that delivery of the coordinated solutions based on complementarity and sustainability does assume the existence of an adequate transnational and trans-regional platform for the formulation and implementation of policy. If the current

studies, in what is undoubtedly the most populous, politically and in other ways varied, of the transregions, have demonstrated anything it is how equally varied are the measures, institutions, powers and even the data available to address what in so many respects are all too similar problems. If opportunities for cooperation are indeed to be seized, then it is of primary interest that such issues should be addressed, and this is a role where the European Commission might consider taking the lead as it is difficult to see any other agency being well placed to do so.

1. External position of the CCC area

1.1. Historical background

For centuries, the CCC area has experienced a more or less buoyant economic development, leading to a continuous accumulation of material and cultural wealth. One of the main pillars was an agricultural production which was much higher than local consumption. This surplus allowed the development of urban settlements in the CCC area as early as prehistoric times.

The number as well as the size of these settlements grew larger in the Roman occupied part of the CCC area. By the end of the Roman era this region had more than 30 cities, of which Trier, Cologne, Utrecht, Reims, Paris, Canterbury and London were the most important. However, despite this and the political unification of a large part of the CCC area under the Roman occupation, the region was not (yet) the most important region in Europe, either economically or culturally.

The CCC area was to hold a dominant position in Europe and even in the world roughly between 1800 and 1950, when more than half of the world's population and surface area were, through colonial empires, controlled by the countries the capital cities of which were situated in the CCC area.

The route to this spearhead position started in the Middle Ages. North-western Europe saw its population booming. A new economic structure emerged, based on the many fast-growing trading and production centres. Flanders, together with northern Italy, were in that period the most densely populated and most urbanized regions of Europe. In the 14th century, Paris was the largest CCC area city and one of Europe's largest cities (probably some 80 000 inhabitants), followed by Ghent (60 000), and London, Bruges and Cologne (40 000), the latter being the largest city of the German-speaking area in Europe.

Production flourished and trade became more and more international. There were intensive trade links between the CCC area and northern Europe (the Baltic area, Scandinavia and Scotland), western Europe (Germany, Britain and France) and southern Europe (Iberia and Italy).

All this was the result of strong social organization through the many medieval institutions, especially on the local level, the local church, the guilds, the cities, the Hanse, the charitable institutions and wealthy families. On a higher scale, however, politics were dominated by the rivalry between England and France, and the local lords in the French Kingdom and German Empire parts of the CCC area, fighting for their independence.

Between 1500 and 1800 the CCC area saw a transition from its European economic base to a worldwide economic system. The main players in this were England, France and the Netherlands, all three building large colonial empires. The three largest European cities, London, Paris and Amsterdam, were all located in the core area of Europe, described here as the CCC area.

Within the CCC area many borders disappeared, as central governments grew stronger, breaking down distinctively local independence. Germany, which was divided into hundreds of small independent regions and cities after the Treaty of Münster, was the exception to this trend.

Rivalry between the large powers (England, France, the Netherlands and the Habsburg Empire) remained, however, and this led to the CCC area, and especially the central part of this area (roughly Belgium), becoming the site of many battles, which gave it the name of the 'battlefield of Europe'.

By the end of the 18th century, the combination of cultural influence and economic and political power of the different states (partly) in the CCC area, made this area the most important one in the world. The Industrial Revolution may even have strengthened this position. London became the world's largest urban area, the capital city of the biggest empire the world had ever seen and the world's financial capital. Rotterdam became the largest port in the world, while other ports ranked at the top of the list of European ports: in the 1930s three of the four largest ports in mainland Europe were CCC area ports (Rotterdam, Antwerp and Ghent). In the second half of the 19th century the Ruhr area started its phenomenal development. Duisburg became (and still is) Europe's most important river port. In the 19th and beginning of the 20th century, industrial production in the CCC area was by far the most important in the world, and the area held a spearhead position in virtually all economic and scientific sectors.

Yet, all this was not translated into political cooperation going beyond military treaties. The national states remained completely independent, even though the evolution of communication technology brought about a greatly enhanced mobility. Much of the economy of the CCC area countries was focused on its internal markets or on colonial markets abroad.

After the Second World War a new world order emerged, with the USA and the USSR as leading countries, and with the gradual decolonization of the 'third world'. As the European countries grew relatively weaker, both from an economic and from a political point of view, the need for cooperation between them was felt ever more strongly. The example was set by three smaller CCC area countries, creating the Benelux. When later the EEC was established, the direction was set for the creation of a strong Europe.

This is how eventually the CCC area became part of a single 'union'. However, a lot of work must still be done to pick the fruits of this unification, since the regional and national competition often hampers the further, common development of the CCC area.

The area may no longer hold the unique spearhead position it once had. However, it continues to offer the political and financial stability, backed by a highly educated and skilled labour force and historical/cultural traditions, which guarantee that it maintains its position among the world's most important regions.

1.2. A core area in Europe and in the European Union

1.2.1. Centrality of the CCC area

Several studies, based on criteria such as distance, time, cost of transport, etc., have been conducted to measure the centrality of the CCC area within the wider EU.

When economic potential, combined with distances for freight transport is taken as a criterion for the measurement of the centrality of European regions,[1] the CCC area as a whole scores very highly: in no part of the CCC area is the value lower than the EU average (100%). Values over 152% were found in Ile-de-France, Greater London, Rhine-Main-Neckar and the larger part of the Netherlands, Belgium and North Rhine-Westphalia.

When accessibility for persons to selected nodes (here: mostly NUTS 2 region capital cities) is

[1] Keeble, D., *Peripheral regions in a Community of 12 Member States*, Cambridge University, 1986.

taken as a criterion for the measurement of centrality,[1] again the CCC area has the highest scores. The isochronal lines of the number of people who can be reached within three hours show that nearly the whole of the CCC area can be reached by the highest number of people (over 40 million), and that a small part of the CCC area (large parts of Picardy, Champagne-Ardennes and Lorraine, and small parts of south east England and Rhineland-Pfalz) score only slightly lower. When travel time to one of the 194 selected economic centres is analysed, the CCC area, with the exception of parts of Champagne-Ardennes and Lorraine, which just miss out, again has the highest accessibility (less than 5 hours).[2]

Ten of the 16 'centres of gravity' of Europe, determined according to four indicators (geography, GDP, population and export capacity) for four different definitions of 'Europe' (the six founding Member States of the EU, the 12 EU States, the 19 States of the EEA and the 30 States of greater Europe) are situated in the eastern part of the CCC area (see Map 1.1).

This all illustrates the central position of the CCC area in Europe, in physical (geographical, population), functional (accessibility for both goods and people) and economic (GDP and export capacity) terms.

1.2.2. A strong position in the European Union

In relation to the other EU areas the CCC area is distinguished by the size of its population and by its relatively high value-added. Within the CCC area, which covers only 11.3% of the total surface area of the EU, about 26.1% of EU inhabitants produce about 35% of the total value-added, indicating a strong concentration of population and economic activity.

The other six EU 'transregions' produce on average less than a third of the value-added in the CCC area, while every one of them is larger in area (see Table 1.2.). This is accompanied by a higher percentage of built-up area in the CCC area compared to the whole EU (see Tables 1.1 and 1.2).

Administrative functions are concentrated in the CCC area, as are not only a number of capitals but also much of the EU administration, and many other international organizations. Services play an important role in the CCC area compared to the EU as a whole.

This becomes more evident if the most important cities in the two strongest economic areas in the EU, the CCC area and the Alpine Arc, are compared with each other (see Table 1.3.). From this comparison it appears that the cities in the CCC area mainly specialize in services and the Alpine Arc cities in industry. It is striking that the GVA per capita in the Alpine Arc is not only higher in manufacturing but also in services. The CCC area capital cities have more public sector employment in services than the cities in the Alpine regions.

In most of the CCC area, agriculture is economically less relevant than in the EU area as a whole. In the service sector, however, the CCC area has a spearhead function and as services become more and more important in the economy of the Union, the economic outlook for the CCC area as a whole, and especially for the service oriented CCC area cities, seems to be favourable.

1.3. New opportunities in a wider European context

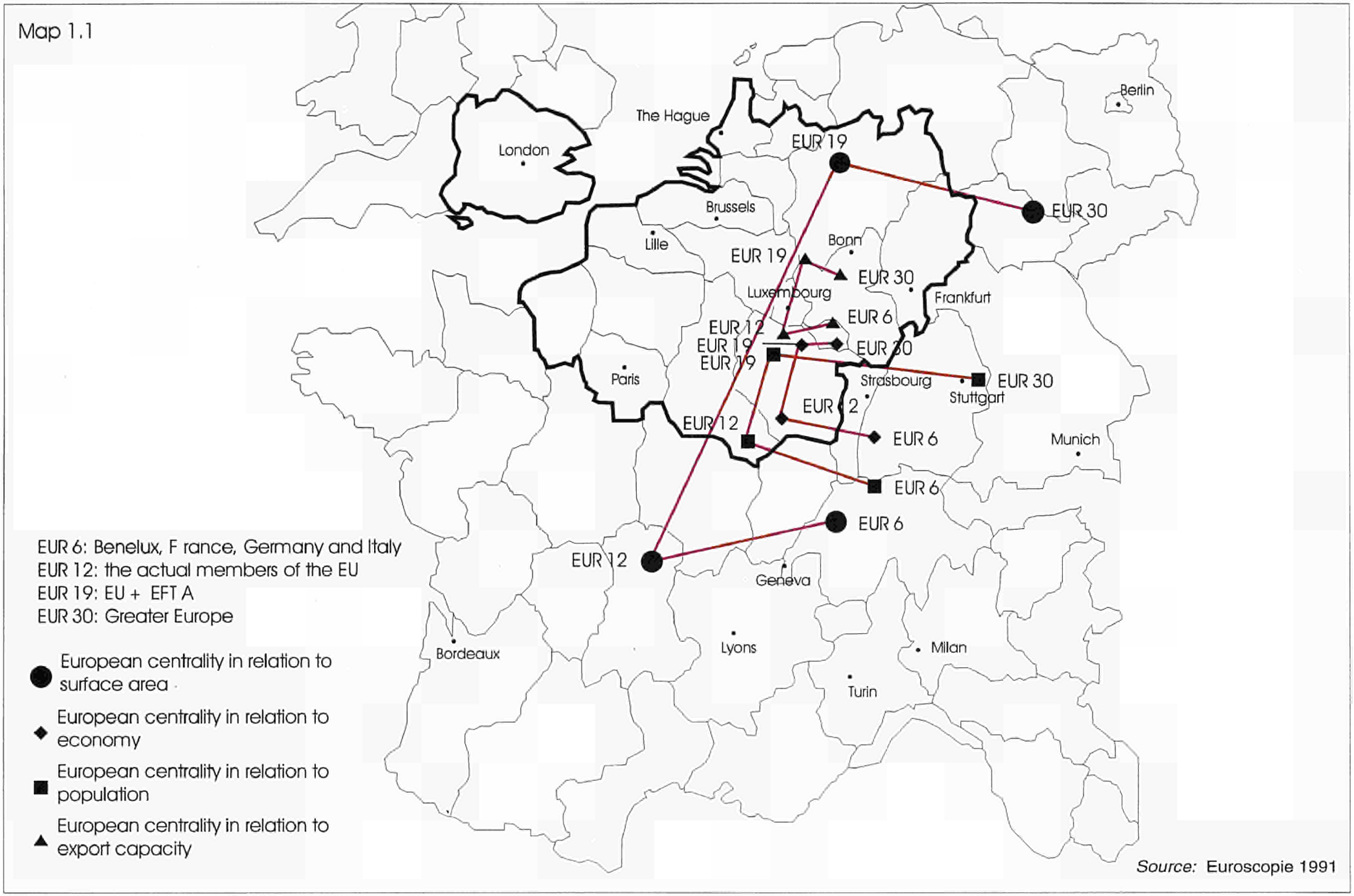
1.3.1. The EFTA countries

In the near future most of the five remaining member States of the EFTA (European Free Trade Association) may join the EU on the basis of the treaty for the so-called European Economic Area (EEA) that they concluded with the Community in 1991. From the point of view of the regions of the CCC area, the EFTA 5 are most welcome to join the EU. Their scientific and technological potential is well developed and would help raise European standards in the global competition with the United States of America and

[1] BfLR., Bonn, 1992.
[2] Idem.

European centrality

Map 1.1



Source: Euroscopie 1991

Table 1.1: Land use: CCC area compared with EU area (without the new German *Länder*) in km²

	CCC		EU	
Forestry	58 864 km²	22.0%	539 980 km²	23.0%
Agriculture	140 186 km²	52.3%	1 280 800 km²	56.7%
Other uses	68 739 km²	25.7%	403 630 km²	17.7%
Total area	267 789 km²	100.0%	2 259 870 km²	100.0%

Source: Eurostat, 1985-90.

Table 1.2: The CCC area compared with other EU transregions[1]

	1989 population (in 1 000)	Population share (in %)	1989 value-added per capita in ECU	PPS index of EU is 100
Alpine Arc	54 704	16.5	15 839	122
Atlantic Arc	52 910	16.0	9 379	83
Northern Arc	41 443	12.5	13 536	104
CCC	89 867	30.1	14 446	111
Diagonal Continental	15 505	4.7	9 173	81
Central Mediterranean	31 044	9.4	7 255	65
West Mediterranean	37 697	11.4	10 695	91
EUR 12	331 354	100.0	12 470	100

Source: European regional prospects, Tables 1.4 and 1.5.

Table 1.3: Comparison of employment per sector between the most important cities of the CCC area and those of the Alpine Arc area

	Employment (in 1 000)		GVA (billion ECU, 1985 prices)		GVA/employee (1 000 ECU)	
Agriculture	234	165	22.7	20.0	97.0	121.2
Industry	3 664	2 546	118 9	146.2	32.4	57.4
Services	10 259	4 014	354.1	243.1	34.5	61.6
Total	14 157	6 725	495.7	409 3	35.0	60.9

Source: European regional prospects, Tables 2.1, 2.2 and 2.3.

Japan. As a result of their relative prosperity, all five would be net contributors to Community budgets. The GDP per head of the population in the EFTA 5 is more than 50% higher than that in the CCC area. They may also be expected to be most helpful in contributing to monetary stability in an expanded Union.

The EFTA 5 are already well integrated into the EU economy, that is to say that their economies are relatively dependent on exports into the single market. The orientation of the five EFTA countries towards the EU is part of the newly opened east-west linkages in Europe. Austria, which has also applied for membership, will play a particular role in east-west trade. It seems evident in the 1990s, that south European countries are standing to lose export shares which they have gained as a result of market access. The trend of recent years for trade to expand in the direction of southern Europe will probably be replaced by a trend in the direction of northern Europe. Trade from the new German *Länder*, the Czech Republics and Slovakia, Poland and Hungary may well prove to be competitive in terms of exports to north-western Europe in substitution for exports from southern Europe.

[1] The population figures are not altogether in accordance with the figures in the social issues chapter. This table, however, may be used to compare the relative position of the CCC area with that of the other EU areas.

Thanks to enhanced economies of scale, an extension of the single market in the directions of central and northern Europe may be expected to lead to additional productivity gains for CCC-area-based companies. Such productivity gains would, in turn, encourage accelerated economic growth in the central region of western Europe to the detriment of low productivity producers in the peripheral regions of the European Union in the south, Ireland and the peripheral parts of the UK.

1.3.2. Central and Eastern Europe

In the same way that South-East Asian countries are of great importance to Japan, the developments in Central and East European countries are of great importance for the CCC area. Such Central and East European countries are currently undergoing enormous and varied economic change. The changes have to do with the collapse of the CMEA trade system on the one hand and the programmes of privatization which are being carried out now on the other. Although the number of joint ventures with Western companies is growing steadily, many current companies are not able to compete at an international level.

The political and economic consequences of the implosion of the Soviet system have yet to become fully evident. Despite reforms, the Russian economy is performing worse than anticipated in the most pessimistic scenarios. Imports have fallen by 46% since 1991. Real wages dropped 40% in 1992. About half of the industrial production of Russia is simply not viable by Western standards, not even if supported by further cuts in real wages. A further slump in production seems inevitable because the hard currency value of the energy and raw materials which Russian industry consumes is higher than the value of the present Russian GDP. The practice of dumping these goods on the European market is harmful for the more sophisticated producers of the same commodities in the CCC area.

The structure of employment is quite different from that of the CCC area. Employment in the east and central European countries is still very strongly focused on agriculture, especially in Poland and Romania, and on industry. In all countries except Hungary, the importance of the service sector, in terms of jobs, is less than that of manufacturing. A strong decrease in employment in agriculture is to be expected.

Central Europe cannot compete in high-tech capital goods. It has to re-specialize in low technology (light) industries. Sufficient competitiveness is only attainable in labour-intensive products such as clothing and shoes or spare parts. While they may become strong competitors in the primary sector (energy, mining, forestry, wheat and meat), there is no future for their heavy industry, producing steel and chemical bulk products.

The six central European countries Poland, Hungary, the Czech Republic, Slovakia, Romania and Bulgaria have concluded an association treaty with the EU, which will allow them to join the EU when they can meet the conditions. Three of these nations, Poland, Hungary and the Czech Republic, which are closest to the CCC area, have better economic outlooks than the others: In 1992 these three countries were already more economically dependent on the EU than some of the EU Member States themselves, that is to say that they had greater export earnings in the EU as a proportion of their GNP.

The three have abolished all farm support to allow free competition within the rules of the GATT. Lacking the farm support available within the EU this can only lead to a shake-out of rural labour and to country-to-city migration, which could well overflow into (illegal) migration into the CCC area. Economic cooperation between the EU and the three could be placed in the wrong perspective if their potential as low wage producing nations is exaggerated. Such an emphasis could speed up the destabilizing process inherent in growing regional and local prosperity gaps with their consequential migration effects.

In the short term, the economic importance of the Central and East European countries for the CCC area will be limited but there are very significant potentials. A large increase in exports to the Central European countries has already occurred. This increase amounted to as much as 60% in just two years. This of course offers opportunities for exporting countries and special opportunities

for the EU and the CCC area. The CCC area has both strong traditions in the field of international trade and close connections with the immediate vicinity of the new markets. The strategic importance of this possible enlargement of trade is obvious, especially when the formation of trade blocks makes it difficult for the CCC area to penetrate the new and/or fast expanding markets in the Pacific Rim and South America. An essential condition for making the most of the opportunities, however, is that on the EU side, borders are kept open for products from the central and east European countries.

1.4. A competitive economy on the world scale

1.4.1. The CCC area: A major player in the world economy

The EU is one of the world's three main economic power blocks, the others being North America and Japan. The international position of the CCC area, a core region in the EU, is related to this. The leading role of the CCC area within Europe and its function in the international economy is illustrated by the presence of the London Stock Exchange within this area. The relations between New York, Tokyo and London form a global financial network.

GDP per head in the CCC area is at the same level as in the US, however, GDP per head in Japan is higher (Table 1.4).

Table 1.4: GDP in the CCC area countries, US and Japan in 1992

Country	GDP per head (in dollars)	GDP growth (%)
Belgium	22 600	1.6
France	23 900	1.8
Germany	24 120	1.2
Japan	32 018	1.7
Netherlands	21 400	1.2
United Kingdom	17 300	−0.8
United States	22 520	1.7

Source: The Economist, Eurostat.

The economic structure of the CCC area is very similar to that of the US, with a clear emphasis on the tertiary sector. Japan has a relatively stronger emphasis on industrial employment and lower employment in services (Table 1.5). It might be expected then that the CCC area, being the old industrial core area of the EU, will face difficulties similar to those of the Eastbelt, the old core area in the US. Here a shift, primarily in manufacturing but also in certain service functions, has taken place from the Eastbelt towards the Sunbelt, the southern and western part of the country. There are however clear social, economic and cultural differences between the US and the EU which makes such a shift less than inevitable in the EU.

Table 1.5 shows that the economic structures of the EU, US and Japan are quite similar.

Table 1.5: Economic structure in the CCC area, US and Japan. Employment in the sectors

(%)

	Agriculture	Industry	Services
CCC	2.8	28.7	68.5
United States	3.0	26.6	70.4
Japan	7.6	34.4	58.2
OECD	7.6	29.9	62.5

Source: Eurostat, national statistics.

In all three cases unemployment is increasing (Table 1.6), but it is expected that it will decrease in the US in 1993 whereas, on the same judgment, unemployment in Japan will show a small increase. However, the unemployment rate in Japan is low compared to that in the CCC area. The CCC area has a structurally increasing unemployment rate. Full employment has not been a general feature since the 1960s.

1.4.2. Competition focused on high-tech products

In the economic relations of the CCC area with the US and Japan and in the competition between these regions, much of the emphasis is still on industrial production. To a large extent the industrial development of the CCC area and the US has been similar. In the 1960s a large number

Table 1.6: Unemployment in the CCC area, US and Japan

(%)

	1990	1991	1992	1993	1994
Belgium	8.7	9.3	10.3	11.9	12.9
France	8.9	9.5	10.2	11.2	12.1
Germany	6.2	6.7	7.7	10.1	11.3
Japan	2.1	2.1	2.2	2.5	2.6
Netherlands	7.5	7.0	6.8	8.5	9.3
United Kingdom	5.9	8.3	10.1	10.7	10.4
United States	5.5	6.7	7.4	7.0	6.5

Source: Eurostat, OECD.

of traditional industries (shipbuilding, textiles) experienced problems. On the other hand the process industries and high-tech. industry have grown enormously during the past 25 years. The growth in high-tech industry, however, is related to 'immaterial' investment in technological knowledge production. In the 1960s the US was the dominating power, especially in high tech industries. Western Europe is catching up with the US, however, not least because of the establishment of plants of American multinationals in Europe. During the last 25 years Japan has turned its trailing position in high tech into a lead, in some fields at least.

The US has sizeable trade deficits in all industrial goods and has lost a part of its export share. The deficits in the balance of payments are somewhat tempered by the strong position of the US in agricultural products, raw materials and services. Japan has a large trade surplus in high-tech products, but is strongly dependent on the import of some natural resources such as energy. The CCC area occupies a position intermediate between the other two blocks. As to the growth of labour productivity, (Table 1.7) in this respect too, the CCC area occupies a position between the marked growth of Japan and the stagnation of the US.

Table 1.7: Labour productivity in the business sector, annual changes

(%)

	1960-73	1973-79	1979-90
Belgium	5.2	2.8	2.4
France	5.4	3.0	2.7
Germany	4.5	3.1	1.6
Japan	8.6	2.9	3.0
Netherlands	4.8	2.8	1.5
United Kingdom	3.6	1.6	2.1
United States	2.2	0.0	0.5

Source: OECD.

The trade balances in industrial products of the three regions show a concentration on high-tech products (Table 1.8). Thus the competition bet-

Table 1.8: Export division of high-tech products

	United States			Japan			EU (4)*		
	1965	1980	1987	1965	1980	1987	1965	1980	1987
Aircraft	8	5	4	0	0	0	2	3	2
Computers	2	3	4	0	1	4	2	4	5
Automobiles	9	5	5	2	9	12	21	17	17
Machines	9	7	2	2	4	5	16	14	12
Chemicals	3	3	2	0	1	0	10	7	6
Electronics	3	3	3	2	5	8	6	5	6
Instruments	2	1	1	1	1	1	4	2	1
Total	33	27	21	7	21	30	61	52	49

Source: Central Planning Agency of the Netherlands.
*: EU 4: France, Germany, the Netherlands and United Kingdom.

ween the regions inevitably focuses on this sector. As already mentioned, the trade position of the US has declined sharply. In 1987 the US had a trade surplus in aircraft and high-tech chemistry, while its position in computers was also strong. In 1965 Japan already had a trade surplus in high-tech fields such as cars, electronics, specialized machinery and instruments. These surpluses increased strongly in the period 1965-87. By contrast, some products such as petrochemicals and pharmaceutical products, textiles and clothing, non-electric machinery and instruments, processed foods and beverages, are not even competitive within the Japanese home market.

As is becoming familiar, the CCC area occupies a position between the US and Japanese experience. Its trade position is positive in almost all sectors (except for computers) but it has declined during the past 25 years. The relative specialization of western Europe (cars, high-tech chemistry and specialized machinery) remains largely unchanged over the period.

As competition focuses on high-tech products, R&D is of vital importance. Compared with Japan and the US, and with the notable exception of chemicals, especially pharmaceutical products, Western Europe does not have a strong R&D specialization. The pattern of specialization in technological knowledge production is a result of differences in social preferences, the way the knowledge infrastructure works and the way it comes into being. The R&D specialization of the US (aircraft, space travel) is strongly dependent on its (military) status as a superpower. The Japanese pattern shows 'industrial targeting' with little interest in aeroplanes, space travel and pharmaceutical products.

The development of the long-term specialization pattern is not, however, dependent solely on the existing pattern, but also on the position the major economic powers take in technology fields with future potential. It appears from a study by the US Department of Commerce that Japan has the best position in that respect, given that electronics is the most promising technology.

For the present, the emphasis in economic relationships is still on manufacturing. For the future, international competition will increasingly be directed towards services, which are becoming more international in character. In the field of knowledge-intensive services, the US has the leading position but the CCC area, as an area with a concentration of services within the EU, also has an important role. Japan's international position is not strong in this respect. On the other hand, with the seven largest banks in the world being Japanese, Japan is very important in the banking sector. The US has by far the strongest position in the telecommunications field (Table 1.9): some commentators have seen this as a reflection of strong regulation in the CCC countries in contrast to the free-market situation in the USA.

1.4.3. The effect of the formation of trade blocks

EU import restrictions on Japanese manufactured goods and trade disputes within the GATT have encouraged the Japanese Ministry of International Trade and Industry (MITI) to bring about a shift from commodity exports to foreign direct investments during the 1980s. More than half of Japanese direct foreign investment in Europe took place in the United Kingdom and the Netherlands. In each country, Japanese investment in

Table 1.9: Telecommunications in the CCC area, USA and Japan

	Gross domestic product		Percentage of world total in telecommunications (b)	Factor (b) : (a).
	Million ECU	% (a)		
CCC countries	3 265	32.3	16.3	0.5
USA	4 271	42.2	35	0.83
Japan	2 568	25.4	11	0.44
Total	10 104	100	62.3	0.62

Source: Ungeyer, 1990.

business services (USD 12.4 and USD 8.6 billion respectively) is four times higher than in manufacturing (USD 3.1 and USD 1.5 billion respectively). Japanese investment in business services in Luxembourg (USD 5.4 billion) is twice as high as all Japanese investment in manufacturing in Germany and France from 1951 to 1990 (USD 0.9 and USD 1.0 billion respectively).

Owing to a sharp recession in Japan, direct Japanese investment in Europe virtually came to a standstill in the 1990s though the recession did not prevent a further 5% increase of direct investment by Japanese companies in Asia in 1992. As an export market for products made in Japan, South-East Asia has recently surpassed the EU and the US.

Japanese investors have not shown as great an interest in investing in the old industrial reconstruction areas in the CCC area as they have shown in comparable British areas beyond the CCC boundary.

As global players in international trade the major Japanese companies will remain in need of the business services and transport offered by the main cities of the CCC area. The CCC area is more important as a centre of trade than as a centre of industrial production, research and development. London will remain the most important business centre (banking, marketing, advertising, consultancy, accountancy, etc.) for the Japanese in Europe so long as the strategy of the large Japanese companies to decentralize management to 'global regional' headquarters is maintained.

Trade with North America amounts to one third of all EU foreign trade. However, US trade with all of Europe accounts for only 3% of its GDP.

1.5. Conclusion: A strong position under pressure

The concentration of population and functions, together with its central position, have led to the CCC area holding a 'spearhead' position, including a particularly advanced position in specific sectors such as industry, R&D and financial services. This spearhead position has for a long time been a very important characteristic of the CCC area. Its present position in the world economy may, in many respects, be characterized as lying between the other major economic powers: the US and Japan. Until now, this position has shown itself to be quite stable. A major difficulty in the CCC area appears to be its inability to create enough jobs. Although there has been an increase in employment, the level of unemployment is structurally higher than in the US and significantly higher than in Japan. The economic structure of the CCC area is more closely related to that of the US than to the Japanese so, at first sight, the CCC area might be expected to encounter the same problems as the old core area of the US in the Eastbelt. However, given the different social and cultural structure of the CCC area, these problems will not automatically lead to a major shift of economic activities to other (southern) regions. For foreign investors, especially the Japanese, the CCC area remains an important investment area.

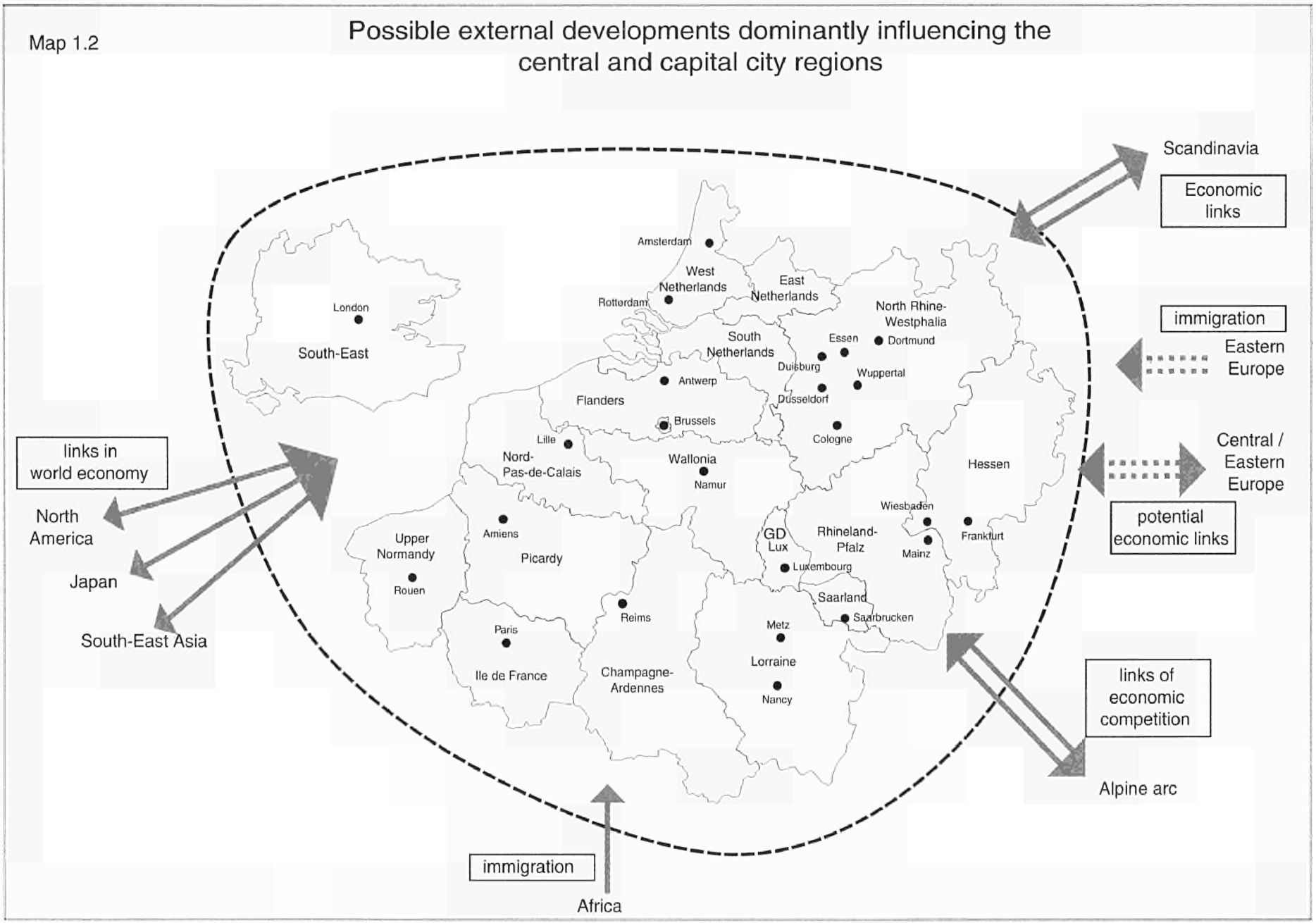
Developments in the east and central European countries and the future entry of the remaining EFTA countries into the EU are creating distinct opportunities for the CCC area. Economic relations with these countries will be of great importance. EFTA countries are already well integrated into the EU economy and, on joining, they are expected to reinforce the power of the CCC area. Both developments will probably lead to a shift from a southern towards a more northern and eastern orientation for the CCC area.

Recent tendencies, internal as well as external, however, indicate that this spearhead position may be threatened.

Internally, a number of problems are being accentuated by endogenous forces within the CCC area: the area contains several old industrial areas facing regeneration problems, retarding the renewal of the economy. Some areas which are lagging behind, especially in the older coal- and steel-based industrial areas, are characterized by unemployment and social tensions. Growing traffic congestion could reduce the accessibility of the economic centres. A concentration of environmental pollution could hamper or threaten some spatial functions. Living condi-

Map 1.2

Possible external developments dominantly influencing the central and capital city regions



tions are threatened by noise, availability of drinking water, concentration of nuclear plants and 'Seveso' plants. The continuance of some economic activities such as agriculture and forestry are also in doubt. Nature conservation and development are hampered by competition for space and by worsening environmental conditions.

External factors also threaten the spearhead position of the CCC area. Although developments in east and central European countries do offer new opportunities for the CCC area, the maintenance of the spearhead position cannot be guaranteed. There is a tendency towards deconcentration of political decision-making across the EU, as the administrative functions of Germany move to Berlin, and with the general tendency to spread the EU administrative functions more equally over its territory. Undoubtedly many urban areas in the eastern part of the present EU will benefit from the new trade links with central and eastern Europe. This will, to some extent, cause an eastward shift in the Union's centre of gravity. Then there is the growing importance of the large metropolitan areas in southern Europe. The dominance of the economic decision-making power of the CCC area may be in danger as new economic powers are emerging within the EU (the Alpine Arc region), or outside the EU (e.g. the Asian 'Tigers' and China). At the moment, however, the strongest competition to the EU, and thus to the CCC area, comes from Japan and the US.

2. Demography and social issues

2.1. Main demographic characteristics

2.1.1. Overall population

In 1990, the population of the CCC area was 89.2 million, or 26% of that of the EC area (including the former East Germany). Between 1980 and 1990, the population of the CCC area increased by 2.7% compared with a slightly higher growth rate of 2.9% for the EC area (excluding the former East Germany).

The Netherlands Economic Institute's forecasts (base year 1985) showed the population of the EC area remaining stable between 1990 and 2000, but predicted a decline in the population of the CCC area of 1.3% in the same period. However, those forecasts predated recent trends in international migration. More recent projections by Eurostat, taking account of migration, envisage that the population of both the EC area and the six CCC countries might grow by between 3 and 6% by the year 2000. Within the CCC area, some regions are expected to grow between 5 and 10% and others to show similar declines. Population will increase in Gelderland, East Sussex, West Sussex, Surrey, Bedfordshire, Hertfordshire, Berkshire, Oxfordshire and Buckinghamshire. A decrease of the population will occur in Hainaut, Liège, Luxembourg (B), Ile-de-France and Greater London. The German part of the CCC area is of particular note as a natural decrease of the population is expected to be offset by immigration from the former East Germany.

The debate continues about forecasts to 2015: the issue is the level of immigration rather than uncertainty about natural change in the population of the CCC area. For the purpose of developing scenarios for the period beyond the year 2000, this study assumes a small natural increase for the CCC area as a whole, limited immigration, and thus a gradual but consistent growth in population.

Although population growth is static across much of the CCC area, there is a tendency towards smaller households, increasing the demand for dwellings. The average household size in the CCC countries is between 2.35 in Germany and 2.7 in France (see Graph 2.1).

Based on a number of population variables, the regions of the CCC area can be categorized into six groups. The variables used were:

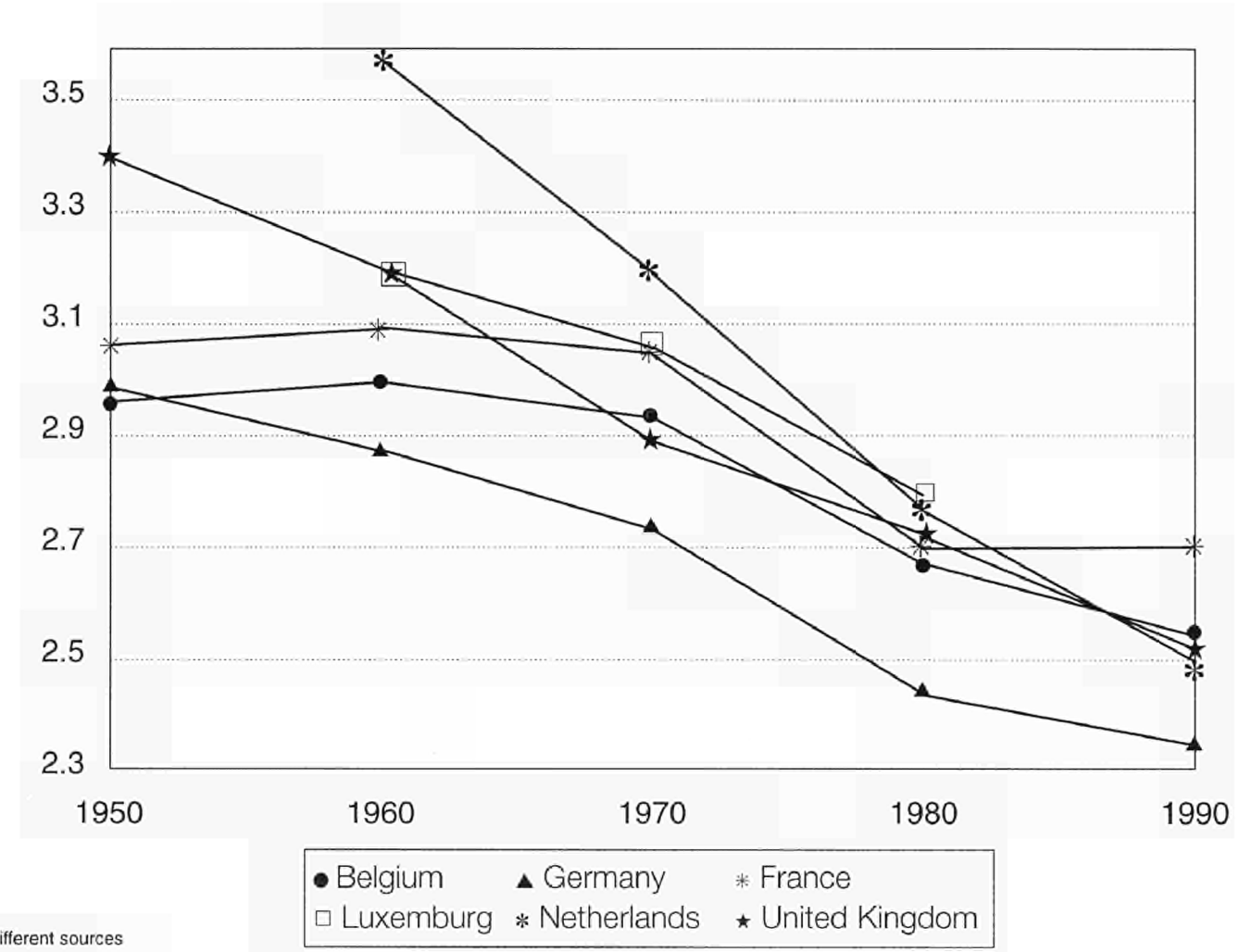
(i) net migration experienced between 1980 and 1990;
(ii) projected population for the year 2000;
(iii) the ratio of people 60 + :under 20 for the year 2000;
(iv) activity rates for the year 2000.

Map 2.1 categorizes the regions of the CCC area on that basis. The following types are defined:

Type 1: decreasing population, negative migration, older population;

Graph 2.1

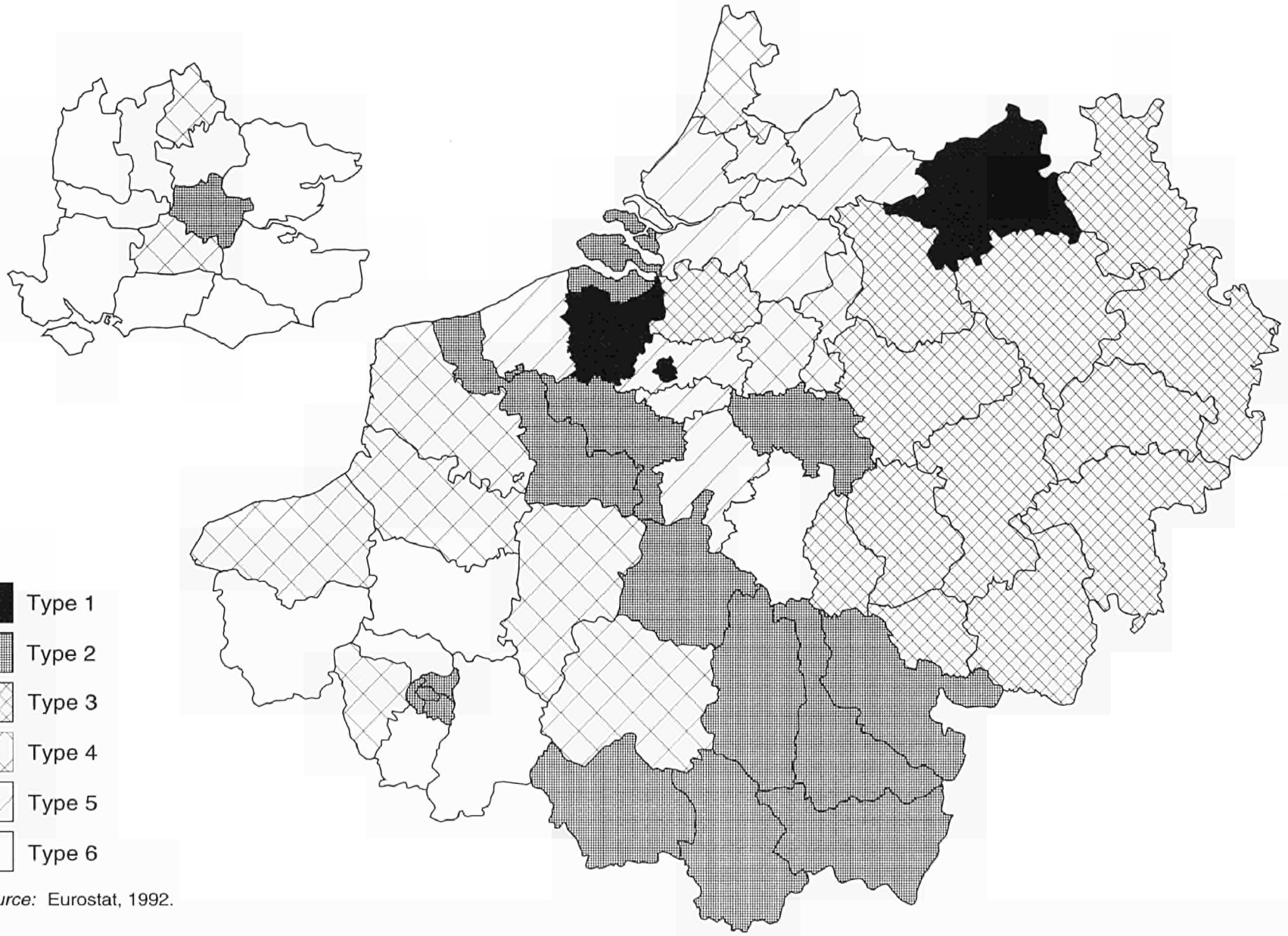
Average household size in the CCC-countries



Source: M+R, based on different sources

Map 2.1

Typology of population structure and dynamics



Source: Eurostat, 1992.

Type 2: decreasing population, negative migration, younger population;

Type 3: decreasing population, positive migration;

Type 4: increasing population, negative migration;

Type 5: increasing population, positive migration, lower activity rate;

Type 6: increasing population, positive migration, higher activity rate.

2.1.2. Changing population structure

Although only modest changes are expected to the total population of the CCC area by the year 2000, its demographic composition is expected to alter significantly. Two main structural changes are evident in this respect — ageing and migration.

Ageing

Ageing is expected to be the more significant factor in demographic change both in the CCC area and the EC area. In 1985, 27% of the population of the CCC area were in the under-20s age-group, 55% were between 20 and 59, and 19% were aged 60+. This age structure was comparable to that of the EC area as a whole. Various projections anticipate that, by the year 2000, the percentage of people aged 60+ in the population of the CCC area will have increased to 21% while that of the under-20s age-group will have decreased to 20%. It is expected that this tendency towards an ageing population will continue after the year 2000 especially in the German regions. The percentages for 2015 are expected to be 26% for those aged 60+ and 23% for the under-20s age-group in the CCC area.

In 1985, in the CCC area, there were 72 people aged 60+ for every 100 people under 20. This ratio was 67:100 for the EU as a whole. The lowest ratios (less than 54:100) were found in North Brabant (NL), Limburg (B) and in most regions of France. The ratio exceeded 78:100 in Greater London, some Belgian regions and all of the German regions: in some English counties, such as East and West Sussex, the ratio actually exceeded 1:1 (see Map 2.2).

By the year 2000, it is expected that the ratio for the CCC area as a whole will be 97:100 with most German regions having ratios of over 123:100 (see Map 2.3). By 2015, the ratio for the CCC area might exceed 130:100, with persons aged over 60 outnumbering the under-20s in most regions. It is further expected that the average age of the population will increase in all regions but not to the same degree. Immigration, however, might influence the future age structure of the population for it can be hypothesized that young migrants will move into the CCC area. Changes in the age structure of the population will affect social and economic structures, for example facilities will be required to cater for the specific needs of elderly people.

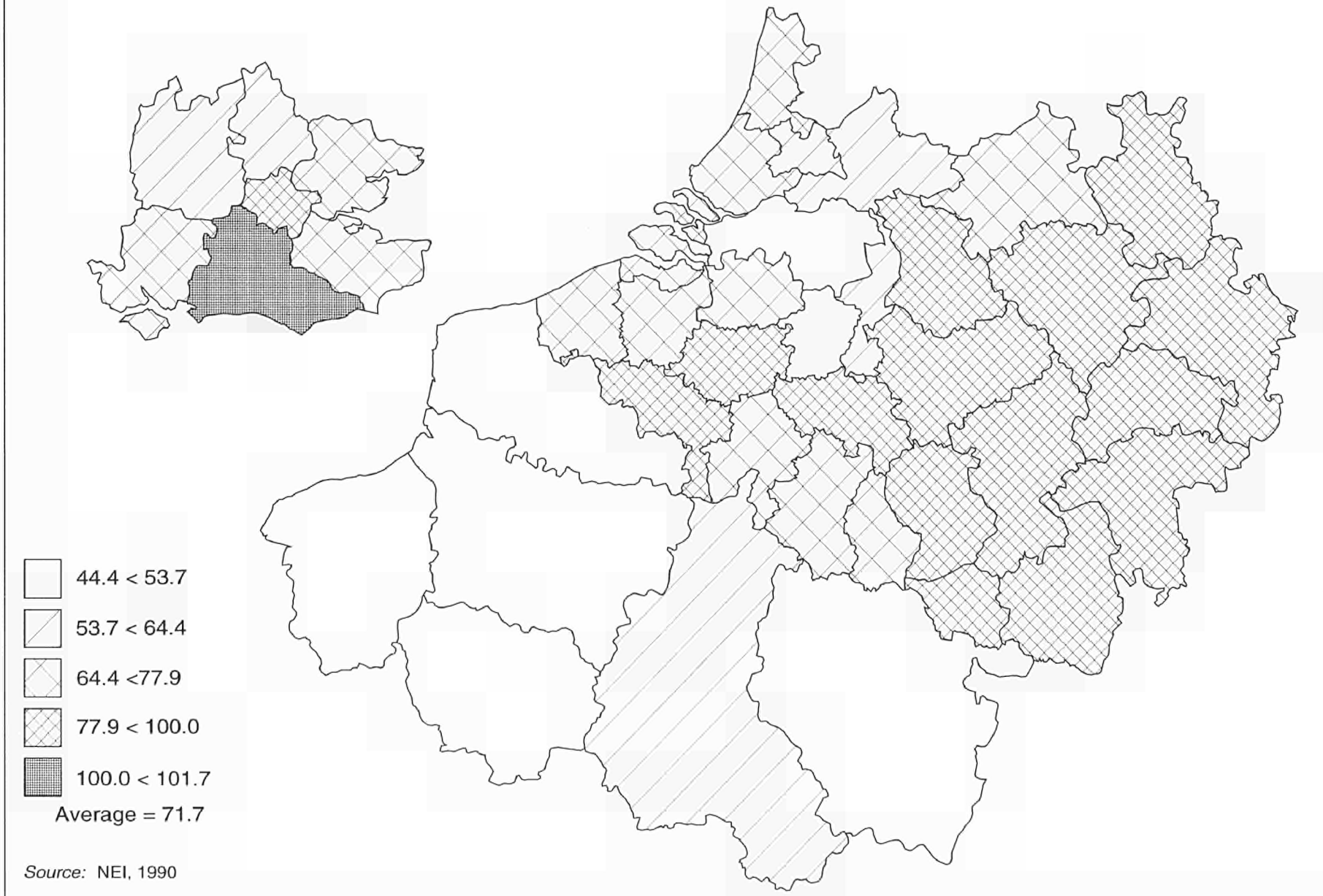
Migration

Migration is an important element of demographic trends in the CCC area, particularly in its effects on the urban areas. Immigration stems from the economic and cultural opportunities of the CCC area but there has been a tendency to attract poorly educated rather than well educated people. The concentration of migrants, especially those with low incomes, in some areas is sometimes regarded as a threat to social cohesion. Most countries have some form of policy to provide a range of services to facilitate the rapid integration of permanent migrants into the community. Maps 2.4 and 2.5 show the migration balance in the CCC regions.

In 1990, 18 of the 22 NUTS 1 regions in the CCC area had a higher proportion of foreign residents than the EC average of 3.9%, with 10% or more foreigners living in Brussels, Grand Duchy of Luxembourg, Ile-de-France, Wallonia and Hessen. Those below the EC average were some Dutch regions and Upper Normandy (Map 2.6).

Map 2.2

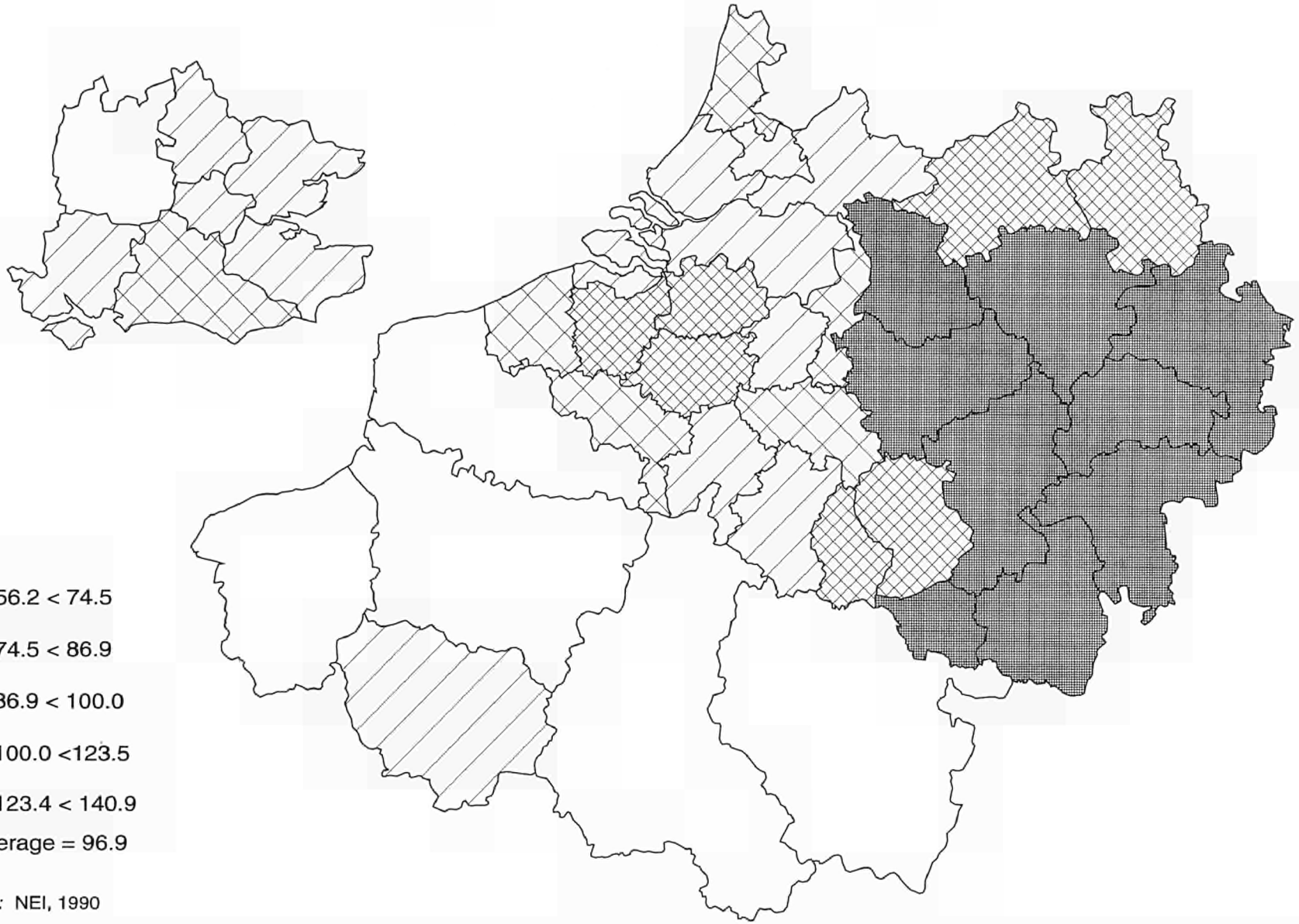
Senility rate, 1985



Source: NEI, 1990

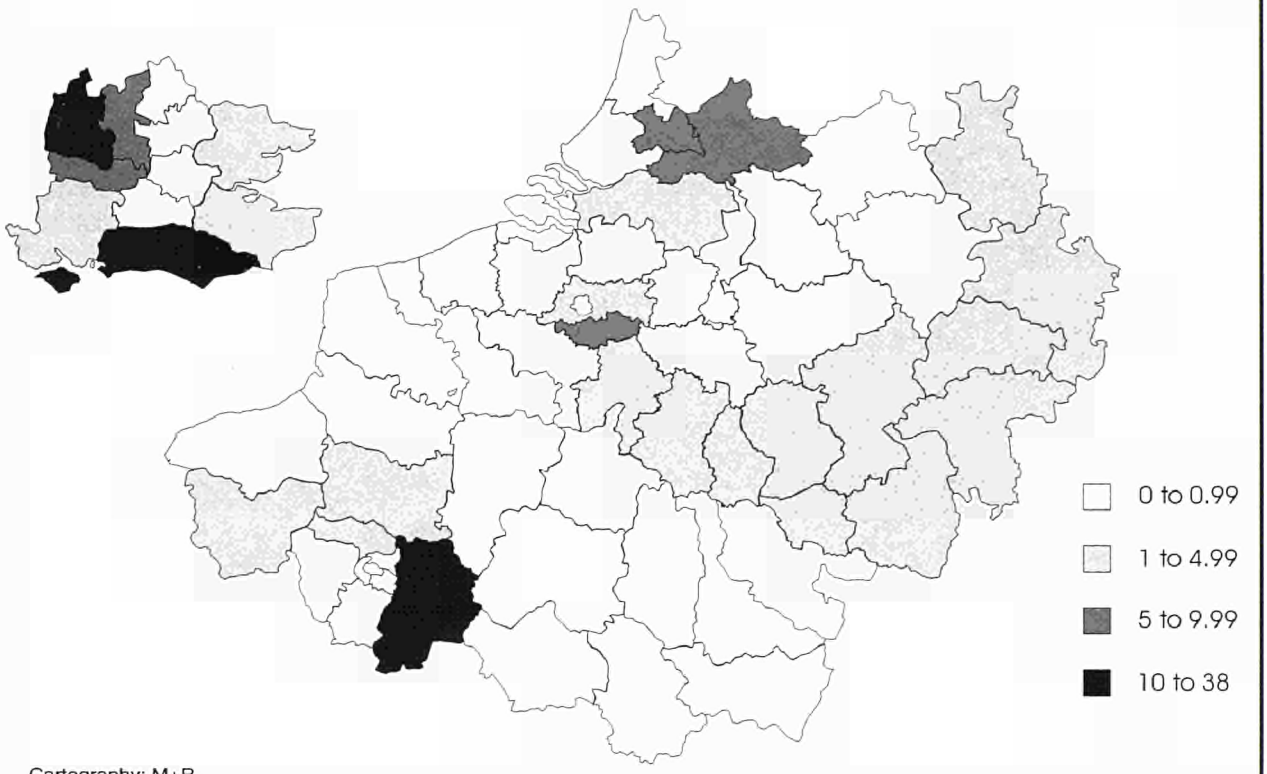
Map 2.3

Senility rate, 2000



Source: NEI, 1990

Map 2.4 Implicit positive migration balance 1980-89, per thousand



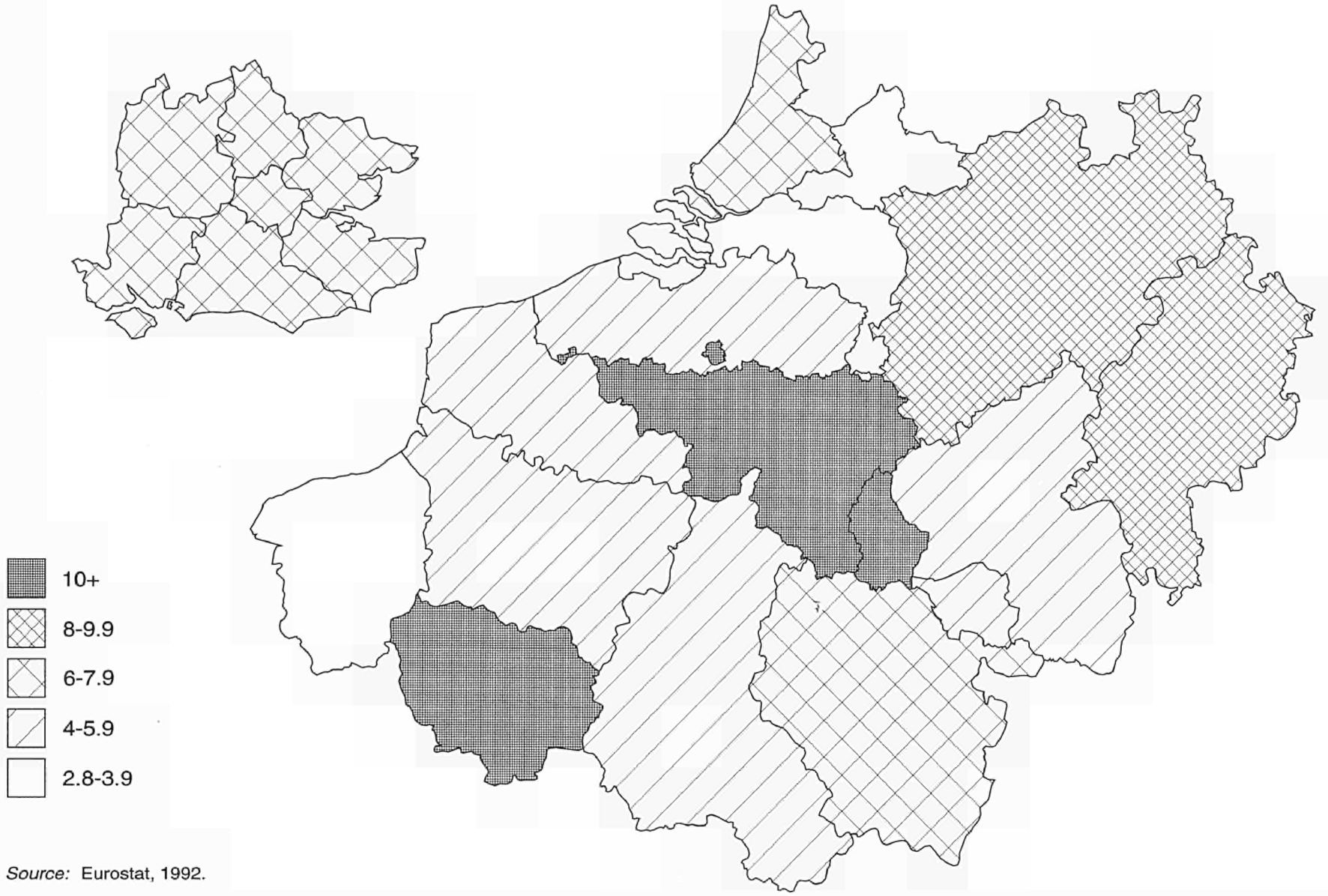
Cartography: M+R.
Source: C. Vandermotten.

Map 2.5 Implicit negative migration balance 1980-89, per thousand

Cartography: M+R.
Source: C. Vandermotten.

Map 2.6

Resident population of foreign nationality, 1990



Source: Eurostat, 1992.

Non-EC nationals make up 4.8% of the resident population of the CCC area which is twice that of the EC population, with Brussels, Ile-de-France, North Rhine-Westphalia and Hessen having more than 6%.

The provision of housing for immigrants, especially in urban areas, will be a difficult task for national and local governments: this is already a big problem for German regions.

2.1.3. Population density

At 325 persons/km^2, the population density of the CCC area is high relative to that of the EC area at 145 persons/km^2.

There are significant differences in the population densities of regions within the CCC area, the contrast between the northern and southern parts of the CCC area being the most striking (see Map 2.7). In the northern regions (South-East England, Nord-Pas-de-Calais, the Netherlands, Flanders and North Rhine-Westphalia), densities exceed 300 persons/km^2, and numerous regions have a density greater than 500 persons/km^2. In the southern regions (France, Wallonia, Grand Duchy of Luxembourg, Hessen and Rhineland-Pfalz), densities rarely exceed 300 persons/km^2, and only Ile-de-France has a density greater than 500 persons/km^2.

In the north-eastern regions, there are numerous areas with very high densities (>1 000 persons/km^2) located close together. By contrast, in most of the south-western regions, the areas of high density are less numerous and more widely dispersed. There are few areas with very high densities comparable to those of the Ruhr region, London and Paris.

The general pattern is not expected to change over the next decade. Almost all rural areas have a population density which can sustain a minimum level of social facilities. No region of the CCC area is isolated to the same extent as regions in other parts of the EC area.

Much of the CCC area is highly urbanized, especially in the northern part and in the Ile-de-France, and this pattern will not change materially in the coming decades. It is estimated that, in 1981, 66.5% of the CCC population lived in urban areas compared to 55.7% of the EC area population. Regions with at least 80% of their population living in urban areas included Brussels, Greater London, Düsseldorf, Cologne and the Ile-de-France. Regions with less than 30% of persons living in urban areas were Liège, Limburg and Luxembourg in Belgium, Gießen, Kassel, Koblenz and Trier in Germany, Picardy in France, and Grand Duchy of Luxembourg. It can be assumed that this general situation has not changed markedly over the last few years.

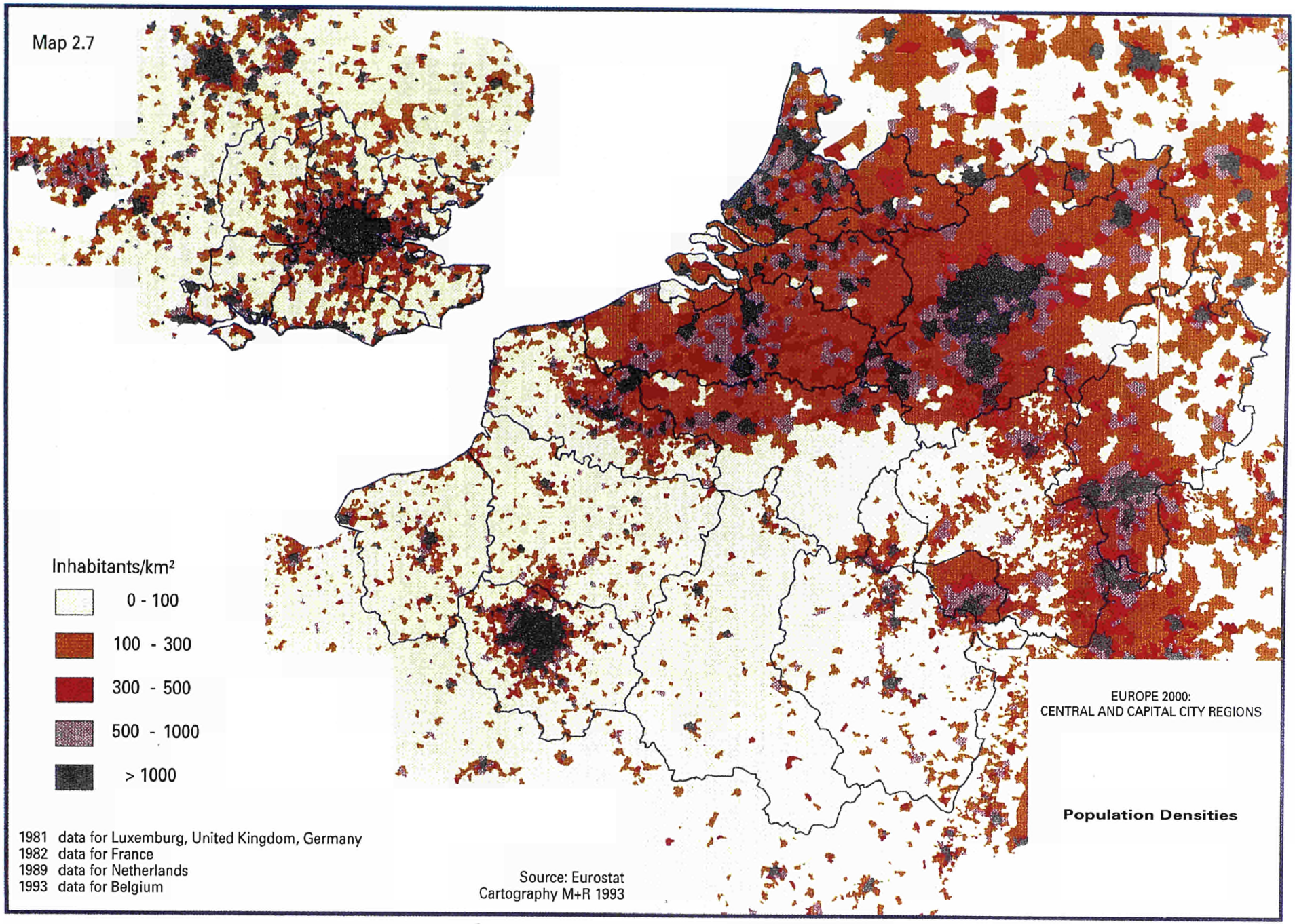
2.1.4. Activity rate

Only part of the total population is of an age to be economically active. Excluding children and those in the retired age-groups, 70.3% of the 'working age population' is economically active in the sense of being either employed or seeking employment. Comparing these numbers with the total population, 58.5% of men and 41.5% of women in the CCC area (an average of 46.2%) were economically active (= employed + unemployed). Between 1983 and 1990 the number of economically active people increased by 7%.

It is expected that, whereas 70.3% of the working age population were economically active in 1985, the rate will have increased to 71.7% by the year 2000, but it is unclear what the implications of such a change might be for economic development in the CCC area. The potential decrease in the total workforce as a consequence of an increasingly ageing population might pose a threat.

2.2. Differences in regional economic well-being

Three criteria were used to measure and compare regional variations in welfare. They express different aspects of unemployment (total, female and youth unemployment rates) for the period 1985-92. It was not possible to select criteria giving some indication of purchasing power because of a lack of comparable data at Community level, and different national situations, e.g. in relation to the facilities within dwellings.


Map 2.7
Inhabitants/km²
0 - 100
100 - 300
300 - 500
500 - 1000
> 1000
1981 data for Luxemburg, United Kingdom, Germany
1982 data for France
1989 data for Netherlands
1993 data for Belgium
Source: Eurostat
Cartography M+R 1993
EUROPE 2000:
CENTRAL AND CAPITAL CITY REGIONS
Population Densities

2.2.1. Regional differences in unemployment rates, 1985 and 1992

Between 1985 and 1992, the unemployment rate in the EC area fell from 10.8 to 9.4% (see Map 2.8 for the regional overview). Most regions (NUTS 2 level) of the CCC area experienced a decrease in their unemployment rate over that period, but this was not the case in three regions. In Nord-Pas-de-Calais, unemployment increased from 12.4 to 12.6%, which indicates the depth of the restructuring problem in that region. In South-East England unemployment increased from 8.8 to 10.3% and in Ile-de-France from 7.4 to 8.0%: this trend could have arisen because regional economies linked to world cities, which are heavily dependent on the service sector, were the first to feel the impact of the recent recession.

The rather positive view of unemployment trends between 1985 and 1992 presented above should be viewed against a background of increases in unemployment in many regions of the CCC area during 1993. This latest reversal might indicate that the CCC area will be affected by a new economic recession in the coming years. In five regions, unemployment levels exceed that of the EC area both in 1985 and in 1992. A continuation of this situation would indicate structural unemployment problems in Upper Normandy, Champagne-Ardennes, Brussels, Wallonia and Nord-Pas-de-Calais. This directly affects the welfare level of the unemployed, and could lead to polarization between the 'haves' and the 'have-nots' especially in an urban environment.

In two regions, i.e. South-East England and Picardy, unemployment levels in 1993 exceeded that of the EC area in 1992. In South-East England there was an increase in male unemployment due to the recession and to the fact that the United Kingdom was the first EC country to be so affected, but there are no indications that change will become structural as will be illustrated in the following sections on female and youth unemployment. In Picardy there are indications, based on female and youth unemployment rates, that increasing unemployment may become a structural problem.

The unemployment rate in Lorraine was above the EC average in 1985 but, by 1993, it had fallen below the EC average for 1992. This is regarded as a positive change. However, the following sections of the report on female and youth unemployment levels indicate that this is only true for the male active population.

2.2.2. Female unemployment, 1985 and 1992

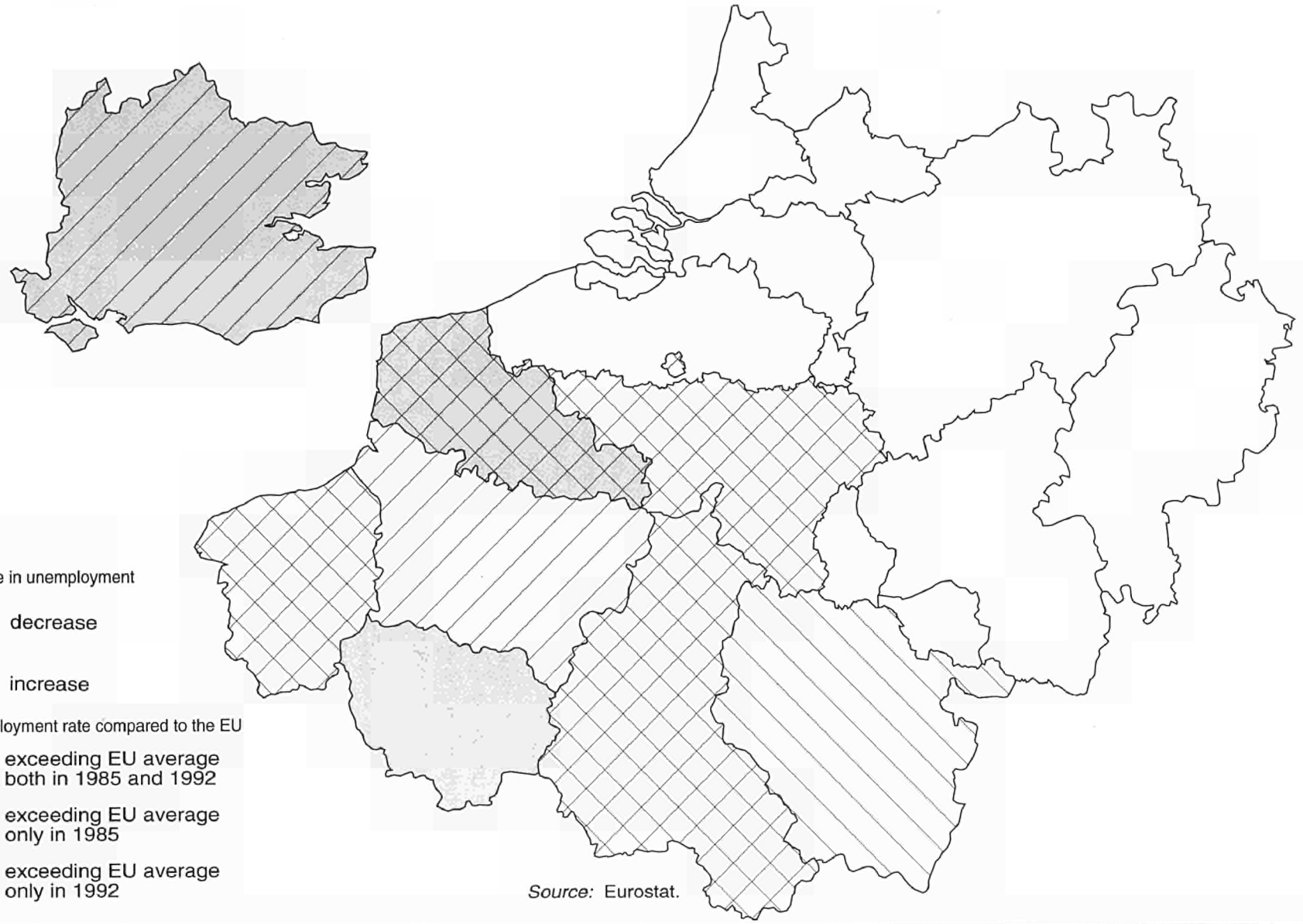
Female unemployment rates for both 1985 and 1992 were about 2% higher than for total unemployment. However, between 1985 and 1992, in line with unemployment rates generally, female unemployment rates in the EC area fell from 12.8 to 11.5%.

Most regions of the CCC area witnessed a decline in female unemployment rates between 1985 and 1992 (see Map 2.9), although this was not the case for three regions. In Nord-Pas-de-Calais the rate increased from 15.0 to 15.8%, suggesting that unemployment may affect females in areas subject to economic restructuring. In Ile-de-France, the figure rose from 8.3 to 8.7%, which is higher than the total unemployment rate. South-East England also saw an increase from 8.8 to 9.0%, although the 1992 female unemployment rate was below the total unemployment figure for that year (10.3%) thereby reinforcing the view expressed above that the recession in that region affected males to a greater extent than females (which is distinctly different from changes in other regions of the CCC area). The increase in female unemployment in South-East England would appear to be cyclical rather than structural: this could reflect a relatively high number of part-time female jobs and employers' preference to employ females at lower wage levels. Although the UK has long promoted equal opportunities in the workplace, the wage differential between males and females is among the highest in the EC area.

No less than seven regions, with rates greater than those for the EC area in both 1985 and 1992, face problems of structural female unemployment. This situation continues to affect all French regions except Ile-de-France and all Belgian regions except Flanders. Given the increasing number of single (and especially single female) parent families, there is a risk of creating a

Map 2.8

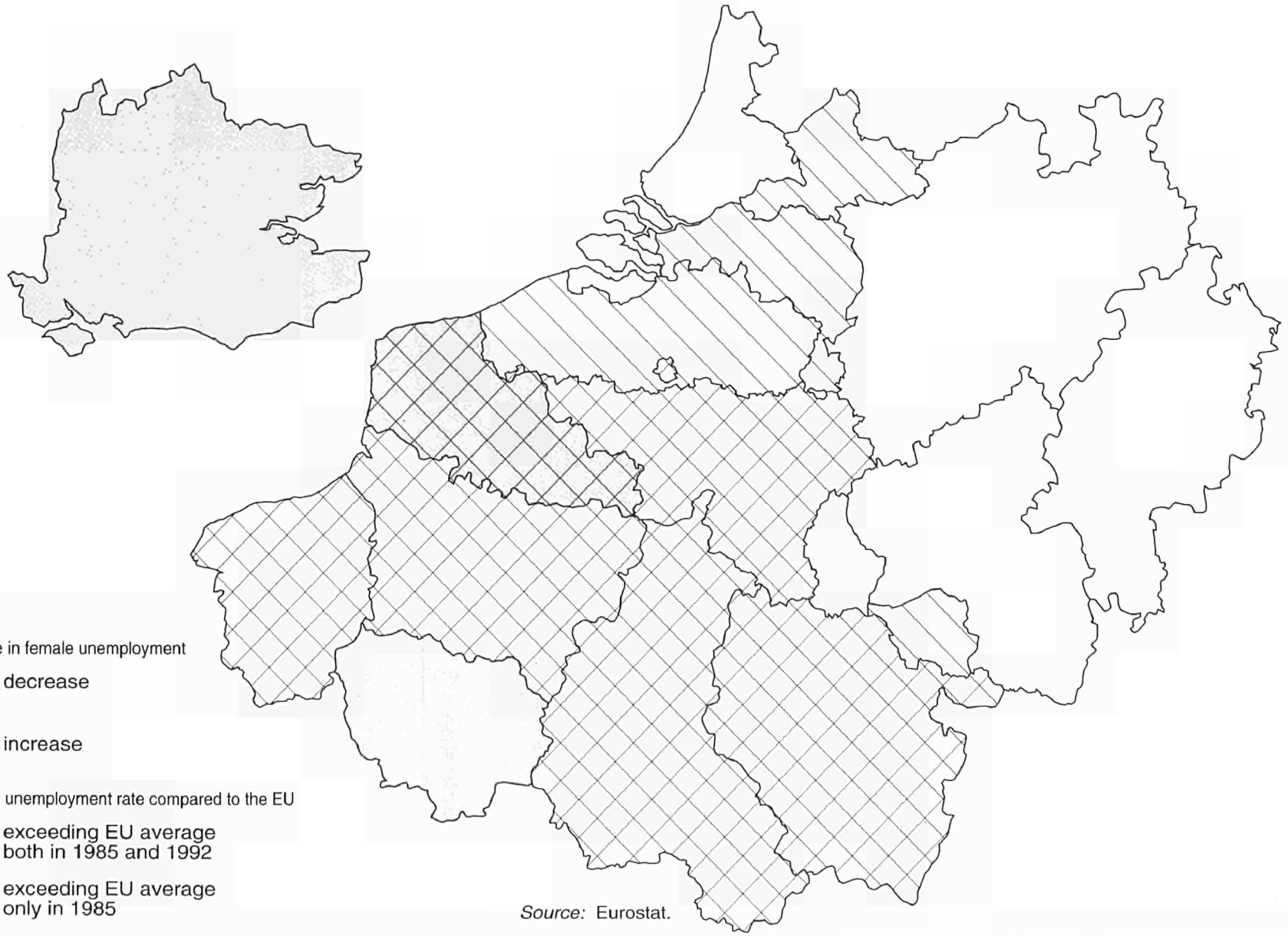
Evolution unemployment (%) 1985-92



Source: Eurostat.

Map 2.9

Evolution female unemployment (%) 1985-92



Source: Eurostat.

new generation of deprived people which, in turn, might lead to more polarization especially in urban areas.

Whereas Flanders, South Netherlands, Gelderland and Saarland had female unemployment rates above the EC average in 1985, by 1992 all had rates below the EC average.

2.2.3. Youth unemployment, 1985 and 1992

Between 1985 and 1992, youth (under 25) unemployment levels in the EC area decreased from 22.8 to 18.1%. These figures were nevertheless twice as high as total unemployment levels, which shows that unemployment is even more of a problem for the young than for females. It should be noted that youth unemployment is lower than total unemployment in the German regions, which is unique in the CCC area.

All but one of the regions of the CCC area (South-East England) experienced a decrease in youth unemployment levels (Map 2.10). As the level remains below that for the EC area it should not be seen as a structural problem. The fact that this was not the case in South-East England can be explained by the impact of the recession.

2.3. Conclusion

The overall population level of the CCC area is quite stable, but some regions, mainly in the British part of the CCC area, are expected to increase their population, while other regions will face a decrease of their population. The natural population decrease of the German part of the CCC area is compensated by an important immigration from the new German *Länder*.

Also the age structure of the population varies from region to region, although all the CCC regions have a rather old population. Ageing is expected to become an even more important factor in demographic change in the future, and especially the German regions are expected to be affected by this trend.

The CCC area attracts many immigrants thanks to its economic and cultural opportunities, but most of the immigrants are poorly educated. As they tend to concentrate in the urban areas of the CCC area, this leads to large parts of urban areas being affected by specific immigration-linked problems.

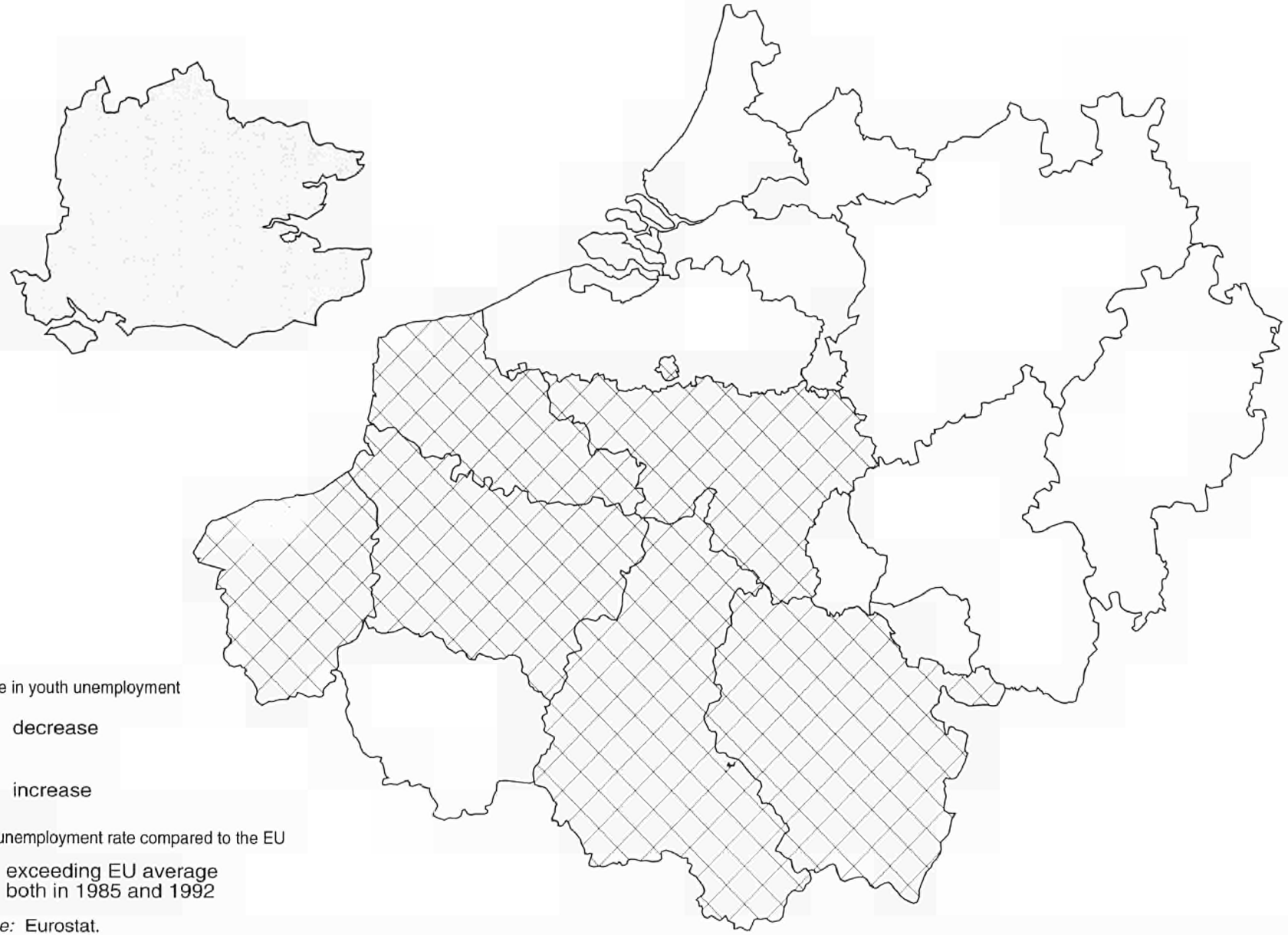
The population density of regions of the CCC area also differs substantially, which results in an uneven distribution of population throughout the CCC area. A clear division can be made between the northern and eastern parts of the CCC area with a high population density, and the southern part with a predominantly low population density, in which the Paris metropolitan area features as a densely populated 'island'.

Compared to the rest of the EC area, some regions have relatively high welfare levels, but there are significant differences between regions which have not diminished during recent years.

The activity rate is expected to show a small rise in the future. Unemployment, decreasing in most of the CCC regions during the last few years, is increasing again since 1993, and is expected to continue to rise in the years to come. Especially the French regions, and to a lesser degree the South-East England, Wallonia and Brussels seem to face the highest unemployment rates, both in general and for female unemployment. Youth unemployment is generally twice as high as the global unemployment figures, however, and this is unique in the CCC area; in Germany youth unemployment is lower than the general figure.

Map 2.10

Evolution youth unemployment (%) 1985-92



Source: Eurostat.

3. Economic issues

3.1. General perspectives

3.1.1. An economic structure dominated by the service sector

3.1.1.1. A continuous decline of the share of agriculture and industry in total employment

In 1983, there were 34 702 000 jobs in the CCC area. This was 28% of all EU jobs. Of these, 63% of jobs in the CCC area were in the service sector as compared to 57% in the EU as a whole; 34% of CCC area jobs were industry-related, the same share as in the EU as a whole. Only 3% of all CCC jobs were found in agriculture, notably less than the 9% of the EU as a whole.

Between 1983 and 1989, the job growth in the CCC area was somewhat lower than in the EU as a whole (+1.8% against +2.4%). However, with 35 328 000 jobs the CCC area still had 28% of EU jobs in 1989. The service sector then accounted for 68% of jobs in the CCC area, remaining higher than the EU figure of 63%. By 1989, 29% of CCC area jobs were industry-related, much the same as the 30% in the EU as a whole. Only 3% of all CCC area jobs were in agriculture, still less than the 7% found in the EU as a whole.

As in other Western, highly developed economies, the service sector has experienced the biggest growth in employment. It is expected that this change in economic growth will continue in the years to come, though at a slower pace. The increase in service jobs is not limited to the service sector: an increasing proportion of workers in the secondary sector, perhaps as high as 40%, are also now estimated to be involved in services.

The CCC area still has a more advanced economic structure than the EU as a whole. However, with the other parts of the EU now moving more strongly towards the so-called 'post industrial society', the difference is diminishing. Nor is the advanced structure which may be seen as characterizing its 'spearhead' position, evenly spread across the whole CCC area.

3.1.1.2. Industry's declining share of gross value-added

Changes in economic structure are also reflected in the gross value-added (GVA) figures (Table 3.1). Despite an absolute increase of 27% in industrial sector value-added, the relative importance of the secondary sector has been decreasing

With growth in both employment and GVA in the CCC area slower than total EU growth in employment and GVA, the CCC area manufacturing sector is losing ground. Manufacturing, however, still remains an important economic sector. This is shown not only by the fact that GVA is still growing in the CCC area but also that GVA per employee in manufacturing is substantially higher than the average in the service sector.

Table 3.1: Changes in gross value-added in the CCC area (GVA is at 1985 market prices and exchange rates)

	Average* 1975-79	Average 1980-84	Average 1985-89	GVA million ECU	1989	GVA per employee	1989 index
Total CCC	100.0%	100.0%	100.0%	1 117 976	100.0%	32 549	100
Industrial + service	45.6%	37.5%	35.4%	387 808	34.7%	38 185	118
Industries services	54.4%	62.5%	64.6%	730 178	65.3%	30 191	93

Source: Ereco/Kolpron Consultants.
* South-East England estimated.

3.1.2. Gross regional product in the CCC area regions

3.1.2.1. Regional differences

The productiveness of CCC area regions varies widely. In 1990, GRP varied between 78% (Hainaut) and 166% (Ile-de-France and Brussels) of the Community average. As recently as 1988, the GRP of Hainaut stood at 75%, which makes it eligible for the Community's 'Objective 1' status. Manufacturing as a proportion of total employment in 1989 varied between 14% in Greater London and 46% in Arnsberg, compared to an EU average of 30%. In 1991 unemployment varied between 1.8% (Grand Duchy of Luxembourg) and 13.3% (Hainaut), compared with an EU average of 8.7%. The greatest concentrations of jobs are located in the South-East England, North Rhine-Westphalia and Ile-de-France.

On the basis of employment structure and growth of employment, statistical analysis identifies fairly clear clusters of regions in the CCC area. On those criteria, four clusters of regions are apparent:

1. A French-Walloon cluster (excluding the Ile-de-France among French CCC area regions), which is characterized by relatively low scores on both manufacturing and services.

2. A German cluster, characterized by high scores on manufacturing and average scores on services.

3. An English-Dutch-French (Ile-de-France) cluster, characterized by low scores on manufacturing but relatively high scores on services.

4. A Dutch-Luxembourg cluster, characterized by scores around and above the average on manufacturing and notably high scores on services.

Apart from the four clusters, there are a few regions that take what might be called an intermediate position. Interestingly, that description applies to their geographical as well as functional relationship to the clusters. Examples of such buffer zones are the Belgian regions of West Flanders, East Flanders and Limburg. Germany has Darmstadt, where Frankfurt's banking and other service activities reduce the region's manufacturing score below that of other German regions; and Düsseldorf and Trier, which regions are characterized by a clear dominance of manufacturing activities, while their scores on service structure and activity are (except for Duisburg) very low in comparison with the other German regions.

The pattern shown by this analysis is one of a strong manufacturing sector in the German regions as well as in the southern Netherlands and in Flanders. Although Lorraine, Nord-Pas-de-Calais and Wallonia are traditionally characterized as industrialized regions, it is noteworthy that, perhaps as a result of their experience of declining manufacturing employment, they do not figure in this analysis as over-represented in the manufacturing sector. Agriculture is mainly over-represented in Zeeland and the southern part of the CCC area. Service sector over-representation is a metropolitan phenomenon: the two main exceptions are Darmstadt which, despite its important service sector, maintains a strong manufacturing base, and the Rhine-Ruhr area. Moreover, parts of ABG-stad and the Randstad do not show an over-representation of services. The impor-

tance of the service sector in the whole of South-East England, however, is striking.

It can be concluded that the CCC area as a whole has a rather complex structure in which two main patterns dominate. First there is an east-west pattern characterized by a dominance of manufacturing activity in the east of the CCC area, with a decline westwards. The north-south pattern on the other hand is shaped by the dynamics of services with high scores to be found in the north and low scores in the south.

3.1.2.2. Evolution during the 1980s

Not only are there clear socioeconomic differences across the CCC area but the picture is a changing one. A general overview reveals that during the 1980s the strongest job growth took place in the Grand Duchy of Luxembourg, the Dutch regions and some parts of ROSE (the South-East region outside Greater London), while Picardy, Champagne-Ardennes, Nord-Pas-de-Calais, Lorraine, Hainaut, Liège, Trier, Düsseldorf, Arnsberg and Saarland all experienced overall job losses (Map 3.1).

More CCC area regions saw their per capita gross product fall below the EU average than improved their positions from below to above the Union average. Most regions with a decrease are non-metropolitan regions. This could indicate that the spearhead position of the CCC area as a whole is increasingly reliant on the metropolitan areas.

There was a significant decrease in the 1980s in the number of CCC area regions in which unemployment rates exceeded the EU average. However, the difference between the regions with the highest and the lowest figures increased during the decade. Evidence is that unemployment rates are highest in inner parts of urban areas and in regions undergoing economic restructuring. At present the regions with the highest unemployment rates tend to be located in the south-western part of the CCC area (see Map 3.3). This situation differs from that in the early 1980s when high unemployment rates were mainly a Dutch and Belgian phenomenon (Map 3.2). The spatial pattern of regions with a lower than EU average GRP has been rather more stable. The greatest shift has taken place in northern France, where Lorraine and Nord-Pas-de-Calais have a lower than EU average GRP, and Champagne-Ardennes had a relatively lower GRP in the early 1980s but now has a GRP higher than the EU average.

Economic experience through the 1980s can be described by reference to four geographical sectors. The eastern parts of the CCC area, broadly Germany and the Grand Duchy of Luxembourg, figured positively over the whole decade, although some German regions had difficulty in keeping pace. The northern parts, the Netherlands and Flanders scored negatively in the first part of the decade but then moved strongly towards a positive situation. The southern parts, that is Wallonia and the French regions except for the Ile-de-France, generally registered rather weakly, with a tendency to fall further behind. South-East England constituted a sector of its own, moving into a rather positive position though with room for improvement in some aspects.

In general, it may be said that high GRP rates increasingly became associated with the larger metropolitan areas; that industrial employment continues to hold a strong position in the economies of the eastern and centrally located regions of the CCC area; and that unemployment increasingly affects regions in the south-western part of the CCC area, as well as in inner parts of larger urban areas.

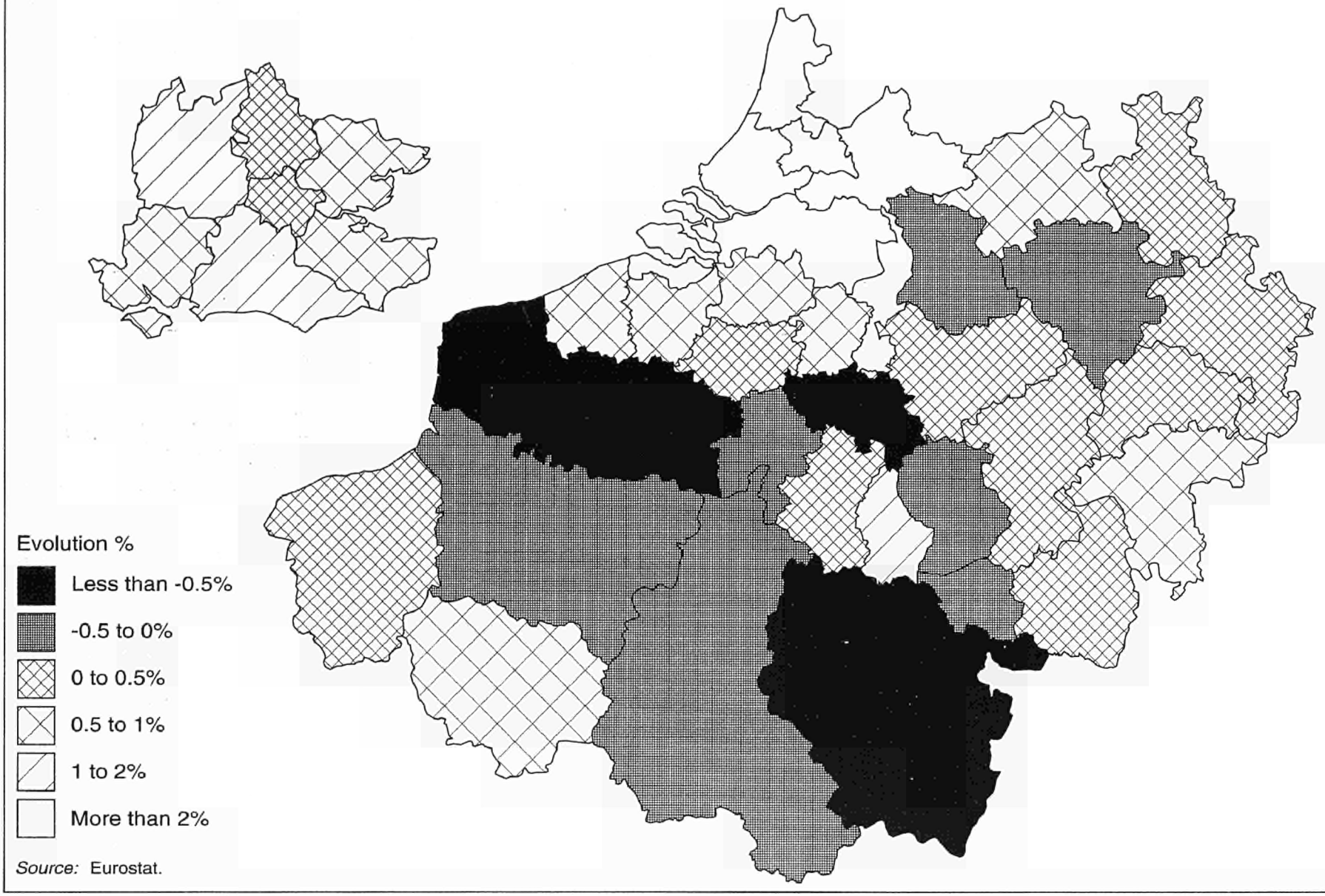
3.1.3. The CCC area: A concentration of regeneration areas

3.1.3.1. Regeneration related to old traditional industrial structures

Economic regeneration takes place everywhere. However, the concept of regeneration is strongly related to areas with a weak underlying economy and where the process of reconversion takes place on a large scale. Until now, this has invariably involved the reconversion of traditional industries and employment, i.e. the establishment of new, small and medium-sized industrial com-

Map 3.1

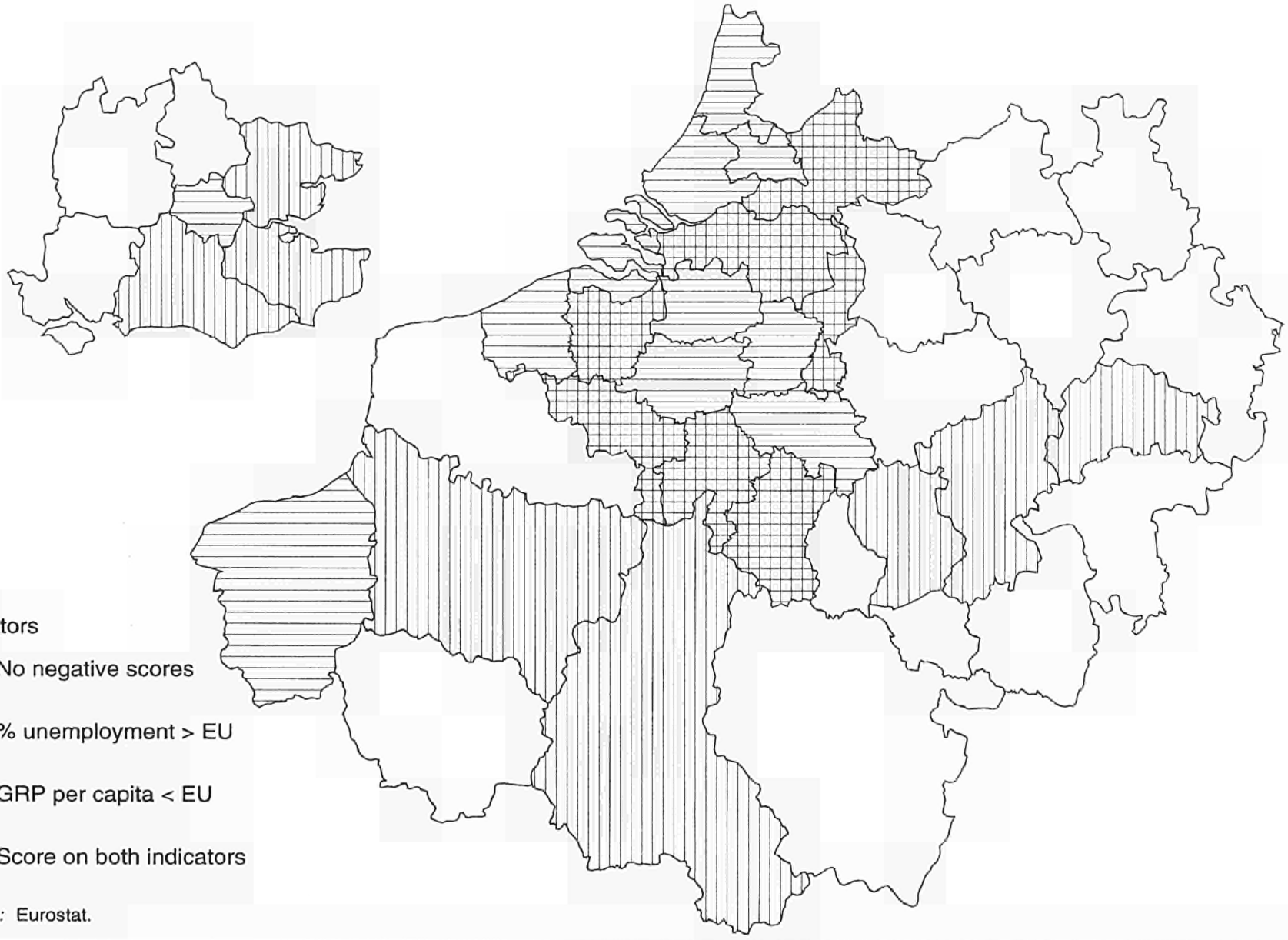
Annual growth of employment 1980/81 to 1990/91



Source: Eurostat.

Map 3.2

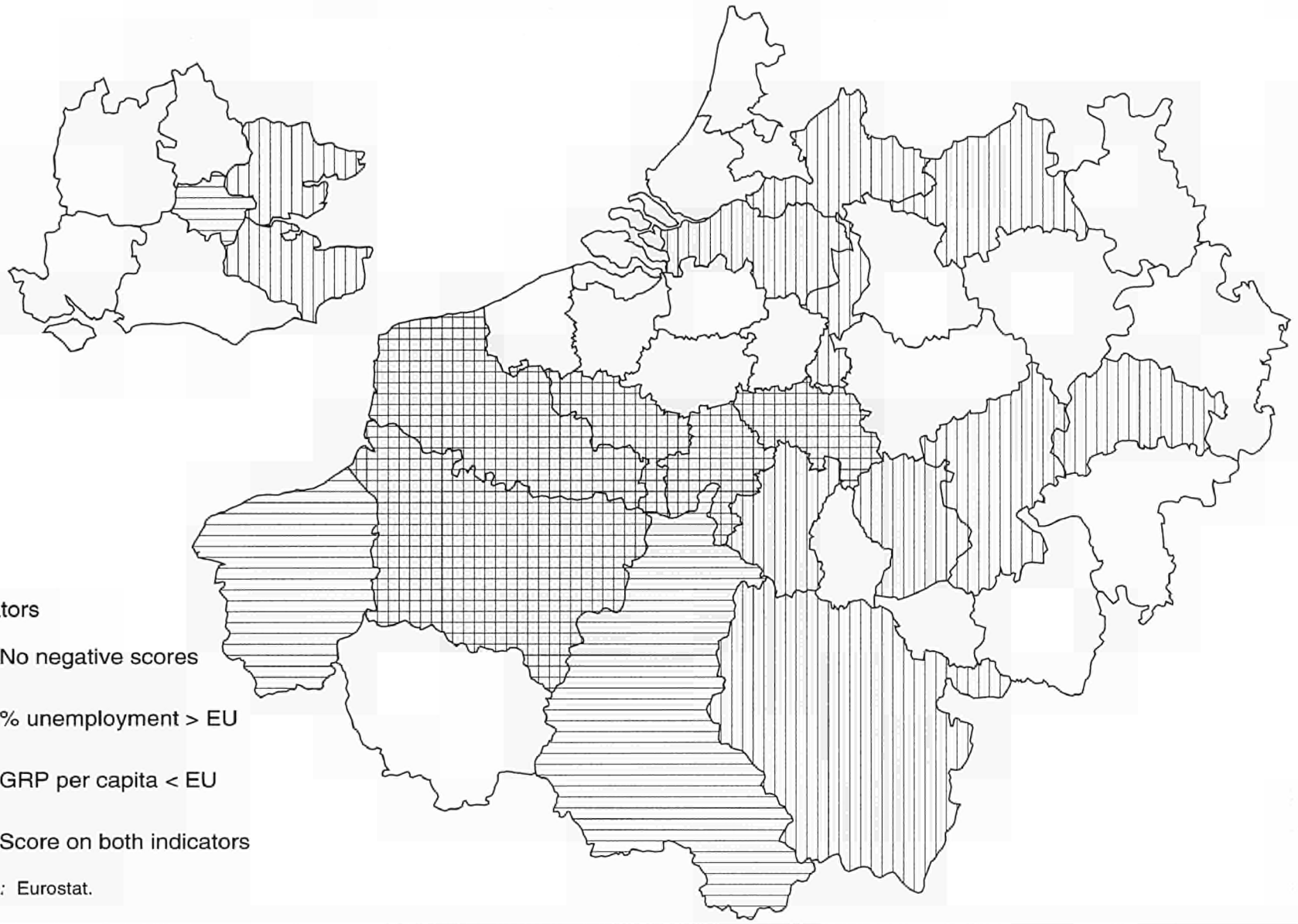
Socioeconomic situation 1983
Regions with low scores on unemployment and GRP



Source: Eurostat.

Map 3.3

Socioeconomic situation 1990/92
Regions with low scores on unemployment and GRP



Source: Eurostat.

panies in the industrial core areas. The new activities are based on research and development (R&D), innovation of products and production processes, new materials and modern technologies. The most important economic change since the mid 1980s has been the emergence of this modern type of manufacturing and service industry, characterized by internationalization and flexibility of production and product.

The regeneration areas of the European Union are concentrated in the CCC area. This is a reflection of the long tradition of industrial development in many regions of the CCC area, although it would be wrong to characterize all traditional industrial areas as regeneration areas.

The decline of traditional industry has particularly affected areas whose economy was heavily dependent on old heavy industry and mining. Areas of industrial decline (restructuring areas) stretch from Le Havre via Lille, Charleroi and Liège to the Ruhr. A second region of this kind is found in the Metz-Nancy-Saarbrücken area. The most important restructuring regions in the CCC area are:

in France: Nord-Pas-de-Calais and Lorraine;

in Germany: the Rhine-Ruhr and Saarland;

in Belgium: parts of Wallonia, especially in the provinces of Liège and Hainaut, and the province of Limburg in Flanders;

in the United Kingdom: East London and the East Thames Corridor.

With regard to Objective 2 of the European Regional Development Fund, restructuring areas are identified on the basis of NUTS III regions, an areal definition that enables problem areas to be identified. In general, restructuring measures concern the reorganization of certain old industrial areas and the development of new activities — often with a strong emphasis on R&D and the stimulation of new activities. A concentration of Objective 2 areas is clear in the CCC area.

3.1.3.2. Similar problems, different potentials

In general, the major handicaps of regeneration areas are environmental weaknesses (including damaged landscape), a poorly diversified socio-economic structure, a rigid social framework, and the absence of dynamism of the local capital. The weakness of the tertiary sector is often a characteristic which greatly hampers the reconversion of these areas. North Rhine-Westphalia is an exception since two major decision centres, Düsseldorf and Cologne, are located within its regeneration areas.

Environmental weaknesses, e.g. air, water and soil pollution and landscape despoiled by the extractive industries, are often a feature of regeneration areas. In recent times, there has been a decline in the extractive industries, due to competition from foreign imports, but these activities are unlikely to cease in the short term because of their strategic importance notably in the field of energy (lignite and pit coal). In particular, Germany does not want to depend completely on other countries for its energy supply with the result that, in the Rhine-Ruhr and to the west of Cologne, extraction will decline at a slower rate than in the rest of the CCC area

In the short term, the old heavy industrial areas have insufficient spatial quality to create an attractive living or working environment. However, a gradual process of change is taking place in those areas whereby former factory sites are being replaced by other land uses such as offices, residential areas, parks (nature areas), and recreational areas. Change also occurs as a result of the replacement of heavy industry by modern light industry which is less damaging to the environment. Nevertheless, the environment remains a weakness of those areas because of both pollution and image, i.e. the perceived quality of life.

Regeneration areas generally have a below EU average in terms of wealth per inhabitant (Vandermotten, 1990). Urban areas with regeneration characteristics have a low index of prosperity and welfare especially in the Le Havre-Lille-Liège arc. The German areas of Düsseldorf, Cologne and Saarland and the French region of Lorraine are exceptions (Cortie, Dignum, 1992; Cheshire et al., 1988).

As indicated above, regeneration areas frequently exhibit the same characteristics. However, the

only rational way of presenting the possible development of those regions is by dealing with them separately. The Rhine-Ruhr is emphasized because the other regeneration areas are also dealt with in the section on border regions.

North Rhine-Westphalia and Saarland

In Germany, coal mining still takes place in the Rhine-Ruhr as well as in Saarland. In 1988, 130 000 people worked in coal mines and 16 000 in lignite mines in the Rhine-Ruhr while in Saarland mining still provided about 20 000 jobs. Coalmining is subsidized by the State governments and by the Federal Government. The restructuring process in the Rhine-Ruhr is concentrated on the northern part of the area for the greater part of which, with a high concentration of jobs and production in coalmining, iron and steel and ancillary industries, the economic prospects are poor. The southern part of the Rhine-Ruhr with urban areas such as Cologne, Bonn and Düsseldorf performs better.

However, the economy of the Rhine-Ruhr functions relatively well with economic growth only a little below the national average. Unemployment is declining, although it should be noted that it is still a lot higher than in western Germany as a whole. The region has a varied and dynamic economic structure in which modern industry (high tech) as well as trading and transport activities play a part. In the 1980s, the Federal Government, in conjunction with the authorities in North Rhine-Westphalia, embarked on a large scale regional development programme, going beyond sectoral restructuring, to diversify the economy of the area. Environmental problems are tackled energetically which has already had positive effects on the living environment. There are areas of high landscape value, especially in the eastern part of the Rhine-Ruhr, which results in the development of many new activities.

The Rhine-Ruhr has been able to remain competitive as a result of large-scale rationalization and mechanization stimulated by the government. In the Rhine-Ruhr, much is being achieved by innovation. Professional education has increased both in terms of the range of subjects and the quality. With more than 1 900 general and professional training programmes for (re-education, favourable conditions are present for employees to adjust to increasing quality requirements. Since 1965, six universities have been established in the Rhine-Ruhr region. Besides university research centres, about 50 research institutions (government, provincial and private) are situated in this region. Moreover, a large number of technology centres and parks have been developed in the past few years helping new fledgling companies to translate innovative ideas into products to suit market needs.

North Rhine-Westphalia remains an important economic centre even though it has been weakened by the decline of traditional industries, such as mining and iron and steel, in some locations. Rhine-Ruhr, with its mutually dependent companies and technically high quality industries, continues to prosper. There is a possibility that the remaining mining and iron steel activities in this area will not go unscathed, but the economy of the Rhine-Ruhr seems strong enough to meet these challenges.

The economic situation in Saarland, by contrast, deteriorates and the area has a low level of activity in high tech industry. In the 1970s, employment in large industrial companies (branch plants) was created with government subsidy. However, the dependence on these large companies made the problem of industrial reorganization worse, as the branch plants were the first ones to be closed in times of economic recession. The region's prospects could improve if Saarbrücken would cooperate more closely with the main urban areas of a region embracing Lorraine and Luxembourg (see Metropolitan areas chapter). The improvement of the transport infrastructure, e.g. the TGV Est, will create new opportunities for the region.

Wallonia and Limburg

Since the 1950s, Wallonia has experienced a decline in the regional share of industrial employment and a decline in the coalmining industry. Moreover, there has been a continuing movement away from agriculture which employed 11.4% of the working population in 1950 compared to 4.0% by 1983. The loss of industrial

and/or agricultural jobs has partly been compensated by an increase in tertiary employment, although the latter developed less strongly in Wallonia than in Flanders.

In particular, Hainaut and Liège cope with severe restructuring problems. This is because it contains mainly old industrial areas and few groups of mutually dependent industries. It also appears that modern manufacturing industry, which could form a basis for far-reaching restructuring, does not play an important role in these areas.

Wallonia features poorly on a number of economic indicators, such as unemployment, regional income, and its share of high tech and modern industry. The competitive position of the steel industry, given the close proximity of French and German competitors, is not favourable. Coal production has completely stopped and the decline of traditional industries has resulted in a low level of industrial employment. This can be regarded as a first step in the process of economic restructuring. Moreover, it can be argued that Wallonia's position towards the economic centre of Western Europe is favourable, and when infrastructure is improved and modern activities are promoted it will be possible for this region to take advantage of its favourable geographical situation in the single European market.

Parts of Limburg (Belgium) have been severely hit by the decline of employment in the mining industries. Sites previously used by these activities are unattractive for other economic activities or housing development. These areas need to be made more environmentally attractive if regeneration is to be successful. Currently, programmes are being developed in the field of services, tourism, and innovation and technology transfer.

Nord-Pas-de-Calais and Lorraine

These traditional, industrial areas have suffered from the crisis in heavy industry (mining, iron and steel and shipping) to such an extent that, since 1950, there has been a decline in the regional share of population, employment and GNP. A relocation of industrial activities, especially the car industry, resulted in a small recovery in these regions, but the decline since 1960 has been continuous.

Nord-Pas-de-Calais and Lorraine have a high proportion of declining traditional industries. There has been insufficient diversification of economic activities in Lorraine, and to a lesser extent in Nord-Pas-de-Calais. The development of new industrial activities has been attracted to regions such as the Rhône-Alps, rather than to Nord-Pas-de-Calais or Lorraine, which has a better climate, environment and living conditions (Hamilton and Linge, 1983).

In France, a sizeable de-industrialization took place in the two restructuring regions of Nord-Pas-de-Calais and Lorraine which lasted until the 1980s. In the period 1974-86, industrial employment decreased by more than a quarter to about 40% of the working population. Lorraine is still heavily dependent on coalmining and the iron and steel industry. A positive development, however, is the creation of jobs in other industries especially in the service sector: as a result, and in view of some outward migration, the unemployment rates are not as high as they otherwise would be. The decentralization of the car industry from Paris to Lorraine and the advent of foreign car manufacturers and suppliers have been very important, and have resulted in an increase in employment. Economic development in Nord-Pas-de-Calais has been slower, probably because other depressed industrial sectors are overrepresented (especially textile and clothing), but the Channel Tunnel offers new opportunities. There are some favourable coastal locations for the steel industry in this region, and since 1973, the large blast furnace plant in Dunkirk has become a real competitor for the steel factories that are not situated near to the sea.

The East Thames corridor

The East Thames corridor stretches from the City of London towards the North Sea and runs along the Thames Estuary. The corridor is characterized by a higher unemployment rate than the South-East average and many vacant, derelict and underused sites which previously supported other urban uses. This resulted from a decline in the main economic activities of the area, namely port-related activities and manufacturing industry. The poor quality of the environment and of accessibility have been reasons why the area has

not succeeded in attracting new economic activities.

Although some parts of the East Thames corridor currently have problems of environmental degradation, they also have potential for economic development. The area has a large labour force and development opportunities are located close to London so as to provide for the needs of industry seeking to decentralize. New transport infrastructure and the Channel Tunnel create further potential for distribution activities and also certain forms of manufacturing and service industries. Significant development has already occurred especially in the Essex part of the Corridor to the north of the river. The Thames Estuary also has an important environmental and ecological function to fulfil and certain parts have potential for leisure activity.

3.1.3.3. Perspectives

The regeneration of urban areas in restructuring regions is hampered by the environmental pollution and negative image of old industrial areas. However, there are clear regional differences as exemplified by the striking difference between the old industrial areas of the Rhine-Ruhr and the Wallonia regions. The Rhine-Ruhr is more successful in bringing about regeneration than Wallonia. In the Rhine-Ruhr, there are groups of mutually dependent industries on an important east-west axis from Rotterdam (one of the world's largest sea harbours) to Duisburg (one of the world's largest inner harbours) in a very interesting environment (six universities, high population density, politically important area, etc.). These factors give the Rhine-Ruhr a good start in the regeneration process which has clear spatial impacts. Large industrial areas are being transformed into high tech industrial areas or urban areas. The Government stimulates this transformation process with a clear policy and special projects.

The Rhine-Ruhr has clear advantages compared to other regions, but the same is also true of Nord-Pas-de-Calais, because of the Channel Tunnel, which has good prospects for regeneration in the longer term. Wallonia, however, does not have, or at least to the same extent, such 'plus factors' as the Rhine-Ruhr; it has a smaller population and the infrastructure is less developed. The regeneration process in Wallonia will therefore develop more slowly than in the Rhine-Ruhr. Many of the problems of Saarland and Lorraine could be solved by cooperation between those regions and Luxembourg, thus giving the Saar-Lorraine-Luxembourg region a new identity and a place amongst the metropolitan systems of the CCC area. New infrastructure can strengthen this development.

3.2. Sectoral perspectives

3.2.1. Financial and business services: A key sector in the economy

3.2.1.1. Recent developments

Financial services (banking, insurance) and business services (among others legal services, accounting services, consultant engineers, computer services, advertising, real estate) are important to the regional and national economies not only because of their contribution to employment, but also because of the linkages with other firms. These services directly support the production of goods and services by other firms and are also instrumental in transferring knowledge and information.

Generally these services cluster in large urban areas. Together with headquarter functions, financial and business services form a complex of corporate activities in those areas. The headquarter functions will also be treated in this part of the study.

The CCC area contains the major financial centres and the major stock markets and, therefore, plays an important role in the distribution of financial services in the EU. In the CCC area, financial services have grown in the period 1980-90, with employment in banking growing slightly more rapidly than in insurance.

In terms of absolute employment growth, three regions in the CCC area have shown the highest

growth figures: Greater London, Surrey, East-West Sussex and Darmstadt. These regions were followed by Berkshire-Buckinghamshire-Oxfordshire, Ile-de-France and Cologne. The growth in the Greater London, Darmstadt, and Ile-de-France regions is due to the presence of a strong international financial centre in each case. The strong growth in Surrey, East-West Sussex and Berkshire/Buckinghamshire/Oxfordshire is probably caused by relocation of 'back office' functions from London. The Grand Duchy of Luxembourg also showed a proportionately high growth. Luxembourg aims to become an important centre for insurance companies that must have an EU base.

Financial services are unevenly distributed over the CCC area. In absolute terms Greater London and Ile-de-France (Paris) are far ahead of the other regions. In relative terms Greater London, Brabant and Luxembourg have the highest share of employment in financial services followed by Surrey, East-West Sussex, Ile-de-France, Darmstadt, North Holland and Utrecht.

The national pattern in the location of financial services is that there is generally one 'financial capital' which usually contains the central bank, the principal regulatory organizations and the country's main stock market. In several countries, there are secondary financial centres which owe their prominence to specialization in certain types of financial services, or perform regional capital functions across a range of financial services.

The regional dispersion of insurance activities is comparable with the regional pattern of the banking system. Insurance activities are also highly concentrated in financial centres, of which London, e.g. the presence of Lloyd's, is the most important. Like banks, the insurance sector has a network of branches and agents at local level.

Greater London, the Ile-de-France and, on a lower level Brussels, dominate their countries in financial services. The Netherlands and especially Germany have a more dispersed pattern of employment in financial services. The core of the financial system in the German part of the CCC area is Frankfurt. The wide regional dispersion, which nevertheless exists in Germany, is partly caused by the institutional make-up of the banking system, which includes separate central banks in each federal state. The second most important centre in this respect is Düsseldorf which acts as a financial centre for the Ruhr area. Münster is also a city with a strong emphasis on financial services. At a national scale, Cologne is the most important location for insurance services. In the Ruhr agglomeration Dortmund, and to a lesser degree Wuppertal, act as regional centres in insurance. Other important centres are Wiesbaden and Münster. In the Netherlands the dispersed pattern of financial services is explained by the spread of service employment over the Randstad, which is located in three different regions.

In business services, Greater London and Ile-de-France again dominate the CCC area: 38% of all people employed in business services are concentrated in these two regions. The regions of Düsseldorf, Darmstadt, South Holland and Cologne which all employ more than 100 000 people in business services, are next in importance. However, the 155 000 people employed in the third-ranking region, Düsseldorf, are only 25-30% of the numbers employed in either Greater London or Ile-de-France. The 10 most important regions together have 68% of all employment in this sector.

Business services have grown strongly in the CCC area as a whole in the 1980s, although there have been significant differences in growth between the regions. The highest absolute growth in the sector was in Greater London and Ile-de-France. These two regions were followed by Darmstadt, South Holland, Surrey, East-West Sussex and Berkshire/Buckinghamshire/Oxfordshire.

It is not a coincidence that the most important business service regions are those regions that contain the most important urban areas. However, a growing demand for specific services has also led to the development of many local or regional operating service organizations which, not unnaturally, tend to be located in regional centres. This may be one explanation for the growth and development of medium-sized cities.

As far as headquarters are concerned, a clear hierarchical pattern can again be distinguished:

'world' headquarters locate in 'world' decision centres and regional headquarters locate in regional centres. This hierarchy can also relate to the level of facilities; 'real' metropolises have a complete and extensive supply of services; subcentres have a lower level or only a few specialized services. The location pattern of the 500 headquarters of the largest commercial and manufacturing companies shows that in 1973 London was already the centre of international headquarters, while Paris was the leader among cities of the second category. Germany and the Netherlands had more than their share of companies in the top 500: in consequence, the urbanized zone from the Benelux to South Germany was also strongly represented. This picture had changed markedly by 1988: London together with Paris dominated, while the other second category cities had lost in importance. In particular, the number of headquarters in Germany and the Netherlands was reduced.

At the regional level, there are indications of a dispersal of firms. Decentralization of tertiary activities appears to be well established or even accelerating in major metropolitan areas though there is increasing evidence that this process does not necessarily involve large-scale relocation of firms and activities from the central city to the suburbs. Continuing suburbanization and peri-urbanization are also a reason for the emergence of ever more decentralized development patterns. The outcome seems to reflect a functional differentiation, which does not, however, amount to a locational determinant: for example, in Greater London, as a result of cost pressures, there has certainly been a move of support services from the centre towards the metropolitan fringes but this differentiation in 'front' and 'back' offices is of course only possible in larger organizations.

In the Netherlands evidence has been found that organizations in central and suburban areas differ with regard to their market area. In the central parts of large cities there is a concentration of firms operating at an international or regional level, whereas in the suburbs and on the urban fringes there is a heavier representation of firms working at no more than a national scale. One significant differentiating factor may well be accessibility, which in terms of road traffic is generally better in the suburbs than in the inner parts of the larger cities. The large city centres on the other hand, will tend to relate well to international transport modes such as air or HST.

3.2.1.2. Perspectives

At present, financial institutions in all Member States of the EU are preparing themselves for the enhanced competitive pressures which they believe will be a consequence of the completion of the single European market. The wave of acquisitions and alliances will continue as firms seek to find the critical mass that will enable them to play a significant role at the international level.

As a result of their strong positions and of the scale of their existing activities, London, Frankfurt and Paris are seen as the centres most likely to receive the largest benefits. They will remain at the top of the hierarchy in the sector. Amsterdam lags behind the leading three in scale and scope of financial services and could either retreat to more specialist roles or make the quantum leap to the 'first division'. Brussels and Grand Duchy of Luxembourg may need to develop specialist niche markets in order to retain their activity in the sector. Some of the regional centres could face a loss to larger, more internationally oriented services. Overall, a further concentration of financial services in core regions is expected.

In the years to come, the demand for business services is expected to rise. International or national scale business services are expected to concentrate in existing centres which will reinforce the hierarchical pattern in business service locations. With the further development of business services it is to be expected that a network of affiliated offices will emerge. This network will not generally be expected to be so diffuse as in consumer-oriented financial services, as it will be strongly business orientated; however, that conclusion is of variable applicability according to the degree of specialization for each slice of the business service sector; e.g. there will be a more dense network of accountancy firms than of marketing firms.

Firms operating regionally and locally will remain the engine for service development in medium-

sized cities. Medium-sized cities located in or close to core regions have especially favourable development prospects.

Competition between regions to attract business services is intense. Greater London and Ile-de-France have had a large increase in business service employment, and must continue to attract such activities because of their dominant international position. Frankfurt and London are in the best position to attract international companies in business services. The future position of London as the main centre of business services however is very much a matter of debate.

There has been a concentration of offices in two agglomerations in the CCC area — London and Paris. During the 1980s, there was a decrease in the number of headquarters in the Netherlands and Germany. The old central zone, stretching from the Randstad to the Ruhr area, has lost importance in this respect. With the increasing internationalization of economies, a further concentration in Paris and London is expected. The limit to the growth of headquarters and related financial and business services in these metropolitan centres and in other large urban areas is set by their cost, congestion and environmental quality disadvantages.

Despite the specialization trends identified above, financial and business services and headquarters, or in general the office sector, have growth characteristics that make them the motor for urban regeneration in many cities, not just the most favoured.

3.2.2. Transport and distribution: A sector with a major spatial impact

3.2.2.1. Recent developments

The transport and distribution sector is an important though relatively small one. Within the sector, a split in activities can be outlined. In the first place it includes activities directed towards the control and handling of stock (wholesale, distribution, warehousing). In the second place it contains the actual transportation of goods (transport). The two groups of activities may be accommodated within one company or in separate companies. However, distribution activities of industrial enterprises are often contracted out to 'logistical' service companies supplying both warehousing and the actual transport. Growth in the sector is creating both jobs and development opportunities: there are also the new requirements of 'just-in-time' delivery and production to be met. Together, these are encouraging the evolution of specialist companies into multi-functional service providers which offer an integrated package of logistical services and worldwide transportation.

The search for economies of scale is tending to drive internationally-operating companies, which formerly had an outlet in every country, towards concentrating their European distribution activities in one or two main outlets. Another factor pointing to growth of goods flows handled by the transport and distribution sector is increased production and consumption related to demographic developments (the overall population for the CCC area increased by 2.7% during the period 1980-90); and a rising level of prosperity (e.g. in industry the gross value-added increased by nearly 27% between 1975 and 1989. The single market and the internationalization of economies generally, are also tending to promote growth of transport flows.

In the CCC area, inland flows of goods (in tonnes) have increased during the last decade. This increase is mainly in road transport. Since 1983, goods flows by road have shown a continuous growth (see also the chapter on flow systems on this issue).

Goods volumes by rail are decreasing slightly. The main reasons for this are rail transport's lack of flexibility, lack of cooperation between the national railway companies and the high cost of new rail infrastructure and facilities.

Carriage of goods via inland waterways continues at the same levels overall as in 1980, with the Rhine remaining by far the most important route. Inland shipping experienced hard times in the 1980s, mainly due to the shift from bulk goods to containerization and because of a lack of modernization of fleets.

In general, flows of goods within regions have levelled off or show small declines. Inter-regional transport within countries is growing, as is international transport. Intra-regional flows are generally larger in volume terms than inter-regional or international flows. This is particularly true for road transport with intra-regional road transport accounting for more than half of the global road transport volume in every single NUTS 1 region of the CCC area. By contrast, for rail and waterway transport, intra-regional transport has a subordinate position compared with national and international flows. Overall, the most striking feature of the pattern of goods movements is just how spread out they are. There are only a few dominant inter-regional flows, such as that between West Netherlands and North Rhine-Westphalia, mostly consisting of bulk transport. Otherwise inter-regional flows are characterized by 'criss-cross' patterns exhibiting a strong relationship with neighbouring regions and with industrialized and urbanized regions further afield.

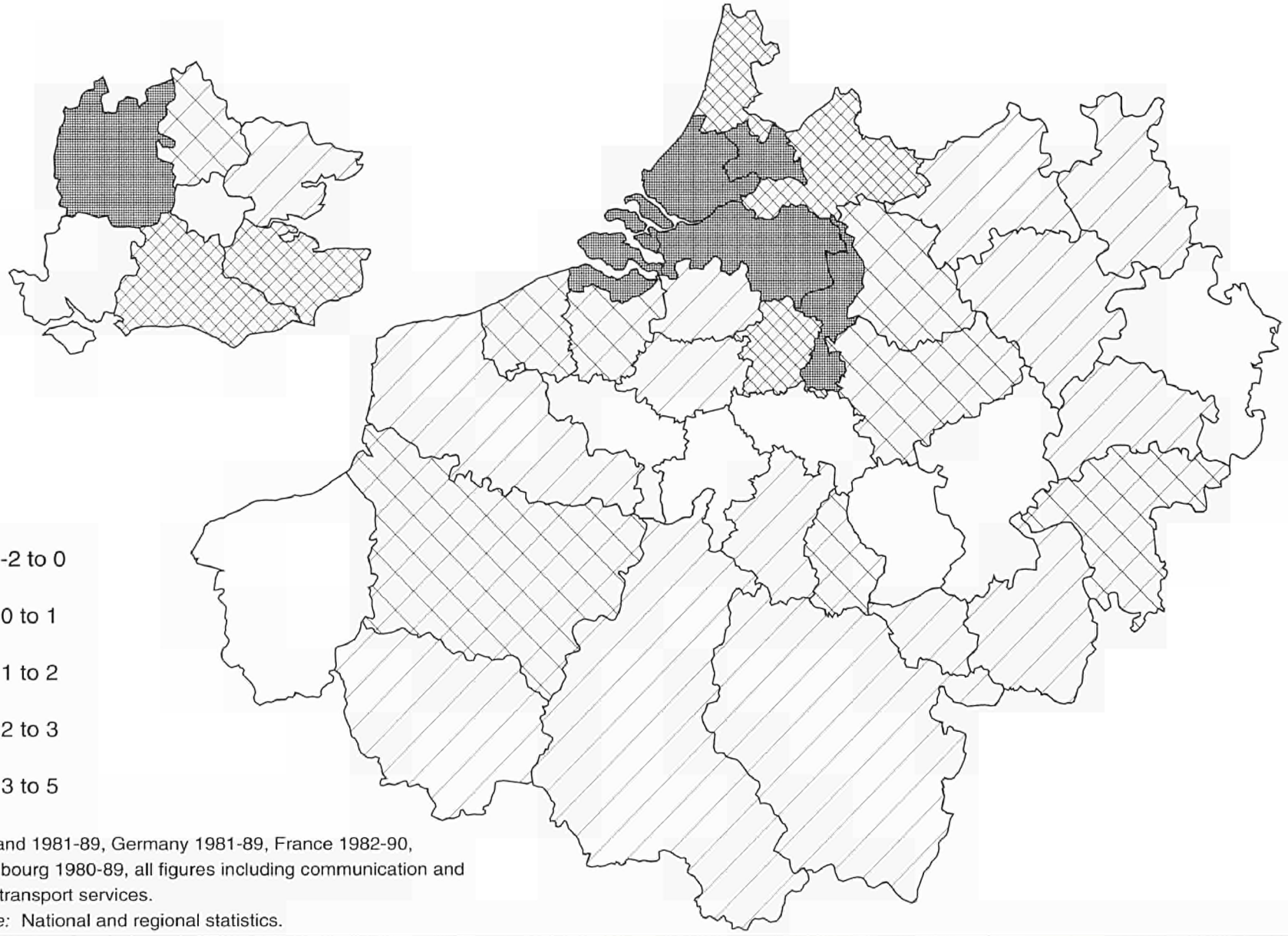
In general, employment in transport and distribution shows an increase in the CCC area. The increase has been similar to the growth of total employment, averaging about 1.1% per annum. Employment in wholesale distribution has grown 1.2% a year and in transport has averaged 1.1%. Map 3.4 shows clear regional differences in growth rates. The Dutch regions, notably North Brabant, have experienced significant growth. Strong growth is also recorded for Berkshire /Buckinghamshire/Oxfordshire, where total employment has grown relatively quickly. In Kent, lying between London and the continent, transport and distribution have grown quite rapidly, especially when compared to a modest growth of total employment. Regions in South-East England with a decrease of employment in transport and distribution are Greater London, where total employment is also decreasing though not as quickly as in transport and distribution, and Hampshire, where total employment has been growing. A decrease has been registered by all Wallonian regions except for Luxembourg (Belgian); all of them also showing decreasing or at best static total employment. Distribution and transport employment is growing in the Flanders regions but with only minor growth in Antwerp and Brabant. In France, only Picardy has shown above-average growth and that only by a little. In the other French regions employment is stable. In Germany also, employment growth in this sector has only been modest though the strongly urbanized regions of Düsseldorf, Cologne and Darmstadt have grown by a little more than the CCC average.

The share of total employment in transport and distribution in the CCC regions as a whole is 12.1%, which is modest compared, for example, with manufacturing with a 32.4% share. Of the 12.1% just under half (5.6% of the total) is in wholesale/distribution, while just over half (6.5% of total employment) is directly in transport.

The proportion is highest in Antwerp, Brabant, Utrecht, North and South Holland, all with a share over 15%, and Darmstadt (14.7%) (Map 3.5). All but one of these regions have an important seaport or airport: the exception is Utrecht, where the high share is mainly caused by the strong position of wholesale distribution as a result of its central location in Holland (plus perhaps the presence of the headquarters of the national railway corporation). Brabant, and to a lesser extent Antwerp, have similar locational advantages; Dusseldorf also has a leading position in transport and distribution because of the presence of the Duisburg harbour located in the centre of the industrialized Ruhr-area and container and 'huckepackstations' in Bochum, Hagen, Wuppertal-Langerfeld, Neuss and Düsseldorf.

Though not proportionately as dependent on employment in the sector as the regions above, Kent and Greater London have a strong position in South-East England. This is mainly a function of employment in transport. In London's case, the sector is experiencing a decline not only in its share of total employment but in actual numbers employed. As to wholesaling, in South-East England in general it has tended to move away from its traditional locations within or near the larger settlements towards points of greater accessibility to the road network. This has had its most powerful expression in reducing the importance of wholesaling activities within the Greater London area. In other parts of South-East England, with the exceptions of Hampshire and Essex, the position of transport and distribution is strengthening in employment terms.

Map 3.4 Regional development of employment in transport and distribution 1980-90, average annual growth*

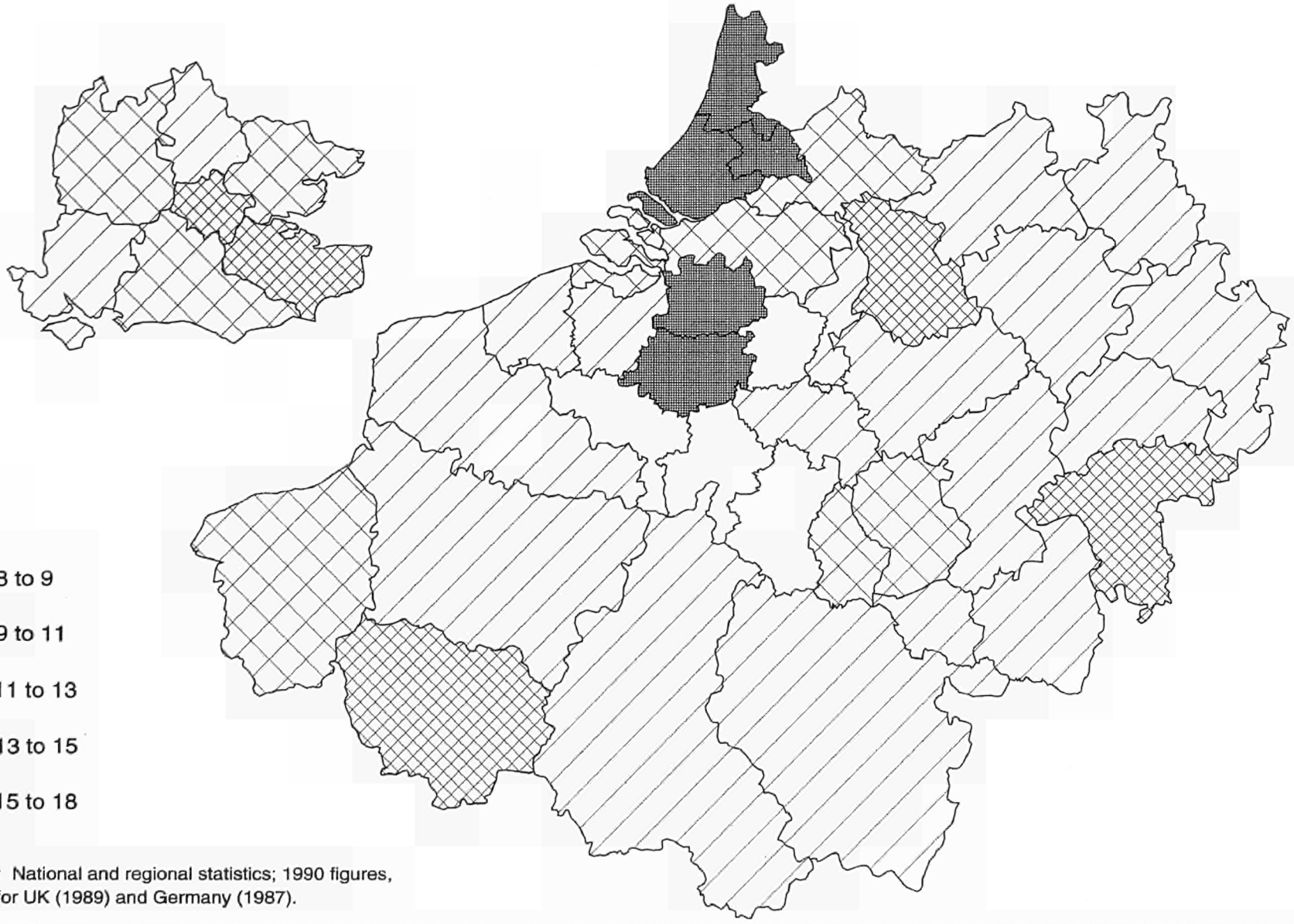


* England 1981-89, Germany 1981-89, France 1982-90, Luxembourg 1980-89, all figures including communication and public transport services.

Source: National and regional statistics.

Map 3.5

Share of total employment in transport and distribution by NUTS 2 regions



Source: National and regional statistics; 1990 figures, except for UK (1989) and Germany (1987).

In France, the Ile-de-France obviously is the economic centre and this applies to transport and distribution as to other activities. The sector shows about the same small growth as total employment and accordingly has a stable share of about 13.6% of total employment. Another concentration of wholesale activities occurs within the Lens-Douai-Lille triangle, while at regional level Nancy and Rouen are relatively important.

In general, it can be concluded that most regions with significant transport and distribution functions are still experiencing some employment growth but that this growth tends to be slower than that in some less advantageously situated regions. The reasons may relate to space shortages and traffic congestion in the well-located regions, together with an increase of total employment in less-central regions. Even in the faster-growing regions, the effect is relatively modest, with the transport and distribution share of employment having increased at most by about 1%.

The availability of infrastructure is an important condition for realization of regional potential in the transport and distribution sector generally, as well as specifically for the competitive position of sea and airports. A study [1] identified the competitive strength and attractiveness of six major regions in north-west Europe for the establishment of several types of companies. The relationship between the availability of infrastructure and competitive strength seems to be strong. Infrastructure was the most important consideration for both sea and airport related European distribution activities. The results for the six regions are given in the form of rankings from 1 for the highest to 6 for the lowest. The ranks in the table should be read horizontally.

The table shows that the two regions with the most important goods ports in the CCC area (Randstad and Antwerp) are also the most favoured regions for establishment of European distribution centres. For airport-related distribution, on the other hand, it is remarkable that Frankfurt, the region with the largest freight airport, has such a low ranking. This is mainly caused by its low score for infrastructure and very high land prices. Brussels/Antwerp by contrast, with Zaventem only on the fifth place of large freight airports, has the same ranking as London and Paris both of which have access to large freight airports.

The establishment of European distribution centres by Japanese and American firms during the period 1987-90 shows another picture. Despite the theoretical attractiveness of the Paris region, none of the centres were established in France. About 65% of all companies established centres in the Netherlands (with two thirds of them in the Randstad), 18% in Germany (all in Frankfurt or Dusseldorf/Cologne), 11% in the UK (none of them in Greater London) and 7% in Belgium (half in Brussels/Antwerp).

3.2.2.2. Perspectives

In general, it is expected that there will be increasing volumes of freight to be moved around. The following factors may be expected to contribute:

(i) an increase in both production and consumption driven by rising prosperity levels;

[1] Buck Consultants (1991).

Table 3.2: Ranking of the attractions of regions for airport- and seaport-related distribution companies

		Randstad	Brussels/Antwerp	London	Paris	Düsseldorf/Cologne	Frankfurt
Seaport related	Final score	1/2	1/2	4/5	3	4/5	6
	Condition of infrastructure	1/2	1/2	5	3	4	6
Airport related	Final score	4	2/3	2/3	1	5	6
	Condition of infrastructure	3/4/5/6	2	3/4/5/6	1	3/4/5/6	3/4/5/6

Source: Buck Consultants, 1991.

(ii) the realization of a single internal market in the EU (and indeed in the wider EFTA);

(iii) economic development in south, central and east European countries;

(iv) further segregation of production and distribution activities;

(v) although 'just-in-time' production philosophies will be increasingly important, it is expected that the volume of goods that has to be stored will rise because of rising production.

These trends will not only lead to a rise in freight volumes, but also imply increases in distances over which freight will be transported; freight transport expressed in tonne and kilometres will accordingly grow with an emphasis on international transport within the EU. Obviously, such growth of freight volumes will be expected to be accompanied by significant opportunities for further development of the transport and distribution sector.

Table 3.3: Forecast annual percentage growth of freight volumes by mode; and of value-added for the whole sector 1977-95

	Road	Rail	Air	Value-added
Benelux	4.6	1.0	5.4	9.7
Germany	4.6	2.7	6.2	4.0
France	4.7	– 0.1	5.0	4.0
UK	0.6	2.6	4.9	0.8
EUR 12 total	3.8	2.2	5.5	3.1

Source: Forecasts by Ifo Institut, Bipe, Prometeia, Cambridge Econometrics and Nei.

Table 3.3 shows that high growth rates are expected for the countries of the CCC area,. In general, growth in the area is more rapid than in the Community as a whole. The main exception is the UK which, probably as a result of its isolation from the infrastructure of the mainland, exhibits lower growth rates for modes other than air transport. The UK transport sector is and will remain mainly domestically oriented. The forecasts suggest that the Benelux countries will grow fastest in terms of value-added. An explanation can be found in the strong position in international transport already enjoyed by both Belgium and the Netherlands.

The table also points to a continuation of growth in both air and road transport, with little difference between the individual countries other than the UK. Although rail transport is also expected to grow, it is expected to do so more slowly than road or air transport. Two points of note are the low growth rates in the Benelux, reinforcing the already low rail usage in the Netherlands; and the forecast reduction in rail transport in France. Such a decrease in France would be remarkable in view of a government policy dedicated to increasing the proportion of goods transported by rail. French railways will also provide high-speed long-distance rail transport which must improve the competitive power of French railways generally, though TGV services currently provide only for passenger transport. Freight transport by TGV in the future, in the absence of confidence in its profitability, is most doubtful.

Inland waterway and sea transport are also expected to show modest growth in volumes. Inland waterway transport has market opportunities for transport to Eastern Europe (Rhine-Main-Danube canal).

The airports of London, Paris, Frankfurt and Amsterdam (and maybe Brussels) and their surroundings are expected to benefit the most from the developments set out above. The regions containing the ports of Rotterdam and Antwerp will also benefit though they will face competition from Hamburg. This will also lead to a certain clustering and 'thickening' of the flows of goods. Smaller seaports and airports will fulfil roles as feeder-ports, which will enlarge flows of goods between these small ports and the main ports.

Proper use of the various modes will be important for maintenance of the efficiency of the European transport system and to minimize the environmental nuisance. In particular, if it can be achieved, some replacement of road transport by other modes would help to temper growth of road traffic, while perhaps offering also some support for rail transport. However, it is not certain yet that the widespread provision of intermodal nodes, that would be needed to foster such an approach, will come into being. Admittedly,

plans for hinterland terminals do have an intermodal character, with a strong emphasis on rail/road connections. However, at European level there have not yet been any proposals for the organization of an integrated intermodal network.

A combination of structural change in the industry and of increasing consumption in the CCC area make it clear that the T and D sector will continue to require extra space to the end of this century and beyond. On technological and financial grounds, there seems no early prospect of this conclusion being overturned by transport innovation, e.g. underground transport.

In the past great store was set by a central location in the national market area; this was certainly the case for wholesale distribution. In the future, though, many companies will continue to operate at this sub-national level, for many there will be more emphasis on a strategic position near the important axes and intersections of the European transport networks, which connect the urbanized areas with each other.

The following list of conclusions emerges from consideration of the transport and distribution sector:

1. At the CCC area level, changes in prospect will be relatively limited: existing junctions expand as well as existing axes.

2. As a result of high land prices and congestion problems within the most important urban areas, it seems likely that T&D companies will tend to develop in areas outside, but well related to, the main consumption centres.

3. For a mix of environmental and transport reasons, multimodal transport junctions might develop. If this happens, it is not yet clear where it will happen both because it will be shaped by the behaviour of companies and because governmental policies have yet to emerge.

4. Road transport will experience the highest growth of traffic volumes and so will encounter the main problems. Growth in air transport will in turn lead to further pressures on the road infrastructure, particularly in the area immediately surrounding airports.

5. Threats to air traffic are congestion in the air, the sometimes inadequate airport infrastructure and an increase of air and noise pollution.

3.2.3. Research and development: A strategic sector

3.2.3.1. Recent developments

The importance of R&D in the CCC area is not so much related to the limited direct spatial consequences of this activity but to its wider economic effects. R&D is increasingly important for the economic development of a region because products and production processes have a growing 'knowledge' content. It may be assumed that there is a positive connection between R&D intensity and the share of manufacturing in the economic structure of a country though to date the causality is not proven. A large share of industry and services in the economy has a positive, though not significant, connection with a high R&D intensity; and on the other hand, large shares of agriculture in an economy tend to be associated with a low R&D intensity. This weak linkage between manufacturing and R&D indicates that R&D activity and physical production do not have to be geographically close to one another. Even at the national level, and thinking especially of small, 'open' economies, a country with a high R&D output is not necessarily the only or main beneficiary in terms of physical production.

Historical data, even for the recent past, are available only on a national basis so the position in the CCC area cannot be considered separately. The intensity of R&D in Germany increased strongly over the 30 years from 1960 to 1990. At 3% of GDP, R&D activity in Germany is currently running at the same level as it is in Japan and the US. The UK and to a lesser extent France saw R&D activity decrease during the 1960s and early 1970s, stabilize in the late 1970s and increase during the 1980s. At present R&D accounts for 2 to 2.5% of GDP in the UK, France and also in the Netherlands where it has followed very much the French pattern. The Belgian R&D figures have traditionally been much lower but they are moving closer to those of the Netherlands, France

and the UK. The UK and France have a high percentage of research in the field of defence. When R&D figures are adjusted for defence-related R&D, the UK and France lose ground to Germany. The direct economic impact of R&D expenditure for defence purposes is limited. In the years 1989-91 the growth in R&D slowed down. National governments have widely withdrawn funding for industrial R&D in almost all countries except France. From 1985 to 1990, the real value of government sector funds for industrial R&D declined in Germany, the UK and the EU as a whole.

R&D is a heterogeneous activity. An analysis of actors in R&D within the countries of the CCC area shows clear differences (Table 3.4). The large share of governmental institutions within the total R&D activities in France contrasts with its very small share in Belgium. The Netherlands leads in the matter of the contribution of universities to R&D activities, immediately followed by Germany. Germany has clearly the highest R&D activity within companies.

Table 3.4: R&D as a percentage of gross national product

	Total	Companies	Universities	Governmental institutions
Germany	2.83	2.05	0.41	0.36
UK	2.20	1.47	0.33	0.32
France	2.29	1.36	0.34	0.57
Netherlands	2.26	1.36	0.47	0.39
Belgium	1.61	1.18	0.29	0.07

Source: OECD, STI, v/d Minne, 1992.

Industrial R&D is concentrated in aerospace, computers, electronics, pharmaceutical products, motor vehicles and chemicals. At the same time, however, some industries that are not generally considered as R&D intensive are significant in a few countries by virtue of the importance they hold in their production or exports. This applies to the food, drink and beverages industry in the UK and the Netherlands, and to the fabricated metals industry in Germany.

There is a strong concentration of R&D activities in the EU area as a whole. An analysis of R&D activities, carried out within the framework of the FAST programme, revealed 10 areas of concentration in the Community (Map 3.6). The study looked at R&D activities in the field of biotechnology, artificial intelligence, textiles, aeronautics and space. These islands of innovation have a relatively limited geographic size and a metropolitan character. A high concentration of both public and private R&D was found. Not only was the concentration of R&D noticeable at the local or regional scale but nationally the number of foci was limited; and as to their research scope, the foci themselves were notably specialized.

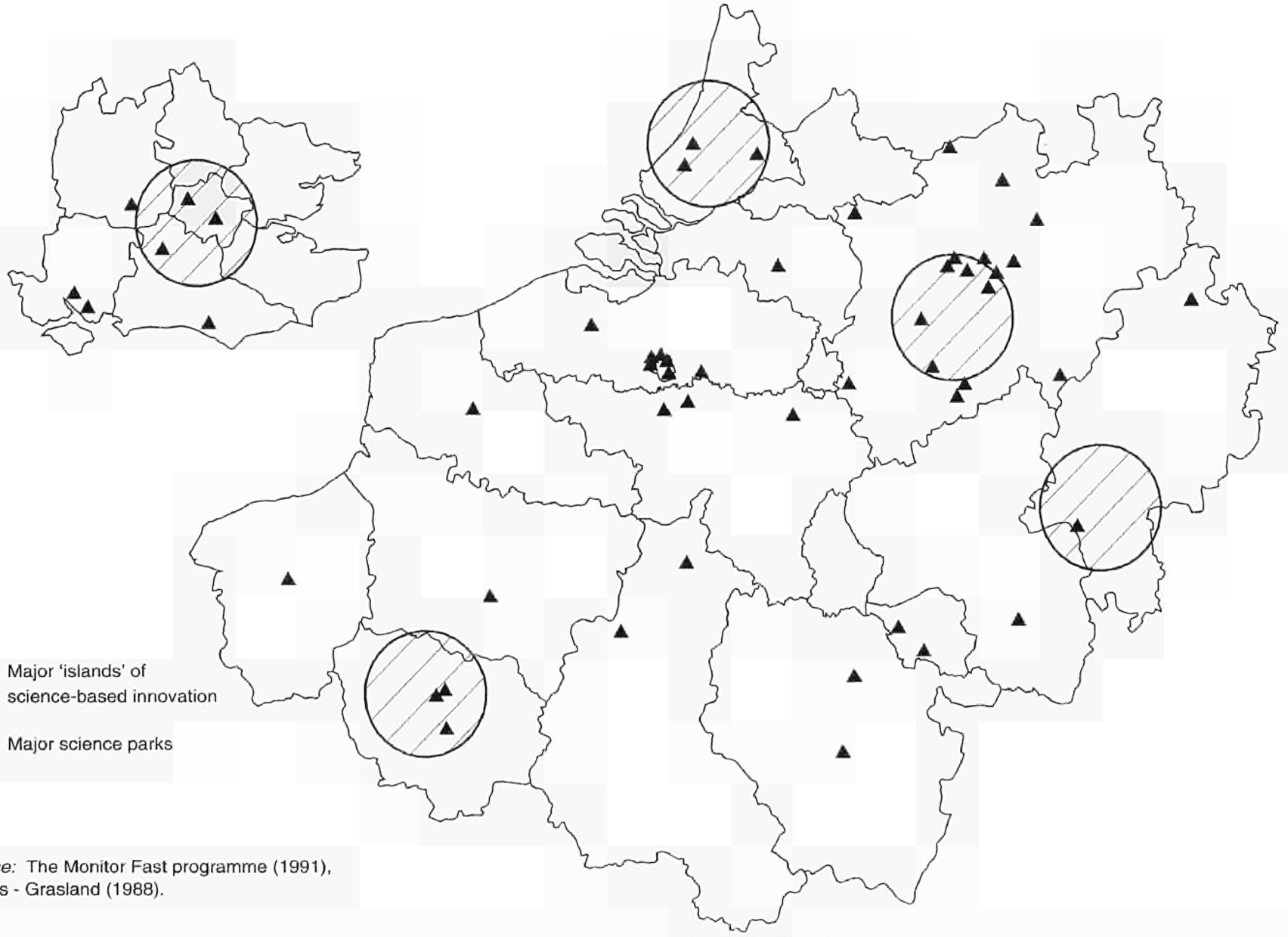
The distribution of these islands of innovation presents an interesting picture. The CCC area and Alpine Arc dominate the EU. Each transregion holds five concentration areas. According to the FAST study the dominant R&D centres in the CCC area are: Greater London, Randstad, Ile-de-France, Rhine-Ruhr and Frankfurt. Cooperation between R&D institutions results in a limited and exclusive R&D network; 90% of this cooperation takes place among partners situated in these areas of concentration.

An analysis of employment in all R&D activities carried out by the Dutch Central Planning Agency shows a concentration of R&D activities in metropolitan areas. Key differences as compared with Map 3.6 are the relatively important position of R&D in the economies of North Brabant and Limburg, whereas the relative importance of R&D in the Rhine-Ruhr is much reduced. The relatively important position of North Brabant and Limburg is mainly based on the importance of business sector R&D. Figures for Belgium and South-East England are not included. However, it is clear that Belgian R&D activities are concentrated in Brabant and Antwerp; that the South-East is a focus for R&D within the UK; and that, within the South-East, Greater London is a strong centre though other centres, such as Oxford and Reading, are also important.

The concentration of activities in Ile-de-France in terms of R&D investment volumes is considerably larger than the concentration in terms of R&D employment. Paris is well removed from other urban centres and has a strong concentration of headquarters, some of them with their own R&D functions and others deciding where R&D activity would most conveniently be located.

Map 3.6

Research and development



Source: The Monitor Fast programme (1991), Reclus - Grasland (1988).

The concentration of R&D activities in Hessen is geographically linked with other important R&D regions in Germany, notably Bavaria and Baden Württemberg. The Dutch R&D centres are in turn geographically connected with these centres in Germany. Rhineland-Pfalz also has a degree of concentration in R&D. The low scores registered by the old industrial areas in the CCC area is worthy of note. The production environment is obviously not attractive for the establishment of R&D activities which are footloose and which seek a high quality of life and of environment.

3.2.3.2. Perspectives

Specific areas for R&D activities are currently being developed by national governments, in all French regions and also in Germany. In France various initiatives are grouped together as 'Technopoles' designed to stimulate regional development of R&D and high-tech industries. Technopoles have been set up as centres of excellence in order to encourage cooperation between research, industry and training. In all, 69 Technopoles have already been set up or are planned, of which 11 are located in the CCC area. In the 'reconversion' areas of north-east France, the *Grandes Écoles* and the universities are contributing to economic regeneration. Similarly, in Germany centres of innovation have been established, with a particular concentration for obvious reasons in the Ruhr area. In this case, the centres are being developed with support of regional as well as national government, with the same objective, to provide a boost to economic recovery.

The intensity of R&D activity within universities and governmental institutions is increasing in France whereas these activities are decreasing in Belgium. In Germany, the UK and the Netherlands the situation is broadly stable.

3.2.4. Manufacturing: A key sector of the economy

3.2.4.1. Recent developments

Some industries with low productivity and little value-added have come to a standstill in the CCC area or have been squeezed out of the area altogether. Mining of coal and iron ore, the steel industry, shipbuilding and labour-intensive sectors of textile and food industry have been most affected. At the same time, average unemployment rates have been rising and unemployment has become a structural phenomenon in those parts of the CCC area where old industries have not been replaced by those economic sectors which have shown a more than average growth since the 1960s. Only industrial activities which gain a competitive edge over other areas by deploying a highly skilled or qualified labour force, have been growing faster than the EU average. The quality of labour has been the most important single factor in favour of industrial growth in the CCC area, which can rarely compete on price of other factors of production.

Together with the decline of traditional forms of manufacturing activities, a new economic order based on small and medium-sized companies, has developed in new economic core regions. These activities are based on research and development, innovation of product and production process, new materials and modern technologies. From the early 1970s, this type of modern manufacturing, together with service industries, assumed the most important role in economic change, and was characterized by internationalization, flexibility of production and product, by large companies returning to their core business and by intra- and inter-company trade.

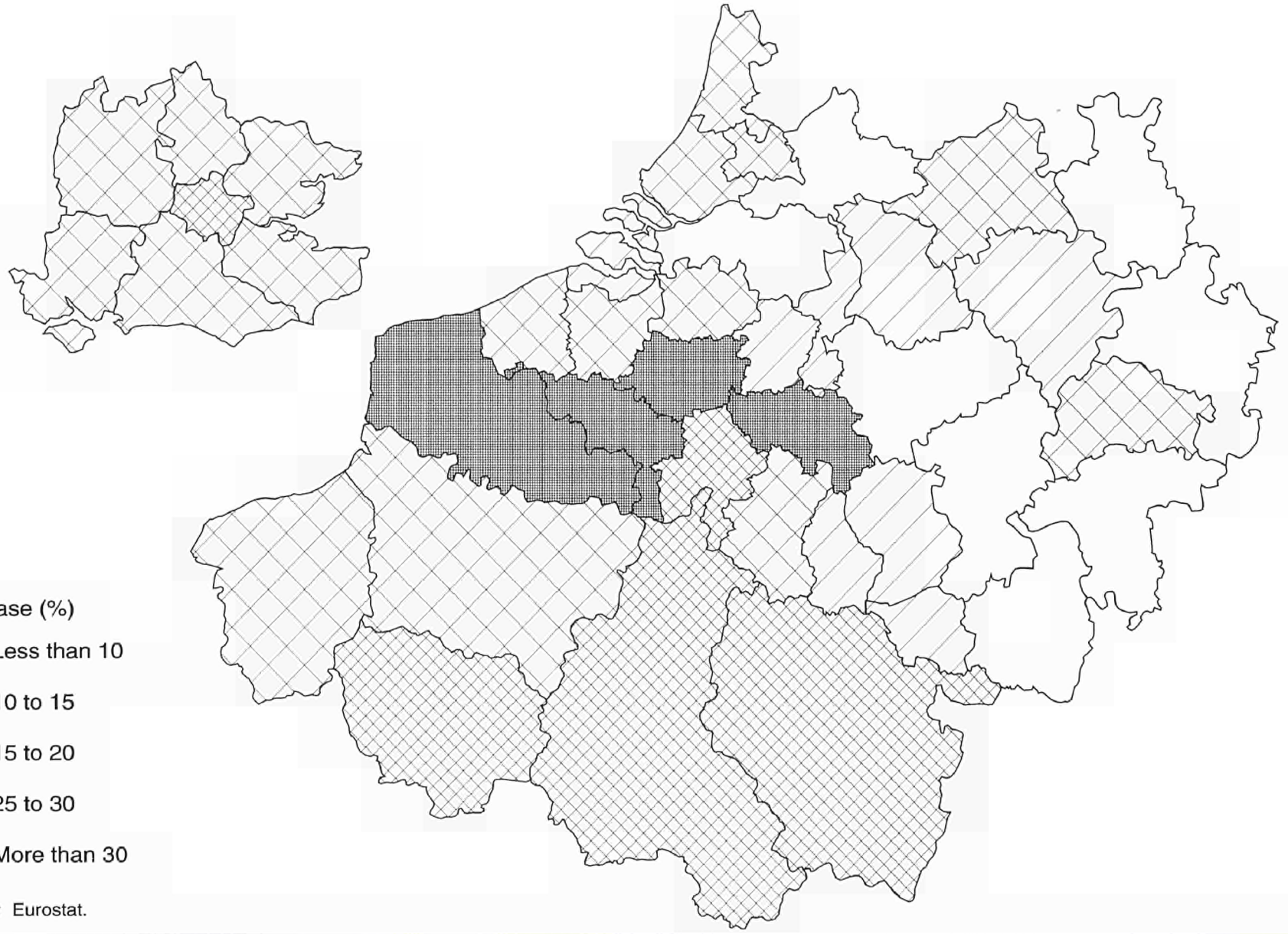
Although industrial employment in the CCC area decreased between 1975 and 1989 (Map 3.7), both gross value-added and gross value-added per employee in industry are still growing. At the same time, employment is declining. This is partly a result of the diminishing importance of old labour-intensive industries mentioned above. The second reason is the growth of automation and robotization of production activities, combined with rationalization of production in order to compete on world markets.

Map 3.8 shows regional shares of manufacturing employment as a proportion of total employment.

The importance of manufacturing in a region can also be measured by comparing manufacturing value added to total value-added in the region

Map 3.7

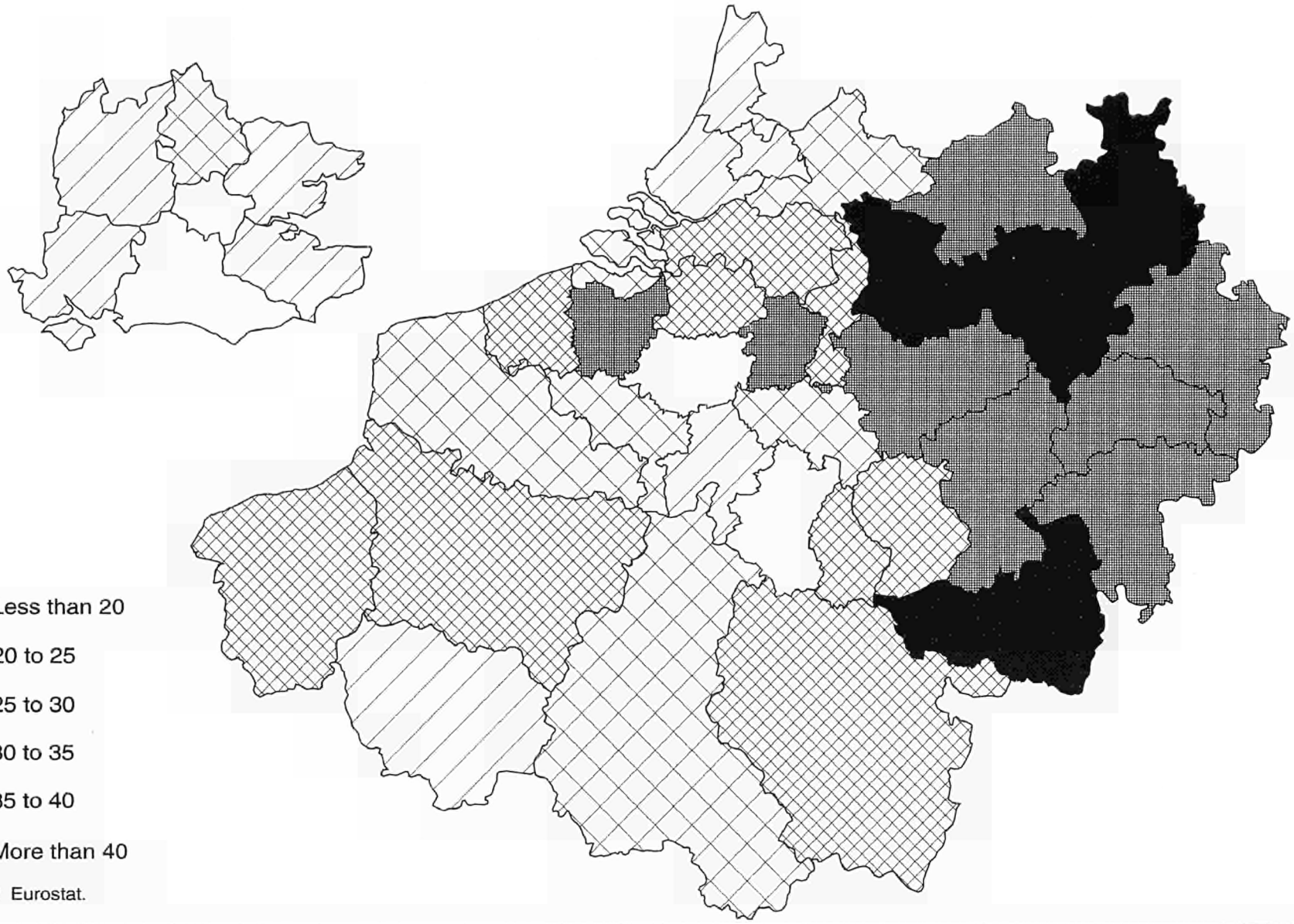
Change in industrial employment 1975-89



Source: Eurostat.

Map 3.8

Share of industries 1989 (% of total employment)



Source: Eurostat.

(Map 3.9). It appears that manufacturing constitutes more than 45% of total value-added in six regions. In order of importance these regions are: Rhinehessen-Pfalz (49%), Arnsberg, Limburg (B), Münster, Upper Normandy and Detmold. At the other end of the scale, the regions least dependent on manufacturing in terms of value-added, all of them with shares below 25% are: Utrecht, Greater London and last of all with 20% the Belgian region of Luxembourg.

One other measure of economic importance of manufacturing in a region is a comparison of labour productivity in manufacturing with overall labour productivity. It is striking that only one region in the CCC area, namely Kassel, has a productivity in manufacturing that is below the average regional productivity for all sectors. Other regions, notably Surrey, Zeeland, Hainaut, North Holland and Upper Normandy, have manufacturing productivity that is over 70% higher than their average for all sectors. The share in Upper Normandy is 92% higher.

The overall importance of a region in manufacturing terms is shown by comparing value-added by manufacturing in the different regions. In order of importance the most important industrial regions with a value-added of more than ECU 14 000 million are: Ile-de-France (ECU 56 603), Düsseldorf, Arnsberg, Darmstadt, Cologne, Greater London and Nord-Pas-de-Calais. The least important regions in these terms, with a value-added of less than ECU 3 000 million, are: Limburg (B), Utrecht, Trier, Grand Duchy of Luxembourg, Zeeland, Namur and Luxembourg (B), the last bringing up the rear with ECU 335 million.

The question of whether manufacturing is successful in a region as compared with other regions (i.e. its external success) can be answered by comparing labour productivity figures. In order of importance the externally successful regions (with a productivity of more than ECU 40 000 per person employed in manufacturing are: Ile-de-France (ECU 60 151), Upper Normandy, Zeeland, North Holland, South Holland, Nord-Pas-de-Calais, Champagne-Ardennes, Lorraine and Antwerp. The externally least successful areas (with a productivity less than ECU 20 000) are: Saarland, Gießen, Namur, Gelderland, West Flanders, Luxembourg (B) and Kassel (ECU 18 863).

When a region scores high on all four measures, it can be characterized as an important industrial region that is also very successful (see Table 3.5).

In the small, successful economic regions, such as Zeeland and the Grand Duchy of Luxembourg, manufacturing plays a very important role. However, as a result of the small size of these economies such regions are also very vulnerable because small economic shifts can have significant consequences.

From the economic analysis, Wallonia cannot be considered as an important manufacturing area. Its modest performance has a number of causes: its industrial areas are mainly old; it has no groups of mutually supportive industries; unlike, for example, in the Ruhr area, Wallonia does not have excellent infrastructure. In the current absence of modern manufacturing investment in Wallonia, change will be dependent on a far-reaching restructuring. The Ruhr area appears, as a result of the presence of mutualy dependent companies and technically high-quality industry, to be much better placed. This technically high-quality industry will have to be refocused but the basis to do this (skilled employees, standardized production methods, etc.) is present.

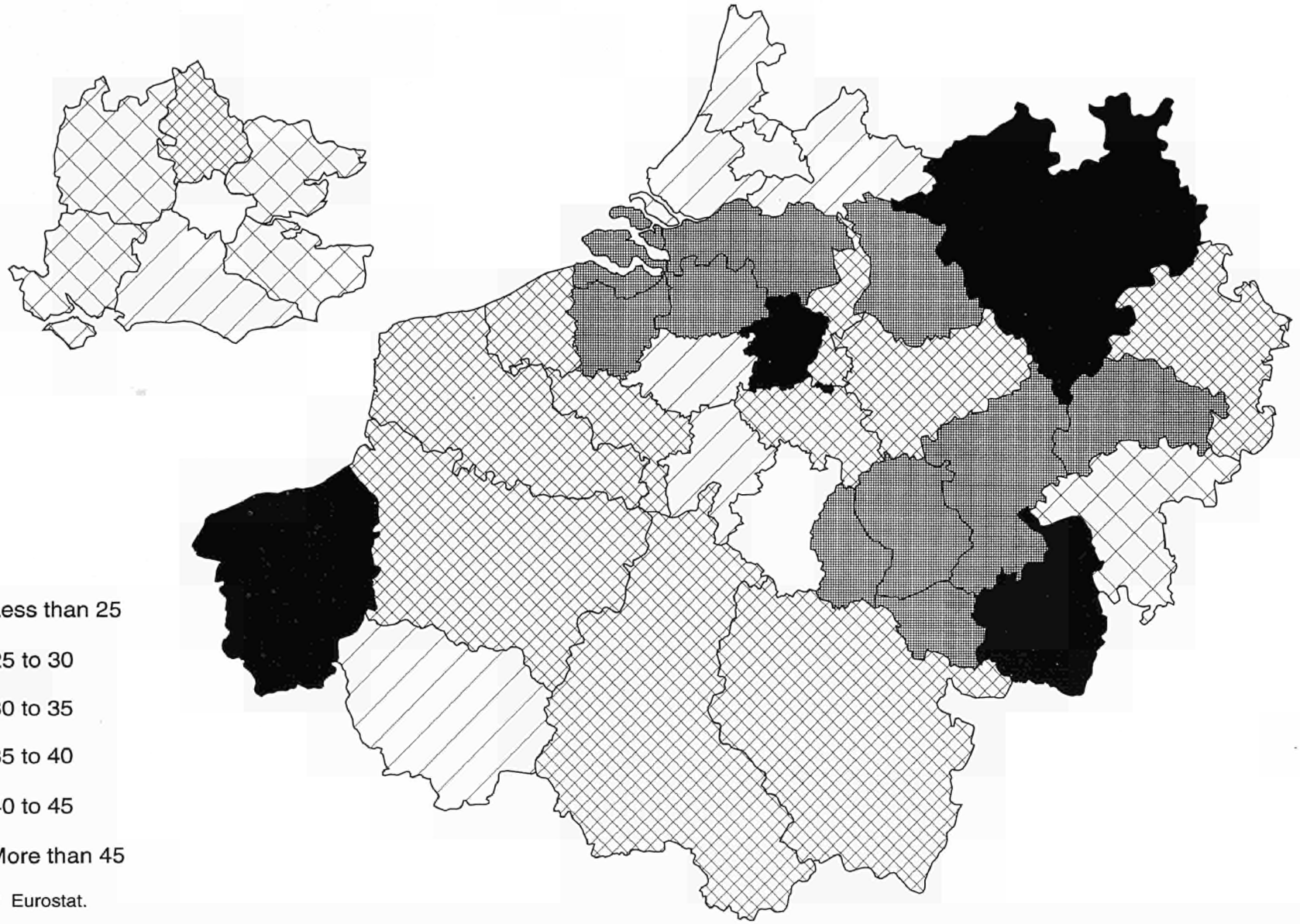
It is striking that, from the analysis, German manufacturing is highly significant among CCC area regions but cannot be considered as altogether successful in German national terms. This is caused by the fact that the most successful German industries are those situated in the Alpine Arc transregion, especially Bavaria and Baden-Württemberg.

3.2.4.2. Modern and high-tech industries

The proportion of modern (and high-tech) industries within each region describes the extent to which technological innovation has penetrated into manufacturing industry in each case. Modern manufacturing is the sector in which information and communication technologies (ICT) are integrated (or are expected to be integrated

Map 3.9

Share of industrial GVA 1989 (% of total GVA)



Source: Eurostat.

Table 3.5: Importance of industry per CCC region; importance of regional industry compared to the other CCC regions

	Position of industry in the regions (%)		Relative position of regional industry	
	Industrial value-added compared to the total regional value-added	Industrial productivity compared to global regional productivity	Regional value-added in industry (ECU million)	Labour productivity in industry (ECU)
Antwerp	>40-<45			>40 000
Arnsberg	-45		14 000	
Champagne-Ardennes				>40 000
Cologne	>40-<45		14 000	
Darmstadt			14 000	
Detmold	-45			
Düsseldorf			14 000	
East-Flanders	>40-<45			
Gelderland				<20 000
Gießen				<20 000
Greater London	<25		14 000	
Hainaut		>70		
Haute Normandy	-45	>70		>40 000
Ile-de-France			14 000	>40 000
Kassel		-30		<20 000
Koblenz	>40-<45			
Liège				
Limburg (B)	-45		<3 000	
Limburg (NL)				
Lorraine				>40 000
Luxembourg (B)	<25		<3 000	<20 000
Luxembourg (GD)	>40-<45		<3 000	
Münster	-45			
Namur			<3 000	<20 000
Nord Pas-de-Calais			>14 000	>40 000
North Brabant	>40-<45			
North Holland		>70		>40 000
Rhinehessen-Pfalz	-45			
Saarland	>40-<45			<20 000
South Holland				>40 000
Surrey		>70		
Trier	>40-<45		<3 000	
Utrecht	<25		<3 000	
West Flanders				<20 000
Zeeland	>40-<45	>70	<3 000	>40 000

Source: ERECO 1992.

in the future) into the production process. The degree of modern manufacturing industry already present in a region may give some indication of the prospects for its future economic health.

The share of modern manufacturing industry in Grand Duchy of Luxembourg is far below the CCC area average. Manufacturing in the Grand Duchy is nearly 40% concentrated in the manufacture of basic iron and steel products. On the other hand, the share of modern manufacturing in the German part of the CCC area is above the CCC area average, primarily as a result of the amount of employment in chemicals and mechanical engineering in the former.

Table 3.6: Share of employment in modern manufacturing 1990 (provisional) related to total employment in manufacturing

	Employment in manufacturing	Modern manufacturing	%
GD Luxembourg	37 454	6 378	17.0
Belgium	763 678	267 145	35.0
Dutch CCC regions	946 100	384 600	40.7
French CCC regions*	1 940 904	824 806	42.5
South-East**	1 298 740	684 306	52.7
German CCC regions	3 365 886	2 229 070	66.2
Total CCC regions	8 352 765	4 396 305	52.6

Source: National statistics.
* France: 'lieu de résidence'.
** South-East: 1989.

The Community is the largest producer of chemical products, far ahead of the US and Japan. As shown in the earlier section making external comparisons, the R&D effort in the field of chemicals is the only sector where the CCC area is ahead of the US and Japan. R&D expenditures in the chemical industry are estimated at 4.5% of turnover; in specific sectors of the pharmaceutical and agro-chemical industry this percentage rises to 10-12%. Bio-technology is incontestably the most innovative field. In the chemical sector, a great deal of R&D effort is focused on improving techniques to reduce impacts on the environment.

As in other sectors, from 1974 employment in the chemical industry fell, but from 1984 the start of a production upturn led to stabilization of employee numbers. The majority of employees in this sector have a high level of qualification and training. The chemical industry is very concentrated: no less than 80% of the EU chemical industry is localized in the CCC area. This concentration is more marked for basic chemicals than for refined chemicals. Germany is by far the largest producer but Belgium and the Netherlands are, considering their size, important producers. The French, German and Dutch regions tend to concentrate on production of basic chemical substances and plastics, while the UK has a greater share of pharmaceutical production.

The chemical industry has a strong presence in Antwerp, Düsseldorf, Cologne, Münster, Darmstadt, Kassel, Rhineland-Pfalz, Zeeland and Limburg. A concentration of high-tech activities, mostly located within South-East England, has also developed along the M4 corridor westward from London.

3.2.4.3. Perspectives

The following trends can be observed in the occupation of space by manufacturing activities. On the one hand, occupation of space is decreasing because production is moving to 'low-wage' countries; this applies to relatively low-quality production of goods as well as to extraction. The increasing rationalization of industries in Europe, for example in the car industry, truck industry, electronics, etc. resulting in the closing down of production plants, also plays a role. At the local leved, there is a tendency to disperse activities from areas such as the Ruhr, leading to a decrease in the occupation of space by manufacturing.

On the other hand, occupation of space is increasing as industries expand on moving out from old inner city locations. Processes such as subcontracting and joint production also lead to increased use of space. Where in the past everything was made in one place, in the car industry, electronics, etc., parts are now manufactured and the product assembled in different places, resulting in increased space demands overall. Finally, there is the tendency towards continually increasing production in many sectors, leading in turn to larger plants and thus growing demands for space.

It can also be surmised that the quality of the space occupied by industry will rise as a result of the increasing importance of environmental requirements. In the old industrial areas spatial quality will improve as a result of decreasing pressures on the industrial occupation of space and as a result of the modernization of industrial activities. The introduction of visible measures such as the introduction of a green zone, a PR campaign, and political and commercial support of these measures, makes the improvement of spatial quality especially evident in the Ruhr. In Wallonia, by contrast, the process of restructuring, and so the improvement of spatial quality, is much slower than in the Ruhr area.

One consequence of the changes in the occupation of space will be a change in the spatial occurrence of manufacturing activity. This will take the form of a decrease of industrial concentrations in the old industrial areas and the construction of new industrial areas or sites in peri-urban areas or away from the urban areas altogether. The result will be a more diffuse spatial pattern of industrial activities.

With greater dispersal and because production takes place in more than one place, there are increasing pressures on transport and logistic systems. Also, the share of services to industry will increase in the CCC area.

It is to be expected that employment in manufacturing will decline in most regions in the CCC area for the period to 1996. The forecast annual average decline is 1.06%. In turn, the share of industry in total employment will reduce. The GVA in manufacturing, however, is expected to continue to grow at least until 1996 (at an average 1.87% per year). Despite this growth, the increasing importance of service firms in the medium term will lead to a continuing decline in the importance of manufacturing industries to regional economies across the CCC area.

3.2.5. Tourism

3.2.5.1. Economic importance of tourism

Tourism[1] is an important economic activity in the EU. It generates 5.5% of total GNP and 6% of total employment in the EU. Some 761 000 trips are taken annually in the EU, and three quarters of these trips represent domestic tourism.

Between 1980 and 1987 overnight stays by domestic tourists rose by 8% and by international tourists 27.6% in the whole EU.

There are four main types of tourism in the CCC area (see Map 3.15): coastal, mountain, rural and urban. For Belgium and Luxembourg the share of the main types of tourist trips by foreign visitors is as follows: 26% coastal, 18% mountain, 36% rural and 20% urban. In the Netherlands, 37% of the trips are coastal and 16% urban tourism, and most of these trips are situated in the CCC area. The British part of the CCC area is responsible for much of the 49% urban and 21% coastal tourism in United Kingdom. The French part of the CCC area has a large share of the French urban tourism, which is 17% of total tourism. A similar picture is found for urban tourism in the German CCC area (20% of total tourism in Germany). (Calculations M&R).

3.2.5.2. Tourism types

Map 3.10 gives an overview of the different types of tourism

Coastal tourism

Coastal tourism in the CCC area is by definition confined to the coasts of the Channel and the North Sea. Tourism in coastal areas consists of activities on the beach, in dunes and the fringes of the polders. Tourism on the coasts of the Channel has a long tradition. The built-up area has a wide range of facilities: e.g. apartments and other residences, hotels, camping sites, holiday resorts, all-weather parks and additional recreational facilities.

Mountain tourism

This type of tourism does not really exist in the CCC area. Only moderately mountainous areas like the Ardennes, Eiffel and the foothills of the Vosges qualify for it. These semi-mountainous areas have, especially in summer, a tourist function for walkers, cyclists and climbers. Because of their relatively low altitude and consequent lack of guaranteed snow, these areas are not really suitable for skiing.

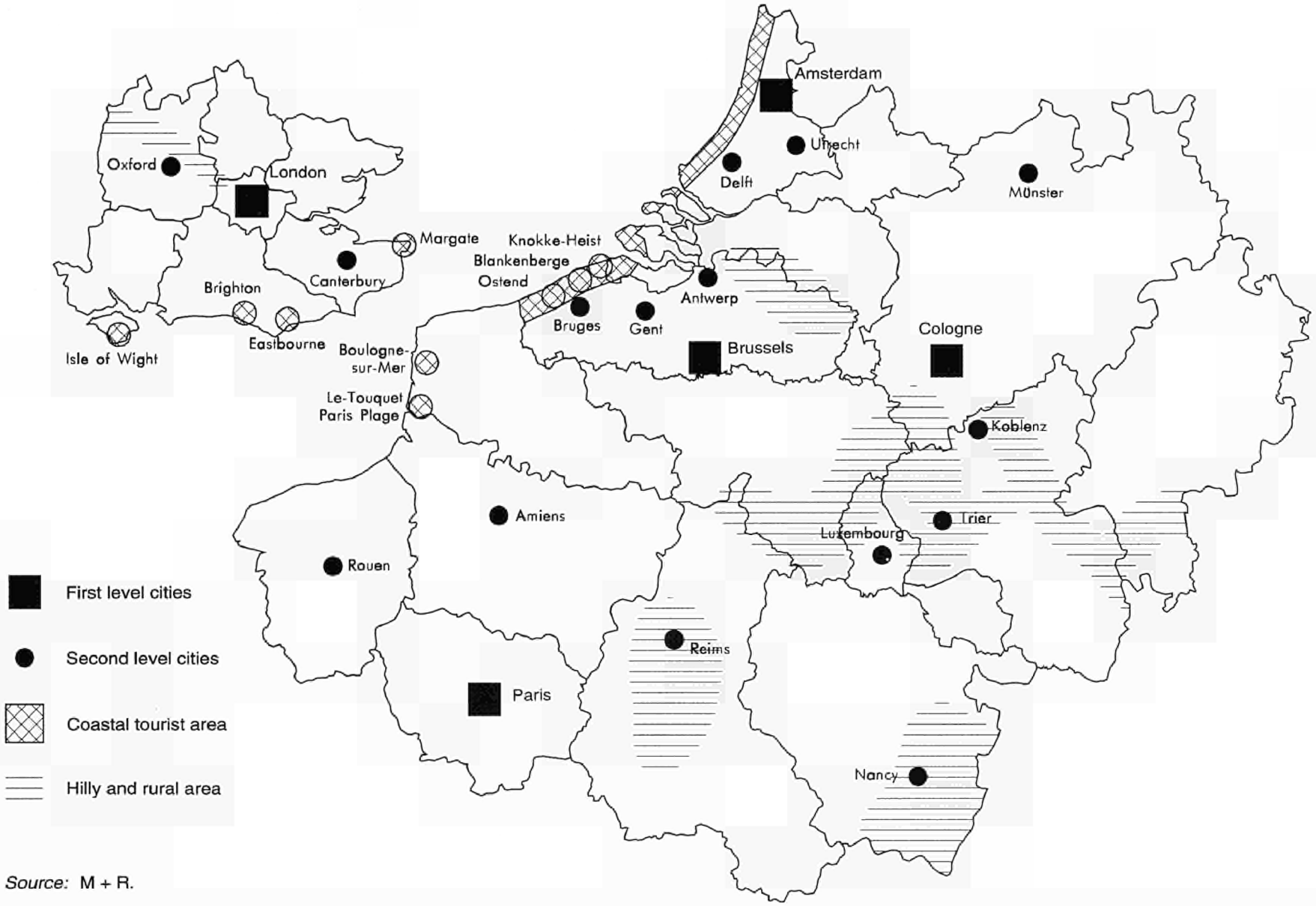
Rural tourism

The target group of rural tourism is very wide: from young families, including nature and culture

[1] Tourism can be defined as all trips lasting one night or more away from a person's home, other than for permanent employment, education or medical treatment.

Map 3.10

Basic structure of tourism in the CCC area



Source: M + R.

lovers through to the large population of elderly people. Rural tourism is used as a collective description for farm, countryside and village tourism. Overnight stays can be in a bed and breakfast; the owner renting a part of an working farm or market garden (e.g. a converted barn, a former coach house, a hunting tower, etc.). Individual rental dwellings, country houses and campsites are possibilities.

The major rural tourism in the CCC areas are: for Belgium the Ardennes and the Kempen; for the Dutch CCC area the Hoge Veluwe; for the French CCC area Champagne and Normandy; for the German CCC area mainly the woodlands; and in the UK, a range of rural locations in villages in the metropolitan Green Belt, and further from London, in the rural areas of counties such as Oxfordshire, Essex, Kent and East-West Sussex.

Urban tourism

Urban areas, and especially inner cities, are attractive for tourism due to a combination of elements. Urban tourism has in general four important niches: history, culture, shopping and amusement.

Large cities have a high density of cultural historic heritage, museums, opera houses, music halls, theatres, cinemas, art galleries, restaurants, bars, hotels, shops, festivals, rock concerts, sporting events, amusement parks, etc. In the CCC area, urban tourism is of great importance because there is a significant concentration of cities with such tourist potential.

Main urban tourism areas of the CCC are: London, Paris, Brussels, Amsterdam and Cologne. Secondary tourism cities worth mentioning include Oxford, Bruges, Reims, Canterbury, Antwerp, Münster, Delft, Utrecht, Rouen, Ghent, Luxembourg, Amiens, Nancy, Trier, Koblenz.

3.2.5.3. Perspectives

The sector is expected to grow between 1990 and 2000 in the EU, at an annual rate of 3.4%. Receipts are expected to increase from ECU 237 billion in 1990 to ECU 317 billion in 2000 and the number of people employed in tourism-related activities from 7.9 to 10.6 million. The sums of these expectations, is a projection that the number of trips will grow by 40% to an annual total of 1.1 billion.

The tourism industry is expected to grow in every EU country. The economic importance of the sector will increase this decade for every EU region, and it is also true for the CCC area. The annual growth rates per annum between 1900 and 2000 are expected to be between 3.9 to 4.4%.

The annual growth rates between 1990 and 2000 are expected to vary for the different types of tourism as follows: coastal tourism +2.3%, mountain tourism +3.3%, rural tourism +3.8% and urban tourism +4.7%.

The following general trends are expected:

(i) international tourism to the CCC area will increase;

(ii) the number of trips is expected to increase considerably faster than the number of trip-takers;

(iii) growth will be slow in the first half of the decade, but will accelerate during the second half.

Coastal tourism

Coastal tourism in the CCC area is tending to invest in facilities that fulfil the demand for shorter and more frequent holidays. That is why the coastal parts of the CCC area are investing in all-weather infrastructure, marinas, recreation parks, golf courses and conference infrastructure. This will lead to a significant increase of pressure on the coastal environment, as well as to an increase in space occupation.

Mountain tourism

Mountain tourism will, because of the uncertainty of snow in the CCC area mountains, always be a secondary destination. Cross-country skiing is

the most appropriate form of skiing to concentrate on, not needing any hard infrastructures. But the impact on the environment will nevertheless be significant, as mountains are vulnerable environments.

Rural tourism

Rural tourism has the largest potential of all tourism types in the CCC area.

The objective is to develop a high-quality product which aims at, and at the same time supports local character. Quality is much more than just comfort. Quality is also hospitality, atmosphere, regard for people and consideration of accomodation capacity. The trend towards a rise in the use of the countryside for tourism will inevitably lead to an increase of pressure on the local environment. The concept of carrying capacity can pave the way for sustainable rural tourism.

Urban tourism

The tourist industry is searching for new holiday products and destinations. Urban centres, and in particular the historic cores of cities, are being targeted as key destinations in this evolution. Unlike the general impression, in comparison with the sun, sea and sand type of holiday, a vacation in a city centre is an active holiday, so the increasing importance of urban holidays, is also part of the trend towards more active holidays.

The most important feature in the urban tourism product is the traditional sightseeing and heritage. The importance of the following items of the urban tourism product is expected to continue to increase: business and conference tourism, major theme parks, retailing relating to tourism and major events products.

Urban tourism can be divided into small and large city tourism, each with different potential. Small cities have a limited capacity to absorb tourists. Some historic cities are in danger of being overrun by mass tourism (e.g. Bruges, Delft), with severe consequences for their historic heritage. That is why these small cities in particular must introduce the concept of carrying capacity. If the norms are exceeded, well-defined capacity monitoring measures become active. In large cities, overall 'swamping' is rare though it is not unknown around potential 'honey pots', which many have to follow the capacity limitation approach. Otherwise capacity is more likely to be regulated by the availability and/or price of accommodation.

3.2.6. A changing future for agriculture and forestry

3.2.6.1. The economic importance of agriculture

In general, agriculture is becoming less and less important in the economic structure of the CCC area. The CCC area percentage of agriculture in gross value-added is lower than the EC value (Table 3.7), as people in the rural parts of the CCC area increasingly earn a living from economic activities concentrated in urban areas.

Maps 3.11 and 3.12 show the economic importance of agriculture for each region for 1982 and 1991. CCC area regions where the economic importance of agriculture is lower than the CCC average are all the German CCC area regions, South-East England and the Ile-de-France. Only in Champagne-Ardennes, Picardy and all the CCC area regions of the Netherlands does the economic importance of agriculture exceeds the EU average.

3.2.6.2. Main characteristics of agriculture in the CCC area

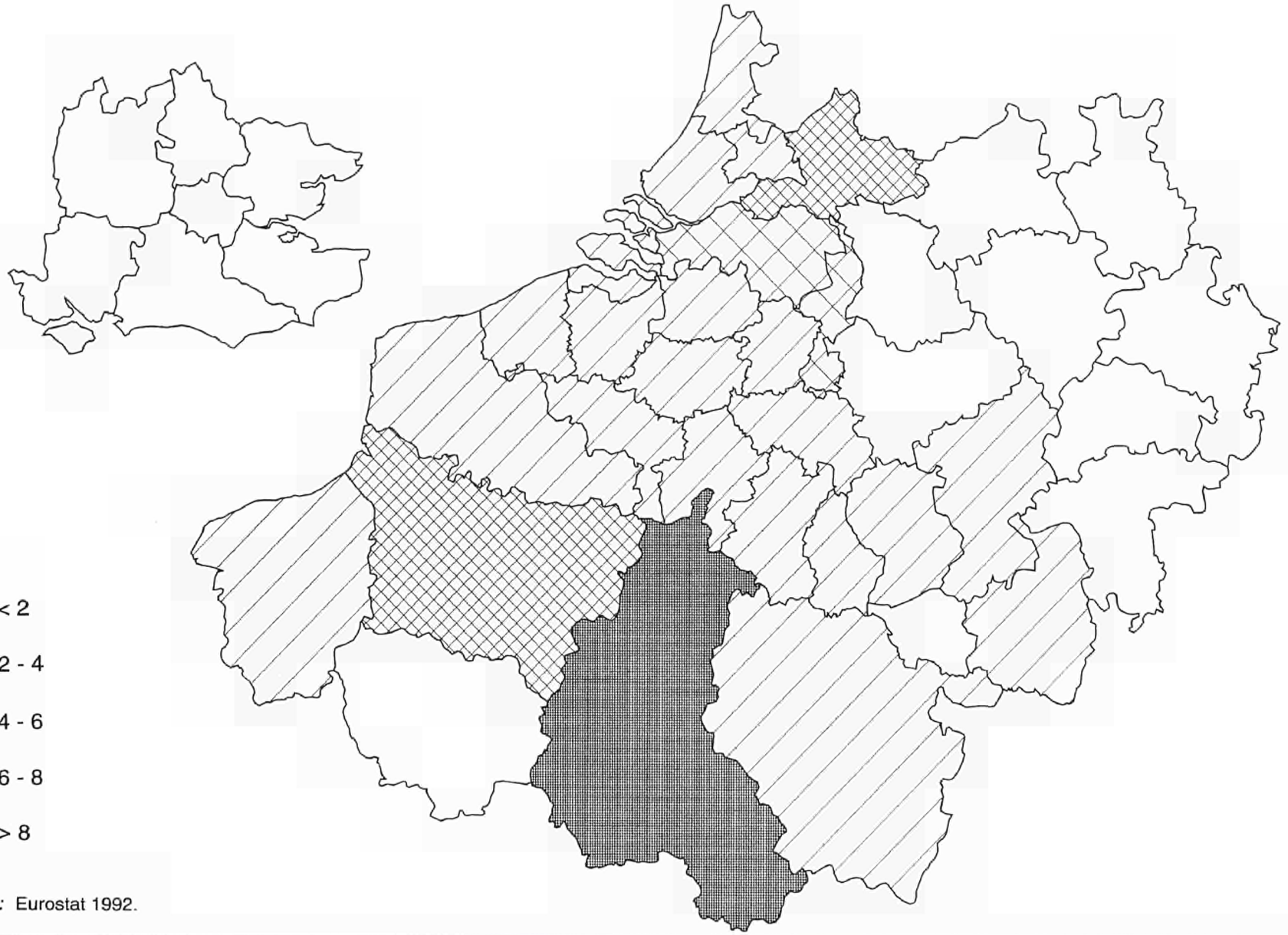
In this text terms like 'intermediate areas', 'rural areas with a higher level of human exploitation' and 'rural areas with a lower level of human exploitation' will occur.[1]

High productivity is an important strategic strength. The steady increase in productivity is due to mechanization, land development, intensive fertilization and improvement of crop strains.

[1] The definitions of these terms are to be found in Chapter 8 'The CCC rural areas', under the subheading 'Spatial characteristics'.

Map 3.11

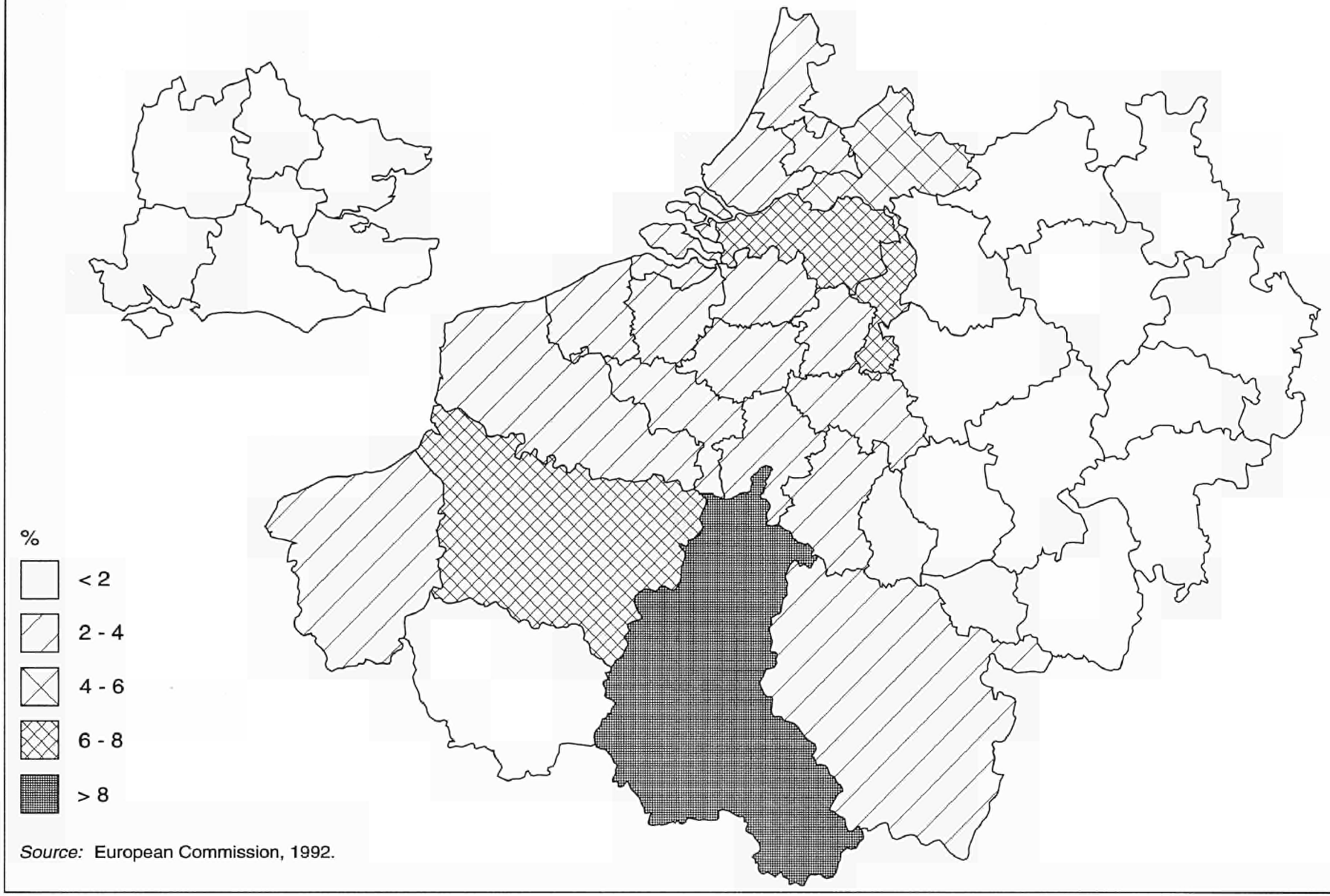
Part of agriculture in GRP (1982)



Source: Eurostat 1992.

Map 3.12

Part of agriculture in GRP (1991)



Source: European Commission, 1992.

Table 3.7: The share of agriculture in the economy, the relative profit per value of production and the main crops (1991)

	% agriculture in gross added value	Relative profit per value of production in %	Crops whose % in the total production value is more than the EU average
Flanders	2.1	23.9	Pork, vegetables and fruit, beef
Wallonia	2.2	26.5	Beef, milk, other cultures, grain
North Rhine-Westphalia	0.7	7.6	Pork, milk, beef
Hessen	0.6	8.9	Milk, beef, pork, grain
Rhineland-Pfalz	1.5	13.3	Wine, grain
Saarland	0.4	18.3	Milk, vegetables and fruit, beef
Ile-de-France	0.3	28.7	Grain, other cultures, vegetables and fruit
Champagne-Ardennes	9.0	39.9	Grain, wine, other cultures
Picardy	6.1	33.6	Grain, other cultures
Upper Normandy	2.6	29.9	Grain, milk other cultures, beef
Nord-Pas-de-Calais	2.1	29.3	Grain, milk, other cultures
Lorraine	2.1	33.0	Milk, grain, beef
Luxembourg	1.8	36.7	Milk, beef, wine
East Netherlands	4.9	28.0	Milk, pork, beef, eggs and poultry
West Netherlands	3.2	46.2	Vegetables and fruit
South Netherlands	4.3	28.7	Pork, milk, eggs and poultry
South-East England	0.5	11.5	Grain, vegetables and fruit, eggs and poultry
Total CCC	1.8	23.2	
EU	2.6	24.3	

Source: European Commission 1992. 'The agricultural situation in the Community', 1992 Report.
The crops mentioned are those with a production rate higher then the EU average and, in each case, listed from most important to least.

The different areas of the CCC area regions complement each other in crops such that, overall, self-sufficiency is attained for most foodstuffs. The Benelux provides sugar, vegetables and pork, the French areas grains and sugar. All over the CCC area regions there is a high production of beef, milk and other such products. Only for fruits, oils and fats is the CCC area as a whole not self-sufficient. There is an important threat however: market mechanisms hamper the exchange of agricultural goods between the CCC area regions, and it is to be expected that these economic barriers will become even more significant in the wake of the GATT decisions.

Agriculture is characterized by high and growing input costs and a rather low relative profit per unit of output (Table 3.7). Their distance from the ports and their consequent reliance on imports and transport, explain the relatively high intermediate values of the produce of the German CCC area regions. Based on the relative profit per value of production, linked to the percentage of agriculture in the GVA and the GRP, a list of 'top ten' regions in terms of the importance of agriculture to the economy of their open areas is derived. These regions are in order of importance: West Netherlands, Champagne-Ardennes, South Netherlands, Picardy, Flanders, East Netherlands, Upper Normandy, Nord-Pas-de-Calais, the Ile de France and Wallonia.

Proximity to consumer markets eases the distribution of products. Proximity to ports lowers the costs of transportation of imported products. The zones in the intermediate areas are extremely interesting for horticulture, due to the high density of population and proximity to consumption centres. The regional differentiation varies with the density of the urban network and so is best represented in Flanders, the Netherlands, Ile-de-France, South-East England, Dusseldorf and Cologne.

The high educational level of the farmers, the high quality of both research and soil, and the sophistication of technological development are important strengths of CCC area agriculture The soil-climate complex is generally favourable for agriculture and allows future differentiation giving

Table 3.8: Statistics of the employment in agriculture (1985)

Region	Employment in agriculture (%)	Employment predicted by Perrier-Cornet as the stable point (%)	Expected rundown of total employment (%)
Flanders	3.4	1.5-2	1.4-1.9
Wallonia	3.8		1.8-2.3
North Rhine-Westphalia	2.3	2.5-3	stabilization
Hessen	4.4		1.4-1.9
Rhineland-Pfalz	5.6		2.6-3.1
Saarland	0.9		stabilization
Ile-de-France	0.5	4-5	stabilization
Champagne-Ardennes	9.9		4.9-5.9
Picardy	7.6		2.6-3.6
Aisne	9.7		4.7-5.7
Oise	4.9		stabilization
Somme	8.9		3.9-4.9
Upper Normandy	5.3		0.3-1.3
Nord Pas-de-Calais	4.1		stabilization
Lorraine	4.1		stabilization
Luxembourg	4.1	n.d.	
East Netherlands	n.d.	4-5	
West Netherlands	4.1		stabilization
South Netherlands	4.3		stabilization
Zeeland	4.1		stabilization
North Brabant	5.7		0.7-1.7
Limburg	5.7		0.7-1.7
South-East England	1.2	1.5-2	stabilization
Total CCC	2.9		
EU	8.6		

Source: Eurostat; Perrier-Cornet, M + R.

a competitive advantage to the CCC area. In all CCC area regions, universities and research institutions investigate the problems of agriculture and try to improve agro-technology.

The employment generated by agriculture is less important in the CCC area than in the EU. About 2.9% of all employees in the CCC area work in agriculture as compared with 8.6% in the EU area. Regions with agricultural employment of more than 10% are Luxembourg (B), Trier, Champagne-Ardennes, Meuse, Aisne and Zeeland. Regions where agriculture makes up less than 1% of employment are found in Ile-de-France and Saarland (see Table 3.8).

In general, a continuing rundown of agricultural employment is expected though according to some predictions, a number of regions in the CCC area may already have reached their stabilization point. The expected decline of employment in agriculture is described in detail in the rural areas chapter. An intensive rundown (more than 2.5% of total employment or about 50% of the employment in agriculture) is expected in Rhineland-Pfalz and Champagne-Ardennes. Regions which are expected to 'bottom out' in the next few years are Flanders, Wallonia, Hessen, Upper Normandy, North Brabant, Limburg and Luxembourg.

3.2.6.3. *Changing mega trends in agriculture: CAP and GATT*

CCC area agriculture produces a broad variety of crops but in unbalanced quantities. Milk, beef and grain represent 51% of the total value of agricultural production in the EU as a whole. Regions where the equivalent figure exceeds 60% are Upper Normandy, Wallonia, Lorraine and the Grand Duchy of Luxembourg. Only in the West Netherlands and Flanders do milk, beef and grain together represent less than 40% of the total value of agricultural production.

In general, there is a structural overproduction of sugar, meat and dairy products, but a relative

shortage of fruit. Strategically, monoculture and specialization make the regions of the CCC area more vulnerable to cyclical changes but also to epidemics (e.g swine fever, mad cow disease). Variety of agricultural activity is least in those rural areas with low levels of human exploitation, and highest in rural areas with higher levels of human exploitation.

Little by little, farmers are changing their production from grain and dairy-products to horticulture. This is a structural process, as it is happening in all CCC area regions, independently from the soil quality and condition of the regions concerned.

Wine is not very important in the totality of CCC area production though in two regions it makes up more than 20% of the total value of agricultural production: Rhineland-Pfalz and Champagne-Ardennes.

Much of the CCC area's agricultural production is vulnerable to decisions taken through the common agriculture policy (CAP) and as a result of the General Agreement on Tariffs and Trade (GATT). Figure 3.19 sets out the share in total production of cultures (beef, milk, grain) directly influenced by EU policy and most sensitive to changes in this policy.

It is estimated that the CCC area receives 18.5% of EAGGF funds (see Section 3.8.5) on 11.8% of the EU area. During the mid-1980s, the EU developed a policy to stabilize agricultural production. Initially, this had a positive effect. However, the increase in productivity, which was not controlled by the policy, neutralized all benefits of it. As a result, expenses started to rise again. The so-called 'conductive' measures (set-aside, reconversion) have yet to produce the expected results.

The future evolution of many rural parts of the CCC area will depend on European agricultural policies (more than 60% of the EU budget is spent on agriculture) and on GATT. Hence, the CAP focuses on the reduction of the subvention on product prices in favour of a direct subvention on income per hectare. The most affected sectors are: grain (a price reduction for grain of 29%), beef (price reduction of 15%) and dairy (price reduction of 2.5%). The grain producing regions (all the French CCC area regions) will be the most affected by lower incomes.

The new GATT agreements result in a further liberalization of the food trade. Thus, demand for food produced in the EU will change. In general, for the EU this agreement means a decrease in exports, increasing imports and lower prices for the producers. The following grain-producing rural areas will be negatively affected: Champagne-Ardennes, Picardy, Upper Normandy, Nord-Pas-de-Calais, Lorraine, and to a lesser degree South-East England, Hessen and Rhineland-Pfalz.

Regions of high beef production are likely to lose on the export market and will have to import fodder. The European Commission forecasts an increase in the consumption of white meat at the expense of red meat. The most vulnerable regions in this respect are: Wallonia, Hessen, the Grand Duchy of Luxembourg, North Rhine-Westphalia, Saarland, Lorraine, East Netherlands, Upper Normandy and Flanders.

Important milk-producing regions, which will be affected by quota reductions of from 4 to 6% and, as a result of falling import taxes, by price decreases of 10 to 15% are Hessen, Saarland, Lorraine, the Grand Duchy of Luxembourg, East Netherlands, South Netherlands, Upper Normandy, Nord-Pas-de-Calais, Wallonia and North Rhine-Westphalia.

Free trade and higher levels of cheaper imports will stimulate export oriented and intensive agriculture/horticulture and livestock production. Regions with sectors like vegetables and fruit, pork, wine, other cultures, eggs and poultry will be less affected by the outcome of GATT.

Proximity to ports and good accessibility should give the CCC area advantages over other regions but may enlarge differences among CCC-area regions. The following regions could benefit from cheaper imports: West Netherlands, South-East England, South Netherlands, East Netherlands and Flanders. However, the problems expected in the grain, beef and milk sector may well reduce diversity by encouraging farmers to refocus their efforts towards a limited range of sectors. Owing to existing diversification of produc-

tion (wine, other cultures, vegetables and fruit) a number of regions have a higher 'buffer capacity' to cope with such changes, among them Rhineland-Pfalz, Saarland, Champagne-Ardennes, Ile-de-France, Nord-Pas-de-Calais and the Grand Duchy of Luxembourg.

Summarized, the GATT and CAP reforms will lead to better economic returns for intensive farming in West and South Netherlands, Flanders and East Netherlands. On the other hand, some adverse effects are likely to be felt in regions such as Champagne-Ardennes, Picardy, Upper Normandy, Nord-Pas-de-Calais, Ile-de-France, Wallonia, South-East England and Hessen, which generally produce crops in a more extensive way.

3.2.6.4. *Support for agriculture as an element for regional development*

On a European scale, 80% of the funds of the EAGGF (European Agricultural Guidance and Guarantee Fund) reach 20% of the farms, mostly the largest and most intensively worked ones. Policies for the rural areas of the Community are shaped by the Structural Funds, the most important being the EAGGF.

Only a few parts of the CCC area are currently supported by the EU under Objective 5b (rural areas in need of economic diversification). They are mostly peripheral, often border, regions, e.g. the border between Champagne-Ardennes and Lorraine, Rhineland-Pfalz and Saarland, Rhineland-Pfalz and the Grand Duchy of Luxembourg, the Grand Duchy of Luxembourg and Wallonia. Peripheral regions such as Meetjesland, Westhoek (Flanders), the southern and eastern parts of North Rhine-Westphalia, and the Trier area are eligible as well.

3.2.6.5. *'Agro-tourism': A possible complement to agriculture but not an alternative*

Rural areas have many cultural, natural, ecological and architectural roots, which give them significant development potential. Promotion of little-known regions and investment can both contribute to the realization of such potentials. The most successful regions are or will be those that offer several resources in the same place, and remain affordable for a broad public. Proximity to major urban areas, existing access facilities, and the range of (semi) natural areas play important tourist and recreational roles. This is shown by the coastal areas but also in the hilly areas: Ardennes (B), Rhineland-Pfalz, North Rhine, Hessen and the Grand Duchy of Luxembourg.

Some EU programmes are available to stimulate and support investment in this sector (Objective 1: EROF and others, Objective 5a EAGGF, Objective 5b, Leader).

Regions with high agro-tourism potentials are South-East England, the Grand Duchy of Luxembourg and the German parts of the CCC area (North Rhine, Sauerland, the northern Eifel, the Siebengebirge and Teutoburger Wald, Hessen, Rhineland-Pfalz, Hunsrück and Pfalz). A number of other regions have potential, though probably to a lesser extent, and could be promoted: Picardy, Champagne-Ardennes, Upper Normandy, Lorraine and Wallonia.

In considering the potential of regions to accommodate 'agro-tourism' three topics will need specific consideration: agriculture and rural identity; agriculture and investment; and tourism and diversification.

3.2.6.6. *Forestry*

Although 21.7% of the CCC area is forested, forestry is of very limited importance to its economy. However, the strategic importance of timber production and forestry, which may not be fully reflected in the economic indicators, should not be overlooked as they produce raw materials and bio-energy.

Despite its degree of afforestation, the CCC area is not self-sufficient in the production of timber. The EU produces only 6% of the world total but consumes 13%, a deficit of 50% making it the greatest importer in the world. The CCC area has an even larger 67% deficit. The region produces 21.5 million m^3 but consumes 66.5 million m^3; so that annually 45 million m^3 have to be imported. Table 3.9 gives an overview of the forecasts for the CCC area timber deficit by the year 2000.

Table 3.9: Expected timber deficits in the CCC area by the year 2000

	Demand (million m^3)		Supply (million m^3)		Deficit (million m^3)	
	Low	High	Low	High	Low	High
Round wood	29.07	34.6	7.0	7.9	21.17	27.6
Others	36.02	41.9	7.6	8.6	27.42	34.3
Total	65.09	76.5	14.6	16.5	48.59	61.9

Source: ETTS-IV, NEI, Eurostat, WWR, M + R.
Low: low estimations; high: high estimations.

The deficit makes the CCC area sensitive to increasing pressures on the global timber market. As the availability of timber from Eastern Europe slows down, it is expected that deforestation, growing timber consumption in the developing countries and public resistance will further increase pressures on timber markets and result in higher prices. Growing timber consumption in the CCC area will weaken the strategic position of the CCC area, as it increasingly becomes timber deficient. It should also be noted that forests in the CCC area face strong environmental pressures, given the concentration of people, activities and air pollution in the region.

Forestry development in the CCC area is hampered by the short-term cycles of the wider CCC economy. Forest fragmentation is another problem. Especially in 'intermediate' locations between the fully urbanized and most rural areas, both the wooded area and its ownership structure are too fragmented to function efficiently. This leads to poor information, management, exploitation, rentability, and finally to a lower quality product.

Forestry can only become viable in the CCC area when afforestation can provide a realistic income. Short-term afforestation as an alternative to agriculture is at present hard to achieve. Afforestation has to be considered as a long-term investment.

Several CCC area regions (South-East England, West Netherlands, Nord-Pas-de-Calais) have great potential for forestry. Higher timber production is attractive because it would reduce balance-of-payment pressures. This should be achievable through improved management, an appropriate choice of species and simply through expansion of the afforested area.

At European level, the shift from agriculture to forestry is recognized as a challenge. The European Commission has already taken some initiatives to encourage investment in the forestry sector as part of the strategy to cope with set-aside. These initiatives are designed to encourage individuals in various sectors, of which agriculture is the most obvious, to shift their efforts towards forest exploitation. The initiatives have not had significant results at the European scale.

So far some but not all EU Member States and some regions within the CCC area (the Netherlands regions, the *Länder* in Germany, Flanders), have made efforts to develop comprehensive forestry policies. In general, if a more balanced global policy is to be achieved, more intensive linkages between spatial policies and forestry policies will have to be developed.

3.3. Conclusion

The CCC area is characterized by quite different internal economic structures in different regions. There is a strong emphasis on services, with metropolitan areas having the highest scores. The German parts of the CCC area as well as South Netherlands and Flanders have a relatively stronger focus on manufacturing, while northern France has extensive primarily agricultural areas.

Employment growth has been strongest in the Netherlands, while areas in France and Wallonia undergoing restructuring have seen decreases in employment. The socioeconomic situation in the early 1990s compared to the situation 10 years earlier has changed in favour of the northern part of the CCC area while the situation in restructuring areas of France deteriorated.

Strong growth in financial and other business services has led to a degree of growth in the urban cores of metropolitan areas but especially to growth in medium-sized cities in the metropolitan areas and in the freestanding cities which act as regional centres. This growth is likely to continue. The demand for services will also continue to rise. The already strong hierarchical pattern in the distribution of services will strengthen still further. A further concentration of headquarters in London and Paris is to be expected. Large scale deconcentration has not and probably will not occur: the one exception is South-East England, where labour shortages and the costs of a London base have seen a variety of deconcentration strategies adopted by different sectors of industry.

For transport and distribution activities, growth expectations are high with the exception again of South-East England. The fastest growth will occur in road and air transport. This may lead to congestion, which reinforces the need for multimodal approaches requiring specific facilities. There is also a need for a Europe-wide air traffic control system addressing future congestion in the skies. Further changes in the spatial pattern in transport and distribution will be limited. The Channel Tunnel will probably have the largest single impact on transport flows but even this is unlikely to cause major changes. The impacts of the construction of high-speed railways will be limited in respect of freight transport. For the immediate future interregional transport will show particular increases. This increase in distances covered will, however, create opportunities for modes other than transport by road; that will not prevent road transport showing the highest growth rates in the short term.

Most R&D activities are concentrated in the business sector. The strategic importance of R&D is more closely tied to companies than to regions because information is 'footloose'. The application of the results of R&D activities is not necessarily in the region where the R&D itself took place. The CCC area is, together with the Alpine Arc, the concentration area of R&D in the EU. Driven by German and French governmental support and in cooperation with the business sector, specific areas for R&D activities have been set up in these countries. Although these initiatives seem to be quite successful, the stimulus they provide could be less than expected. In the event, R&D activities remain concentrated in just five large metropolitan areas in the CCC area.

The CCC area experienced a decline in manufacturing employment in the period 1980-90 and further declines are expected in future. However, total manufacturing GVA and GVA per employee are still rising. Despite the rise in importance of services, manufacturing remains a vital sector of the economy. In all regions except for Kassel the GVA per employee in manufacturing is higher than the GVA in the total economy. Manufacturing is most strongly represented in the German part of the CCC area. However, even in the traditional industrial areas, many of them now undergoing economic restructuring, it is instructive to note that manufacturing has lost its formerly dominant role. Further increases in the occupation of space by manufacturing are expected in future, accompanied by a more diffuse spatial pattern of industrial activities.

Tourism has been a fast growing sector in the economy of the CCC area, and its importance is increasing accordingly. Much of the growth can be attributed to the growth in international tourism. The attractiveness of the CCC area is, to a great extent, determined by the attractiveness of its cities. City tourism is expected to grow fast, and as a result the greatest attractors, e.g. Bruges, are in danger of being overrun by mass tourism. In the larger cities, this problem is less marked, not least because there is more potential for creating new tourist locations. Coastal areas on the contrary are faced with at least relative declines in tourist numbers. The greatest effort here will have to be on maintaining or even increasing their attractiveness. Tourism in rural areas can benefit from the trend towards more short holidays: in particular, the opportunities created by agricultural rationalization may enhance the potential of the CCC area's few upland areas. The demand for theme and amusement parks is expected to grow but the willingness of prospective customers to travel and the frequency of such visits should not be overestimated. In general, it is expected that the CCC area will continue to lose ground in long-visit tourism but it has the potential to offset this with shorter trips.

Agriculture's share of production and employment in the CCC area is smaller than its contribution in the EU as a whole. Only in Champagne-Ardennes and Zeeland does the economic importance of agriculture exceed the EU average. The CCC area has an unbalanced food-production profile, which makes the regions more vulnerable to structural change and disease or epidemic. In general, agriculture is declining in importance in the whole CCC area. Further reductions in agricultural employment are expected, with particularly severe consequences for Champagne-Ardennes and Rhineland-Pfalz. Agrotourism could possibly compensate to a degree for the decreasing importance of agriculture. However, the future evolution of many rural areas will depend not so much on secular trends as on specific European agricultural policy and the impacts, as they become apparent, of GATT.

Forestry is of limited economic importance in the CCC area. There may well be many attractions in a greater emphasis in the future on afforestation but, in the short term, afforestation provides too limited an economic base to be regarded as an alternative to agriculture.

4. The CCC flow system

Introduction

This chapter contains four major items. Firstly, passenger transport networks are described, focusing on their present position and short-term future. Second, seaports and airports are analysed. The third part looks at telecommunication networks, again dealing with the current situation and the future trends. The fourth and final part describes the energy transmission networks and deals with energy supply, transmission, energy dependency, emissions and the integration of the transmission networks.

4.1. Efficient passenger transport systems

4.1.1. The actual situation

Spatial pattern, accessibility and missing links

In considering the development of the CCC area, the density of its transport networks, the wide availability of all transport modes and the accessibility of the main economic centres are generally regarded as important strengths. This section of the report limits itself to passenger traffic. Special attention is paid to accessibility on a European level.

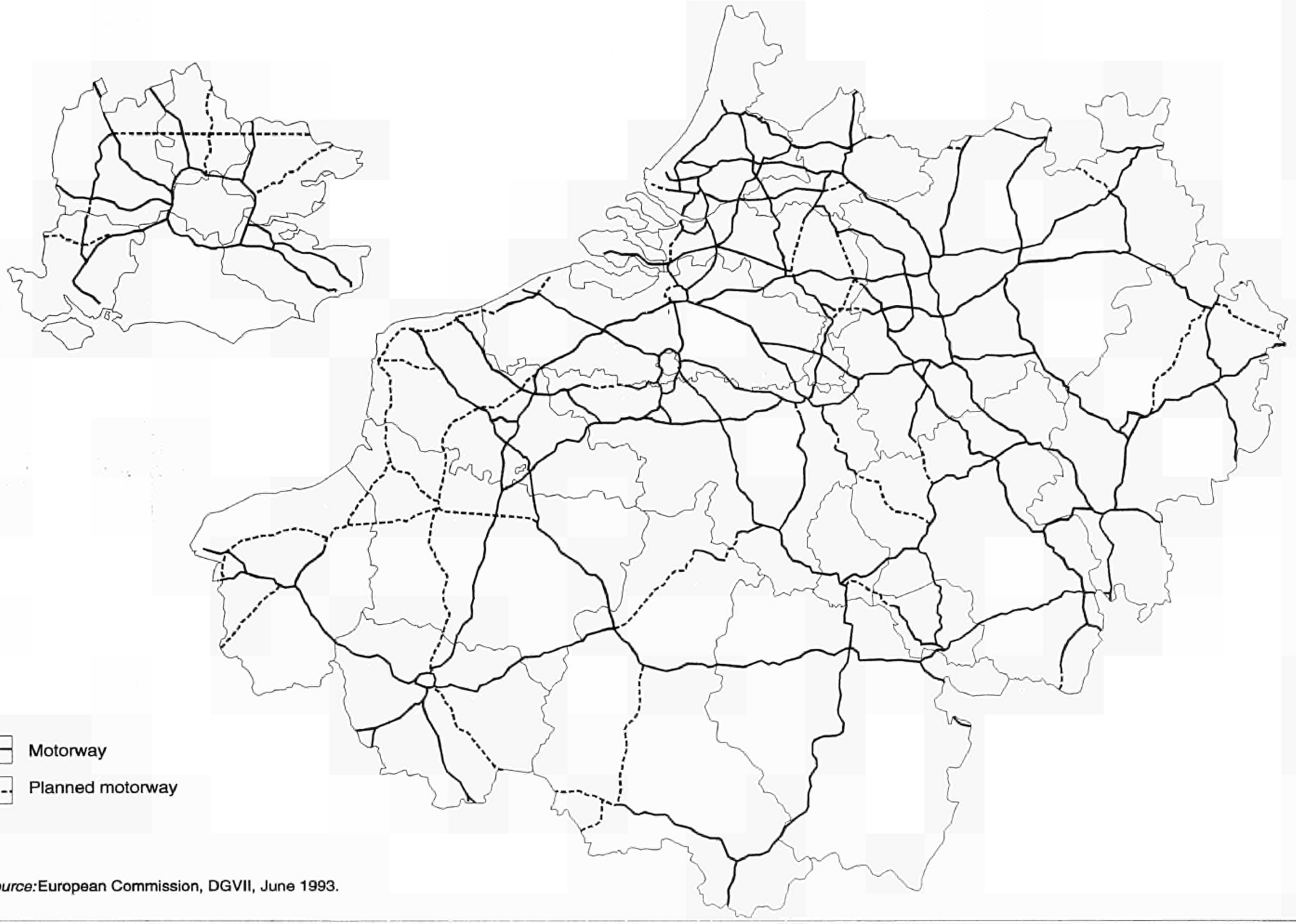
Overall, there is 0.014 km of motorway for every square km of EU territory. The CCC area has a denser motorway network: 0.0386 km per square km. However, there are marked regional differences (see Map 4.1). The spatial pattern of the road and traditional rail network shows that Nord-Pas-de-Calais, Flanders, South, West and East Netherlands and North Rhine-Westphalia have a close network of routes. In South-East England and France on the other hand, the networks are broadly radial/concentric, relating to Paris and London as national centres of communication. While all the other national networks are physically connected, connections between mainland and British networks have always had to rely on ferry or air links: in this sense, the Dover-Calais ferries can be regarded as replacing an international road connection. The Channel Tunnel link finally sees a physical connection established.

The high accessibility of the CCC area is illustrated by the fact that travel times from each of the regions to the nearest of a selection of agglomerations (London, Paris, Amsterdam, Rotterdam, Brussels, Cologne and Frankfurt), are low. Most of the regions are less than an hour away from one of the centres. Travel times exceeding two hours are real exceptions and are only found in parts of Luxembourg (Belgian), Champagne-Ardennes, Lorraine and North Rhine-Westphalia.

Even on the mainland, cross-border connections remain limited compared with internal networks. In some cases, national motorway infrastructures are interrupted at the border. In other cases, missing links inhibit movement. As far as the development of the CCC area is concerned, the inadequacies of cross-border infrastructure plus

Map 4.1

Motorway network CCC regions



Source: European Commission, DGVII, June 1993.

growing congestion generally, may be seen as weaknesses (see Map 4.2).

The single most important bottleneck for road and rail traffic is the Channel, which in CCC-area terms at least, limits the accessibility of South-East England. Of all main road connections in the CCC area, the London-Lille link is the only one on which an average speed of 90 kmph cannot (yet) be achieved.

Amiens is in a remarkable situation, as a regional capital with no connection to the motorway network. Amiens is, though, better integrated into the railway network. However Paris-Troyes remains an important gap in the radial pattern and has a negative influence on the relationship of Troyes with the Ile-de-France. Similarly, the missing link both in the rail and road network from the northern part of West Flanders to Calais reinforces the former's peripheral situation.

Currently, the EU is discussing European high-speed rail and motorway networks which would solve the problems of missing links and bottlenecks. Congestion problems on Eurocorridors and in centres with a high nodality need to receive priority attention and will require an improvement of (or new) infrastructure. The Randstad-Antwerp-Brussels axis is an example of such a bottleneck. Missing links and bottlenecks inside urban areas are as significant as those between them, which might imply the construction of new infrastructure networks such as rail-related regional mass rapid-transit systems similar to the Paris RER. (Réseau Express Régional).

4.1.2. Nodality and Eurocorridors

Infrastructure networks are very important for the further development of the CCC area. Elements of the networks often run in parallel but converge in urban areas. Urban areas are accordingly considered here as nodal points. On the basis of their nodality, the main cities are grouped in four categories. Three factors were taken into account in the analysis: transport by road, by air and by rail on the basis of future as well as existing main international passenger infrastructure. At present, the situation is as follows:

1. Very high accessibility (node of the first order): London, Paris and Frankfurt.

2. High accessibility (node of the second order): Brussels, Amsterdam, Cologne, Antwerp, Ghent, Liège, Rotterdam, Utrecht, Bonn and Duisburg.

3. Low accessibility (node of the third order): The Hague, Lille, Düsseldorf, Charleroi, Luxembourg, Eindhoven, Arnhem, Nancy, the Medway towns, Luton, Essen, Dortmund, Münster, Valenciennes, Lens, Rouen and Reading.

4. Very low accessibility (node of the fourth order): Le Havre, Portsmouth, Southampton and Brighton.

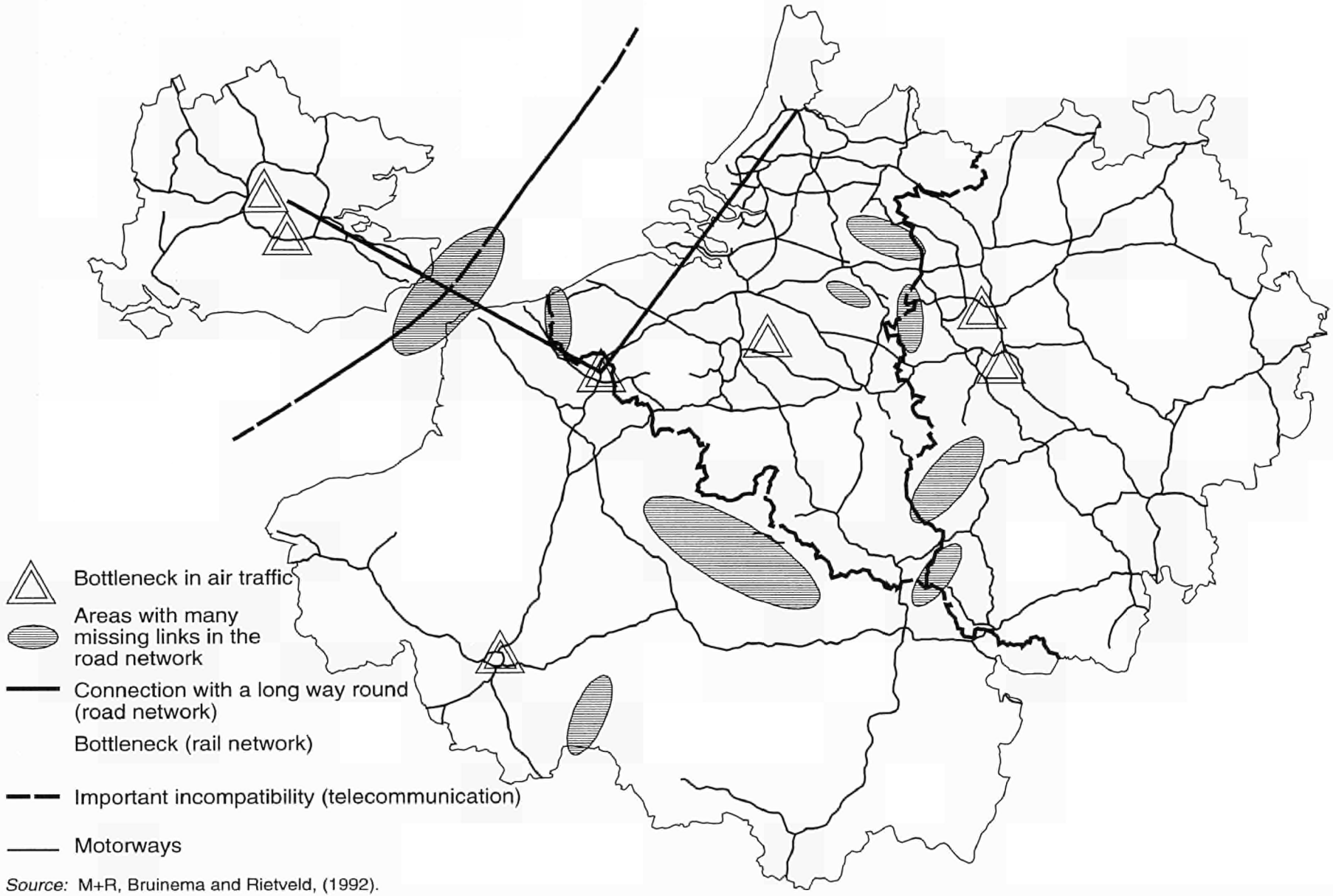
Source: Calculations by M + R, Eriplan.

Only three cities (London, Frankfurt and Paris) score the maximum. They are decision-making centres in the three major countries in the CCC area. Nodality is not directly related to the population of the city. The cities belonging to category 2, still with a high nodality index, are more numerous. Among them are two capitals (Brussels and Amsterdam). It should be noted that all the cities in this group are incorporated in polycentric conurbations: Rhine/Ruhr, Randstad Holland, ABG-stad, MHAL. Cluster 3 contains one capital (Luxembourg), and several types of towns: towns belonging to a polycentric spatial pattern, or towns in rural areas. Four cities peripheral in CCC area or regional terms are in the lowest category despite their size and (economic) importance. Nine cities score on all three modes, and can be seen as real centres of transport infrastructure and as having, therefore, the highest potential to maintain their favourable position. This group contains Paris, London, Brussels, Amsterdam, Bonn, Frankfurt, Cologne, Duisburg and Düsseldorf.

In the last five years cross-border traffic in the CCC area has doubled and the highest growth rates were on international motorways. This was the immediate cause for the introduction of the term 'Eurocorridor', defined as a combination of one or more important infrastructure axes (road, rail, telecommunication lines) with heavy flows of cross-border traffic, linking with each other the important European urban areas.

Map 4.2

Infrastructure networks: missing links and bottlenecks



Source: M+R, Bruinema and Rietveld, (1992).

A European network of Eurocorridors, linking with each other urban areas with a high nodality, can be considered as a strength for the further economic development of the CCC area and its internal cohesion. The most important Eurocorridors are situated in the central part of the CCC regions: the Randstad Holland-ABG-stad-Lille and the ABG-stad-Rhein-Ruhr conurbation. These Eurocorridors, however, are facing important capacity problems.

The connection between ABG-stad and Paris consists of two parallel corridors. The corridor via Valenciennes primarily links Brussels and Paris; while the other corridor links the Netherlands, Ghent and Antwerp to Lille, and Lille with Paris. No fewer than four separate passenger flows make up the London-mainland Europe Eurocorridor. Passenger movements London-Amsterdam and London-Paris are air traffic flows; London-Calais-Lille and London-Ostend-Brussels are served by road/rail ferry routes. The Randstad-Rhine-Ruhr conurbation Eurocorridor is less important for passenger flows alone, but is very significant if passenger and goods traffic are looked at together. Frankfurt is linked to the network of Eurocorridors by separate road and rail connections to the Rhine-Ruhr conurbation; air passenger traffic of up to one million passengers per annum is also very important between Frankfurt and London and could be considered as a third parallel strand in the Frankfurt corridor.

4.1.3. Major projects and their effects

Continuing European unification will involve growing traffic flows. Without policy or investment initiatives, this could threaten the accessibility of the nodal centres. Under normal economic conditions, it is expected that the internal market will stimulate economic growth, causing a significant increase in traffic volumes. For the period 1985-2000, a growth of 30% in car use is predicted. Air traffic for business purposes may show growth of 40%, air traffic for private purposes could grow by 20%. According to the forecasts, rail traffic will experience an estimated growth of 10 to 15% in the period. In particular, growing mobility in the CCC area is expected to be translated into an increasing number of middle distance trips of 200 to 600 km. This would emphasize interregional relationships and require well-integrated transport networks of suitable capacity. Future transport networks will thus have to be characterized by new connections and facilities.

The Channel Tunnel and the HST network

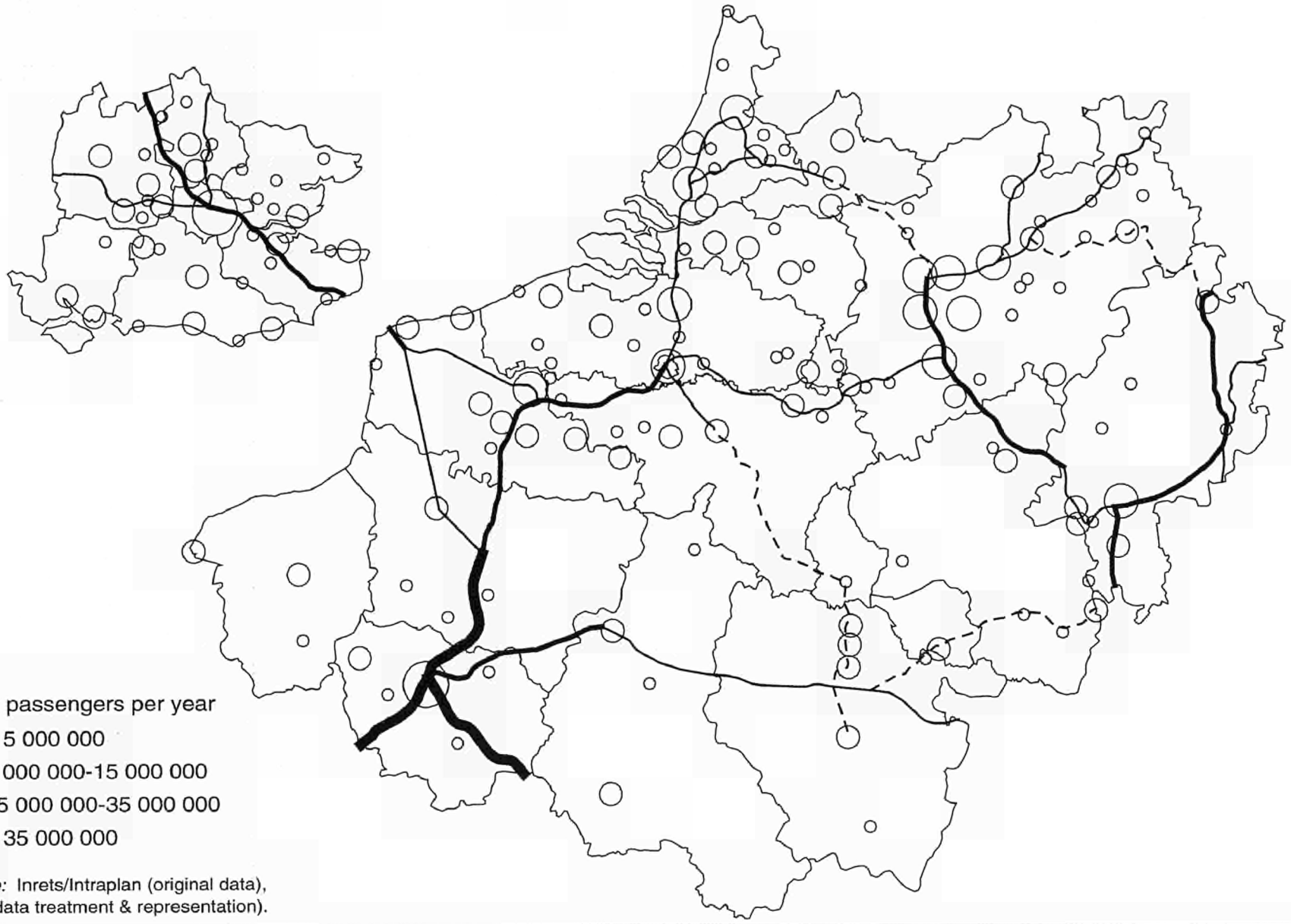
The construction of the 'Chunnel' and the elaboration of the HST network will create an opportunity to overcome some congestion and capacity constraints and to deal with various environmental issues.

The 'Chunnel' physically links Britain to mainland Europe. It is expected to have a major impact on cross-channel traffic and on the integration of the UK with mainland Europe. This could result in a 50 to 75% loss of passengers on the ferries, especially affecting Dover and Calais, which today handle 75% of the traffic. The actual impact of the Tunnel will of course be influenced by the price relative to ferries not only Dover-Calais but also taking into account the Folkestone to London connection. The introduction of the HST would be expected to see rail passenger traffic increase substantially. The number of rail passengers on international lines could increase by a factor of 2.6 as a result of the introduction of the HST Paris/London-Brussels-Amsterdam/Cologne (see Map 4.3).

At least 50% of all extra international passengers using the HST, will be former plane or car users. The rest will be new travellers. Thanks to the reduced travel times and the absence of congestion problems, the HST is a good alternative transport mode, especially for medium to long distances. For journeys between cities that it serves, a fully operational HST network is expected to reduce car traffic by between 1 and 8% and air traffic by between 6 and 23%. In the case of several airports such as Paris and Amsterdam, construction of an adjacent HST station makes the HST network complementary to the air trip. Such multi-modal transport nodes, for example Lille, could become favoured locations for economic activity (e.g. for distribution and offices), and have a noticeable impact on the structure of the CCC area.

Map 4.3

High speed rail network-passenger flows (forecast 2010)



Source: Inrets/Intraplan (original data),
M+R (data treatment & representation).

An important question is the extent to which the HST network will reinforce or reduce accessibility differences among CCC-area regions. Travel times on the HST network are shorter than for traditional rail or road transport. In some cases the provision of new HST lines will be expected to help relatively inaccessible areas. Two examples are the effects on Amiens and the surrounding Picardy region of the Calais-Amiens-Paris-Lille link; similarly, the upgrading of the Brussels-Luxembourg line may be expected to have a positive effect on the accessibility of Luxembourg city and Namur. However, not all regions in the CCC area are currently within, say, one hour's travel time of an HST station. Recognizing that the HST must tend to reinforce accessibility differences, if accessibility improvements are to be spread as widely as possible, it is essential that the existing rail network should be well connected to the new HST network, not only by physical links but through coordination of timetables.

In addition, the HST may also be a good alternative from an ecological point of view. This forms, together with the reduction of congestion problems in city areas and around airports, a good counterbalance for the use of limited space. The spatial pattern of the HST network will follow for the greater part the existing spatial pattern of the rail/road network. This is a positive aspect both for the use of space as for barrier effects.

Road infrastructure

Cities and regions which are not directly linked to the main Eurocorridor/HST network may nevertheless benefit from the existence of the networks if the connections by means of traditional modes (railway, motorway) are improved and harmonized with the HST construction schedules. Investment to complete the transport network is necessary. This can end the existence of missing links (e.g. Paris-Troyes), tackle capacity problems, complete ring roads or upgrade inadequate infrastructure (e.g. Antwerp-Boom-Brussels).

New road infrastructure will need to be created as a result of the construction of the Channel Tunnel/HST network. This will include new sections of road (e.g. Calais-Amiens-Paris), as the existing infrastructure is not present or is insufficient to cope with the extra volumes. Delayed completion of some stretches of planned motorway (e.g. Veurne-Calais) is often regarded as a handicap for the economic development of some regions (e.g. West Flanders). A great part of the planned investment in the road network in the German regions is located in Rhineland-Pfalz, where little direct HST impact is expected. To improve integration of Zeeland and the Randstad Holland, a fixed link is planned; the 'Westerschelde Oeververbinding' (WOV). This might be extended to a new international link between Ghent and the Randstad. The scheme complements the north-south corridor linking Rotterdam and Antwerp, the Antwerp-Zeebrugge connection and the Lille-Kortrijk-Ghent-Antwerp corridor.

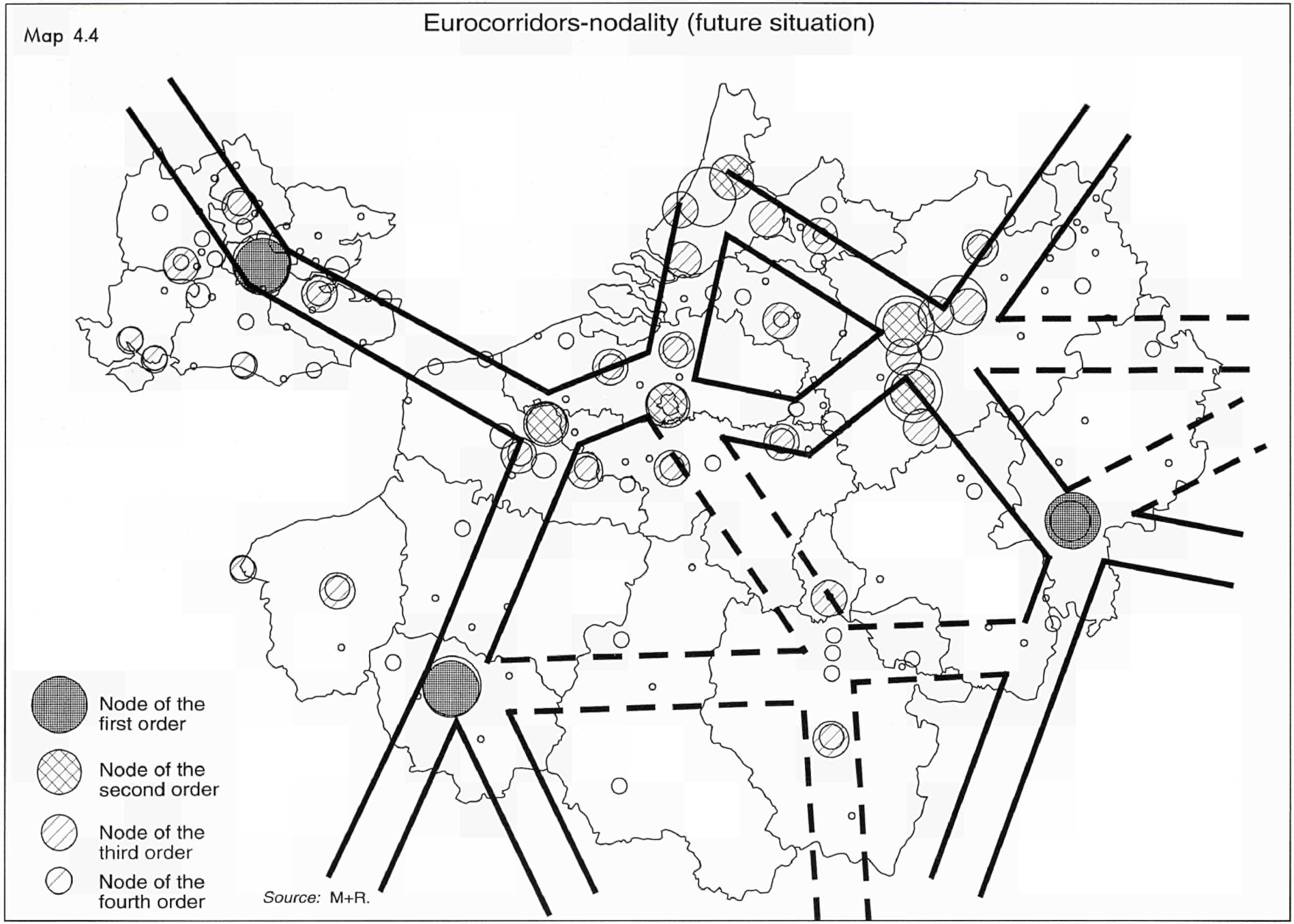
4.1.4. Nodality and Eurocorridors

The construction of the Chunnel and the HST network will strengthen the existing Eurocorridors. Cities located on these Eurocorridors are by definition easily accessible. This will create economic and development opportunities for them. The development of a HST network will not be neutral in its effects on cities however: some will see their accessibility increase as a result of the new networks; others will fail to be directly connected to it (see Map 4.4).

Comparing the accessibility today with the future situation, no dramatic changes are expected for the cities in categories 1 and 4. However, in the two other categories, changes are expected to occur. Six cities move from category 2 to 3: Antwerp, Ghent, Liège, Rotterdam, Utrecht and Bonn. The introduction of the HST (e.g. in the case of Antwerp) is not a guarantee that the current accessibility position can be maintained. Only one city, Lille, in moving from category 3 to 2, is shown to benefit from the new infrastructure. The construction of a HST network around Lille and Brussels will decrease the nodality of larger towns relatively close to Lille and Brussels. Flemish and Dutch towns are especially affected. The nine cities mentioned earlier remain versatile highly accessible transport centres.

Map 4.4

Eurocorridors-nodality (future situation)



Source: M+R.

The accessibility categories in the future situation:

1. Very high accessibility (node of the first order): London, Paris and Frankfurt.

2. High accessibility (node of the second order): Brussels, Amsterdam, Cologne, Lille and Duisburg.

3. Low accessibility (node of the third order): Antwerp, Liège, Rotterdam, Bonn, Dusseldorf, Essen, Dortmund, Ghent, Luxembourg, Utrecht, The Hague, Eindhoven, Nancy, Reading, Luton, Münster, Charleroi, Arnhem, Valenciennes, Lens, Rouen, and the Medway Towns.

4. Very low accessibility (node of the fourth order): Le Havre, Portsmouth, Southampton and Brighton.

Source: Calculations M + R-Eriplan.

The general conclusion of the accessibility studies is that a distinct group of cities with a very high nodality is emerging: London, Paris, Frankfurt, Brussels, Amsterdam, Cologne, Duisburg and Lille. This is a disadvantage to two groups of cities, those in the vicinity of these nodes, which built their accessability around traditional railway infrastructure and those in regions not linked to the network.

The creation of new major cross-border links will have an important influence on the existing network of Eurocorridors. This, combined with decreasing travel times as a result of new travel technologies will reduce the separation between urban areas with important consequences for spatial structures as well as for relative accessibility.

On the other hand, indirect effects can lead to the shifting of congestion problems and to a greater differentiation in the accessibility of the regions. The motorways from London to Folkestone/Dover could face capacity problems due to the strengthening of the London-Cologne corridor as a result of the opening of the 'Chunnel'. Present capacity problems on the Randstad Holland-ABG-stad-France corridor could lead to Rotterdam becoming increasingly peripheral in that connection, while completion of new infrastructure ('Zoomweg', Veurne-Calais, WOV) could create a parallel corridor. Brussels is a bottleneck on the west-east corridor. The existing road infrastructure between Liège, Namur, Charleroi, Lille, and Calais could become an escape route for heavy transport flows though there are no signs that this route would enhance development potential in Wallonia, the region through which it passes.

4.2. Goods transport

4.2.1. The regional pattern

As shown in Table 4.1, road is the most important transport mode, for both national and international freight traffic.

Table 4.1: Freight traffic: Modal split of EU in percentages based on ton-km (1989)

	Road	Rail	Inland waterways	Air
France	64.6	29.4	3.9	2.1
Germany	62.5	24.3	11.7	1.5
UK	87.6	10.9	0	1.5
Benelux	56.7	7.8	33.7	1.8
Total EUR 12	73.7	16.9	8.0	1.4

Source: Europe in 1995; national statistics.

Both total flow of goods and the share of the modes in total transport activity differ significantly between regions. The main differences can be characterized as follows. In the Dutch regions and Flanders the significance of transport by inland waterways is much greater than in other regions. The main reasons can be found in the presence of the harbours of Rotterdam and Antwerp and the availability of a network of rivers and canals. In West Netherlands, the share of the total flow of goods that travels by inland waterway (in tonnes) is no less than 45%. In Germany, the inland port of Duisburg (North Rhine-Westphalia) is important, handling almost 20% of national freight tonnage movements.

The share of inland waterway transport in France is small, except for the east where it is just over 10%. In the German part of the CCC area (North Rhine-Westphalia and Rhineland-Pfalz) inland waterway transport is of some importance (about 10% of total transport) mainly due to the flows between the Rotterdam harbour and these regions. In South-East England there is very little use of inland waterways. The most important waterways are the Thames and the Medway, which, however, carried only two million tonnes of cargo in 1990, compared with almost 200 million tonnes in the CCC area as a whole.

In general, it can be stated that transport on the Rhine is of overwhelming importance in comparison to that on all other waterways. Rivers such as the Meuse and the Scheldt are connected with the Rhine, as is a system of canals in Belgium and the Netherlands. In the French hinterland the Seine and the Rhône play locally important roles. However, these rivers are only connected with the main European network by narrow canals.

Nationally, rail's share of transport in the countries of the CCC area varies at between 11 and 13%. However, there are regional differences. Most important shares for rail transport are recorded for Wallonia, North Rhine-Westphalia, Saarland, Nord-Pas-de-Calais and Lorraine. However, except for the Netherlands, the proportion by volume of national flows of goods is larger than for international flows. Rail transport is of minor importance in the Netherlands: this is particularly so for national flows. For example, only 5% of goods passing through the port of Rotterdam are carried to and from the port by rail, in contrast to the German ports, where the figure is 50%. Subsidy policy in Germany may be seen as one of the reasons for this difference. Another example: in Antwerp 28 million tonnes are carried by rail annually, while the entire volume in the Netherlands is not more than 20 million tonnes.

Road transport, generally the most important mode, has a larger share of international transport in the Benelux than in French and German regions of the CCC area. In part this can be explained by the relatively small size of the Benelux countries. Flanders, West Netherlands and North Rhine-Westphalia have the highest share (in both relative and absolute terms) within the CCC area of international road transport provided by national transport companies.

4.2.2. Seaports and airports

Besides road, rail and inland waterway transport, sea and air transport fulfil an important role in the carriage of goods. The total amount of goods loaded and unloaded in seaports in the CCC area grew by 8% in the period 1980-89 and airfreight increased by over 62%. In both sea and air transport just a few ports are responsible for almost the entire volume of goods.

The seaports of Rotterdam (39%), Antwerp (12%), Le Havre (9.7%) and Dunkirk (7.6%) together have a share of almost 70% of the total volume of sea freight in the CCC area. Ports in South-East England together take 16%. The only region which experienced a decline in volume in the period 1980-89 was Upper Normandy. Nevertheless, Le Havre, as well as almost all other ports in the so-called Hamburg-Le Havre Range (HHR), showed an increase of volume in the period 1986-90. Though not a seaport, the inland harbour of Duisburg must be mentioned. This port fulfils an important role in inland waterway transport, mainly between Rotterdam and the Ruhr. In 1981, 54.1 million tonnes were shipped and in 1989, despite industrial decline (at least as measured by employment) this was still high at 53.1 million tonnes.

Table 4.2: Freight traffic in Hamburg-Le Havre range 1986-90

(m tonnes)

	1986	1990	% change
Rotterdam	258.1	287.8	11.5
Amsterdam	29.3	31.3	6.8
Hamburg	54.5	61.4	12.7
Antwerp	90.2	102.0	13.1
Ghent	24.2	23.2	0.0
Zeebrugge	15.1	30.2	100.0
Dunkirk	32.4	36.6	13.0
Le Havre	47.2	54.0	14.4
Total	580.5	658.1	13.4

Source: GHR 1991.

The development of seaports in South-East England (not covered in the table) has been driven primarily by the reorientation of British trade towards Europe and away from former Commonwealth trading partners. This process has seen Felixstowe (just outside the CCC-area boundary) and Dover grow to become the UK's largest container ports (respectively 15.6 and 12.7 million tonnes container and ro-ro transport in 1990). London (Tilbury) and Southampton showed equivalent throughputs of only 6.2 and 3.0 million tonnes; and handled 22 and 12 million tonnes of bulk goods.

About 70% of the volume shipped in the HHR consists of bulk goods, with Rotterdam taking half. However, in general the table shows a shift to general cargo, with an important share for containers. For general cargo, the position of Rotterdam is less dominant and the volume is more comparable with that handled by Antwerp. In HHR harbours the volume of general cargo increased 19% between 1987-90 and the volume of bulk goods increased by about 10% in the same period. The general cargo share of freight as a whole is currently 28%.

Similarly, just a few airports are shown to dominate air transport. Darmstadt (Frankfurt airport), the South-East (with the London airports), and Ile-de-France (Paris) have a share of over 70% of total air freight transport in the CCC area. North Holland (Amsterdam, 14.4%) and Brabant (Brussels, 6.0%) also have a relatively important share of air freight. While airports such as Cologne, Luxembourg, Maastricht and Düsseldorf have a regional importance in air-freight terms, their significance is limited on the north-west European scale. Generally all airports show increases in freight transport. Of the larger airports, Frankfurt, Schiphol and Zaventem are the fastest growing, with 74, 81 and 94% growth respectively in the period 1980-89.

Table 4.3: Major airport freight volume, 1983-89

(1 000 tonnes)

	1989		Average annual growth (%) 1983-89		Share in CCC (%)
Frankfurt		1 083		9.5	26.7
London total		932		7.7	23.0
London, Heathrow	692		6.7		
London, Gatwick	210		11.4		
London, Stansted	30		8.9		
Paris total		833		3.9	20.6
Paris, C. de Gaulle	585		2.7		
Paris, Orly	248		7.1		
Amsterdam		583		7.9	14.4
Brussels		243		12.2	6.0
Cologne		149		18.4	3.7
Luxembourg		127		12.7	3.1
Maastricht		55			1.4
Düsseldorf		44		6.0	1.1
Total CCC area		4 049			
Total EU		5 181		7.2	

Source: Panorama of EC industry, 1991.

4.2.3. Perspectives for seaports and airports

The facilities and infrastructure already present are an important basis for future developments. This goes all the more, because of the fact that with reference to both sea and airports a trend can be discerned i.e. the development of a limited number of locations where transport activities are concentrated. This does not mean, however, that patterns within regional transport markets will also change. To serve consumers it remains important to be located near the market. The change lies in the fact that several regional mar-

kets will be supplied from one main distribution centre instead of several. The thought behind this is that both in maritime and aviation circles a limited number of companies will arise that will be dominant in world markets and offer global services. On each continent only one or a few 'home ports' will be served. In aviation, this is called the hub and spoke system, in which the smaller airports will have a role as feeder airports. It is not clear yet how many primary ports will eventually emerge. It is obvious that the transit capacity and degree of service, together with the quality of the hinterland infrastructure will be strong determining factors for the selection of the individual ports. This development will lead to a certain clustering and thickening of the flow of goods and will be accompanied by a concentration of trade and distribution activities and perhaps also of production/assembling activities. The advantage of this on a spatial planning level would be that infrastructure provision can be restricted to main corridors in which the bulk of the goods are transported. Instead of having a fine maze of infrastructure cutting the landscape into small pieces, only a few infrastructure lines would remain, allowing preservation of larger unspoiled areas. Besides direct transit facilities, sea and airports will have to provide adequate physical infrastructure (storage and distribution space).

In France, stimulation of freight traffic by rail (as a part of a combined long distance road/rail transport strategy) is seen as a way of promoting the transit function of ports such as Le Havre and Dunkirk and of handling the resulting transit traffic. On some sections high-speed freight transport will be offered (160 km/hour), including the Lille-Marseille section, which underlines the potential of the Lille region and of a number of sections with Paris as the origin and destination.

Many operators of air and seaports are currently drawing up plans, and to an extent some are already at the stage of plan implementation. This is the case for all Belgian and Dutch seaports. There is no global plan for modernizing the French Channel ports. However there are specific programmes for each of them. The main changes concern the status of dock workers. The proposed changes will transform both the manpower management and broader economic strategies and are meant to increase the competitiveness of the ports, in particular by organizing their hinterland.

With regard to the seaports in the CCC area, those with the highest status seem to be Rotterdam and Antwerp. Although outside the CCC area, Hamburg can also be mentioned because of its influence on developments in both seaports. It is in these ports that the absolute increase in the flow of goods and trade and distribution activities is expected to be greatest and consequently also to have the greatest spatial impact. This expectation is supported by the attraction of port-related European distribution centres to the Randstad and the Brussels-Antwerp area.

The physical proximity of both ports and the presence of the smaller harbours of Zeebrugge, Ghent, Terneuzen and Vlissingen also leads to specific development potential for port-related trade and distribution activities in the area of the Rhine-Scheldt delta so distributing the benefits not only in South Holland and the region of Antwerp but also in East Flanders, the western part of North Brabant and parts of Zeeland.

As already noted, just a few airports in the CCC area dominate. They include Frankfurt, the London airports (especially Heathrow) and Paris (Charles de Gaulle). Amsterdam (Schiphol) holds a good fourth position. Zaventem (Brussels) however, could become a formidable competitor. Brussels could take advantage of its position and image as the seat of the EU, which could result in more airlines choosing Brussels as a hub. Also the Brussels/Antwerp area is well located for airport-related European distribution. However, to date, plans have lacked an integrated approach.

The share of other airports in the European air freight business will be limited. Excessive restrictions on night flights for the important airports could possibly change this situation because many freight couriers seek night flights. However, for the time being the advantage lies with the regions containing one of the few most important airports. This relates to Darmstadt, Greater London, Paris, North Holland and perhaps Brabant (Belgium). An increase in space consumption will mainly be noticeable in these regions. On the one hand there will be a greater concentration on the freight-handling capacity of the airport itself and,

on the other hand, pressures to establish business parks and lower order activities such as warehousing, transport, distribution, packing and assembly.

Bonn/Cologne, Charles de Gaulle, Frankfurt and Schiphol airports are already the subject of integrated and expansion orientated plans. Zaventem also has expansion plans. These airport hinterlands experience strong demands for space for distribution activities and to a lesser extent for offices. In such areas there is generally capacity for expansion of distribution activities though Zaventem and the London airports (except for Stansted) have spatial limitations in their immediate surroundings. The capacity of Frankfurt can be doubled by closing down the military activities.

In spite of the fact that air freight is the fastest growing part of the sector, the space which it occupies will be much less than the space occupied by seaports. Nevertheless, infrastructure and quality of the environment will be put under more pressure in the vicinity of airports. The fact that these areas are often preferred for office development results in extra pressure on the area surrounding the airports. This increases the demand for space which is usually in scarce supply and also pushes up land and property prices, as a result displacing the space-extensive distribution activities. The surroundings of Frankfurt airport are a good example of the working of this market principle.

4.2.4. The Channel Tunnel

The Channel Tunnel is an infrastructure project which will certainly affect future activity patterns. The new connection between Calais and Folkestone will probably attract mainly 'roll-on roll-off' transport. The two Channel ports could lose 30 to 35% of their traffic, while the other ports in Kent, Nord-Pas-de-Calais, West Flanders and Zeeland might lose 70% of the ro-ro traffic. Unaccompanied ro-ro freight, an important component for West Flanders, will probably be less affected by the Tunnel. For long distance transport between the UK and mainland Europe a slight swing is expected from road to rail transport, while the Tunnel will partly substitute for sea and air transport services between England and France. The regions best placed to profit as a result of the Channel Tunnel are concentrated in the London-Brussels-Paris triangle. On the other hand, economically 'grey' areas will arise in Normandy and Zeeland. It is not expected that the two biggest ports (Antwerp and Rotterdam) will experience much competition from the Tunnel. Their good transit facilities and distribution services are more important than a fast link under the Channel. Furthermore the Tunnel could even strengthen the advantages that are already enjoyed by the Netherlands and Belgium as centres for European distribution by easing access to the large market of South-East England.

The expectation is that in the year 2003 between 7 and 11 million tonnes of cargo (mostly containers) will be transported through the Tunnel. When these volumes are compared with those currently handled by the existing ports, the relatively minor importance of cross-Channel traffic compared to overall volumes of European freight movements is emphasized. Nevertheless it is expected that the regions at each end of the Tunnel (Kent in the UK, Nord-Pas-de-Calais in France) and the regions alongside the most important supply axes, albeit at some distance of the Tunnel itself, will profit the most.

Special mention must be made of the Lille region. This region is strategically situated compared to the more northerly parts of Europe both in relation to the Channel Tunnel and as an important junction on the HST network, giving it a key position in transport and distribution networks and offering more general economic potential. In this context, it should be noted that the expected effects of the Channel Tunnel can only be realized when good connections with the hinterland are provided. Even then, it is possible that Nord-Pas-de-Calais will follow a restrictive policy (like Austria and Switzerland) by rejecting uncontrolled growth of road transit traffic.

Although Kent is expected to benefit from the existence of the fixed link, neither it nor any other part of the South-East is expected to benefit to the same extent as the most favoured mainland regions because the UK is an island with a smaller market. Nevertheless, the opening of the

Channel Tunnel in 1994 is by far the largest infrastructure development of relevance to freight handling in South-East England. It is, in effect, an intermodal development with its source traffic coming from both rail and road. However, there is no governing intermodal policy in the UK, the Government relying essentially on market forces to determine modal choice. One weakness of this is that it is still not clear what the exact nature of rail freight services to the Tunnel will be, nor what their implications will be for regional development.

It must be emphasized that most infrastructure projects are intended to improve existing connections rather than create new ones. The rather robust pattern of the most important flows of goods and also of the persistent sectoral development character of the regions will not allow rapid structural change. However, infrastructure developments are crucial for the ultimate realization of regional potential or at least for the retention of current positions. In this sense, projects such as the Channel Tunnel, which are capable of bringing about an immediate change in the economic geography of regions, are an exception. It might take something of the scale of a future integrated European development of a high-speed freight traffic rail network or, still further in the future, movement of container traffic by pipeline to change this situation.

4.3. Emerging uniformity in the transmission of information

4.3.1. Present state of the telecommunications sector

Traditional services

Traditional telecommunications services are well provided for across all regions of the CCC area. This links the various regions, increases the quality of life in the CCC area and is seen as a strength for its economic development.

Compared to the EC area as a whole (50 lines/ km^2), the telephone network in the CCC area is very dense (158 lines/ km^2) (see Map 4.5). The pattern largely coincides with that shown by population density. The main lines are important elements of the basic service network. Almost all other traditional and new services, e.g. telex and facsimile, are connected to this network. The number of the lines of these services grows with the degree of digitization and integration of the system. It is important that the basic network is integrated in all regions of the CCC area.

As a result of the high density of this basic network, all regions of the CCC area have a good starting point for the introduction of new and advanced services. The CCC area has a telephone penetration of 48 main sets per 100 inhabitants. Telephone penetration is lower than average in Belgium, and in parts of some German regions and parts of South-East England. Higher than average densities are found in France, the Grand Duchy of Luxembourg and some German regions. The number of main telephone sets per line (1.03) is higher than in the EC area (0.86). Hence, the network is fully used. In the UK and Belgium, the take-up rate remains below 1.0, which means that there is still capacity left in the systems. In Luxembourg and the Netherlands the rate is nearer 1.2 main sets per line, which indicates a more intensive use of the network.

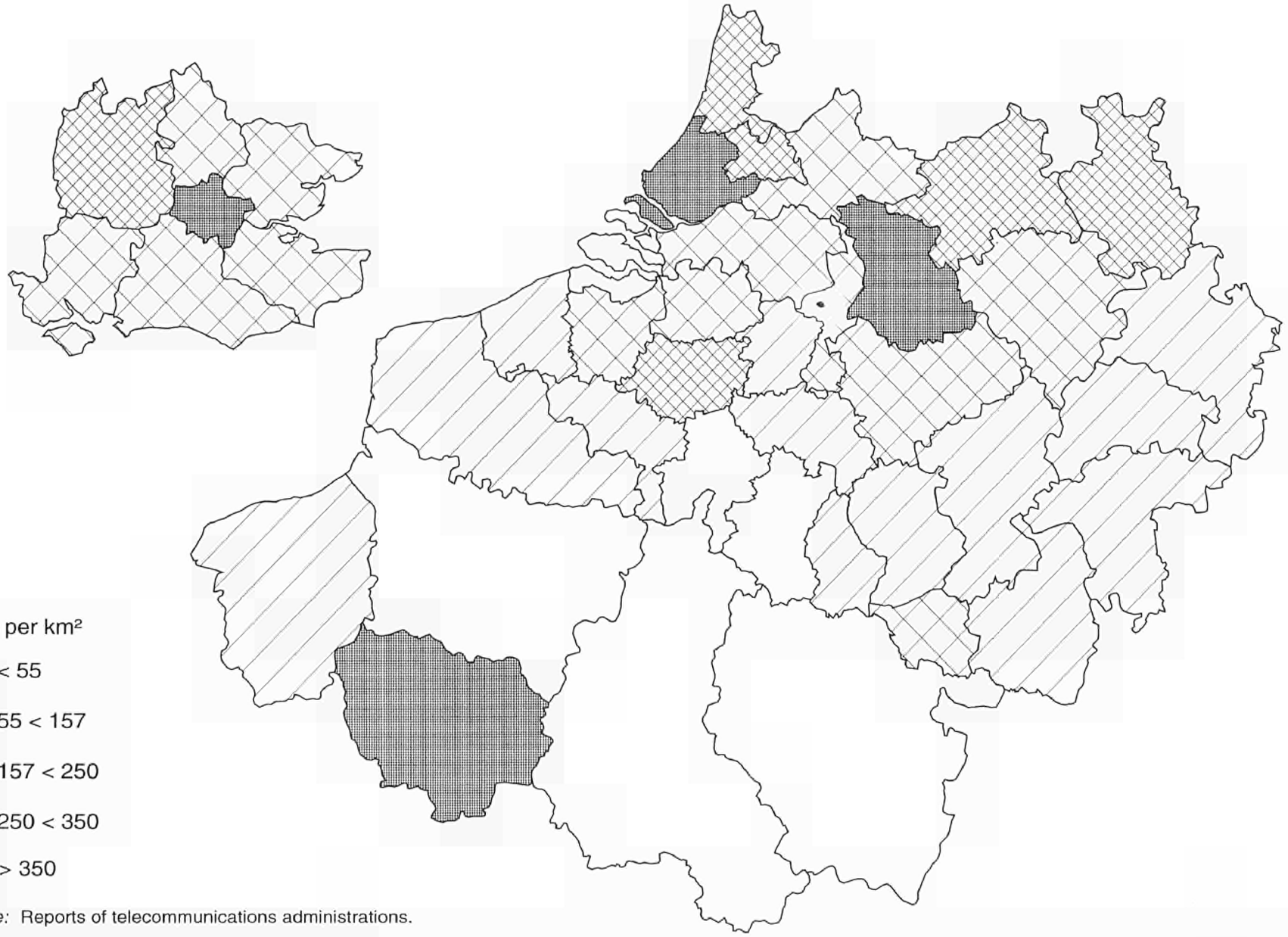
Every region of the CCC area has theoretical access to a cable television network. Important limitations in practice are the regulatory situation and, to a lesser extent, the fact that the choice of TV stations diffused by cable, is determined by the provider company. New technologies in TV broadcasting are the direct broadcasting satellites (DBS): Germany, France and the UK each have a DBS in orbit already and high-definition television (HDTV).

The number of telex connections has declined during the last two years. Telex is still used more extensively in the United Kingdom and Germany because of their important relationships with former overseas trading partners and the East European countries respectively. Telefax became widespread during the 1989s as a result of its lower costs and user-friendliness.

Videotext services are most widespread in France where a Minitel terminal has become part

Map 4.5

Density of the basic telecommunications network, end 1990



Source: Reports of telecommunications administrations.

of daily life for millions of households. The French situation demonstrates a demand for and acceptance of this service by the public at large. Germany and the Grand Duchy of Luxembourg are taking steps to allow interconnection of their systems to the French videotext network.

New and advanced services

New and advanced services have been introduced rapidly into the CCC area. There are no technical limitations to their introduction. This is seen as a strength for the development of the CCC area. ISDN determines the possibilities; new transmission technologies influence the transmission speed and capacity. The introduction of ISDN and new broadband transmission technologies encourage the development of future services. The most important links in ISDN, necessary for the integration of the total CCC area, are indicated as the 'electronic highways' of Map 4.6. Some locations in the CCC area offer more and/or new advanced services in telecommunications. The presence of such services gives the location a nodal function. The region around such a node benefits from this equipment if a direct link between them is present.

Such nodes are more equally spread in Germany, Belgium and the Grand Duchy of Luxembourg than in the French, Dutch and British parts of the CCC area. Three or more nodes are usually found in urban areas of at least 100 000 inhabitants. Urban areas of primary interest are Paris, Brussels, London, Lille, Utrecht, Cologne and Frankfurt; they offer additional services, such as the location of a research or control centre for advanced telecommunications services or a teleport, and/or basic nodes in the ISDN broadband network.

Optical fibres can carry almost unlimited amounts of information. Initially, they are being introduced in world-wide and transnational links. A transatlantic submarine optical fibre cable connects the UK with North America. Undersea cables also provide physical connections between the UK and the European mainland.

Satellites can be used to transmit point-to-point telecommunications as well as to broadcast television programmes point-to-multipoint at the head ends of cable TV networks. In Europe the Eutelsat satellite system is currently being used mainly for broadcasting purposes. The Eutelsat I-F2 satellite provides space segment capacity for digital circuits via the satellite multiservice system which can be used for a wide range of intra-European international business services, such as high-speed data transmission, and videoconferencing.

Incompatibilities

Specific national systems, limited geographical use of new services, congestion and different tariff principles prevent the capabilities of the various systems being used to their full extent and hinder the integration of the CCC area. This is a weakness for the development of the CCC area.

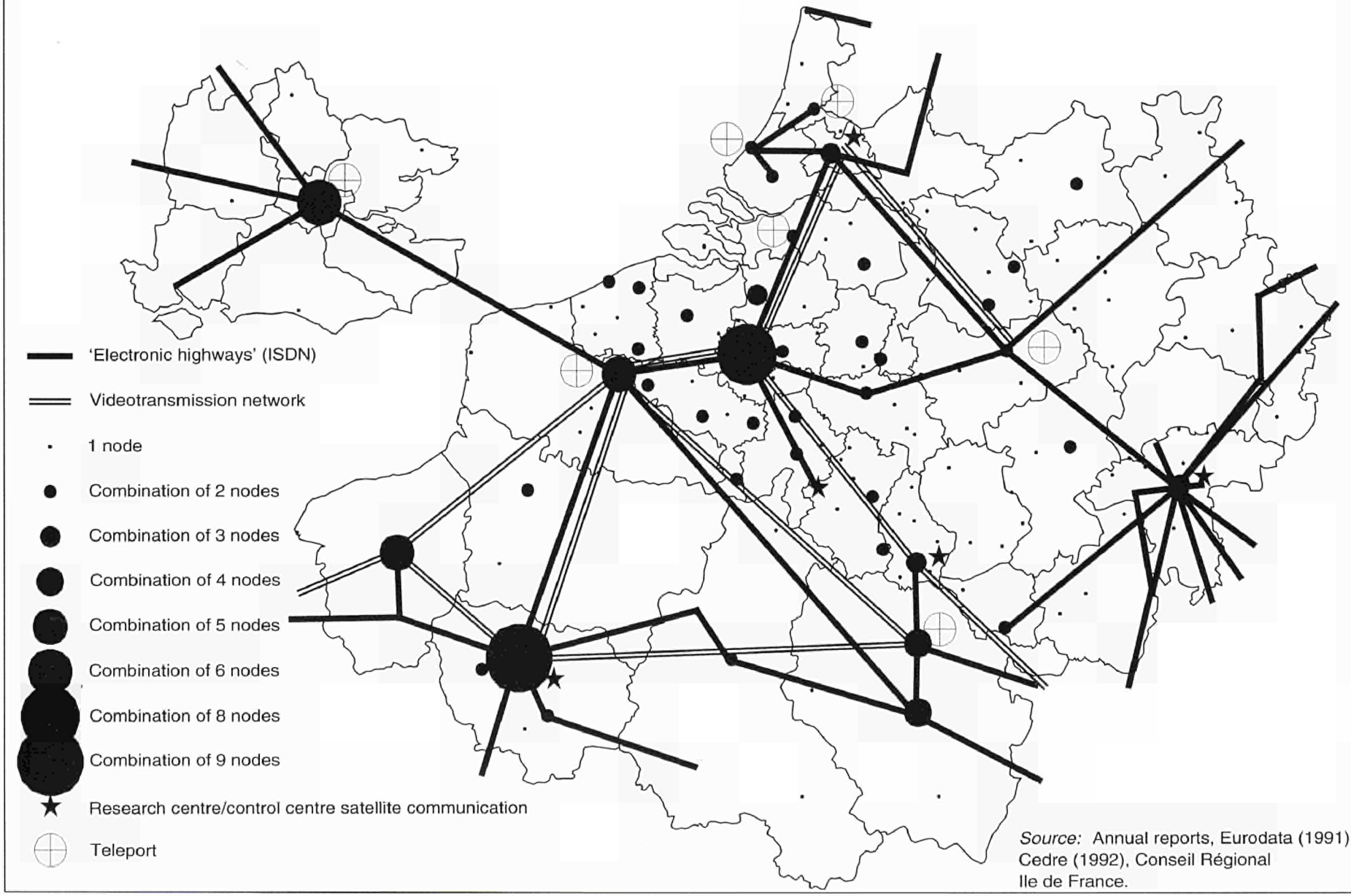
Incompatibilities exist in the CCC area as not all types of telecommunication can be used everywhere. Service breaks follow national boundaries. Only in the case of telephone services are no incompatibilities found. Within the CCC area, the UK is the most 'isolated' country. The CCC area is divided into four blocks: the UK which is totally on its own (except for telephones); France has the best connections with Germany (radio-paging and videotext); Germany and the Benelux countries each have their own videotext system.

Mobile phones cannot be used in some French and German areas, as well as along the borders of the Benelux countries. Belgium and the UK face congestion problems. The mobile phone system is mostly used in urban areas. The reservation of frequency bands for the pan-European digital mobile service allows no further expansion of the existing analogue systems. New investment projects in Belgium, Germany and the UK are designed to facilitate the creation of a common system.

Just as for telephone services 30 years ago, the demand for and introduction of new and advanced telecommunication services arises in the business environment. The financial and insurance sector has a leading position in the use of new and advanced services, whereby the exchange of money is translated into data transmission. No wonder that the most important nodes in

Map 4.6

Telecommunication nodes for telephone, teleconferencing, videoconferencing videotransmission, semaphone, matitime satellite station, situation 1990



Source: Annual reports, Eurodata (1991), Cedre (1992), Conseil Régional Ile de France.

the telecommunication network coincide with the leading financial centres, all of them being important urban areas; all three characteristics are, no doubt, mutually reinforcing.

Compared to the United States, the European market for satellite communications is strictly regulated. EU Member States have launched different satellites for different goals. The total integration of the network requires standardization of interfaces and terminals, specification of the number of end-to-end services to be provided, with universal availability and general tariff principles to ensure open use of the network infrastructure.

4.3.2. Future trends and spatial evolution

Supply

Continuing technical integration of the telecommunication network is seen as important for the development of the CCC area. The existence of a common network with a high-carrying capacity will reinforce the implementation and use of standards allowing the realization of an advanced telecommunications network. In these ways, telecommunication facilities become important elements in the strategy for future development. Outlines for this strategy are published in the Green Paper on Telecommunications by the European Commission. The availability of a cross-frontier communication network in ISDN and a European digital mobile radio network will be two important projects towards the year 2000 (Map 4.7).

The Green Paper aims at a penetration rate for ISDN of 80% by the year 2000. In the Benelux countries, this target will be reached after the year 2000. The expected network of electronic highways for 2000 compared with 1990 shows a number of spatial changes. The seven existing nodes of primary interest strengthen their position in the network. These nodes are joined by five new nodes: Rouen, Metz, Kassel, Amsterdam and The Hague. Other important urban areas (e.g. Antwerp, Eindhoven, Dortmund) become secondary poles.

ISDN introduction and integration make the implementation of advanced trans-European services possible. Examples are Euronet, which allows the interchange of data between data terminals at high speed; and the Ovide system for Videotext. A total integration of all telecommunication services will be reached through the integrated broadband communications network (IBCN), but it would be rather optimistic to expect that the inauguration of the IBCN will take place before the target year 1995. With a similar time lag, broadcasting services will already have started to expand the application of HDTV, which will require the introduction of DBS and VSAT systems. From 1995 on, it is expected that they will become fully operational and widespread in Europe. However, this implies a more flexible regulatory framework and more effective coordination. These comments are not unique to the CCC area but apply to Europe as a whole.

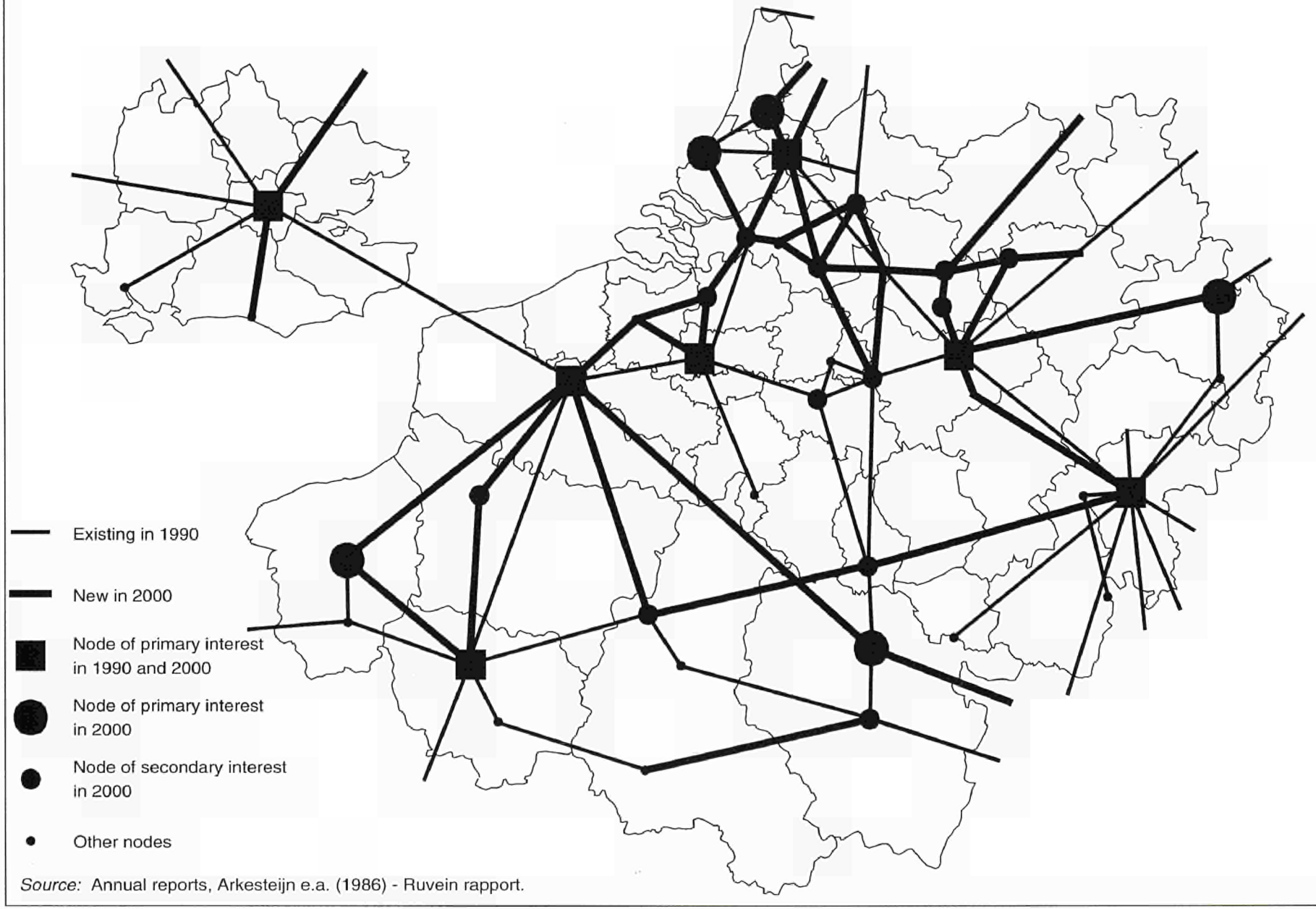
In the longer term, satellite communications will increasingly face competition from fibre optics, even for international communications (undersea cables). Transmission via satellite has a very small retarding effect. However, satellite communications will remain important for long-distance mobile communications. Inmarsat, which was created for maritime communications, plans services in land mobile communications using small 'Standard C' dish antennae which could be located on trucks for low data rate services and telex.

Urban and economically strong areas are the first to be supplied with new and advanced technologies. This means that the competitive potential of urban areas will tend to be strengthened to the disadvantage of peripheral and rural areas. In this context, telecommunication services are becoming an important element in regional competitiveness.

The application of new telecommunication services may also create some opportunities for growth in rural areas and for balancing economic development in the CCC area. Perpetuating regional differences can lead to a stronger polarization in the regions of the CCC area, or the creation of 'pass-through' regions. This is a threat to the prosperity and development of the regions affected, but also to for the integration of the CCC

Map 4.7

Electronic highways (ISDN), situation 2000



Source: Annual reports, Arkesteijn e.a. (1986) - Ruvein rapport.

area. Tele- (or home-) working will reduce home to work displacement and enable workers living in rural areas to share in the opportunities of successful economies. In this context, teleworking merits continued attention. The introduction of teleworking is still in its preliminary stages (e.g. in Purmerend in the Randstad and through the Frontline project in the UK) since extensive application of the idea still encounters the opposition of social organizations. Exploratory research in the Netherlands shows that in most cases not more than 20 to 30% of the work can be done using existing communication technologies. Based on US experience, when new technologies are available this may increase to 60%.

Demand

Open attitudes towards telecommunication would reinforce the development of new services and open new markets for specialized information technologies, so creating new private sector opportunities. The availability of new transmission technologies and advanced services will lead to huge increases in the use of the networks in both the business and private spheres. The number of users of the mobile system in the CCC area is expected to exceed 2.5 million in 1996. In households the possession of a second telephone will become more common. The introduction of information-related services will have an impact on private lifestyles, e.g. telebanking, telepublishing or home shopping.

The widespread availability of telecommunication services may impact on the location patterns of economic activities. In theory it offers the opportunity to balance economic development between urban and rural areas. In practice, experience to date does not point to the necessary development of growth foci to alter the balance of advantage between economic centres.

Telecommunications are not expected to create important spatial shifts within the CCC area before the turn of the century. There is evidence of a limited tendency for some decentralization of specific parts of larger companies, mainly of what are referred to as back-office activities. This trend is mainly a London phenomenon. Meanwhile, the consensus is that decision units on different levels will increasingly concentrate in a limited number of 'world centres' (see also the chapter on business services and headquarters functions).

The impact of telecommunication services on the number of traffic movements is ambiguous. The telecommunication networks enable environmentally friendly ways of exchange. This is a major strength and an opportunity for the development of the CCC area. New and advanced services will reduce the need for journeys of various kinds. This takes place against the background of increasing recreational traffic and in of *ad hoc* face-to-face contacts for quick and clear decision-making.

4.4. Towards an integrated energy transmission network

4.4.1. Supply and transmission

Security of energy supply is greatest where there is a high diversification of energy sources. The total final demand in the CCC area is projected to increase by 12% in the period 1980-2000. Electricity and natural gas are expected to increase their share of final consumption of energy in the CCC countries in the period 1980-2000. The consumption of heat recovered from electricity plants, and of geothermal heat, is increasing rapidly but shares of total consumption will remain limited.

There are important differences between the CCC countries in the share of energy sources in final energy consumption. Almost half of the final energy consumption in the year 2000 in the Netherlands (an important gas producer) will be covered by gas compared with about a quarter in the CCC countries as a whole. About 22% of consumption in France will be of electricity against an 18% average in CCC countries. Energy supply security is positively influenced by the dense and technically reliable internal transmission network, which is undoubtedly a strength of the CCC area.

All the Member States have oil stocks equivalent to at least 90 days' oil consumption. Crude oil

pipelines serve to connect oil fields, ports and refineries with each other. Only Picardy, south-eastern Wallonia, the Grand Duchy of Luxembourg and North Hessen are not or only partially connected to the oil pipeline grid (see Map 4.8). Compared to the rest of the European regions, the CCC area has a well-developed gas transmission network. The southern part of Wallonia, the centre of Champagne-Ardennes and the the Grand Duchy of Luxembourg, however, are not connected with major gas pipelines (see Map 4.9). The CCC area has a well-developed electricity transmission network. Only Luxembourg (B), the Grand Duchy of Luxembourg, West Flanders and a part of Lorraine are less well connected to the high tension network (see map 4.10). Given the planned high tension links between France and Wallonia, the Grand Duchy of Luxembourg and Germany, and the planned new plants in West Flanders, this will change in the foreseeable future.

4.4.2. Energy dependency and emissions

Energy security is negatively influenced by the very high energy dependency rate. Most of the regions in the CCC area reach a dependency rate for fossil fuels of nearly 100%. The average dependency rate for fossil fuels in the CCC countries fell from 44.4% in 1980 to 38.3% in 1990 (given the expansion of nuclear energy), but is forecast to increase again to 47% by the year 2000.

Hard coal is still mined in North Rhine-Westphalia, Lorraine and Saarland. Lignite is also produced in North Rhine-Westphalia. The CCC area has very limited land-based oil exploitation. There is some production in South-East England, West Netherlands, Rhineland-Pfalz, Ile-de-France, Lorraine and Champagne-Ardennes. Off-shore oil production is limited to the area facing West Netherlands. Gas fields (off-shore and on-land) are found in West Netherlands, South-East England and Hessen.

Hard coal is imported by all regions of the CCC area; only North Rhine-Westphalia can export one third of its production. Lignite is used for the generation of electricity. With the exception of North Rhine-Westphalia, Saarland and Lorraine, all other regions of the CCC area import almost 100% of their solid fuel consumption. Because of limited oil production in the regions of the CCC area, oil imports cover almost 100% of regional consumption everywhere except for West Netherlands.

4.4.3. Integrating the transmission networks

The EU policy of integrating the energy transmission networks will lead to higher energy security and a more efficient energy production/distribution.

In general, the following advantages of integration can be listed:

(a) security of energy supply if one of the external supplies is interrupted;

(b) increased competition between energy companies will lead to economic gains;

(c) diversification of primary energy sources to reduce the dependency on oil;

(d) increased cooperation with third countries; and

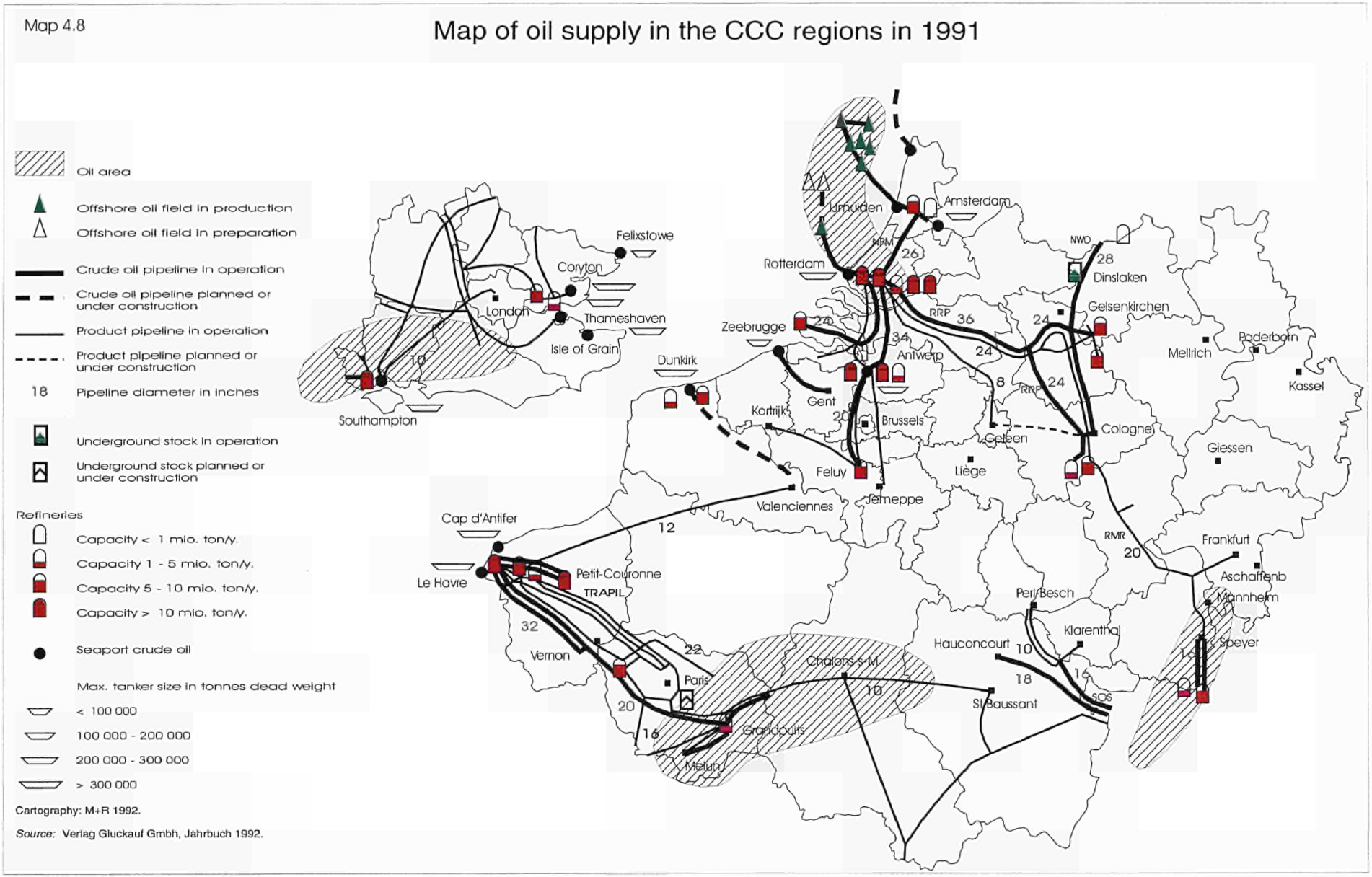
(e) more efficient use of existing energy production plants.

Gas transmission network

Projected future growth in natural gas consumption cannot happen without an extension of transmission networks, which in turn implies increasing integration of existing national networks. A variety of measures and initiatives will be required to integrate national markets. Such measures include the development of interconnections, not least the establishment or improvement of connections with third countries, e.g. with gas fields in Norway. Furthermore, gas transactions will be involved between European gas companies to reduce costly transmissions over long distances; and there will be a need for information exchanges between control centres to enable the

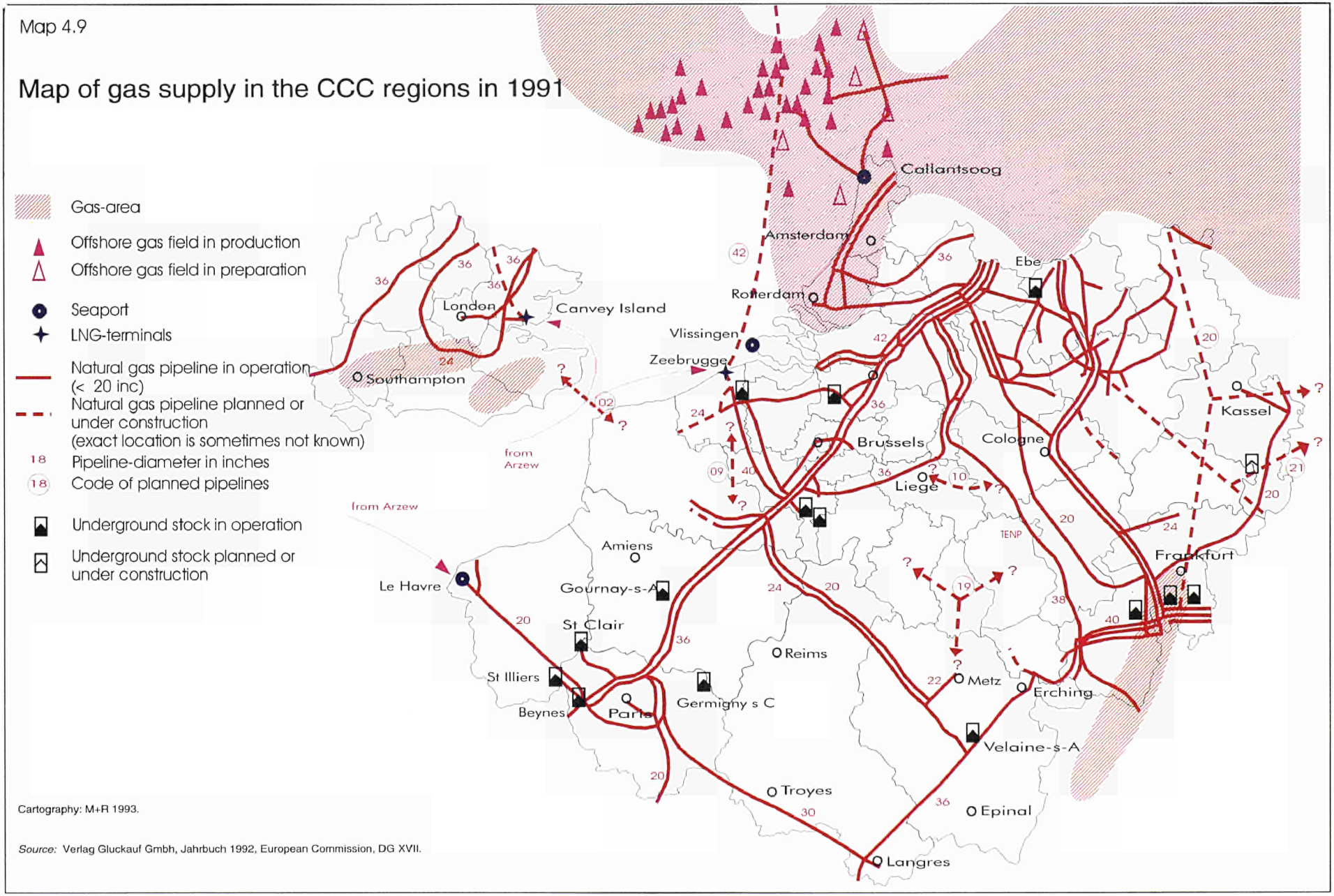
Map 4.8

Map of oil supply in the CCC regions in 1991



Map 4.9

Map of gas supply in the CCC regions in 1991

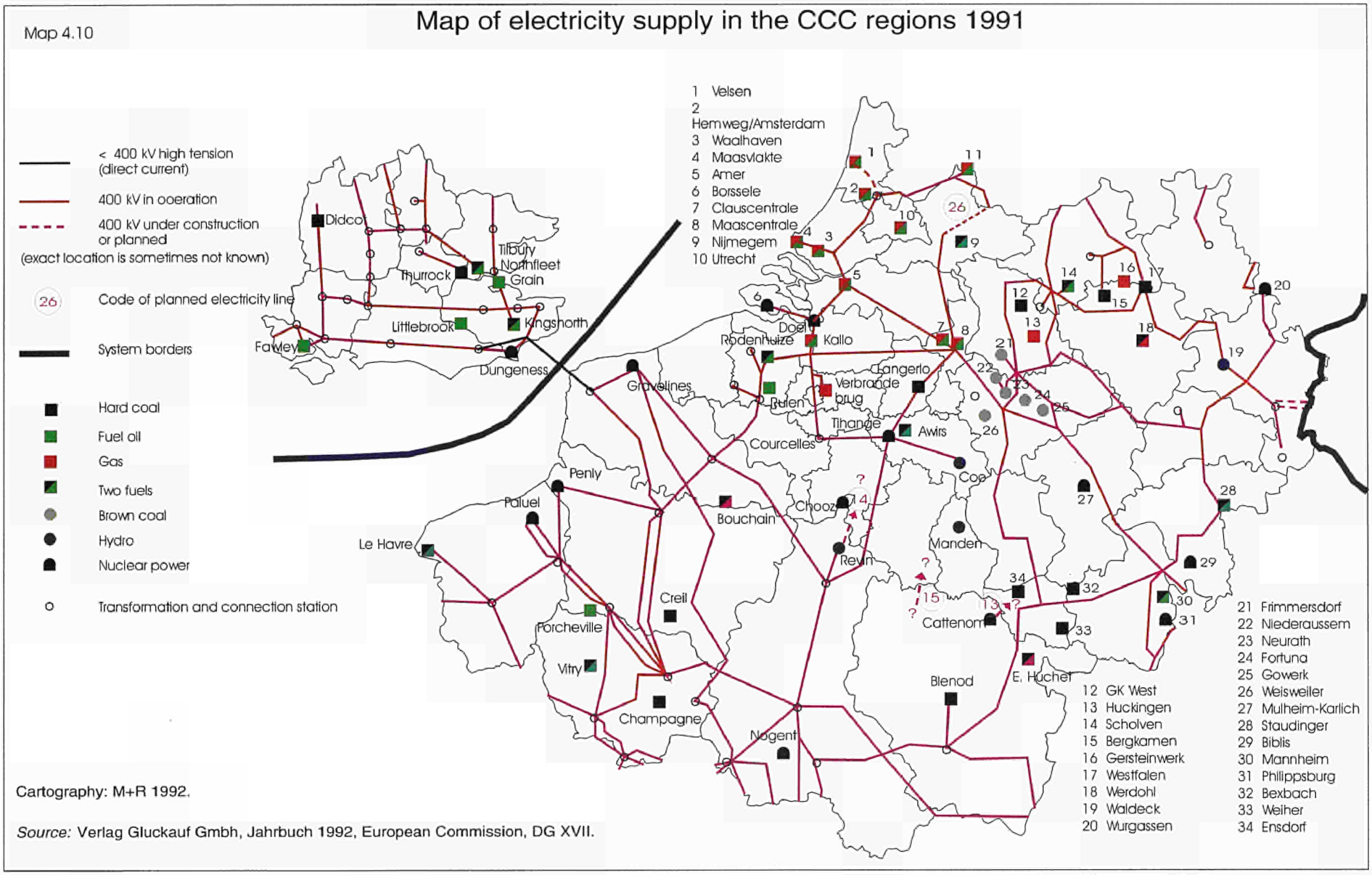


Cartography: M+R 1993.

Source: Verlag Gluckauf Gmbh, Jahrbuch 1992, European Commission, DG XVII.

Map 4.10

Map of electricity supply in the CCC regions 1991



Cartography: M+R 1992.

Source: Verlag Gluckauf Gmbh, Jahrbuch 1992, European Commission, DG XVII.

most efficient use of the main gas transmission and storage infrastructure. This system would progressively lead to the establishment of truly operational, technical cooperation between the European gas transmission networks, so exploiting all the possibilities of the interconnected system. A fourth measure can be mentioned, namely the renting of underground gas storage facilities to other gas companies in the Community which, for geological reasons, cannot establish their own facilities. Finally, mutual assistance arrangements between gas companies will be needed in order to deal with a total or partial interruption of imports in one or more Member States. The most important and urgent investments in gas transmission/infrastructure are located outside the CCC area.

Electricity transmission networks

The integration of electricity markets will be achieved as the following measures are taken. Firstly, the existing transmission capacities of networks will need to be used more intensively. This is possible through the improvement of information exchange between the control centres of the electricity networks and the use of more advanced equipment for network management and voltage control. Secondly, the existing interconnections are to be strengthened, and new ones are to be created. Interconnection projects planned by companies for 1995 meet three types of need, namely the connection of national systems with the Community network; the strengthening of existing EU networks, e.g. possible doubling of the France-UK submarine link, or the extension of the links between France and other countries; and lastly, creating and increasing interconnections between the EU and non-member countries.

4.5. Conclusion

Accessibility within the CCC area is very high. This is the result of the dense pattern of the infrastructure networks; of the existing relationships and connections between the national networks and systems; and of the presence of large sea and airports. The existence of transport infrastructure, 'electronic highways' (telecommunication infrastructure) and the internal transmission network (energy carrying infrastructure) illustrate this, together with the transborder and intercity relations within this area. This leads to the current interregional passenger flows, information and energy carriers to and within the CCC area, so facilitating the equal development of all regions in the CCC area.

This objective is hampered by the existence of capacity problems, such as are faced by some of the transport and telecommunication modes in larger urban areas. The missing links in the (transport) network of Eurocorridors prevent them from functioning well. Border effects, which are found in the telecommunication and transport networks due to differences in the applied technology and tariff systems, also counter the favourable starting position. The three factors, capacity constraints, missing links and border effects, limit the development of the areas in which they occur.

Planned new infrastructure networks and their integration with existing infrastructure will lead to more efficient use of the networks as a whole. The construction of the HST network and the completion of the main motorway network will reinforce the emerging Eurocorridors. The HST network will add extra transport capacity in a period of growing mobility, as well as capacity reserves. HST stations in the centre of larger urban areas offer the opportunity to help to reduce traffic congestion in these places. In such ways, new development can help to address the weaknesses of the existing networks.

Major urban areas tend to be served first and best by new infrastructure, in that this favours the areas (congested cities and border areas) with the greatest current problems and it can be regarded as helpful. However, new infrastructure also produces spatial shifts and fresh disparities. This can be seen both in the transport and the telecommunication sector. In particular, enhancement of the Eurocorridors, to the extent that they do not integrate all regions of the CCC area, enlarges regional differences in accessibility. Rural areas through which infrastructure passes without connection have to deal both with import-

ant negative barrier effects and with environmental damage.

The CCC area has an important transit function, especially evident in the West Netherlands and North Rhine-Westphalia regions. The CCC area has a concentration of large harbours and airports. Nearly all of these port areas are currently undertaking development in order to keep their competitive edge in the 1990s and beyond. The dominant change in the spatial pattern is one of a growing concentration of freight transport in a limited number of harbours and airports. The Channel Tunnel will have no major spatial impact on the pattern of the most important flows of goods in the CCC area.

Although the application of new telecommunication services will help to integrate rural areas into the wider economy, a major shift in economic activities is not to be expected in the short to medium term. Perpetuating regional differences can lead towards more polarization between the regions of the CCC area, or to the creation of 'pass through' regions. On top of that, the trend to locate an activity away from the traditional centres, towards the highly valued 'green sites' can lead to more suburbanization pressures. This is seen as undesirable for the development of the regions affected.

Rural and peripheral regions will have to rely on improved traditional transport infrastructure connecting the main nodal points with all their new infrastructures in the main Eurocorridor network. Linkage to intermodal and nodal facilities will become more important assets for the development of urban regions than the simple presence or absence of infrastructure.

New infrastructure projects contribute to the improvement of the spatial quality. They will be essential given the growing importance of the 'sustainable development principle'. The new HST network is friendlier to the environment than the other transport modes, in terms of space and energy consumption, congestion and safety. Telecommunication enables environmentally friendly ways of exchange. The application of new telecommunication services brings new opportunities in the private sphere, e.g. teleworking, telebanking and teleshopping.

Further integration of the energy transmission networks can lead to more energy security and more efficient energy production and distribution.

New developments can lead to the reduction of SO_2 and NO_x emissions, which is seen as an opportunity for the continued development of the CCC area.

5. Environmental potentials and threats

Introduction: The relevance of environmental issues for regional development

Spatial and environmental quality are increasingly important topics in spatial planning and regional development. So-called 'life-support' systems and structures can threaten activities such as agriculture (diminishing yields because of acidification), forestry, fishery, the conservation of drinking water, nature conservation and development, and recreation. The living environment is threatened, e.g. visual, noise and air pollution, as well as health problems and the impact on cultural heritage and infrastructure.

5.1. Environmental issues

5.1.1. Rivers as a basic structure of the CCC area

Pollution in rivers in the CCC area

The quality of river water is not the same in every region. In general, river water is well aerated but organic loadings are still high. In some cases, serious oxygen problems remain, for example, in the River Scheldt; notwithstanding the considerable reduction of organic pollution as a result of sewage treatment, this form of pollution remains serious, especially in the River Seine. Eutrophication threatens many rivers, e.g. River Scheldt exceeds the acceptable standards for nitrate and/or phosphate levels by more than five times. Eutrophic rivers contribute heavily to the eutrophication of backwaters and coastal waters. Agricultural activities substantially contribute to the nitrogen and phosphorus loadings of surface waters (see Map 5.1 for the boundaries of the river catchment areas).

In South-East England, the proportion of river stretches of poor and bad quality is significantly lower than in the rest of England and Wales (good quality: 65%; fair quality: 29%; poor and bad quality: 6%).

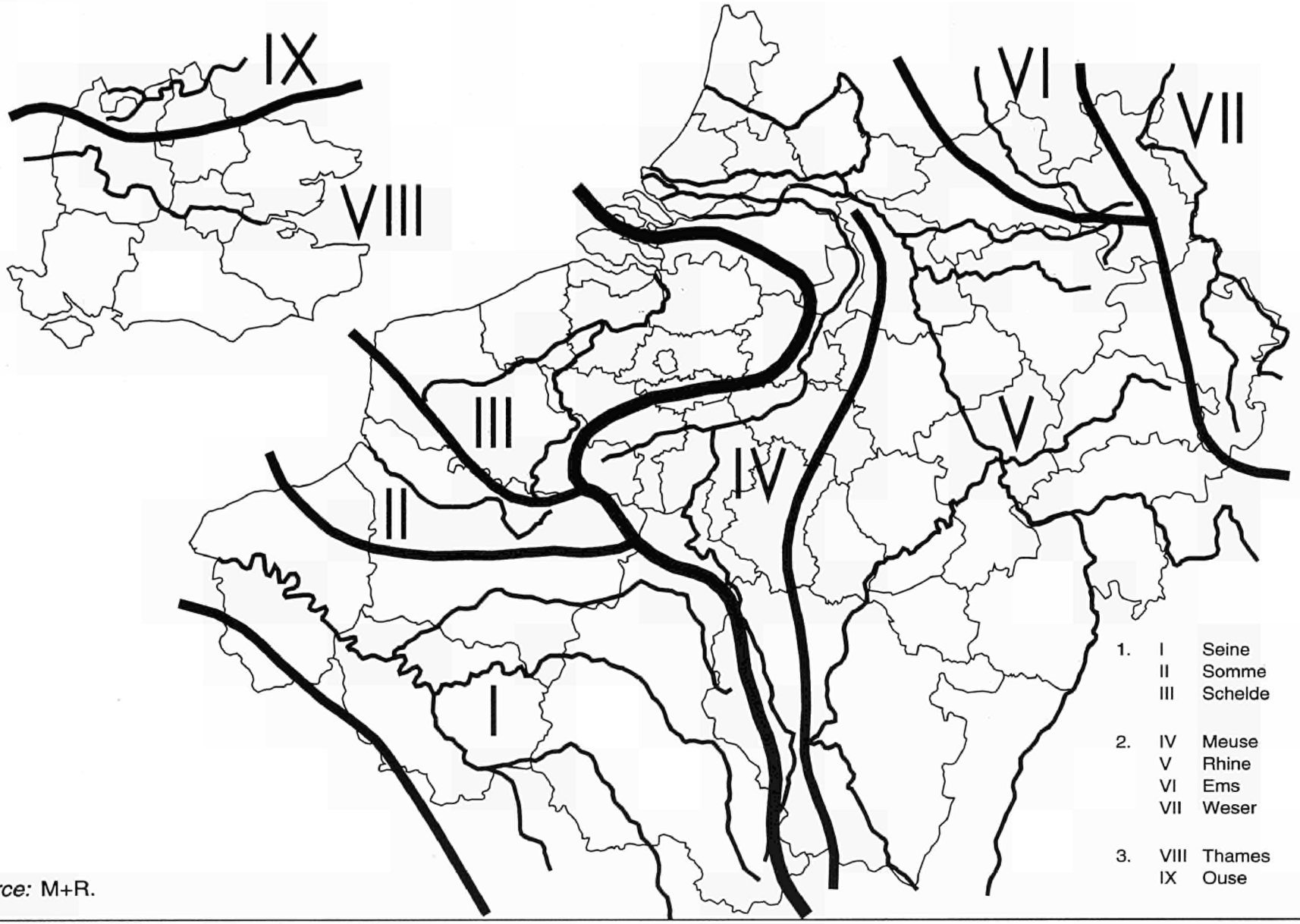
In the French part of the CCC area, most problems arise in rivers to the north (the Marque and the Scarpe), as well as in the Seine basin. Other rivers, such as the Sambre, the Scheldt and the wateringues region are of moderate quality. Only 40% of the sewerage water is treated.

In Belgium, most problems are to be found in the north (Flanders and Brussels). Most Flemish rivers are heavily polluted, whilst the Leie, the Dender and the Zenne are extremely polluted. The Zenne receives untreated waste water from Brussels; this directly affects the quality of the Scheldt of which the Zenne is a tributary. In Flanders, a major investment programme for the collection and treatment of waste water is being implemented. The Zenne and Dender are polluted in Wallonia as well.

In the German part of the CCC area, waste water purification measures have been stepped up

Map 5.1

River catchment areas: the base of the environmental structure



Source: M+R.

since the 1970s and have led to an improvement in the biological quality of running water, e.g. significant progress has been made in cleaning up the waters of the River Rhine.

5.1.2. Groundwater, soil and vegetation

Positive environmental potentials for regional development

In general, soil and climatic conditions in the CCC area are favourable to agriculture. Most soils are fertile and pose few or no limitations on agricultural production. The diversity of soil and vegetation types provides important opportunities for regional development, especially for agriculture and forestry. Moreover, the lack of major drought problems or excessive rainfall are important considerations both for agriculture and living conditions.

However, intensive land use in Europe results in continuously changing land and soil conditions. As a consequence, soil properties are heavily disturbed in a great number of places and groundwater is being threatened on a large scale. This is illustrated in the following points.

Nitrates

Agriculture is an important source for a dispersed contamination of soil and groundwater. The present situation for nitrate leachate in agricultural soils (combination of high nitrate supply and soils highly sensitive to nitrate leaching) shows high concentrations (50 to 100 mg/l and more) in the whole of Belgium, South and East Netherlands, parts of Nord-Pas-de-Calais and Picardy, North Rhine-Westphalia, Hessen and Rhineland-Pfalz.

As a result, the EU standard for nitrates in drinking water is exceeded in 20% of the groundwater underlying agricultural soils in the EU. More specifically, South-East England, Belgium, South Netherlands, North Rhine-Westphalia, Picardy and Ile-de-France are threatened (see Map 5.2).

Pesticides

Pesticides threaten groundwater in all regions of the CCC area. Pesticide leaching creates the necessity to purify drinking water, and a concentration of pesticides in top soils may hamper crop growth (see Map 5.3).

It has been calculated that the EU standard for the sum of pesticides (0.5 µg/l) will be exceeded in 65% of all agricultural land in the CCC area. In approximately 25% of the area this standard will be exceeded by more than 10 times. This is particularly true for Flanders, and South and East Netherlands. Very high pesticide loadings (10 kg/ha and higher) are often used on highly sensitive soils. During the past five years, the amounts used (expressed as kg active ingredients) in countries of the EU-area seem to have stabilized. Average pesticide loadings are high in vegetable and fruit cultures (all pesticides), and in potato and sugar beet crops.

Persistent pollutants

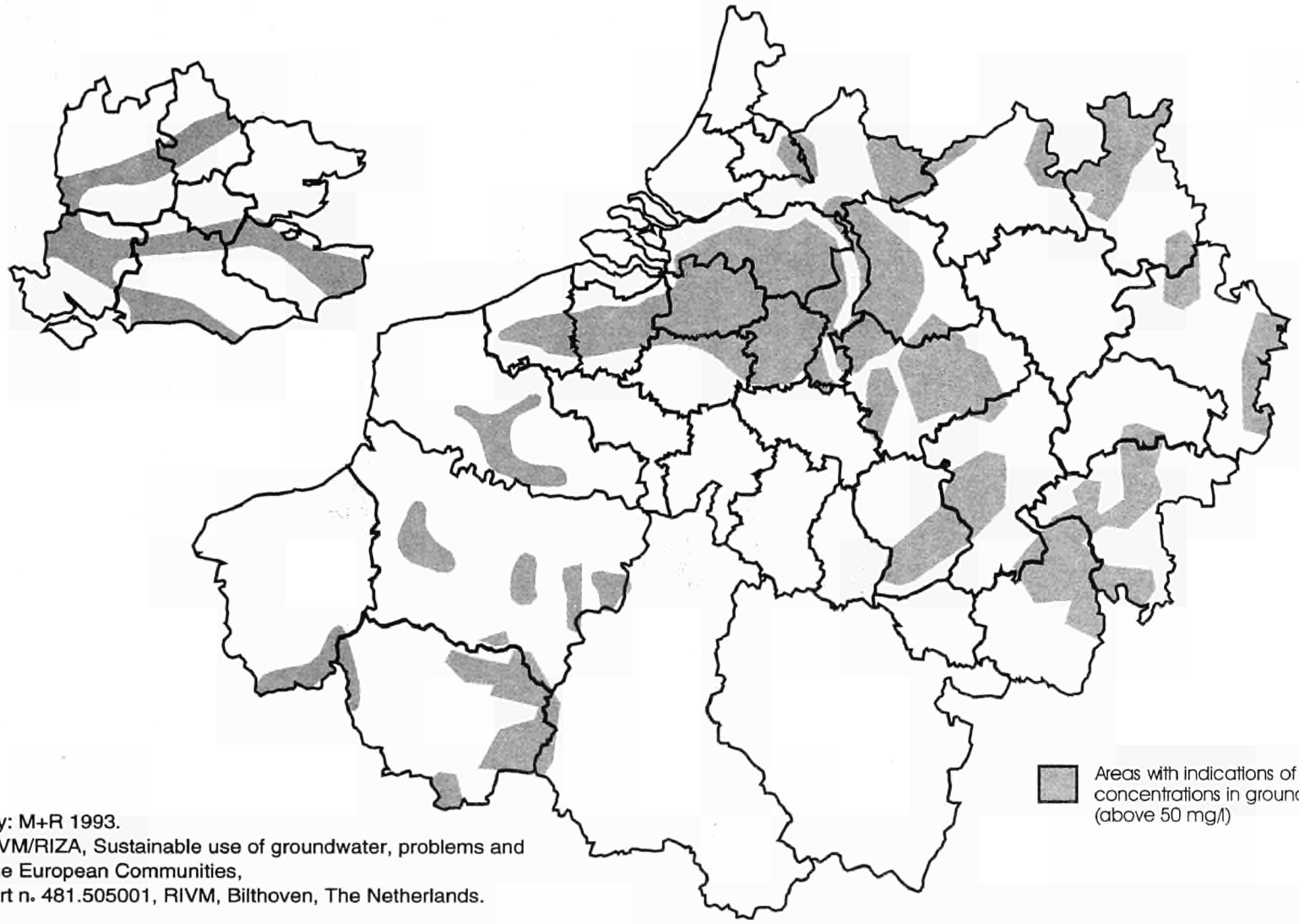
The accumulation of persistent pollutants, such as heavy metals and certain organic compounds, in top soils and sediments poses a significant threat. By way of example, the computed cadmium accumulation in top soil over the last 100 years has increased markedly in Champagne-Ardennes, Lorraine, parts of Nord-Pas-de-Calais, Picardy, Normandy, East and West Netherlands and North Rhine-Westphalia.

Under changing environmental conditions (soil acidity, climate), these pollutants may suddenly be released, with substantial implications for ecosystems and human health. For example, the computed cadmium concentration in soil water poses high ecological risks in parts of Belgium, South Netherlands, the Saarland, Rhineland-Pfalz and Hessen.

The number of point-source pollutants due to urban and industrial activity, creating a threat to the sustainable use of soil and groundwater, seems to be very large. Groundwater is expected to be contaminated as a result of waste disposal by landfilling in South-East England, Flanders,

Map 5.2

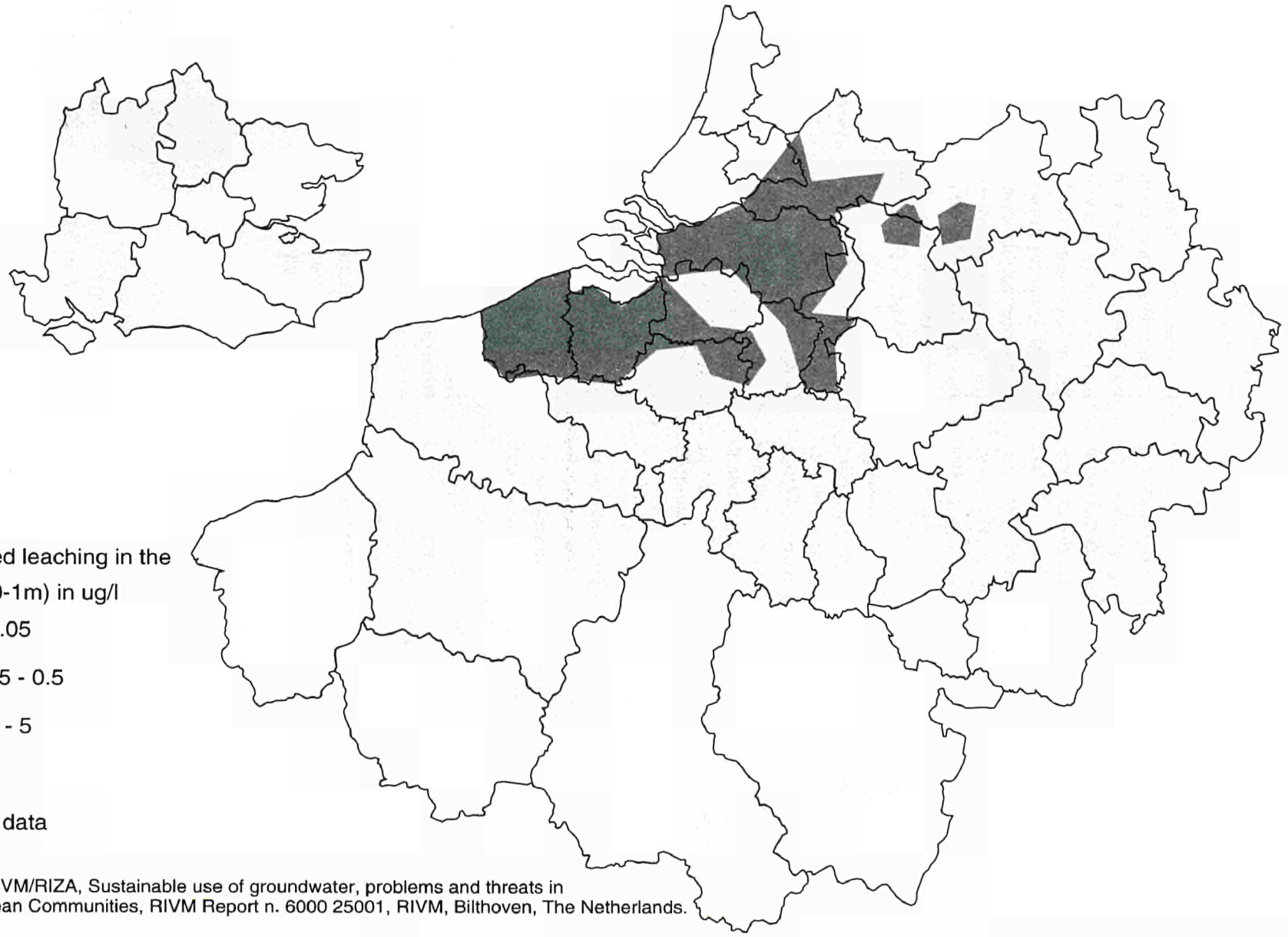
Concentration of nitrate in the groundwater



Cartography: M+R 1993.
Source: RIVM/RIZA, Sustainable use of groundwater, problems and threats in the European Communities,
RIVM Report n. 481.505001, RIVM, Bilthoven, The Netherlands.

Map 5.3

Pesticide leaching in arable soils in Europe



Source: RIVM/RIZA, Sustainable use of groundwater, problems and threats in the European Communities, RIVM Report n. 6000 25001, RIVM, Bilthoven, The Netherlands.

Picardy, Nord, Ile-de-France, the Netherlands, North Rhine-Westphalia, Hessen and the Saarland.

Lowering of groundwater levels

Lowering of groundwater levels and changing groundwater flows, as a result of overexploitation, regulation of surface waters, intensified drainage or an increase in the extent of built-up areas, may have economic and ecological effects. Threatened regions are Ile-de-France, Nord-Pas-de-Calais, Lorraine, South-East England, Brussels, North Rhine-Westphalia and Hessen (see Map 5.4).

Economically, agriculture and the increasing costs of pumping water are the most important reasons for a lowering of groundwater levels. In the Netherlands, for example, 700 million m^3/year is extracted for drinking water purposes. Extraction of 215 million m^3 causes damage because it is no longer available to agriculture. In relation to this, compensation amounting to HFL 3.5 million per annum is paid to farmers.

Ecologically, groundwater related terrestrial ecosystems is notably affected by changes in groundwater levels. Moreover, groundwater is the last remaining water source for rivers and small areas of surface water during dry periods. Some plant and animal species entirely depend on high groundwater levels (vegetation and fauna in marshy areas and brooklands). Even small decreases in groundwater levels affect the ecosystem; rare species tend to disappear first as, for example, in wetlands.

In the French part of the CCC area, the water table in the Ile-de-France region has dropped 100 m since 1840. However, according to measurements, this ceased in 1971. In the district of Roubaix, Nord-Pas-de-Calais, the drop since 1910 has been 40 m.

Along some parts of the coast of South-East England, groundwater extraction is limited for ecological reasons. In the London Basin, as in some other places, there is a groundwater shortage. The balance is being restored by imports from overspill areas, a restrictive water extraction policy, and the introduction of artificial recharge techniques. An increase of 6.5% in water extraction has been observed in South-East England during the period 1980-88 compared with a decrease of 6.7% in the rest of England and Wales.

In Belgium, overexploitation occurs in and around Brussels, where the water table is falling by 0.7 to 2.0 m/year. In the Namur Basin, extraction has led to a lowering of the water table by 65 m between 1945 and 1973. Since then further lowering could be stopped through strict extraction regulations. In the Massif of Brabant (Roeselare and Izegem), the groundwater level has decreased by 50 m between 1970 and 1990, which means that the groundwater level here lowered by 120 m since 1910.

In the Netherlands, the average water table is about 0.2 m below the normal level, but this is enough to cause a severe decrease of the variety of the vegetation, already occurring in about 75% of the nature reserves in the eastern and southern parts of the Netherlands.

In Germany, the extraction of groundwater in North Rhine-Westphalia is restricted to half (and in some districts even to one third) of the annual recharge, since the total extraction would lead to water management problems. This leads to a limited use of groundwater and infiltration of surface water. The brown coal mining area near Aachen may be regarded as a special case: here extensive excavations have resulted in a lowering of the water table by up to 400 m which has an enormous impact. In Hessen, which is 90% dependent on ground water, the water table has declined by up to 20 m causing deterioration of natural vegetation.

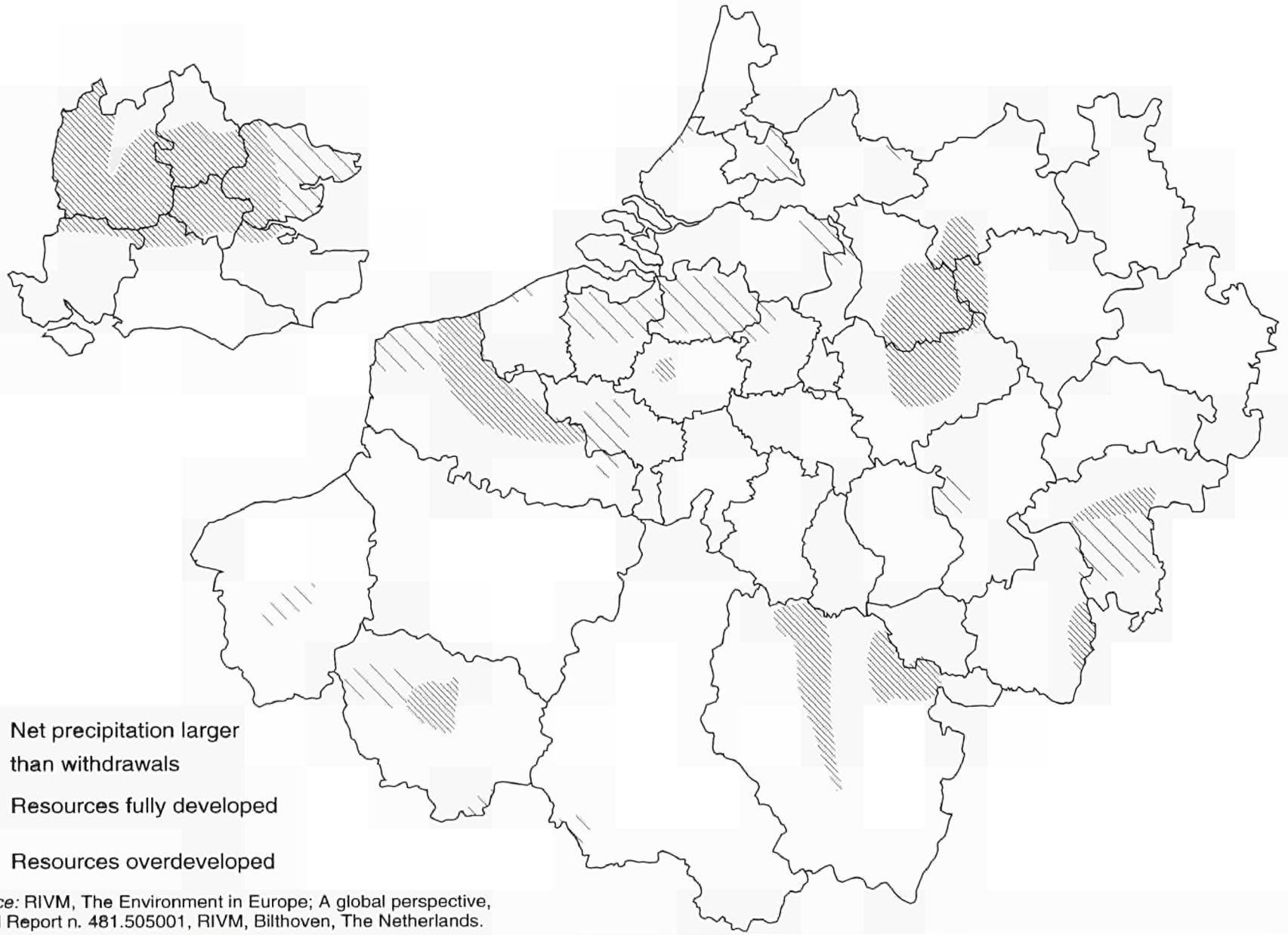
Waste problems

The statistics and estimates available for the Community as a whole distinguish between four main categories of waste: municipal, industrial, hazardous and agricultural. However, more precise data are needed in order to assess the environmental pressures and risks.

In most countries of the CCC area, landfill is still the most common means of disposal of municipal

Map 5.4

Overdevelopment of groundwater resources



Source: RIVM, The Environment in Europe; A global perspective, RIVM Report n. 481.505001, RIVM, Bilthoven, The Netherlands.

and industrial waste. Landfill sites, due to their operation, magnitude and large number, represent a significant threat to groundwater resources in the CCC area (leachate involves a wide range of heavy metals and organic micro-pollutants) (see Map 5.5). On the basis of one landfill site for every 2 500 to 5 000 inhabitants of the CCC area, the number of municipal landfills is estimated at about 18 000 to 36 000. There are indications of many illegal or badly managed landfill sites.

Other types of waste and waste disposal sites exist in the CCC area:

(i) surface impoundment;

(ii) burial and underground storage;

(iii) deep-well disposal (a method used for liquid wastes from oil and gas exploration and specific liquid chemical wastes);

(iv) hazardous waste sites;

(v) dredged harbour sediments: (especially in the delta of the Rivers Rhine, Meuse, Scheldt and Thames to keep harbours, canals and waterways navigable. The sediment from dredging operations is often contaminated by heavy metals and organic pollutants;

(vi) sewage sludge disposal; and

(vii) mining waste: the waste arising from mining operations can be divided into three categories: hard coal and lignite, metal, and salt. Acid leaching from coal mining waste is characterized by high concentrations of totally dissolved solids and may be saline. Metal mine waste often contains high concentrations of sulphide and sulphates. Spoil from salt mining contains high concentrations of chloride and potassium. Large mining areas in the regions of the CCC area are: Alsace-Lorraine (France), salt; Rhineland (Germany), lignite; Ruhr (Germany), hard coal.

5.1.3. Global change

The environmental impact of activities is not always limited to the region in which they occur. Some activities in the CCC area have an impact on the whole continent, or even on the global ecological balance. These impacts are not always clearly visible, or will only become significant in years to come. Similarly, the CCC area is affected by activities which take place in other parts of the world. This part of the report will describe some of the environmental problems which are not limited to the CCC area itself, though they may to varying degrees affect regions of the CCC area.

The global average temperature has increased by between 0.3°C and 0.6°C and sea levels have risen by between 10 and 20 cm over the last 100 years. The Intergovernmental Panel on Climate Change predicted that without controls of greenhouse gas emissions, mean global temperatures will increase by about 0.3°C per decade during the next century leading to a temperature increase over today's levels of 1°C by 2025 and 3°C by the year 2100. Sea levels may increase by 20 cm and 65 cm respectively on the same timescale.

At the regional level, climatic change will adversely affect water availability and natural terrestrial ecosystems in South-East England, Hessen, Upper Normandy, Ile-de-France, Picardy, and Champagne-Ardennes, coastal tourism and sea level rising in coastal zones in the Netherlands, and ground water systems (resource problems) in Picardy, Champagne-Ardennes and Lorraine.

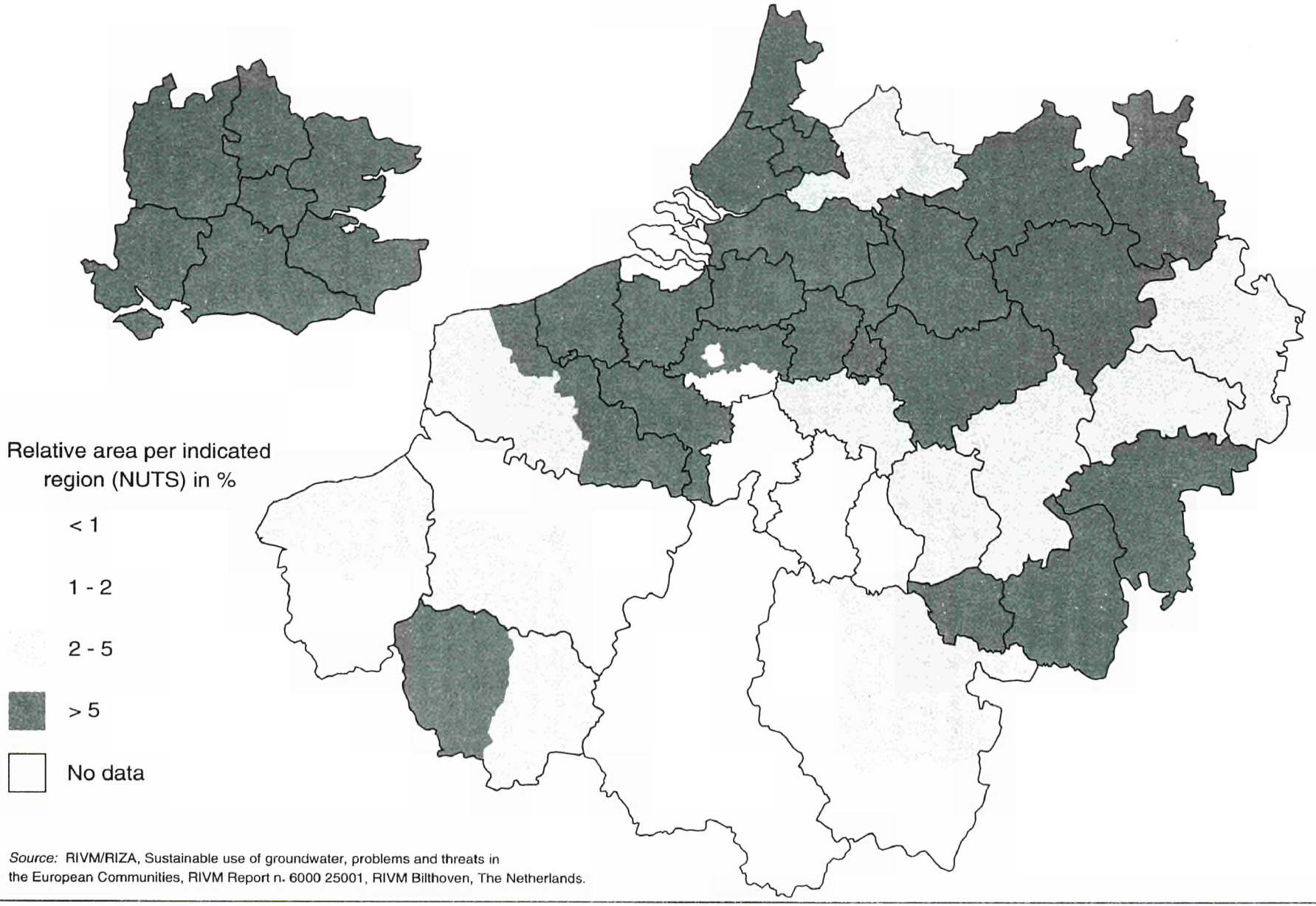
5.1.4. Air pollution

High ozone levels in the troposphere will increase the susceptibility of human beings to disease, can reduce the yield of some sensitive crops, and can damage natural vegetation and materials (Map 5.6 shows the excess ozone regions). Only the fringes of regions of the CCC area (including the whole of South-East England) have relatively low ozone levels, whilst Hessen and Rhineland-Pfalz experience the highest.

Winter smog is related to the high pressure systems above Europe. Smog can cause health problems. For some periods, at least 50 to 75%

Map 5.5

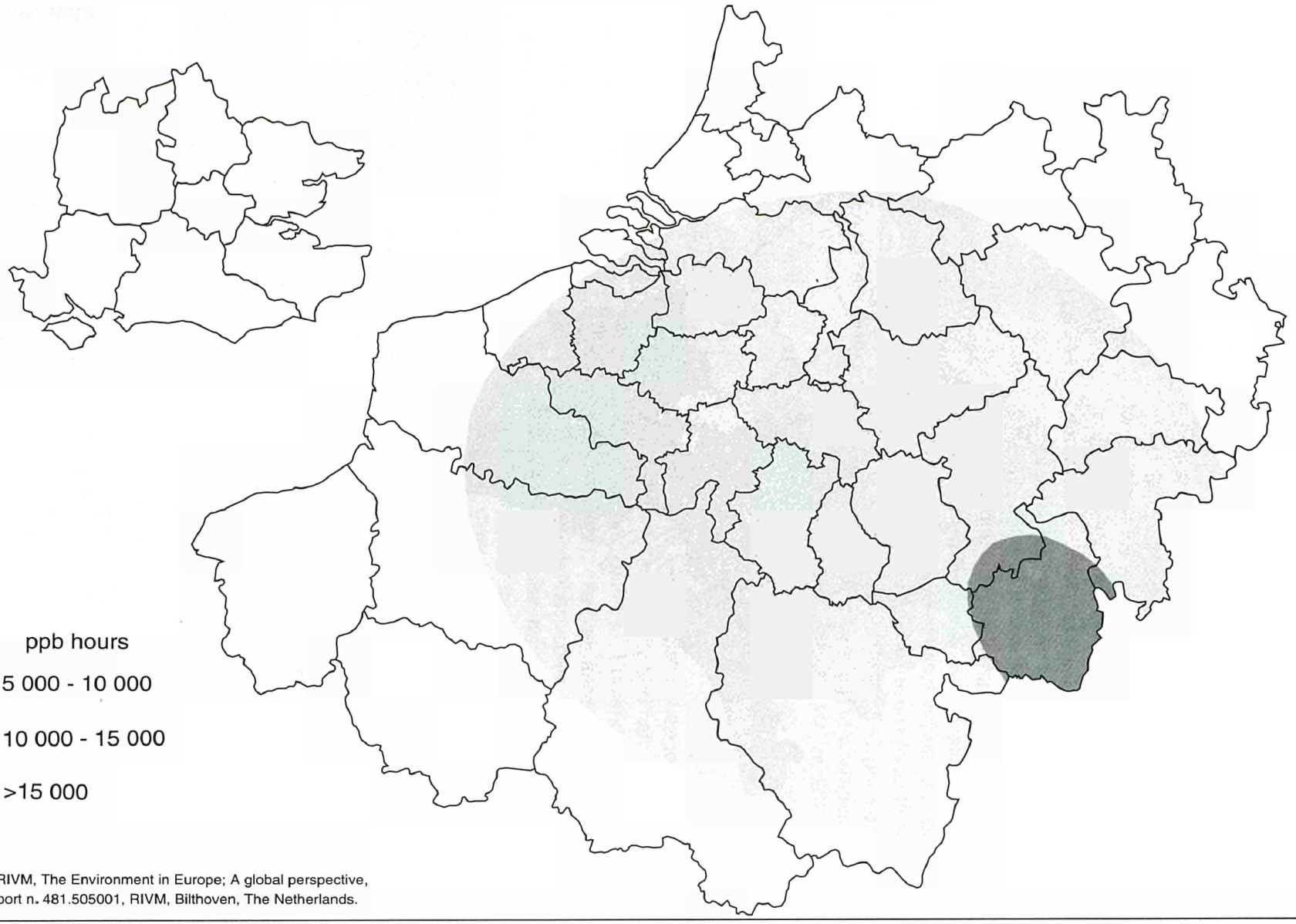
Estimated surface area (as a fraction of the total area per region) in which groundwater is expected to be contaminated as a result of waste disposal by landfilling



Source: RIVM/RIZA, Sustainable use of groundwater, problems and threats in the European Communities, RIVM Report n. 6000 25001, RIVM Bilthoven, The Netherlands.

Map 5.6

Excess ozone i.e. the sum of all ozone concentrations over 75 ppb during a summer season (Simpson, 1991)



Source: RIVM, The Environment in Europe; A global perspective, RIVM Report n. 481.505001, RIVM, Bilthoven, The Netherlands.

of the background SO_2 level originates in Eastern Europe. The regions most affected are Rhineland-Pfalz, North Rhine-Westphalia, the eastern part of South Netherlands and Flanders (see Map 5.7).

High SO_2 and NO_x emissions have important environmental effects, and are seen as weaknesses/threats to the development of the CCC area. Energy production and consumption have important environmental effects. The average SO_2 emission in the CCC area, when compared to the rest of the EU, is relatively high mainly due to the presence of brown coal electricity plants and refineries, high population densities, and important economic activities. The following urban areas and regions have high emission levels: Düsseldorf (140 t/km^2/year), Cologne and Greater London (75-100 t/km^2/year) and East Flanders, Antwerp, South Holland and Münster (50-75 t/km^2/year).

The average NO_x emission in the CCC area, when compared to the rest of the EU, is also relatively high. The following regions have high emissions: Düsseldorf (130 t/km^2/year), Cologne and Greater London (75-100 t/km^2/year), and South Holland and Arnsberg (50-75 t/km^2/year). High emissions are mainly due to the transport sector (more than 50% of NO_x emissions in the EU), electricity plants and the heating of buildings (a third of NO_x emissions in the EU).

In combination with other environmental pollutants, acidification is responsible for 'forest dieback' which also affects the environment. Critical loads are exceeded in approximately 40% of the CCC area, especially in the Benelux and North Rhine-Westphalia.

5.1.5. Radioactivity

The acceptability of nuclear power is a significant problem although the strength of feeling varies among countries of the CCC area. Concern about nuclear power focuses on the perceived risk of a major accident resulting in loss of life, and ecological and economic damage, proliferation, and on the consequences of terrorism. Moreover, the safety of long-term disposal of radioactive waste is disputed.

Three major kinds of nuclear waste are mining waste, used-fuel elements, and material from decommissioned reactors. The main problem of mining waste is radon emission, which can be reduced by adequate soil covering. Used fuel elements are stored or conditioned (immobilization techniques). The decommissioning of reactors is very expensive and produces large quantities of waste.

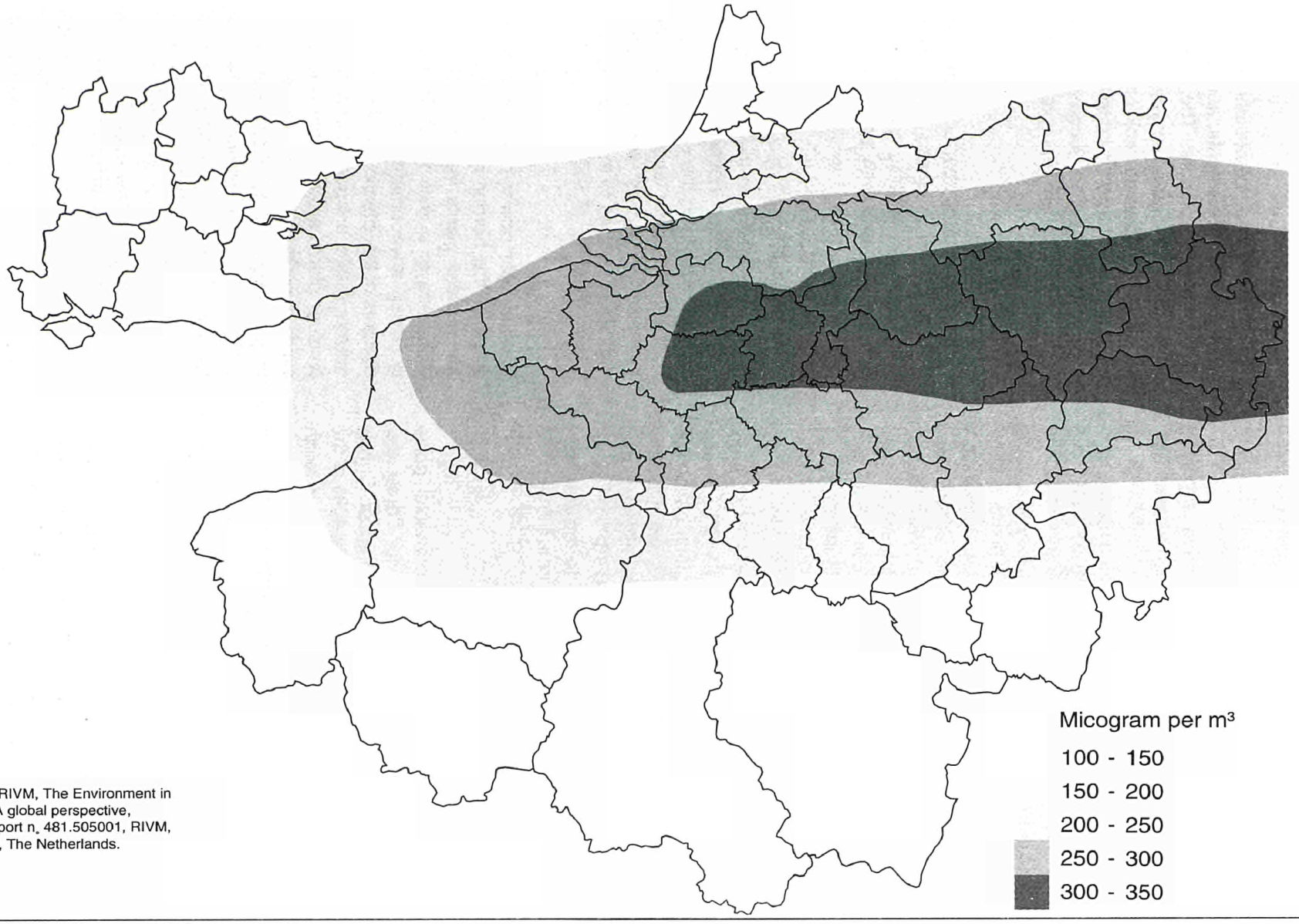
The chances of nuclear accidents are small, but they cannot be dismissed. Present developments aim at simpler reactors with less power production per unit and with potential inherent safety features.

Nuclear energy could continue to play a role during the change to the use of non-fossil-based fuel in the coming decades. This will be dependent on increasing the safety aspects of the production of nuclear energy, and demonstrating this convincingly, as well as on developing acceptable solutions to the final disposal of nuclear waste.

Most nuclear power plants are located near the coast or the border with other countries. There are nuclear plants in almost all regions of the CCC area or in their neighbouring regions. The potential environmental risks and associated dangers of this situation, as well as the disposal of nuclear waste, are considered to be weaknesses. Nuclear plants are sometimes located in border areas: typical examples are the Chooz and Cattenom plants on the borders of France and the Doel and Borsele plants on the Belgian-Dutch border. Most nuclear plants are located further inland, and sometimes in or close to urbanized areas. It is likely that, from the viewpoint of political acceptability, new nuclear plants will often be located alongside existing plants. We note that expected investment in nuclear capacity will mainly take place after 2000. Because of extensive energy transmission networks, the location and expansion of urbanization is seldom limited by the supply of energy.

Map 5.7

SO_2 concentrations during a winter smog episode in Europe, January 1987



Source: RIVM, The Environment in Europe: A global perspective, RIVM Report n. 481.505001, RIVM, Bilthoven, The Netherlands.

5.2. Spatial impacts: A pollution ranking per region

The regions of the CCC area have been classified by an index based on a global appreciation of water, soil, air and noise pollution, and on safety and pollution risks caused by industry (see table in Annex and Map 5.8). The general view is that pollution levels are worse in northern parts of the CCC area than in the south.

The region with the highest overall pollution level is Flanders (score 5), followed by South Netherlands (score 4-5). The remaining Dutch regions of the CCC area received a high score (4), together with South-East England and most German regions of the CCC area (Hessen, Rhineland-Pfalz and North Rhine-Westphalia). Nord-Pas-de-Calais has also a rather high score (3-4).

An intermediate group of regions received a score of 3, i.e. Ile-de-France, Brussels, Wallonia and Saarland.

A lower level of pollution (score 2) applied to the Grand Duchy of Luxembourg and most of the French regions of the CCC area (Picardy and Lorraine), although Normandy received a slightly higher score (2-3). The lowest score applied to Champagne-Ardennes (1-2).

5.3. Conclusion

5.3.1. The importance of new technologies

The availability and application of new technology is of major importance to any serious environmental policy. There have already been considerable achievements in the development of clean technologies and genetic engineering, but a wealth of opportunities and potential new industries await exploitation, as illustrated by the following examples.

1. Environmental issues are increasingly regarded as significant topics in research and development. Other countries are catching up fast with the pioneering position held by the Netherlands and Germany.

2. An increasing development and application of techniques for the prevention, reduction and mitigation of environmental impact.

3. More and more economic organizations take environmental impacts into account when making investment or consumption decisions.

5.3.2. Reducing SO_2/NO_x emissions

The CCC area is relatively prosperous, and has a rather modern economic structure. A low energy increment is required in order to produce additional welfare, as welfare increases at a higher growth rate than the consumption of energy. Reduction of SO_2/NO_x emissions are possible because:

(i) the technology is present;

(ii) inhabitants of the CCC area are increasingly willing to pay for a reduction of emissions;

(iii) the effects of an emission reducing/energy saving policy will not materially worsen the economic situation; and

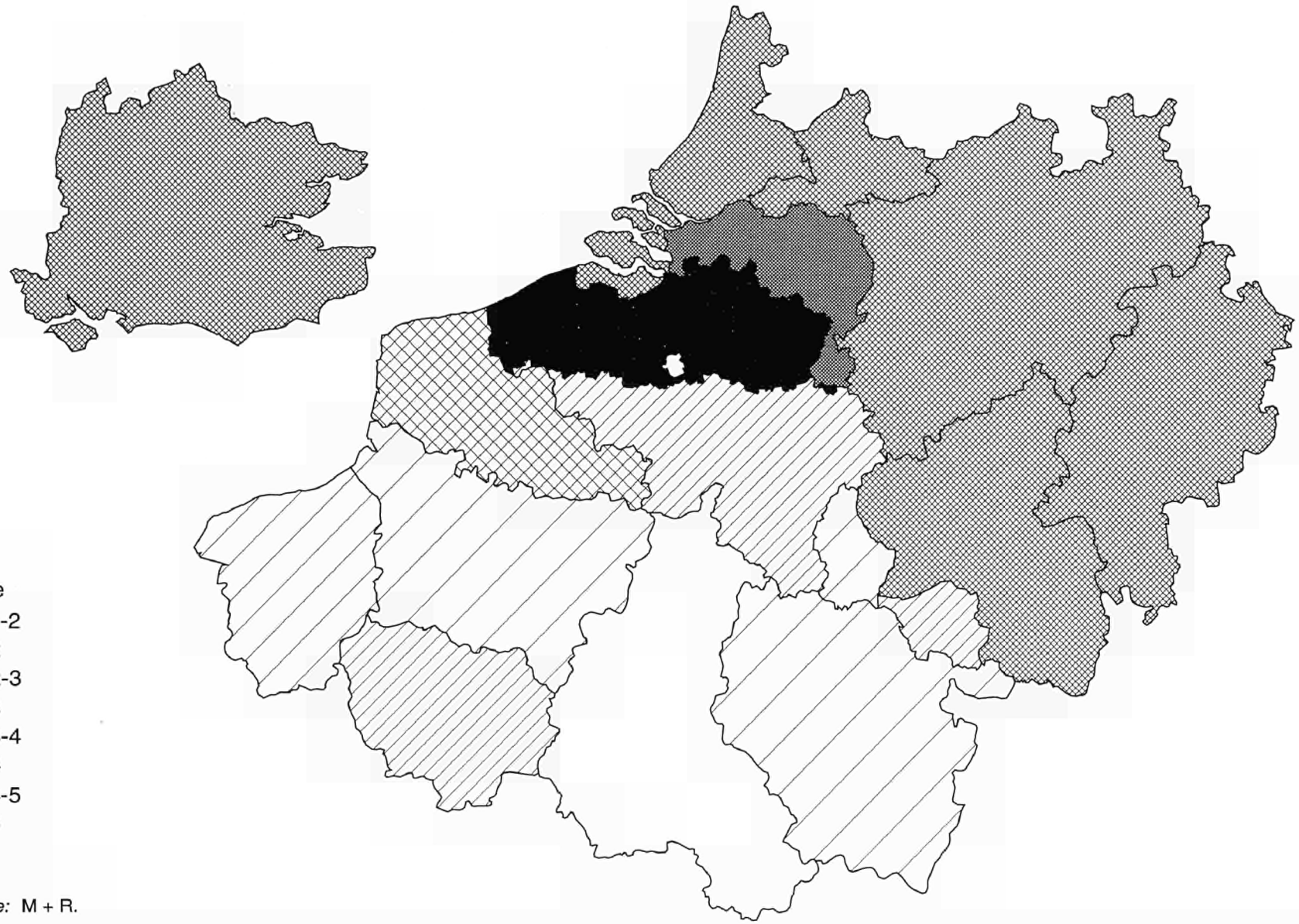
(iv) the substitution of more polluting energy sources, e.g. oil, by less polluting gas is facilitated by the dense and improving gas transmission network.

By 2010, total emissions of SO_2 will probably have been reduced by 50-70% and NO_x by 20-50% compared to 1986.

An energy/carbon tax negatively influences usage in some regions of the CCC area. A policy, which aims to reduce SO_2/NO_x emissions and energy consumption by means of an energy/carbon tax, can have an important impact on those regions with a high share of energy/carbon sensitive sectors. Besides the energy sector itself, ores and metals, chemicals and fibres, office, EDP (electronic data processing) and precision instruments would be the sectors particularly adversely affected by energy/carbon taxes. An energy/car-

Map 5.8

Ranking of the CCC regions by general pollution



Source: M + R.

bon tax would reduce anticipated growth in these sectors as a result of a combination of following reasons:

(i) they are energy intensive and not very labour intensive;
(ii) they have little scope for energy conservation;
(iii) they do not supply equipment for energy conservation;
(iv) they are highly exposed to international competition; and
(v) they are price takers on the world market.

The average share of three of the energy/carbon tax-sensitive sectors in global employment is about 3.5%. Substantially more jobs in these sectors are found in South Netherlands, the Grand Duchy of Luxembourg, North Rhine-Westphalia and Rhineland-Pfalz. Therefore, the introduction of such a tax would represent an important challenge for these regions of the CCC area (see Map 5.9).

5.3.3. Environmental policies on a global, European and national level

A significant advance in environmental protection

For some topics and in some regions of the CCC area, the 20 years that have passed since the United Nations Environment Conference (Stockholm, 1972) have witnessed a significant advance in environmental protection. With regard to water management, Germany, the Netherlands and South-East England have experienced a reduction in oxygen-depleting substances and heavy metals, while Belgium and France are intensifying their efforts. Concerning air pollution, it must be said that sulphur dioxide emissions, particulate emissions and carbon monoxide emissions, have diminished.

The positive impact of European unification and European policy on the environment

The European Commission has taken on powers and responsibilities to create a stricter environmental policy and stimulate technological and economic developments. The new treaty on European Union (1992), introducing the principle of sustainable growth respecting the environment (Article 2), is extremely important to the CCC area. Within the general framework of subsidiarity, the new treaty states that decisions should be taken as closely as possible to the citizens (Article A). The EU has taken measures in following fields:

1. Climate change: recently, the Commission presented a Communication to the Council of Ministers on a strategy to reduce CO_2 emissions and to improve energy efficiency, including Community-wide energy/carbon taxes;

2. Stratospheric ozone depletion: the EU countries and many others have recognized the harmful effects of CFCs and halons on human health and the environment, resulting in two protocols within the UNEP framework. The Montreal Protocol was amended in London (1990), but the EU has already adopted a mandatory reduction scheme which is to take effect more quickly than the London Protocol.

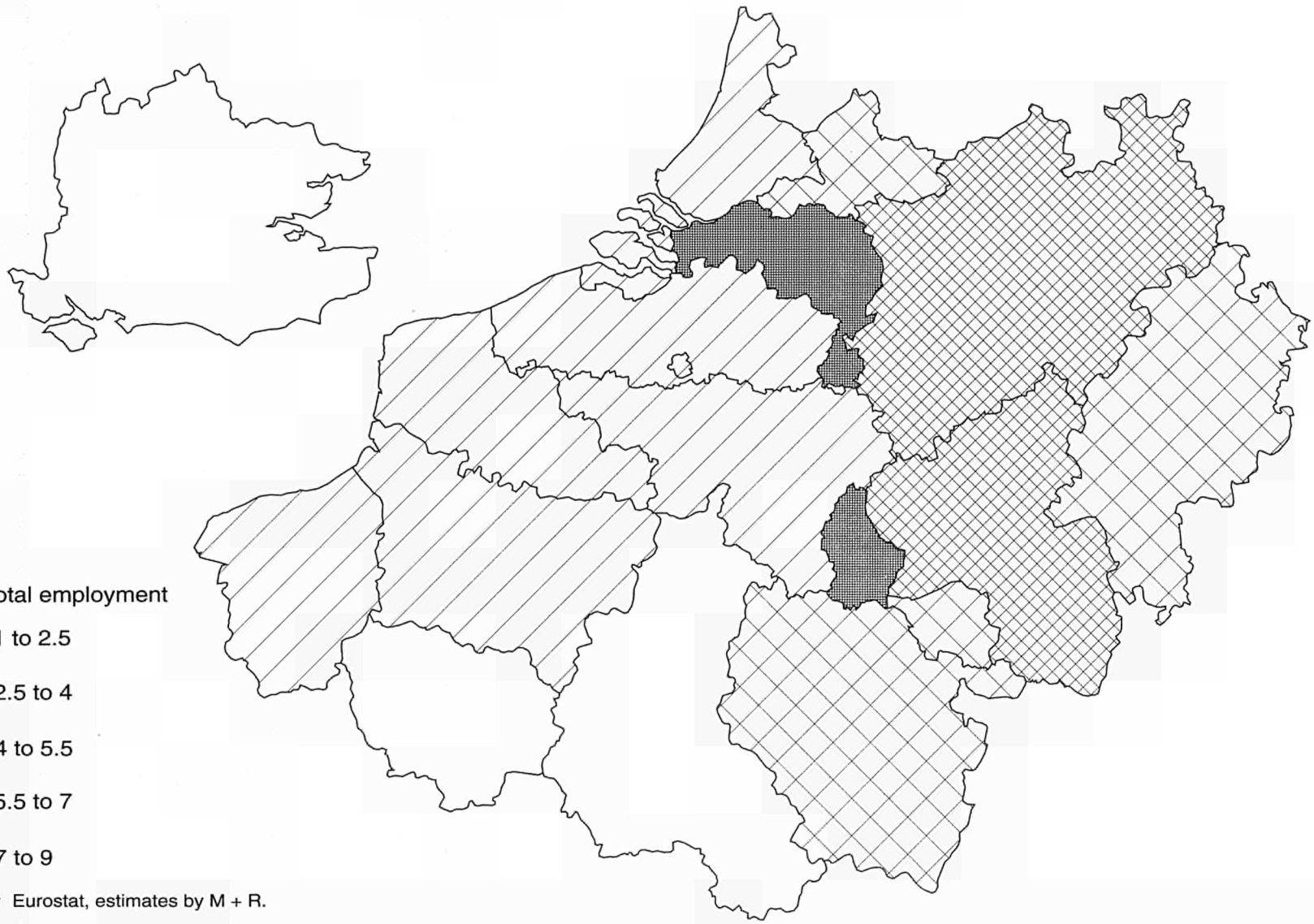
3. Tropospheric ozone: the expected 30% reduction of volatile organic compounds (VOC) and the 20% reduction of nitrogen oxide (NO_x) would diminish ozone peaks by about 5%. In the intended scenario, European SO_2 emissions will decrease to 28 million tonnes/year in the year 2010 (a reduction of 30% compared to the situation in 1990).

4. Acidification: by 2010, the area which is subjected to depositions exceeding the critical loads of acidity for the most sensitive ecosystems will be reduced to 57% (instead of 63%) of the European continent. The areas with the largest excess (> 2 000 eq/ha/year) will cover 3% (instead of 10%).

5. Agriculture: optimistic approaches suggest that transition from the current product subsidies to income subsidies could reduce the EU agricultural budget by ECU 12 billion (27%) by the year 2000, and could reduce adverse

Map 5.9

Share of carbon/energy tax sensitive sectors in total employment in 1988-89



Source: Eurostat, estimates by M + R.

impacts of agricultural practices on the environment by 20 to 60%, while maintaining farmers' overall incomes.

Notwithstanding the remarkable progress in environmental policy on a worldwide and European scale, some items are more oriented to the regions, and specific problems need to be tackled through increased cooperation between the regions.

5.3.4. Environmental policy elements focused on the individual regions

Some issues are at the interface of environmental and regional development policies:

1. Sanctuaries (see Map 5.10): the main sources of noise pollution are road traffic, motorized recreation, agriculture and forestry, industry, mining, military activities, and civil and military air traffic. The policy principally aims to contain noise nuisance in those sanctuaries at a certain level to preserve their recreation functions, or to protect noise-sensitive animals. Some areas such as protected nature reserves, wetlands and national parks should automatically become sanctuaries. Special attention should be given to 'silence zones' in the neighbourhood of urban areas. The enlargement of sanctuary areas would require a more preventative awareness policy.

2. Soil protection areas: the policy should be oriented towards additional protection of specific soil characteristics (including groundwater) in order to protect existing nature values as well as anthropogenic (e.g. landscapes shaped by human interventions) values. The main environmental problems are the diffuse load of domestic and industrial waste, the use of fertilizers, the application of pesticides and acid deposits in the atmosphere. The main target groups are households, industry and agriculture.

3. Soil water protection areas: in these areas, the soil fulfils a water-extraction function. The policy is oriented towards the protection and/or improvement of the quality of local groundwater in the interests of existing and future drinking water supplies. The main target groups are agriculture and horticulture, industrial plants and outdoor recreation.

4. Object oriented ammonia policy: specific actions are needed in order to reduce severe effects of acid depositions. In some cases peak emissions a short distance from acid-sensitive objects will need an object-oriented policy. The sources of a limited number of vulnerable objects should be set out. Criteria for the selection are the sensitivity of the object, the effectiveness of the measures and the relationship with the ecological network.

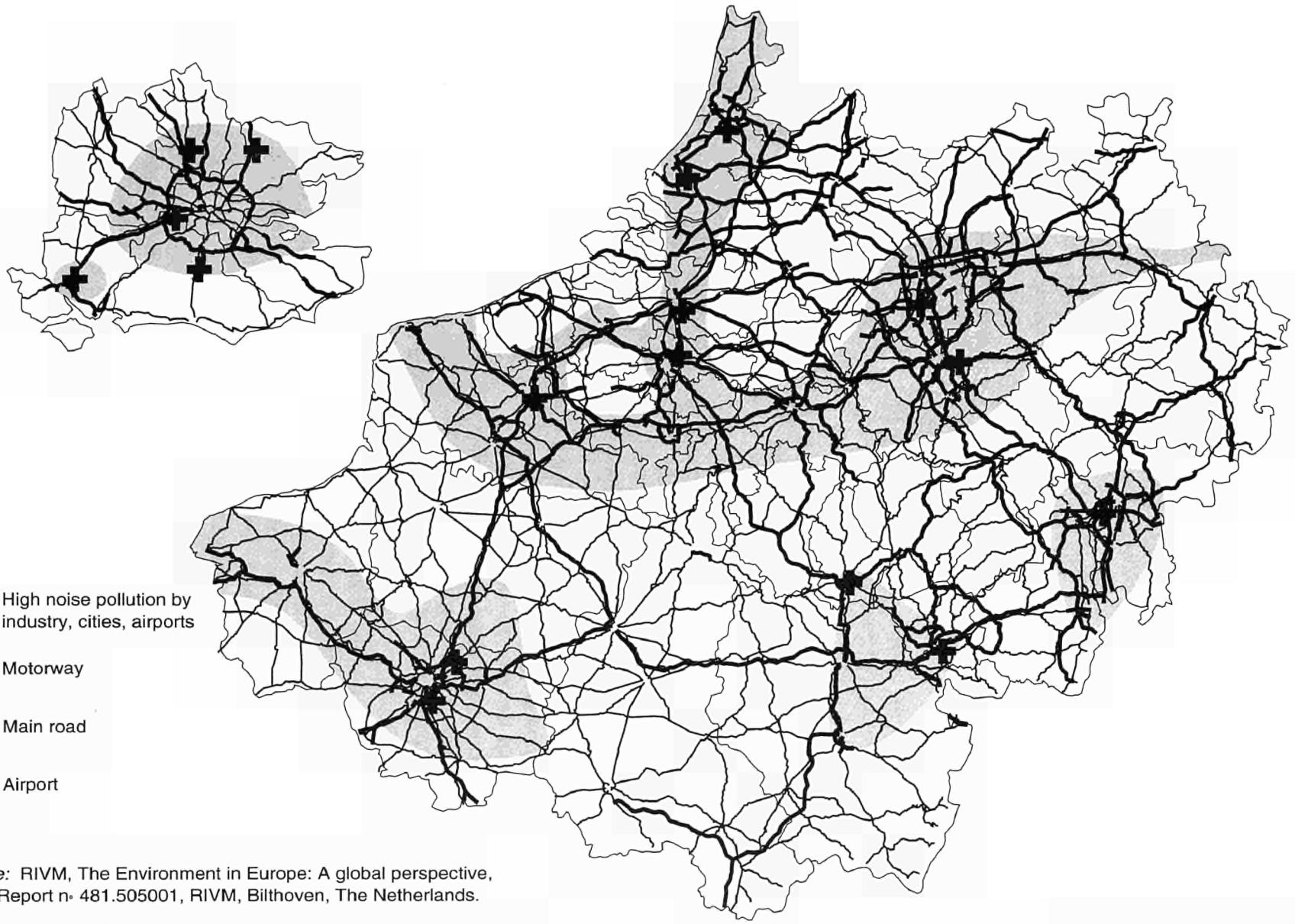
5. Integrated environmental zoning: this is meant to determine zones where coherent measures should be taken, for example in cases where complex industrial plants cause nuisance and danger to the surrounding habitat (Map 5.11). Primarily, it is an instrument for operational measures. Municipalities and industrial plants are directly concerned.

6. Region-oriented projects for the mastering of eutrophication: these aim to avoid damage to groundwater, forests and nature by the r-duction of phosphate and nitrogen emissions to the groundwater. Source-oriented measures are general emission policies (regulation of discharge points, installation of sewer systems); water management measures (hydrological isolation, leaching); and destination measures for the removal of phosphate sediments. The main target groups are agriculture, the water quality managers (purification plants), and industry.

7. Region-oriented drying up projects: these relate to water-management regeneration of dried-up forests and nature areas, and seek to increase knowledge and experience in relation to the regeneration of dried-up areas. Most actors involved are executors of land planning activities and drainage and level management of culture soils and extractors of groundwater.

Map 5.10

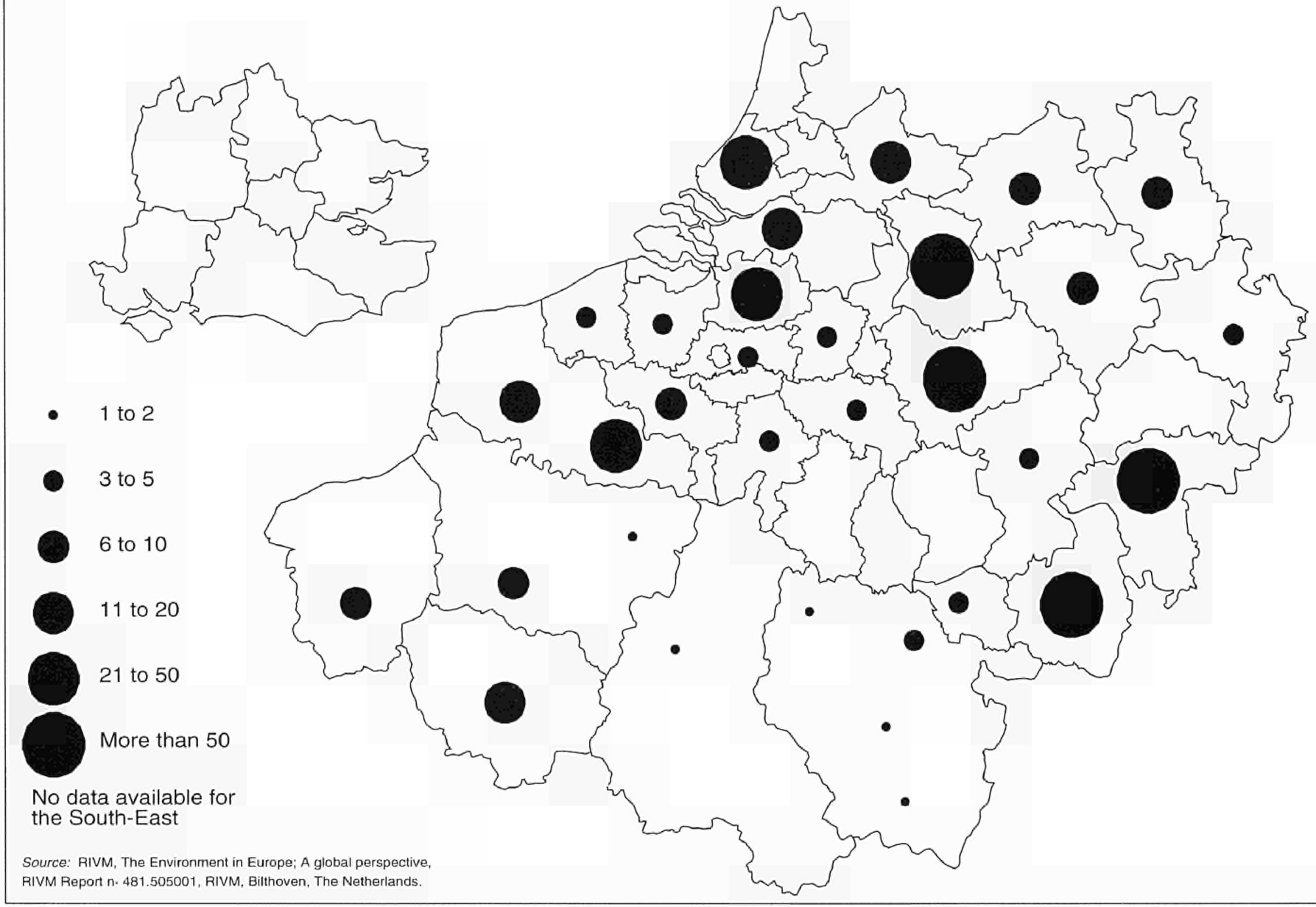
Areas with indications of noise pollution



Source: RIVM, The Environment in Europe: A global perspective, RIVM Report nº 481.505001, RIVM, Bilthoven, The Netherlands.

Map 5.11

Number of Seveso plants (Council Directive 82/501/EEC)



Source: RIVM, The Environment in Europe; A global perspective, RIVM Report n· 481.505001, RIVM, Bilthoven, The Netherlands.

The 'sponge' and 'filter' function of some regions of the CCC area

Heads of river basins function as absorbers of precipitation which percolates through the soil to feed groundwater reserves. The type of vegetation determines the quantity of rainfall that can penetrate into the ground. Forests have the greatest capacity in this sponge function followed by grasslands: these vegetations allow the lowest run-off towards the rivers. Crucial regions are Hessen, Rhineland-Pfalz, Saarland, Lorraine, Aisne, Nord, Oise, Meuse, Upper Marne and Oxfordshire.

The filter function is directed towards quality. The soil-vegetation complex absorbs polluting elements in several ways. Forests 'catch' dust particles present in the air as leaves intercept them. Rain will wash these dust particles onto the ground. Another filter function is related to the sponge function. The water absorbed in the heads of the river basins is being filtered through the soil. In this way, the water loses its pollutants before reaching the groundwater reserves. However, this filter function is limited and becomes increasingly saturated, for example by nitrogen. The most important regions with a filter function are: Oxfordshire, Detmold, Kassel, Gießen, Rhinehessen-Pfalz, Trier, Saarland, the Grand Duchy of Luxembourg, Luxembourg, Namur, Vosges, Meuse, the Ardennes, Upper Marne, and Aube.

Towards a European ecological network

The CCC area was occupied by a wide range of natural ecosystems. The combination of edaphic, climatic and topographic conditions was reflected in the various vegetation types.

Although there are still some ecologically important zones which can be identified in the CCC area, economic growth and increasing population over the centuries have led to a decreased abundance and diversity of natural habitats and wildlife.

Clearly, the threats and trends which have led to a decline in natural areas will be more concentrated in the CCC area than in other parts of the EU. The continued decline and loss of natural ecosystems have quantitative and qualitative aspects (see the chapter on open areas).

The scale and cross-border nature of pressures that are exerted on natural resources in the CCC area emphasize the need for nature conservation and environmental protection policies to be formulated at an international level.

Besides the inventory and protection of individual areas, a coordinated policy of nature protection includes the establishment of a coherent main structure of sites of ecological importance.

Most countries have already established a kind of ecological development strategy; for the EU, a first attempt at an ecological network design has been made on the basis of the Corine data and additional information (Eeconet). As far as the CCC area is concerned, a tentative ecological main structure has been developed.

Key findings of the sectoral perspectives

Given its history and the intensity of its physical and economic development, inertia is a feature of the CCC area. Its fixed investment in infrastructure and buildings, its form and circumstances, including pollution and other effects of past activity, will undoubtedly persist well into the future.

However, the key words that might be taken to characterize the area as it has emerged from the sectoral perspectives, are transitional change and internationalization. Change is endemic to all features of the CCC area structure.

In economic terms, there have been striking and significant transitions from manufacturing to service sector activities; in the decrease of agricultural employment; and through the emergence and growth of wholly new activities, for example in the leisure and personal service fields.

Transition in the economy is marked not only by decline in some industries and areas but by the evolution of sophisticated activity in R&D, in 'Technopoles' and in modern industry/services generally. It is also reflected in clear signs of recovery, with obsolete activities, buildings and 'reconversion' areas beginning to disappear and be replaced by new activities, including the emergence of 'environmentally-friendly production' techniques.

Transition is also reflected in the environmental issues: environmental damage is the consequence of the persistence and intensity of activity. However, the CCC area is still characterized by high environmental experience and potentials; moreover, with rising awareness of environmental issues and with improved private and public sector responses, transition to limit further damage and towards positive enhancement is in prospect.

There is of course an international and indeed global aspect to much of the current environmental concern. There is also, however, a more general sense in which internationalization in one form or another is promoting or driving change in the CCC area as elsewhere.

Significant economic sectors now operate on a global, rather than local, regional or national scale. Companies operating on this global scale are localized in neither their activities nor their investment patterns. Accordingly, individual regions, even one as diverse and expansive as the CCC area, must adapt to an increasing degree of specialization in the functions it performs. Such global-scale internationalization is reflected, for example, in the threatened loss of industrial activity and its decreasing importance in recent decades, in the expected growth of service functions, in the increasing importance of financial services, in the decreasing importance of agricultural employment and in the threatened position of those dependent on the export of final products.

The GATT agreement is a clear manifestation of this worldwide economic interdependence as it affects the world's trade blocks.

The central position of the CCC area, together with the related presence of a number of globally important decision centres, makes the CCC area particularly sensitive to worldwide economic fluctuations.

At a very different scale, the opening of the internal borders in the EU, in part by way of response to the global challenges, is also having marked effects in the CCC area, where there happens to be a high concentration of former national borders.

The changing flow system, and especially the strengthening of the most important transnational connections, has already led to the appearance of 'Eurocorridors' encompassing multimodal transport/communications axes relevant at a European scale.

In general, it is clear that not all areas profit in a similar way from this internationalization, and some areas will feel the effects more strongly than others. In this respect, internationalization may be seen as the stimulant of a particular form of change characterized by spatial unevenness. The most direct influences can be expected in the urban border areas and in the urban areas connected by Eurocorridors, but in principle all CCC area regions can expect to find their linkages and relative positions affected in due course.

To summarize, the overall transition process, consisting of secular change, spurred on by internationalization, is producing a remarkable degree of internal differentiation in the CCC area, characterized by diverse and complex economic, social and developmental patterns.

Spatial perspectives

Introduction to the spatial perspectives

In this second part the intention is to draw out the spatial consequences of the sectoral perspectives and, in particular, to identify the potentials for spatial policy at a transnational level.

The spatial consequences are described in terms of the main categories of space in the CCC area:

the metropolitan systems

the urban areas outside the metropolitan systems

the rural areas.

In order to detect what margins exist for a spatial policy, the key elements of a trend scenario are extracted from the extrapolation not only from the sectoral trends but also on the assumption that policy and investment to address needs will continue on a 'business as usual' basis. Accordingly, the trend scenarios induce the effects, for example, of policies already in place to improve air quality and of commitments to improvement of transport infrastructure.

In turn, key elements of a contrasting policy scenario are described. In order to be realistic and limit the scope of such suggestions, the policy scenario focuses on solutions to the problems caused by the two main factors, transnational change and internationalization, emerging from the studies. The spatial 'policies in preparation' already being developed across the CCC area at regional and national level have proved a fundamental inspiration as sources for policy scenario development.

6. The CCC metropolitan systems

Introduction

• Urban population in the CCC area

The population of urban areas is related to the number of jobs which stem from the nature and size of their productive or economic functions. In this respect the CCC urban areas, with two thirds of the CCC area population, play an important role.

As in the case of population density, a division can be made between a northern part of the CCC area, comprising South-East England, the Netherlands, North Rhine-Westphalia, Nord-Pas-de-Calais and Belgium (without the NUTS 2 region of Luxembourg), where most of the urban areas are located, and the southern part, where only 20% of the urban areas are located.

Table 6.1 shows to what extent the CCC area population lives in urbanized regions. Since this table is based on the settlement database, it shows the population of the built-up areas.

This table shows that 54% of the CCC area population (total population of 89 million inhabitants) lives in urban areas (= morphological built up area) of 50 000 inhabitants or more. The very large and medium-sized urban areas particularly contribute to the urban population.

• Structure of the urban system

According to Pred (1977) and others, an urban system can be defined as an international, national or regional set of urban areas which are interdependent in such a way (demonstrated by their linkages) that any significant change in the

Table 6.1: Types, absolute and relative population of the urban areas

Inhabitants per urban area	Type of urban areas	Global number of inhabitants (in millions)	Percentage of CCC population	Cumulated urban population (in millions)	Percentage total urban population
>500 000	very large urban areas	24.468	27.49	24.468	27.49
300 000-500 000	large urban areas	4.062	4.56	28.530	32.06
100 000-300 000	medium-sized urban areas	11.876	13.34	40.406	45.40
50 000-100 000	small urban areas	7.753	8.71	48.159	54.11
<50 000	very small urban areas	n.a.	n.a.	n.a.	n.a.

Source: Settlements database, Eurostat.[1]

[1] The settlements database dates from 1981, spot checks carried out by Eurostat indicate, however, that the present situation differs only to a minor degree with that represented by the 1981 data.

economic activities, occupational structure, total income or population of one member urban area will directly or indirectly bring about some modification in the economic activities, occupational structure, total income or population of one or more other members of the set.

Such an urban system is generally open, i.e. some of the units belonging to the system interact directly with units outside the system and the system as a whole may be affected by events occurring elsewhere.

Before presenting the outcomes of the analysis of urban systems of the CCC area, the terminology with regard to urban areas needs some clarification. The entity within the original administrative boundaries will be called the core city. For most of the CCC area cities, three further zones coming under the influence of the core city can be identified:

1. The suburbanized area which is characterized by continuous urban land use.

2. The peri-urban area, characterized by urban development in secondary, residential or economic activity centres which are separated from each other and from the core city and its suburban extensions by open land.

3. The wider commuter belt or employment catchment area.

For the purposes of this study, the urban area[1] is taken as the aggregation of the core city and its suburban areas.

The adoption of this definition has consequences for the collection of statistical information. Most statistical definitions of urban areas are based on administrative boundaries, which do not coincide with the physical reality of the urban area. The settlement database (Eurostat) does provide data in the appropriate form but dates from 1981, so the analysis will also need to use other sources, inevitably with different definitions, to compensate for the lack of up-to-date settlement data.

The following groupings of urban areas have been distinguished in the CCC area (see Map 6.1 and Table 6.1) on the basis of population numbers:

13 very large urban areas of over 500 000 inhabitants;

11 large urban areas of 300 000 to 500 000 inhabitants;

71 medium-sized urban areas of 100 000 to 300 000 inhabitants;

111 small urban areas of 50 000 to 100 000 inhabitants;

there are also numerous very small urban areas of less than 50 000 inhabitants which are not shown on the map.

Overlaying a part of the separate urban areas, six metropolitan systems can be distinguished. These are densely populated, highly urbanized areas, with a concentration of very large, large, and other urban areas, and of top level functions.

The six metropolitan systems in the CCC area are:

(i) London;

(ii) Paris;

(iii) Rhine-Ruhr, incorporating Essen, Düsseldorf, Duisburg, Cologne, Dortmund, Bonn and Bergisches Städtedreieck;

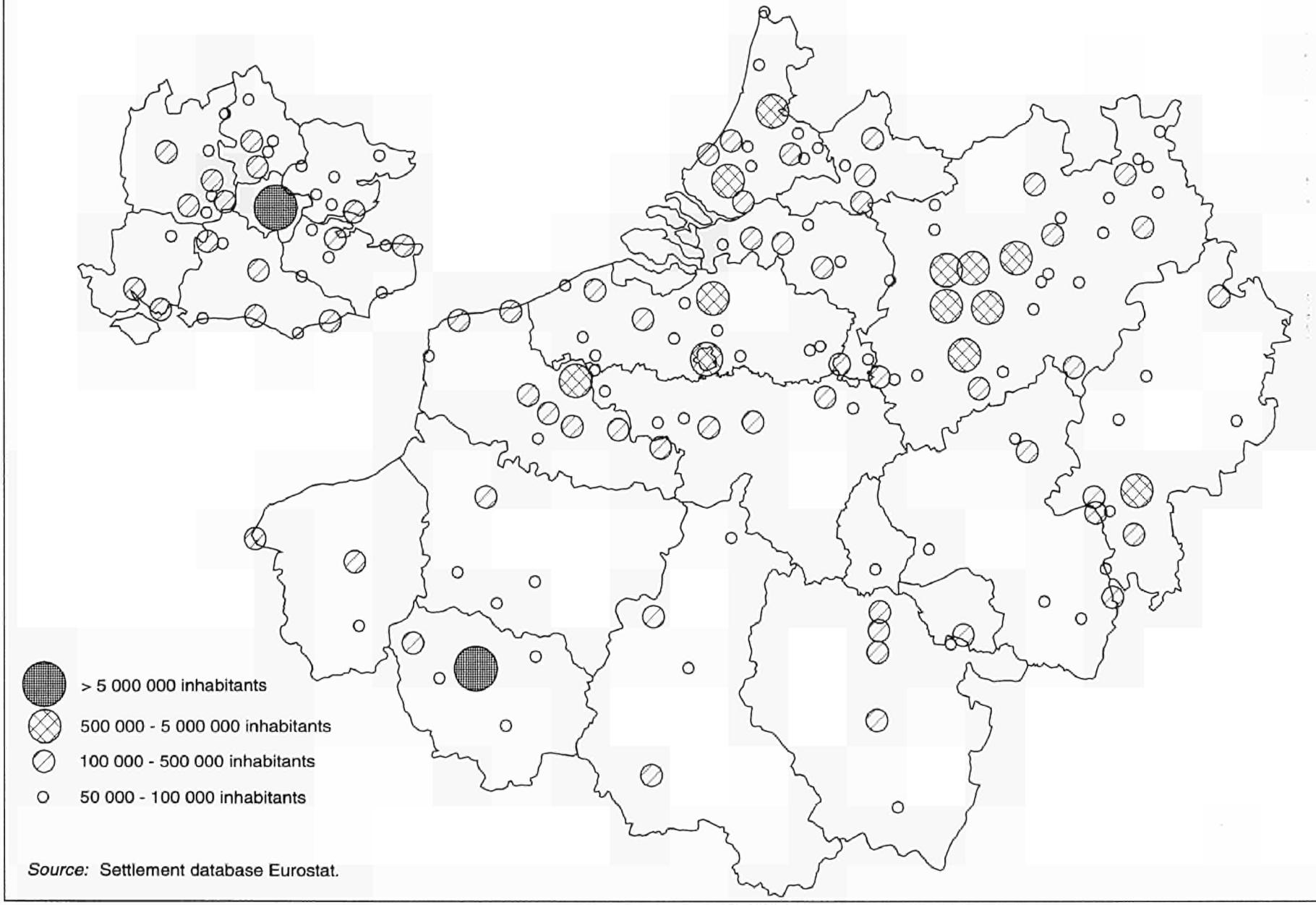
(iv) Rhine-Main, incorporating the Frankfurt conurbation, the medium-sized urban areas of Mainz, Darmstadt and Wiesbaden, and the small urban area of Rüsselheim;

(v) Randstad, including the Amsterdam and Rotterdam conurbations, a large urban area in The Hague, the medium-sized urban areas of Utrecht, Dordrecht and Leiden and all the other small urban areas between;

[1] The core city, together with the three zones around it, form the urban region. This entity is also known as the FUR (Functional Urban Region). In contrast with the suburban area, the peri-urban area and the commuter belt are not physically contiguous with the core city. These zones are characterized by urban development in secondary centres, such as market towns or large villages. Both zones exercise dynamic urban-related functions within open/rural areas, which are not necessarily themselves part of the urban region.

Map 6.1

Population of the urban areas



Source: Settlement database Eurostat.

(vi) ABG-stad[1], consisting of the Brussels and Antwerp conurbations, the medium-sized urban area of Ghent and four other small urban areas.

Only one out of the 13 very large urban areas is freestanding (i.e. outside of the metropolitan systems): Lille, whereas seven out of the 11 large urban areas are freestanding: Bielefeld, Rouen, Valenciennes, Lens, Nancy, Brighton/Worthing /Littlehampton and Portsmouth.

6.1. General perspectives

6.1.1. General characteristics

Differences in population density of the urban systems represent, to some extent, the differences in the degree of centralization or decentralization of urban functions within nations.

In France, the capital city dominates the national urban system. The century-long accumulation of economic and political power, of information and communication, has led to a concentration of the best cultural institutions and educational facilities of the country within the capital. The dominance of the metropolis has also shaped the transport and telecommunications network which links the whole nation to the capital city but tends to neglect links between other cities and regions across the nation.

In the other CCC countries, industrial developments, historical and cultural heritage and the role of regional capitals have greatly contributed to a more balanced regional development and subsequently to the stabilization of the national urban system.

[1] ABG-stad is not an officially accepted concept. A future official definition may accordingly differ from the definition used in this report. Here, ABG-stad is defined as the functionally and morphologically interconnected cities of Brussels, Antwerp, Ghent and Leuven, together with the municipalities in between. The area is comprised of the Brussels capital region and of 137 municipalities in the provinces of Antwerp, Flemish Brabant, Walloon Brabant, and East Flanders. The notion of the Vlaamse Ruit (Flemish diamond), covering a large part of ABG-stad, is introduced in the Flemish Government's structure plan.

The spatial organization of the metropolitan systems varies considerably. London and Paris have a monocentric structure. Within the metropolitan area, the core urban area has a dominant hierarchical position.

Though both Paris and London are recognized, for this purpose, as mononuclear metropolitan systems, they have very different spatial patterns. The bulk of the population of the Ile-de-France is concentrated in the restricted area within the Paris agglomeration. In 1990, no less than 87.4% (or 9 318 900 inhabitants) of the total population of the Ile-de-France (10 661 000, see Table 5.2) lived in the Paris agglomeration, which accounts for only 21.3% (or 2 575 5 km^2) of the total surface area (12 072 km^2). Within the Ile-de-France area there are few urban areas other than the Paris agglomeration, the rest of the area being mainly rural.

The London situation is quite different. The London metropolitan system can be broadly divided into three parts: the Greater London conurbation, encircled by a 'green belt', beyond which in turn there is generally open countryside but with a multitude of smaller urban areas. Taken together, these three zones are called the London metropolitan system in this study. With its 6 679 700 inhabitants, Greater London accounts for only 55.4% of the population of the total metropolitan system. The Greater London surface area (1 578.3 km^2) covers only 15.3% of the total surface area of the metropolitan system (10 342 km^2, see Table 6.2). So here, unlike Greater Paris, an important part of the population of the metropolitan system lives in urban areas outside of the nuclear urban area (broadly defined as Greater London).

In contrast with both world cities, the metropolitan systems of the Randstad, ABG-stad, Rhine-Main and Rhine-Ruhr show polynuclear patterns. The conurbations and large urban areas within these metropolitan systems are very high in (Rhine-Ruhr and Rhine-Main), or even at the top of (Randstad and ABG-stad), their respective national hierarchies, but have different functions so creating a system based on urban complementarities.

In the polynuclear cases, the conurbations and large cities are often separated from each other

by more open, sometimes even rural, areas. In the Randstad for example, a northern and a southern wing can be distinguished. In the northern wing there is specialization in the service sector, especially office functions. The southern wing concentrates on transport, distribution and manufacturing. Another example is the Rhine-Ruhr region where northern and southern parts of the metropolitan system can be distinguished. The most important cities in the north, in the Ruhrgebiet, have some specialization in manufacturing (Essen, Dortmund, Bochum), administration and services (Düsseldorf, Essen and Dortmund) or have no specialization at all (Wuppertal, Mönchen-Gladbach). The southern part (the so-called Rheinschiene) has a less dense urban structure compared to the northern part, but its cities (Düsseldorf, Cologne and Bonn) have taken on international roles.

6.1.2. Population dynamics in the metropolitan systems

Present situation

One of the main characteristics of the six metropolitan systems is their large populations. It is not easy, however, to determine the exact number of inhabitants, since the administrative areas, for which population data are generally available, do not coincide with the physical extent of the urban areas. Nevertheless the following figures can be advanced (see Table 6.2):

Table 6.2 shows a division of the six metropolitan systems into two groups: London, Paris and Rhine-Ruhr all have over ten million inhabitants, whereas the smaller metropolitan systems have only half, or even less, of the population of the larger metropolitan systems. The Randstad is the largest of the smaller metropolitan systems, followed by the ABG-stad and Rhine-Main.

The three largest metropolitan systems, London, Paris and Rhine-Ruhr are comparable in terms of the size and density of their populations. The percentage of the population actually living in an urban situation, however, is somewhat lower in the Rhine-Ruhr metropolitan system than in Paris or London. This is due to the polynuclear pattern of the Rhine-Ruhr metropolitan system: to a large degree, the areas between the urban nuclei consist of very small urban areas or even of rural areas, thereby reducing the percentage of the population living in urban areas of over 50 000 inhabitants.

Table 6.2: The six metropolitan systems[1]

Metropolitan system	Population (in millions)	Surface area (in km²)	Population density (per km²)	Urban population (in millions)	Urban population (%)
ABG-stad	3.930	4 210	933	2.405	61.2
London	12.064	10 342	1 167	9.934	82.3
Paris	10.661	12 072	883	9.087	85.2
Randstad	6.396	6 797	941	3.206	50.1
Rhine-Main	3.450	6 843	504	1.720	49.9
Rhine-Ruhr	11.700	8 450	1 385	8.645	73.9
Total	48.201	48 714	989	34.998	71.8

Source: Settlements database, Eurostat; different official sources; calculations by M+R. See footnote 1, p. 158.

[1] Population and surface area figures cover the following areas:
- ABG-stad: the figure of ABG-stad is the result of the addition of the figures of the 137 municipalities (see footnote 1, p. 158), at 1 January 1992;
- London: the 1991 figures for the revised outer metropolitan area (effective from 1974);
- Paris: the 1990 figures for Ile-de-France;
- Randstad: the figures on 1 January 1992 for the provinces of Utrecht, Zuid-Holland and Noord-Holland, excluding the 'Corop zone' of 'Kop van Noord-Holland';
- Rhine-Main: the 1988 figures for the 'Agglomerationsraum Rhein-Main';
- Rhine-Ruhr: the 1992 figures for the 'Verdichtungsgebiete'.
- Urban population figures are based on the Eurostat settlements database. They are the sum of the figures for the built-up areas of 50 000 inhabitants and more, situated in the areas as defined above. They show the population of the metropolitan systems, living in the built-up areas of at least 50 000 inhabitants.
  The last column gives the proportion of the urban population related to the global population of the metropolitan system (second column).

The other three metropolitan systems, the ABG-stad, Randstad and Rhine-Main have much smaller populations. The population density in Rhine-Main is much lower than in the other metropolitan systems. The percentage of the urban population in the smaller metropolitan systems is lower than that of the larger metropolitan systems. This is especially so for Randstad and Rhine-Main, where only half of the population lives in built-up areas of 50 000 inhabitants or more. Just as for the Rhine-Ruhr, this lower urban percentage of the population is caused by the polynuclear pattern of the smaller metropolitan systems.

Although the mononuclear metropolitan systems (London and Paris) have higher urbanization levels than the polynuclear metropolitan systems, all in all, the six metropolitan systems are highly urbanized, with nearly 72% of their global population living in urban areas of 50 000 or more inhabitants.

The urban population within the six metropolitan systems, i.e. the 34 998 000 people living in urban areas of at least 50 000 inhabitants, represents 39.3% of the total CCC area population; and 72.7% of the total CCC area population living in urban areas of over 50 000 inhabitants (48 159 000, see Table 6.1). About 54% of the total CCC area population live in the six metropolitan systems. This means that, while the six metropolitan systems account for more than half of the total CCC area population, no less than three quarters of the CCC area's urban population (urban areas of over 50 000 inhabitants) live in the metropolitan systems.

Signs of recovery of urban cores: continuing growth in the urban periphery

The urban population dynamics exhibited by the urban areas in the CCC area reveal a multitude of trends. Tentative indications and, of course, urban analysis theories, suggest that both size and location may have some determining effect on the population dynamics of cities.

More specifically large urban areas in metropolitan regions have tended to lose population through migration while free-standing cities, small and medium-sized urban areas have continued to grow. The decline of large urban areas has, to a large extent, been concentrated in core areas. Such trends seem to be fairly general in Western society. The evolution of transport systems has made possible the expansion of cities over wider areas. At the same time, changes in the socioeconomic context and in lifestyles have encouraged new living patterns. Offices, light industry and retailing have tended to follow their employees, their markets or both. Most recently, manufacturing industries, taking account of new tendencies in plant layout, organization of production and logistics, have started to prefer low density, environmentally attractive suburban or small urban locations with good road access, ample space for expansion and moderate land prices.

Looking at change in the period 1970-90, the urban areas selected can be classified into five groups:

1. urban areas with continual growth;
2. urban areas with predominant growth;
3. urban areas experiencing an upturn in the past five years;
4. urban areas in balance; and
5. urban areas exhibiting dominant patterns of decline.

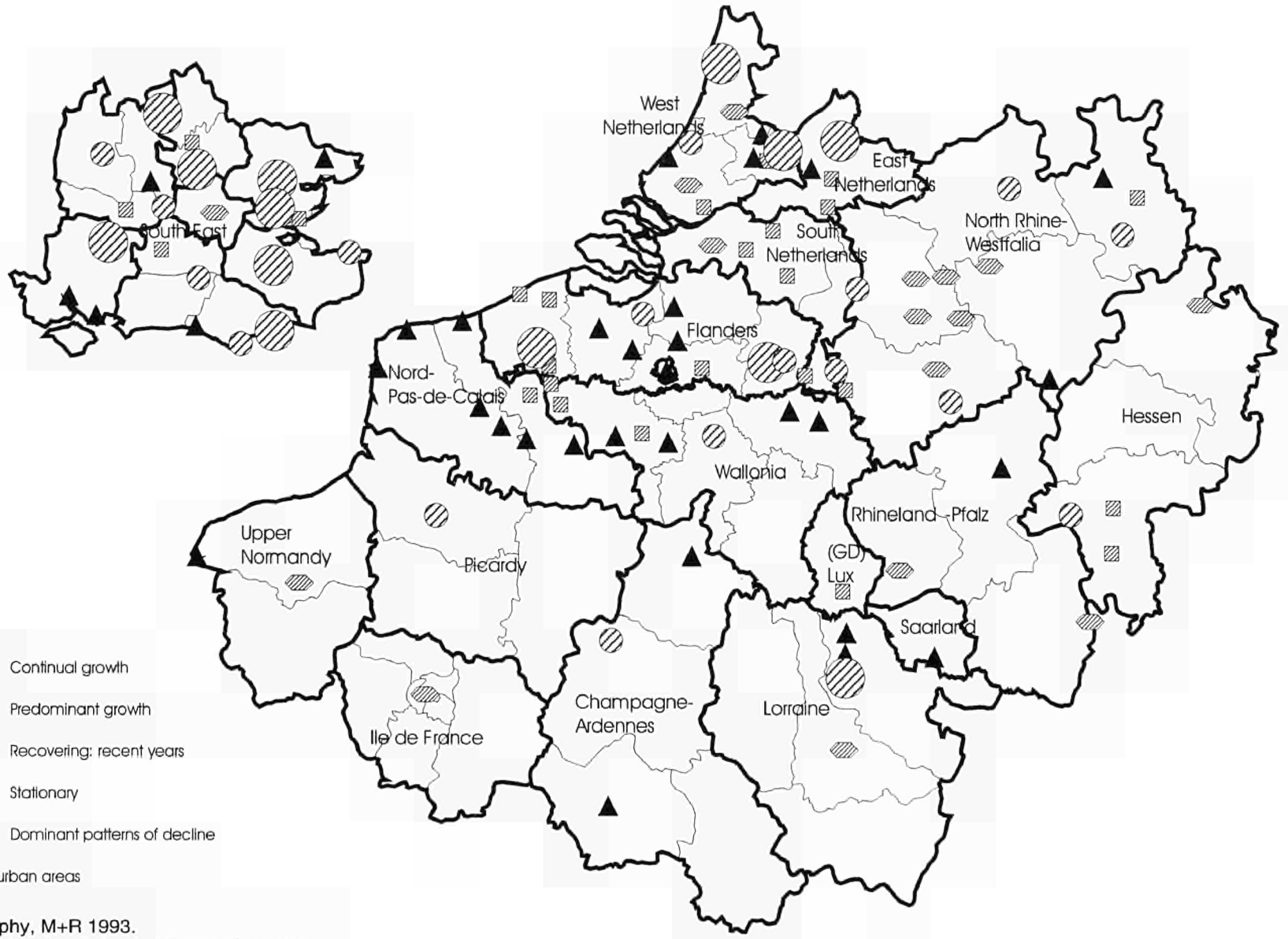
This classification is the basis of Map 6.2 on 'Urban growth and decline 1970-90'.

The first half of the 1970s experienced intense rates of decline in population numbers in the heart of the metropolitan conurbations. For example, the population of the core area of London declined by 220 000 in that period, a figure representing almost half of its loss over the whole 1970-90 period (see Map 6.2).

The decline in the large cities in the metropolitan systems continued in the 1975-80 and 1980-85 periods (see Table 6.3). In the second half of the 1970s, population grew faster in the partly rural hinterland and the peri-urban and commuter zone than in the outer suburbs of the core city.

Map 6.2

Population growth and decline in urban areas 1970-90



Catography, M+R 1993.
Source: London School of Economics 1992

Table 6.3: Population change by size group, main trends in the CCC area

	1970-75	1975-80	1980-85	1985-90
Small urban areas (>100 000 inhabitants)	+	+	+	+
Medium-sized urban areas (100 000 to 300 000 inhabitants)	+	±	±	±
Large urban areas (300 000 to 500 000 inhabitants)	±	−	−	−
Very large urban areas (>500 000 inhabitants)	−	−	−	±

Source: The London School of Economics, composition M+R; ±: an equal number of the concerned urban areas grow of decline.

The advantage of such locations is that they offer a combination of urban and rural lifestyles, taking advantage of good accessibility but without the high costs and other disadvantages of large urban areas. This dispersal phase, led to the growth of small and medium-sized cities, both within and outside metropolitan systems.

In the first half of the 1980s, the rate of decline of the large urban areas within metropolitan systems slowed down. This trend continued in the second half of that decade and even turned into a revitalization of the large urban areas. Many of the metropolitan systems which had declined in the previous 15 years experienced growth in the core population. This was the case for Paris, London, Cologne, Amsterdam and almost all of the urban areas in the Rhine-Ruhr area.

The strong position of the German urban areas in this respect is partly explained by immigration from the former East Germany and from Eastern Europe. This trend may well become even more important in the 1990s. It is by no means a trend confined to the German cities, and the renewed recognition of the attractions of city life affected other large urban areas. It is noteworthy, however, that in most large urban areas renewed population growth is stronger in suburban than in core areas. It might be concluded that the large urban areas have reverted to a suburbanization phase rather than experiencing reurbanization in a more general sense.

Suburbanization processes seem to remain important in Brussels, Rotterdam, on the London-Bristol axis and from Dortmund in the direction of Bielefeld. Suburbanization is considered detrimental only when it leads to wasteful use of space or a worsening of the traffic pattern in and around the urban areas. Such effects tend to accompany an unbalanced spatial distribution of people, firms and employment, under which the core city is defined as a centre of employment. This problem appears mainly in the Dutch and Belgian urban areas, caused by a lack of coordination both within the central municipality and between the municipalities that make up the whole urban region.

An important problem associated with suburbanization can be inner-city decline. In consequence, a good proportion of cities in the Western world have had to make an effort to revitalize their inner cities. In the CCC area, almost all the larger urban areas have been subject to this experience. Revitalization happens through restoration programmes, pedestrianization schemes or new public transport systems. This may point to a reurbanization phase. Reurbanization is taken here to refer to a qualitative recovery of the inner city, in which population either stabilizes or even begins to grow again, accompanied by renewed growth in at least some employment sectors within the central area.

Some cities have experienced inward movement of people with relatively high incomes, and who tend to occupy correspondingly large dwellings. As the creation of larger dwellings is an important condition for city revitalization, the influx of people with higher incomes may be the start towards urban renewal. However, these households are very mobile, and their location preferences may change quickly. This is not necessarily a major problem, because, having created the property value (larger dwellings), the phenomenon in itself may not be equally evanescent, as new house-

holds with higher incomes can move into the deserted dwellings.

The main problem in all this is the small scale of this phenomenon, creating only small islands of urban renewal. A permanent upward turn of inner-city population and employment can only be expected where substantial increases of floor space in the city centre will occur. Without that, reurbanization remains a qualitative phenomenon, i.e. a replacement of one social group through another and at the same time reinforcing social polarization in the city.

Although there is no evidence of general reurbanization processes, the 'life-cycle' concept suggests a possible future fourth phase of reurbanization. The concept, relevant for the whole Western society, suggests that in the reurbanization phase growth will return to the core and that governments will successfully have solved the problems of the central city.

The question that arises is whether the urban population dynamics of 1985-90 suggest that the dominant cities within the CCC area are in fact in the early stages of reurbanization? The major urban areas certainly experienced a degree of some recovery but it remains to be seen how permanent and fundamental this will prove to be. The pattern of urban dynamics over the full 20-year period under consideration suggests a more complex pattern than that promoted by the life-cycle debate.

The United Nations, in their world urbanization forecasts, give some estimates of the recovery trend of some metropolises in the CCC area. The figures in Table 6.4 suggest that recovery will not be maintained for all the urban agglomerations.

The United Nations, in their world urbanization prospects, expect an increase in urban population in the countries of the CCC area,[1] but the pace of the expansion is slowing down. Taking the differences of definition into account, the rate of urbanization is expected to remain stable right through to 2020-25. West European countries are projected to have only limited fluctuations around the recent level of 0.2 to 0.3% per annum.

Table 6.4: Average annual rate of change of the population of urban agglomerations[2] comprising one million or more inhabitants in 1990

(in %)

	1985-90	1990-95	1995-2000
Paris	0.11	0.25	0.04
Frankfurt	−1.01	0.02	0.00
Amsterdam	1.23	1.07	0.90
Rotterdam	0.14	0.19	0.24
London	0.05	0.12	0.18

Source: United Nations, 1990.

This perspective, if realized, will be helpful for future spatial policy. Key issues in urban policies will not need to focus primarily on spatial dispersion of urban areas but can concentrate on problems at an urban level (economic, social, environmental) and on the changing characteristics and the impact of intercity relations. Social renewal and cultural policies will be increasingly important to cities.[3]

Facing declining physical quality and increasing social problems

The prosperity of the metropolitan systems will depend on the way they cope with key issues: regulation of their land markets, dealing with urban congestion; increasing the quality of the urban environment; and finding solutions to growing problems of social segregation and urban poverty.

Environmental degradation especially affects old industrial areas and larger urban areas. Environmental awareness has created growing public

[1] The UN definition of urban areas is different from that in this chapter and differs for each individual country. For almost all CCC area countries, all communities of at least 2 000 inhabitants (in UK 1 000 inhabitants) are taken into account.

[2] The definition of urban agglomerations used by the United Nations differs from country to country. For the Dutch, English and French urban agglomerations the delimitations are comparable to urban areas as defined in the introduction of this chapter. The German agglomerations are smaller than the (built-up) urban areas, and Brussels, officially divided into 19 independent municipalities with all less than one million inhabitants, is not represented in this table.

[3] The thrust of national urban policies and EU programmes related to urban development was described in greater detail in the Interim Report, Part II Chapter 1, Cities, pp. 1.63 and 1.64.

and private support for regeneration measures. Emission levels of air pollutants for Brussels, Paris, London, Amsterdam and Frankfurt are now generally declining. Nevertheless, the extent of air and water-borne industrial pollution remains a major problem in many large urban areas.

The most important environmental problems, according to the Urbinno Network Research (Drewett et al.,1992), are the lack of greenery, traffic-related problems (mainly air pollution and noise), and the treatment of solid waste. The EU's Green Book on urban environment gives an overall description of the key issues for improvement of the quality of the urban areas.

It is expected that traffic will continue to increase in the future, even in the inner urban areas. There is a hope that public transport will be able to accommodate both greater volumes and a larger share of movements. The growing attention being given to pedestrian environments and attempts selectively to reduce private transport, for example in Amsterdam, London and Delft are also important.

Social segregation is a major problem in the large urban areas, especially where it is accompanied by segregation by nationality ('country of birth', to be precise). There have always been large concentrations of low income households close to the city centres. Continuing immigration of people from economically less developed countries outside the EU has changed the cultural composition of those groups. In addition, such groups are increasingly displaced by renewal projects, which often increase land and property values and attract high income groups. This reinforces the process of segregation and marginalization and influences patterns of spatial development.

Urban poverty is mainly a result of growing unemployment. Development axes outside the urban area and in the suburban ring tend to be the big winners in terms of employment recovery, whereas most cities will experience only moderate increases in the inner city and even a decline in the old city centre.

Many large urban areas launch prestigious cultural projects to improve their performance: e.g. *les Grands Travaux* in Paris, new or renewed museums in Frankfurt, Rotterdam and Brussels. All capital cities have important cultural functions, with Greater London and Paris important at the world level. The cultural aspect is also important in Rotterdam, The Hague, Frankfurt, Cologne, Düsseldorf, and many smaller urban areas. International, sometimes returning manifestations (cultural capitals of Europe, international art exhibitions, famous music festivals, etc.) also help to enhance the cultural prestige of the metropolitan systems.

Increasing numbers of visitors to inner cities, their historical monuments, museums and theatres and for shopping reflect a renewed interest in city life. Most large urban areas have initiated important restoration programmes and building activity for new shopping centres, office buildings, hotels and convention facilities has similarly increased. Notably in London and Paris, but also in other cities such as Brussels and Frankfurt, this has led to massive real estate speculation increases in prices and rents, in turn giving a further push to social segregation.

6.1.3. The functions and hierarchies of the metropolitan systems

Present situation

On the basis of 16 economic, cultural and other urban criteria, Reclus has defined a hierarchy of EU cities. The criteria are demographic (population and population growth), economic (numbers of engineers, technicians and executives, the number of multinationals, and the presence of fairs and exhibitions), financial (the presence of banks and other financial services), scientific (the presence of R&D infrastructure and activities, of large laboratories and of universities), cultural (the presence of important museums, monuments, exhibitions, theatres, festivals, cinemas, important activities in the world of fashion, literature and arts, and the number of newspapers and editors), transport-related (traffic through sea and airports) and communication (telecommunication infrastructure and the number of conferences). Additionally, a qualitative appreciation of the 'specialization' of the cities is incorporated.

Relevant parts of the hierarchy are shown in Table 6.5.

Table 6.5: The West European hierarchy according to Reclus, 1989 (five of eight classes presented, cities in the CCC area in bold)

Rank	Cities	Score
1	**London**	83
	Paris	81
2	Milan	70
3	Madrid	66
	Munich, **Frankfurt**	65
	Rome, **Brussels**, Barcelona	64
	Amsterdam	63
4	Manchester	58
	Berlin, Hamburg	57
	Stuttgart, Copenhagen, **Athens**	56
	Rotterdam, Zürich	55
	Turin	54
	Lyons	53
	Geneva	52
5	Birmingham, **Cologne**, Lisbon	51
	Glasgow	50
	Vienna, Edinburgh	49
	Marseilles	48
	Naples	47
	Seville, Strasbourg	46
	Basle, Venice, **Utrecht**	45
	Düsseldorf, Florence, **The Hague**, **Antwerp**, Toulouse	44
	Valencia, Genoa	43

Source: Reclus, 1989.

In this hierarchy, London and Paris are top (class 1), followed closely by a Rhine-Main city (Frankfurt), an ABG-stad city (Brussels) and a Randstad city (Amsterdam) (class 3). The first Rhine-Ruhr city only appears in class 5. Looking at clusters rather than individual cities, however, the scores of Randstad and ABG-stad would probably be higher than the score of Rhine-Main (Frankfurt), giving the following hierarchy: 1: London; 2: Paris; 3: Randstad; 4: ABG-stad; 5: Rhine-Main; 6: Rhine-Ruhr.

By using five groups of indicators (economy and finance, international relations, communications, research and technology, culture) based on the same criteria as the previous hierarchy, 12 groups of cities have been distinguished. The results of this analysis were that London and Frankfurt scored strongly on all indicators, especially economy/finance and international relations; Cologne and Utrecht performed well in research/technology and international relations; Amsterdam, Rotterdam, Antwerp and Düsseldorf scored strongly in international relations and communications and had rather good figures for their economies; Bonn and Duisburg also performed well in international relations, as in combination with culture, did Brussels and The Hague; and Paris registered high scores on both research/technology and culture. Ghent, Essen, Dortmund, Bochum and Haarlem are cities which, though situated in metropolitan systems, do not have a clear specialization.

Another hierarchy (produced by RPD) is based on the degree of interconnection of European urban areas, (Table 6.6).

Table 6.6: Rank order of urban regions with regard to their position within the West European urban system, according to RPD (1992)

Urban region	Number of networks present	Number of relations
Frankfurt	5	10
Hamburg/Bremen	5	10
Ruhrgebiet	5	10
Munich	5	10
Stuttgart	5	10
Randstad	5	9
London	5	7
Central England	5	6
Berlin	4	8
Milan	4	6
Antwerp/Brussels	3	6
Paris	3	5
Zürich/Basle	2	4
Vienna	2	4
Rome	2	3
Lyons	2	2
Barcelona	1	2
Naples	1	1
Madrid	1	1
Lisbon	1	1
Athens	1	1

Source: RPD, 1992.

According to this measure, there is a broad north-south division, with the high-ranking urban areas are mainly in the northern part of the EU and the urban areas with a lower position in the urban hierarchy mostly in the south. This division is also demonstrated in other analyses, for example the work of Cheshire (Cheshire *et al.*, 1986; Cheshire and Hay, 1989; Cheshire, 1990).

Variations in specialization, implying complementarity, may be regarded as a strength of the CCC area urban system. This does not, however, exclude competition between metropolitan areas for some do compete for the same functions, for example Rotterdam versus Antwerp for harbour-activities, Paris versus Frankfurt for financial services, and Paris, London and Frankfurt in international air services.

Whatever criteria are used, the six metropolitan systems tend consistently to head the European urban hierarchies. When the six metropolitan systems are considered separately from the other European urban areas, their relative rankings depend on the particular criterion adopted, with no one metropolis dominating in all hierarchies. Overall, however, when a number of criteria are taken into account (as in fact Reclus did), a clear hierarchy does emerge. This puts London and Paris on top, Randstad, ABG-stad and Rhine-Main in the middle, and Rhine-Ruhr at the bottom, followed of course by all the other non-metropolitan urban areas.

The Reclus hierarchy accords rather well with a hierarchy based solely on population size. There is one important exception though: Rhine-Ruhr, the second largest CCC area metropolitan system features in the last position in the Reclus hierarchy, below Rhine-Main, which has only one third of the Rhine-Ruhr population. This is mainly due to the very strong position of the Frankfurt airport, as well as the strong position of the city in the fields of finance, telecommunications, trade fairs and congresses and high-tech activities. Other than population size, only in port-related activities is the Rhine-Ruhr area clearly more important than the Rhine-Main area.

Economic outlook

A number of factors may offer pointers to how the hierarchies may develop in future. laurif has carried out a comparative study of the competitive position of the Ile-de-France, and seven other metropolitan areas in Europe on the basis of location and profitability (see Table 6.7).

For the locational column, international investors (based on locational preferences of more than a hundred multinational firms), Frankfurt ranked as the best location in Europe, followed by Ile-de-France, London, Brussels, Randstad, Madrid and Milan. As far as profitability is concerned, while Randstad is at the top, Frankfurt figures in last place. The reason for this is a combination of high site costs (though slightly lower than those in London) and high wage costs (54% higher than in London). That Frankfurt is nevertheless the most favoured must be due to its locational advantages for the accommodation of international firms, including easy access to an international airport, its financial services, a first-rate public transport system, international telecommunication facilities at a competitive price, high-quality real estate, and all this in a relative small city.

Table 6.7: The ranking of selected European metropolitan areas according to location and profitability

Rank	Location criteria	Profitability criteria
1	Frankfurt	Randstad
2	Ile-de-France	Ile-de-France
3	London	London, Brussels, Madrid
4	Brussels, Randstad	Milan
5	Madrid, Milan	Frankfurt

Source: Laurif.

Table 6.8 shows another set of rankings of the metropolitan systems, in this case by North American and Japanese companies that had recently established a firm in one of the six metropolitan systems. This is of course a reflection of the perceived competitive power or specific advantages of these areas (Table 6.9).

On these measures, the urban region of Paris shows up as the favoured region for the most activities as a result of the accumulation of a diversity of location qualities in a relatively small area. Infrastructure and the quality of business and commercial sites are the most important features for Paris. Industrially orientated firms are still attracted by traditional industrial regions such as Düsseldorf/Cologne and Frankfurt. London heads the table for international headquarters.

As stated previously, services are important in the economic structure of cities, especially the large

Table 6.8: Qualification of competitive power for six urban areas in the CCC area

Factors	Strong	Average	Weak
Macro-economic profile	Brussels/Antwerp	London, Düsseldorf/ Cologne, Frankfurt	Randstad, Paris
Market	Düsseldorf/Cologne, Frankfurt	Brussels/Antwerp, London, Paris	Randstad
Working climate	London	Brussels/Antwerp, Paris, Frankfurt	Randstad, Düsseldorf/Cologne
Labour market	Brussels/Antwerp	Randstad, London, Paris, Düsseldorf/Cologne	Frankfurt
Infrastructure	Randstad, Paris	Brussels/Antwerp, Düsseldorf/Cologne	London
Subsidies and taxes	Brussels/Antwerp	Randstad, London, Paris	Düsseldorf/Cologne, Frankfurt
Residential climate	Randstad, London,	Düsseldorf/Cologne, Frankfurt	Brussels/Antwerp, Paris
Business locations	Randstad, London, Paris	Brussels/Antwerp, Düsseldorf/Cologne	Frankfurt
Operational costs	Randstad	Brussels/Antwerp, Paris, Frankfurt	London, Düsseldorf/Cologne

Source: Buck Consultants International, 1991.

Table 6.9: Ranking of attractiveness of the urban regions for several types of activities

	High-tech production	Traditional production	R&D activities	Seaport-related distribution	Airport-related distribution	International headquarters	International services
Randstad	3/4	6	3/4	1/2	4	2	5/6
Brussels/Antwerp	5/6	3	5	1/2	2/3	3/4/5	1/2
London	5/6	5	6	4/5	2/3	1	1/2
Paris	1/2	1/2	1/2	3	1	3/4/5	5/6
Düsseldorf/Cologne	1/2	1/2	1/2	4/5	5/6	6	4
Frankfurt	1/2	4	3/4	6	5/6	3/4/5	3

Source: Buck Consultants International, 1991.

urban areas and their share of total employment is expected to increase in future. Manufacturing will show a continuing decline in its share in employment, though the GVA it contributes may grow modestly (Table 6.10). Given the present economic situation, however, it is to be expected that these figures may have to be adjusted. Any divergence from this expectation could see manufacturing decline more rapidly, accompanied by weaker growth in services.

The process of de-industrialization offers, among other things, good prospects for enhancing the quality of the urban environment in metropolitan areas (see the chapter on economic issues).

Urban areas with a strong service sector and good conditions for the establishment of services are best placed to profit from an eventual economic revival. The forecasts in Table 6.11 for individual large urban areas tend to confirm earlier conclusions. The most striking is the high share of market services in both Amsterdam and London accompanied by no more than modest economic growth expectations. For Amsterdam the modest growth can be explained by stabilization or decline in other sectors, despite the forecast growth of market services. In London, growth in both the secondary and market services is expected to lag in comparison with continuing growth potential elsewhere.

Table 6.10: Forecast economic activity in some CCC area cities*

	Employment		Gross value-added	
	share 1989	growth pa (in %) 1989-'96	share 1989 (in %)	growth pa (in %) 1989-'96
Primary	1.7	−1.0	4.6	1.6
Manufacturing	20.3	−1.7	19.3	1.9
Construction	5.5	0.2	4.7	2.0
Distribution	17.8	−1.2	12.4	1.5
Transport and communication	7.9	0.6	7.1	3.7
Non-market services	19.4	1.4	12.9	1.6
Other market services	27.4	1.3	39.0	3.5
Total	100	0.1	100	2.6

Source: Kolpron Consultants/Ereco, 1992.
* Frankfurt, Cologne, Düsseldorf, Paris, Lille, Amsterdam, Rotterdam, Utrecht, Brussels, London.

Table 6.11: Forecasts for individual cities

(in %)

	GVA growth (all sectors) 1989-96	Share of market services in total employment
Paris	3.2	52.4
Frankfurt	2.9	46.4
Rotterdam	2.8	55.1
Cologne	2.8	34.4
Brussels	2.7	67.0
Utrecht	2.6	53.2
Düsseldorf	2.5	42.7
Amsterdam	2.0	60.8
London	1.0	62.9

Source: Ereco, 1992.

6.1.4. Emerging networks between metropolitan systems

Contact between urban areas can take the form of flows of information, goods, people and financial resources or through organizing connections, which can have general objectives or can be more action-oriented, e.g. R&D cooperation. Transport and communication networks and economic potentials are fundamental in shaping the national and international urban system. The combination and magnitude of the movement of goods, people and information say a lot about the importance of intercity relationships and the relative position of urban areas. These relations are presented in maps for present and future situations (Maps 6.3 and 6.4). In terms of the urban system at the level of the CCC area, it is inter-metropolitan rather than national relationships which will be crucial.

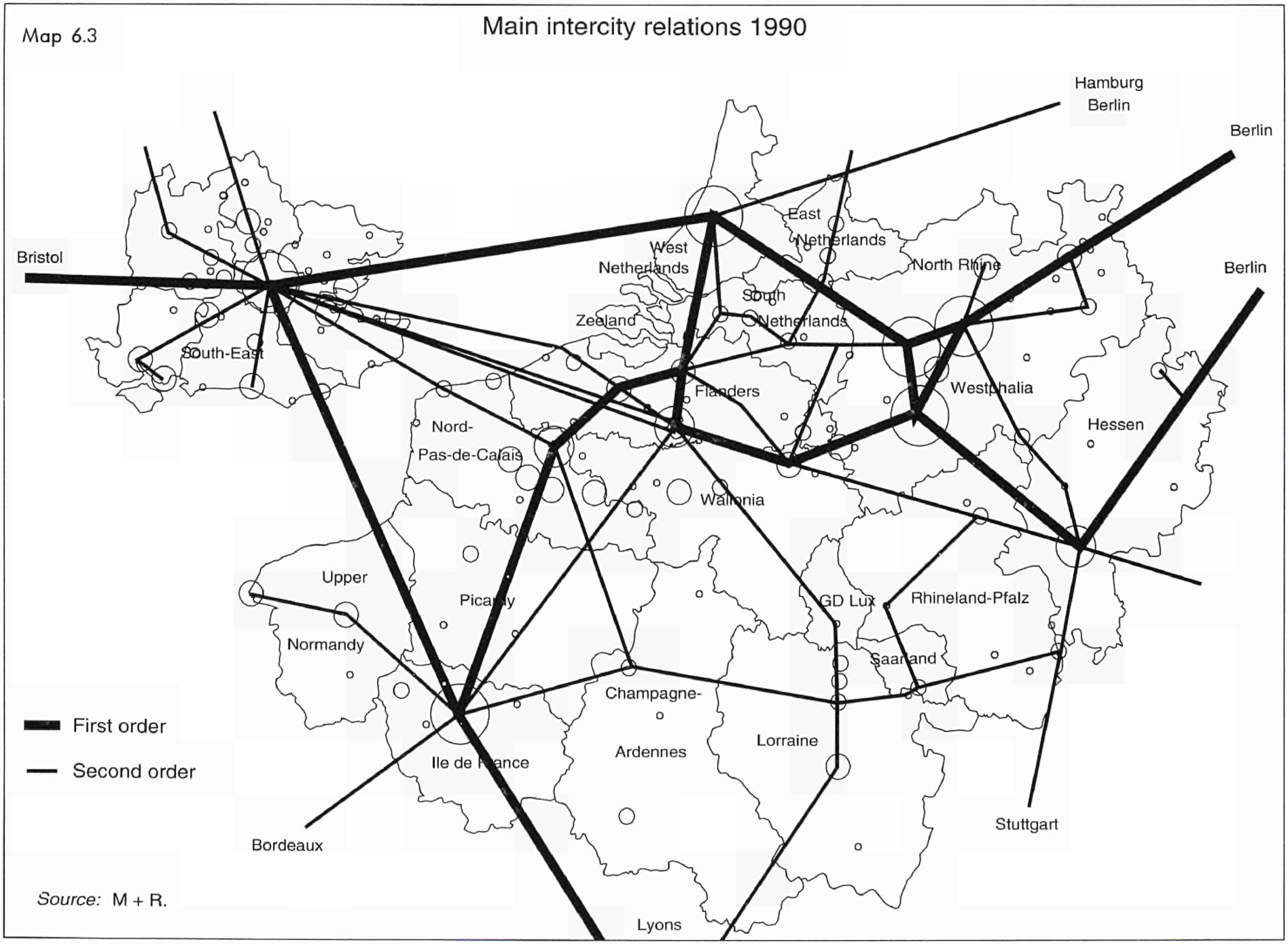
Present situation

The most important relationships are those which link the capital, controlling and decision functions of the metropolitan systems. A further integration of the European economy and its growing internationalization, accompanied by the ongoing transformation of economic activities through technological shifts, give a primary role to mobility both in terms of transport and telecommunications.

On the basis of measurable flows of goods, passengers and information, the most important intercity relations in the CCC area are those between Randstad, Brussels and the Rhine-Ruhr conurbations (see Map 6.3). Although still important, the flows between ABG-stad-Paris-Greater London-Randstad-Rhine-Ruhr and Rhine-Main, and between Greater London and ABG-stad are of a lesser order. These flows merely give an indication of the importance of the intercity relations, as they are influenced by the population density of the regions they cross and, especially in the case of road transport, by the distance between the metropolitan systems.

In comparison with other urban areas in the CCC area, the metropolitan systems are strongly connected with other urban regions (especially Rhine-Main, Ruhrgebiet, Randstad, London). Antwerp/Brussels and Paris are relatively less well connected to the other urban areas (RPD, 1992).

Map 6.3



Source: M + R.

With regard to the future, it is important to stress that urban systems are notably stable. It has, for example, been demonstrated (De Vries, 1984) that the most important European urban areas in the period 1500-1800 remain the backbone of the structure of today's urban network. Other researchers have also pointed out the relative stability of urban systems (see for example Pred, 1978). It is not to be expected, then, that the urban system in the CCC area will change dramatically in the next 10 or 20 years. However, developments in Eastern Europe will have an influence, especially if the urban areas in that part of Europe become more closely integrated with the Western European urban system. This also will lead to changes in the linkages of West European urban areas and metropolises. For example, urban areas in northern Germany, which have suffered a curtailment of their hinterlands for the past 50 years, might now regain their former positions. For the CCC urban areas the possible linkages with Eastern Europe are undoubtedly significant though it is not yet clear what the extent of the changes might be. One indirect impact is the changing position of Bonn following the choice of Berlin as the capital of reunited Germany.

Spatial polarization will remain an important characteristic of the urban system of the future. Although the development of fast transport and telecommunications networks has a theoretical potential for decentralization, in practice, it seems rather to contribute to the concentration process by reinforcing those intercity links that are already the strongest. Accordingly, recent and future investments in transport and telecommunications are likely to continue to favour metropolitan systems. It follows that the continuing impact of the existing spatial/urban hierarchy cannot be avoided. Examples are the growing importance of intercity relationships between the Randstad and the Rhine-Ruhr conurbations and between the Rhine-Ruhr and Rhine-Main conurbations. The 'bundling' of linkages between London and several other metropolises in the CCC area and the strengthening of links between Randstad, Brussels and Paris are creating an important nodal position for Lille (Map 6.4).

6.2. Key elements of a trend scenario[1]

The six national metropolitan systems remain the moving force despite negative environmental impacts

Despite the growing internationalization of society as a whole, the general trend is that the CCC metropolitan systems, although they try to secure their future by strengthening their international position, do not give much proof of intermetropolitan cooperation. Thus the metropolises are rather more competitors than complementary systems.

This situation is not wrong in itself, but it is doubtful that these incoherent metropolitan strategies can cope with the ever-changing challenges coming from the US, Japan, or the new economic powers in Asia.

At this moment the trends do not allow much optimism as far as intermetropolitan cohesion is concerned.

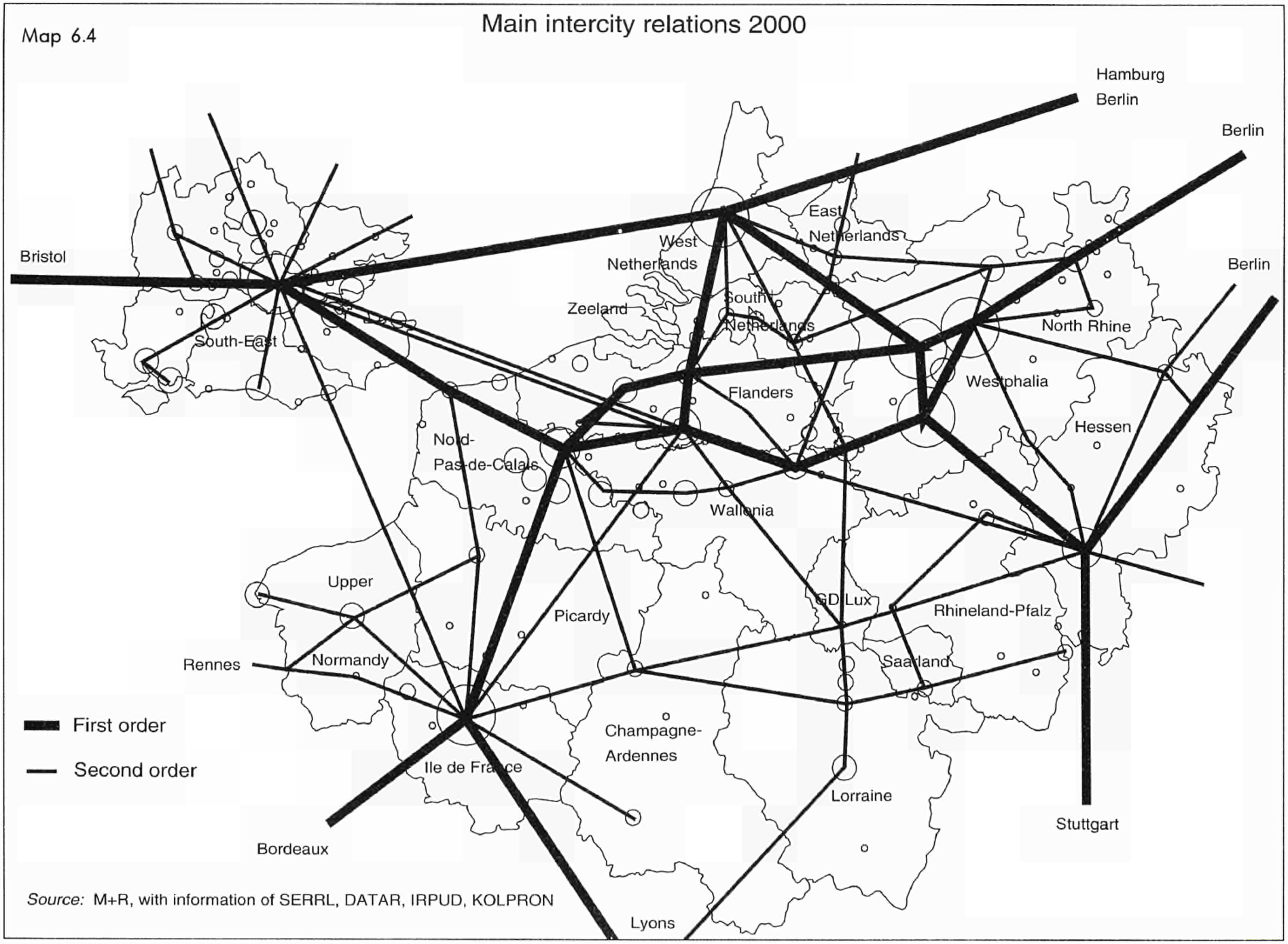
In each of these metropolitan systems strong economic functions are found. The increasing concentration of flows of goods and information through a limited number of nodes; the increasing concentration of headquarters, distribution centres, R&D and high-tech activities in a small number of metropolitan systems; the ongoing internationalization of trade within the EU and outside the EU lead to an increase of scale in all those activities.

The presence of these functions and the economies of scale lead to a further concentration of economic growth in the six metropolitan systems, continuing the present trend. The actual slump

[1] The purpose in the trend scenario was to remain as close as possible to realistic trends. It comprises 'business as usual', including policies in the phase of implementation. Also the policy scenario tries to make only feasible and realistic recommendations. Many of them were already proposed in existing planning documents in the different CCC countries, and on many occasions these documents will be referred to. The policy scenario in this study proposes an integration of these recommendations, completed with new ones, into a comprehensive policy on a CCC area-wide scale. This policy is focused on the two main points here: internationalization and transition of the economic, social, spatial, environmental and communication issues.

Map 6.4

Main intercity relations 2000



Source: M+R, with information of SERRL, DATAR, IRPUD, KOLPRON

may slow this down, but it is not expected to alter the fundamental process.

In general, some common trends for the metropolitan systems can be described.

6.2.1. Social trends

Metropolitan systems are the mirror of society in transition. Thus, all the modern sociological problems are reflected in the large urban areas to their extreme. This is especially true for social inequality caused by high income differences, the greying of the population and migration problems.

This means that there are many homeless people, unskilled people, unemployed, etc. in large urban areas, often concentrated in confined areas.

As metropolitan systems consist of large population concentrations, the inhabitants lose informal contacts with each other. This, together with the trend towards smaller families (many single person families), typically causes problems linked to loneliness.

As they were always there in urban areas, some problems, like extreme poverty and criminality are not likely to be solved in the near future. Other problems being more cyclic, like unemployment and immigrations waves, are society related, and solutions to these problems cannot be found in the metropolises alone.

South-East

The Secretary of State foresees an estimated growth of 260 000 additional dwellings for the period 1987-2001. Serplan proposed an extra overall requirement for the whole South-East, and 175 000 extra dwellings between 1991 and 2000 for London.

Most of these additional extra dwellings are to be expected on the fringes of the built-up area

This growth is not directly caused by an increase of the population. The population of the South-East and London is only a little higher than it was in 1970, and there are no remarkable tendencies that predict a strong increase for the near future. The increase is more related to the growth of households, especially in the inner city of London.

Ile-de-France

The population forecasts expect a further growth of the population (of about half a million people up to the year 2000). However, a remarkable ageing is also expected in the actual forecasts (10.5% of people older than 65 in 1985 and 14.2% in 2015).

Rhine-Ruhr

The employment in industry is still rather high, especially compared to the other metropolises. In most parts of the Rhein-Ruhr, industrial employment still accounts for between 40 and 50% of total employment. A comparable figure is found for the part of employment by governments, while the number of independents is below 10%.

Employment figures varied in 1990 between 9.2 and 13.1%.

For the Rhine-Ruhr system, the share of industrial employment can be estimated at about 35%, and the share of transport and distribution is about 20%.

The share for services (financial as well as business) can be estimated at about 36%. This indicates the economic transition process in the area. However, it has to be remarked that the rapidity of this transition process is slower than in the metropolitan systems of Greater London or Ile-de-France. The most remarkable growth of the tertiary sector can be found in cities as Oberhausen, Essen, Dortmund, Bochum and Duisburg.

The unemployment figures for the Rhein-Ruhr increased remarkably during the last years, especially during the end of the 1980s, with a peak during 1988 (14.7% of active people). However, recent tendencies are indicating the recovery of

the regional economy. Still, the high share of industrial employment is to be considered as a weakness for this area, and efforts are made to support and accelerate the economic transition process.

Randstad

Like in the other metropolitan systems, most of the foreign population in Randstad is concentrated in the large urban areas. No less than 36% of the unemployed Turks and 48% of the unemployed Moroccans living in the Netherlands are concentrated in the four major Randstad urban areas (Amsterdam, Rotterdam, The Hague and Utrecht).

ABG-stad

The most important population dynamics are observed in the suburban areas and in the urban fringes. This concerns mainly the area between Brussels, Antwerp and Ghent, the area around Brussels and the northern part of Walloon Brabant.

In the urban centres of the ABG-stad there are large concentrations of foreigners. In 1991, 28.5% of the Brussels population (271 800) was non Belgian. Most of them (147 800) come from outside the EU, while 82 500 come from North Africa.

Although new legislation, easing naturalization, persuades many immigrants to naturalize, the steady influx of new immigrants keeps the ratio of the foreigners high in the ABG-stad.

Rhine-Main

The high immigration of Germans from the new *Länder* is expected to decrease steadily until the year 2000, when it will stabilize at a low level (about 5 000 immigrants per year). Foreign immigration is expected to remain at the actual level of some 5 000 per year even beyond 2000, but even the cumulated immigration (German and foreign) is, under the current trends in natural population growth, not expected to be able to compensate for the natural population decrease after the year 2010.

6.2.2. Economic trends

Economic development increasingly becomes a matter of internationally oriented service activities. These centres will specialize towards international centres for management, decision making and coordination.

It is evident that political and policy actions are or will be taken in order to safeguard and to increase the advantageous competitive position held by these systems today. Important in this respect is the development/creation of R&D centres closely related to the economic structure of the metropolitan systems, leading to more international cooperation.

South-East

London has a remarkable concentration of business, financial services and headquarters, and they are likely to continue to prefer the core area of Greater London as a location, whilst R&D and high-tech industries continue to find the western part of the South-East (the 'Golden Triangle') a suitable location.

In general, London's future is expected to depend on its success as a world city specializing in international business services and headquarters and a continuing strong position as a financial centre.

Between 1979 and 1986, adult unemployment rose by 242% in London and by 224% in the whole South-East.

Most of this unemployment is situated in the inner city as well as in the East Thames corridor.

Disinvestment in the inner cities affected London.

Regarding employment, the decline in manufacturing employment (decrease between 1971 and 1986 was 45% for the whole South-East and 30% between 1981 to 1988 for London) is accompanied with the remarkable increase of ser-

vice employment (about 11% in the same period for the whole South-East and an overcompensation for London). Especially for London, there was a tendency towards labour shortages and overheating at the end of the 1980s, and congestion is one of the negative consequences.

Ile-de-France

The prospects for the Ile-de-France region are good both for services and manufacturing. The position of Paris as an important financial centre is, however, more and more challenged by Frankfurt. According to the perception of foreign investors the Ile-de-France region ranks high among European urban areas.

The Ile-de-France is expected to keep this favourable position, mainly thanks to its highly qualified workers, the good (and improving) organization of its public transport and its high level of education, research, recreation and cultural facilities.

The Ile-de-France encompasses on its own a quarter of the total employment in France and 27% of the gross national product.

Given the recent developments, the relative economic importance of the 'villes nouvelles' is growing.

These include, la Defénse (business services), Roissy-Paris Nord (around Charles de Gaulle airport), Massy-Saclay (R&D), Marne la Vallée (business services) and Evry (near Orly: electronics and informatics).

Given the bad prospects of the Eurodisney project (Marne la Vallée), the development of the fringe of the metropolis could be hampered there, with consequences on the rather optimistic employment prospects at the beginning of the project.

Given the remarkable shift from the secondary to the service sector (a decline of 325 000 employees in the secondary and a growth of the service sector with 455 000 employees between 1975 and 1987) the metropolis has been passed through a remarkable economic transition process.

Rhine-Ruhr

The Rhine-Ruhr area is very heterogeneous. Service sector activities are concentrated in the south (Bonn, Cologne, Düsseldorf), where most internationally-oriented infrastructures are present. Under a trend scenario, this part will continue to be an attractive location to invest. Seen the current economic recession and the present profile of the northern part of the Rhine-Ruhr area, the trend scenario does not allow such optimistic forecasts.

The pace with which the traditional steel and coal conglomerates adopt new strategies (diversification) and organize new networks of companies in other than the traditional industries is too slow under current slump conditions to overcome the negative effects of restructuring. According to actual prospects, jobs created by foreign or newly-founded companies in R&D, high-tech production and services cannot outnumber job losses in traditional services.

Some of the regions, like Düsseldorf, seem to be able to successfully adjust their economic structure. Although Düsseldorf was characterized by a negative job growth over the period 1980-90, the latter half of the 1980s was characterized by a job growth. Despite the classification of the Düsseldorf region as one of the industrial regions in decline in the EU, the number of employees in manufacturing seems to have stabilized (with a sectoral change towards more modern industries like electrical engineering and electronics) while a large number of jobs have been created in the services sector. Düsseldorf is also popular as a location for foreign companies, especially Japanese subsidiairies (320 in total: the second largest concentration outside Japan).

Notwithstanding these changes, manufacturing in this urban region still has a share of 39% in regional employment. This is a strategic weakness, since manufacturing cannot provide stable employment in the future. Some of the larger urban areas have good prospects for growth of service employment to such an extent that losses of employment in manufacturing will at least be compensated. Best prospects for service developments are for Cologne and Düsseldorf. The

position of Bonn is under pressure because of the choice of Berlin as capital city of unified Germany.

Randstad

Thanks to its good infrastructure and its strong position in European distribution and logistics, the randstad is expected to continue to attract sea-oriented distribution companies and non-European multinational headquarters. As competition between the airports is very strong, the position of the Randstad with respect to airport-related distribution depends on the ability of the metropolis to represent Schiphol as a main airport.

As in other metropolitan areas, industrial activities, except for high-tech industry, will continue to decrease in the urban areas of the metropolis.

Competition in business and financial services is also strong, but, as these services are expected to increase in the world economy, an increase is also expected in the Randstad. The metropolis holds a very strong position in some specific services like financial services for the trade and transport sector, accountancy, insurances, trade-financing and technical services, especially engineering, designing and research. Especially in these services an important increase is expected.

The industry together with transport and distribution are the two main economic activities of the Randstad. These are mainly oriented towards the foreign market, which explains the strategic importance of accessibility to all kinds of transport modes, and their weakness in relation to the growing congestion in the area.

Business and financial services are the third most important economic activity of the Randstad, which is extremely dependent on the presence of international enterprises.

ABG-stad

In recent years, this system did attract many European headquarters of international companies, seen by the presence of international organizations in Brussels. The trend is that Brussels will increase its dominance within the system, as its single urban area is attractive for foreign top-class activities. This would leave the two other larger urban areas as locations for other functions, such as high-tech industries, petrochemical industries, transport and distribution, logistics and eventually some overspill from Brussels for office development.

Also in this large urban area the environment has some threats for future developments. These are the strongest in Brussels followed by Antwerp. This has to do with high unemployment, related to a large foreign population.

Negative impacts on the system as a whole are the possible risk of too little diversification in the economic structure of the other larger urban areas, the insignificance of these other larger urban areas as a possible location for internationally-oriented services and the lack of knowledge and promotion of the system as a functional unit abroad.

Also in the economy of the ABG-stad, the transition process has lead towards a decrease of industries and a remarkable growth of services, and the services are mostly concentrated in the so-called Vlaamse Ruit and in Brussels, especially in the urban areas.

Given the transition from industry towards services and the threatened open areas within this metropolitan system, only a limited extension of new industrial terrain is foreseen in the policy outlines under preparation.

Rhine-Main

The smallest of the six metropolitan systems proved to be highly dynamic during the 1980s. Frankfurt takes a dominant place in the system. Frankfurt became the financial centre of Germany, which attracted business services to the centre of the Rhine-Main system. Its international significance is increasing even more, as Frankfurt is becoming the seat of the European Bank.

The Rhine-Main metropolitan system holds strong positions in R&D high-tech production and chemical industries, and the telecommunication

facilities are excellent, as it is a major testing ground for new developments in this field. Hence, it can grow into a data-processing centre of European significance. Its transport facilities are excellent, and will be increasingly used because of the growing importance of the region and its central location in Europe. The metropolis will also continue to grow as one of the main European service centres.

6.2.3. Trends in traffic systems

More and more, traffic congestion in the urban areas of the metropolitan systems is rising to a dramatic level. These traffic jams are mostly situated on the roads towards city centres and in the city centres themselves. This congestion is caused by the increasing traffic in the metropolises as well as the ever-growing traffic between them.

Besides pollution, traffic congestion is the cause of severe communication problems, both within the metropolitan systems and in inter-metropolitan relations. This calls for new transport systems such as the HST, interlinking directly the urban cores of the metropolitan systems. But also airports are becoming increasingly important, so here too, large investments are being made and are expected to be made in the future, increasing, even more, air traffic. On the lower level, regional rail-related transport systems are expected to develop, putting the city centres within easy reach of the regions surrounding urban areas.

These developments will lead to the creation of multimodal transport centres; linking the different traffic networks with each other.

South-East

London has to cope with particularly heavy traffic congestion. The city roads as well as the M25 motorway around London have reached their saturation point.

Many efforts are being made to solve this problem. The airports are being modernized and enlarged, the London city airport for inter-metropolitan flights was built, the future HST will, if it is built, provide an excellent link with the Continent. On the local and regional scale the London underground system as well as the Docklands Light Rail are being extended.

As cost remains high in London and traffic congestion is not likely to disappear in the near future, and, in combination with the environmental quality they can offer, the medium-sized and smaller urban areas in the South-East, in the London metropolitan system as well as outside of it (Oxford, Reading, etc.), will continue to take advantage of their favourable position.

These urban areas have good perspectives in the fields London is not specializing in, and these urban areas can become important, even at a national level.

Ile-de-France

The Paris metropolitan system, being by far the most important metropolitan system in France, is the largest traffic node of the country.

The already existing 'TGV' network is expected to be extended, thus strengthening the position of Paris as the most important HST node in Europe. Also extensions are planned in the airports of the metropolis.

The Paris underground system is being extended with one more line, presumably the last one to be built for the completion of the system. Other systems of mass rapid transit are being built or studied (tramway (the first line recently opened), VAL, and other, more experimental systems).

The regional railway, the RER, is however to be extended the most. The actual network, which is already rather extensive, is expected to be double its length in the future.

Paris is expected to grow, with an ever-extending commuter zone. The relative low population density of this zone makes the organization of public transport more difficult. So here, car traffic is still

expected to grow, even if public transport will increase as planned.

Rhine-Ruhr

Compared to the Rhine-Main airport, the Rhine-Ruhr airport (Düsseldorf) is a rather modest one. The HST will have a stop in Cologne, which is rather peripheral to the Ruhr area of the metropolis. So here the international links with Rhine-Ruhr are rather weak, compared to the size of this metropolis.

On the other hand the area possesses an excellent and dense network of motorways linking the area to the largest part of Western Europe, and providing good inter-metropolitan connections. These motorways, however, belong to the most congested ones of Germany

The waterway connections are of the highest level, and the recent opening of the Main-Danube canal opens new perspectives in matters of trade with Central Europe.

On the lower level the regional and urban public transport are of high standards, and improvements to the different networks are constantly being carried out (extension of surface as well as of underground sections of tramway, new and extensions of light rail lines). The polynuclear pattern of the Rhine-Ruhr metropolis, however, is not favourable to public transport in general, as this is dependent on areas with large population concentrations.

Especially goods transport on the roads will increase, leading to more congestion, especially on the east-west connections. The creation of a centre for logistics and the expansion of the airport of Dortmund into the third international airport of the region will increase traffic even more.

An important share of goods are transported by inland navigation (37%) with the ports of Duisburg-Ruhrort, and by rail (44%). Road transport is responsible for about 19%. Especially the connection between the Rhine-Ruhr and the main port of Rotterdam, and to a lesser degree Antwerp, are becoming increasingly important.

Randstad

Despite a very dense network of motorways, congestion is increasing and threatens the economic development in the Randstad.

Like the Rhine-Ruhr area, the Randstad metropolitan system has a polynuclear pattern, causing complicated traffic infrastructure networks. Also here the sprawl of built-up areas over a large surface area makes it difficult to organize good public transport.

Public transport in the urban areas is of a high level, incorporating, amongst others, underground, light rail and tramway systems. Research is being done to provide better connections between the urban areas of the metropolitan system (Rail 21, Argus) by railways.

The airport of Schiphol was recently enlarged, and will continue to grow. A future HST line will link Amsterdam to the ABG-stad.

The metropolis is linked both by inland waterways and by seaways with the other metropolitan systems. The Rhine gives an excellent connection for goods transport with the Rhine-Ruhr and with the Rhine-Main metropolitan systems, while the ABG-stad can be reached both by canals and by sea. Rotterdam has created a distinct profile for itself as the main port for Europe, and is expected to continue to do so. The Dutch policy for the Netherlands is for it to remain a main distributor in the EU.

In this respect a new railway connection for goods transport to the east (Betuwelijn) is of importance to guarantee the position of the Rotterdam harbour in Northern Europe.

ABG-stad

Here again, as this metropolitan system has a polynuclear pattern, the same problems concerning public transport occur. On the urban-area level, many efforts are made to provide for good public transport (underground, light rail and tramway systems), but the low speed of it is still a major problem. There are plans for the construction of a regional railway system in Brussels.

Notwithstanding these improvements in public transport, traffic congestion is expected to increase even more in the future.

In the near future, Brussels will be linked by the TGV with Paris, whereas HST links are planned between Brussels and Cologne, and Amsterdam and London. Also Antwerp will have and HST station on the Brussels-Amsterdam line.

The Belgian policy is to close down the regional airports and to concentrate all activities on the main airports. Due to this, together with the already existing enlargement plans and the enlargement works under way, the Brussels airport will continue to grow considerably in the future.

Like the Randstad, although to a lesser degree, the ABG-stad has a concentration of important sea and riverports. The metropolis disposes of a well-developed network of waterways, which, however, is not used to its full capacity. The promotion of goods transportation by waterways through governmental policy may prove not to be sufficient to take all the potential advantages offered by the use of waterways to transport goods.

Rhine-Main

The Rhine-Main metropolis disposes of one of the largest airports in Europe (Frankfurt), and the expectations are that this will remain so in the future. Especially in view of the financial functions of Frankfurt, this is an important strength for this city.

Other international links are those provided by the well-developed German motorway network, and, just like for the Rhine-Ruhr and Randstad, by the Rhine river, and the Main and Main-Danube canal. The motorways, however, are just as congested as in the Rhine-Ruhr area.

Frankfurt, Darmstadt and Wiesbaden/Mainz are served by the German HST network (ICE), linking these cities with Hamburg, Bremen, Berlin, Munich, and Switzerland. A link with Cologne is planned, which will be linked with the ABG-stad and, via the Ruhr area, with the Randstad.

On the regional level, the Rhine-Main urban areas are well-served by public transport. Besides the railway lines linking the urban areas of the metropolis with each other, there is an extensive regional railway network (the 'S-Bahn') which is improved constantly. In this respect the establishment of the 'Rhein-Main Verkehrsverbund' (RMV) must be mentioned, which is an intermunicipal organization, aiming at the cooperation between and the integration of the different public transport systems. The Rhine-Neckar conurbation is well linked with this metropolis by motorways, by trains and by HST.

On the urban level, the underground, light rail and tramway systems are well developed.

6.2.4. Environmental trends

Three factors will result in growing environmental threats.

Firstly, the growing traffic will influence environmental quality in a negative way.

Secondly, the edges of the metropolitan systems and their urban areas increasingly face land consumption for all sorts of developments (economic activities, housing, infrastructure), leading to the extension of the urban fringes. This may threaten the structure of polycentric systems, as it reduces open space between the urban areas.

Thirdly, urban fringes increasingly face recreational pressure from the large urban population wanting to enjoy the scenery. As economic development remains the main priority of decision makers, it is expected that environmental problems in metropolitan systems will increase following this trend scenario.

South-East

Air pollution in London is an old problem, as smog has occured there for decades. Given the exhaust restrictions, there is some improvement in this field. The main air polluter here is road traffic. As this form of traffic is not expected to decrease in the years to come, air pollution in

general is expected to remain an important issue in the future.

Great efforts were made in the field of water sanitation, and here the improvement of the quality of water is obvious. As there is not a lot of heavy and polluting industry in the Thames basin, the future water quality of this river seems to be rather good.

The 'green belt' policy has provided London with a unique belt of open space around the Greater London area. As this green belt is still protected as 'common patrimony' by the authorities, there is good hope for the future existence of this open space. This goes also, although to a lesser degree, for the areas of outstanding natural beauty.

Thanks to strict urban planning regulations, the small urban centres around London have preserved and developed their urban qualities, thus attracting more and more a rich population.

Ile-de-France

As the population density of the agglomeration of Paris is even higher than that of the area in the London metropolis covered by the same population size, environmental problems, and especially those caused by road traffic, are even greater than in London.

There is a growing attention to the preservation of the open areas around Paris, the so-called *couronne rurale*. The aim is to promote agriculture, to protect woodlands, and to prevent unstructured urban expansion in this area. In this area the *trame verte* policy tries to protect agriculture and woodlands.

Water pollution in the Seine basin remains a problem, and, although the amount of most of the pollutants has decreased significantly during the last 15 years, the urban area of Paris is still an important polluter of this river.

Rhine-Ruhr

This area historically always coped with severe pollution of the air, water and soil. However, considerable efforts are being made to deal with this. Whereas the water quality of the Rhine has improved during the last decade, the water quality of parts of the Lippe and of the Wupper between Wuppertal the Rhine is still very poor, while the Emscher is still heavily polluted.

As the Rhine carries already a large amount of pollutants when entering the Rhine-Ruhr area, this problem cannot be solved here alone, cooperation with other regions, both in and out of Germany are indispensable.

A remarkable example of large scale and global environmental sanitation and planning is the *Landschaftspark Emscherzone* in the middle of the Ruhr area, where all the green and open spaces of the Emscherzone are integrated into one large green 'lung'.

The worsening of the economic situation could speed up applications to obtain national and Community funds to improve environmental conditions, or to turn derelict industrial sites into attractive locations for new activities (e.g. Rechar), so that this region would be ready to attract new investments when the economy recovers.

Randstad

A major problem concerning the quality of water in the Randstad is the fact that all the rivers originate outside the Netherlands, thus importing polluted water. Negotiations between the national authorities of the countries concerned are in process, but, as the matter is very complex, the final solution is still far ahead.

The Randstad is in the unique position of possessing a large open area in the middle of the metropolitan system, the so-called *groene hart*. This 'green heart' is situated in the middle of the 'horse shoe'. At this moment, however, there are discussions as to whether this area should be preserved, or if building in this area should be allowed. In this respect, the existence of this green area in the future, is not guaranteed.

Improvement of the general quality of life in the urban areas of the Randstad is one of the priorities of the national, regional and local authorities,

and a lot has already been achieved here. Quite a spectacular example is the referendum which was held amongst the Amsterdam population, in which the population spoke out in favour of drastic restrictions on car traffic in the city centre.

ABG-stad

As this metropolitan system lies in three regions each with its own policy and priorities in matters concerning the environment, the situation is very complicated.

In the Flemish part, the preliminary documents to the Flander's structure plan (*Structuurplan Vlaanderen*) show the protection of the open space as a priority, which is presented as a new trend to the public. However, as these documents raise a lot of discussions in political circles, this new trend is certainly not a fact yet.

Water pollution is a major problem in the ABG-stad. In the Flemish part, large-scale water purification infrastructure is being built, and one may expect some improvement of the water quality soon. Brussels, however, remains an important problem, as all the waste water of this city flows into the Zenne river without any treatment at all.

Rhine-Main

As in the Randstad and Rhine-Ruhr, the Rhine brings already polluted water to the area. As Rhine-Main is the most upstream CCC metropolitan system on the Rhine, all pollution caused in this area will affect the metropolitan systems downstream. Just as in Rhine-Ruhr, the water quality of the Rhine has improved, and so has the water quality of the Main. However, the latter is still more polluted than the Rhine.

There are large woodlands (Taunus, Spessart, Odenwald) in and around this metropolis. Protection of them should be part of a global policy, in which the woodlands are considered together with the urban areas. In this policy the woodlands could have a function similar to the green belt in London or the *couronne rurale* around Paris, that is: to structure and/or restrict urban development in the open areas around the urban area.

As the Rhine-Main metropolis, even under the current less favourable economic conditions, is expected to grow further in the coming years, the environmental threats are expected to grow as well.

6.2.5. Spatial trends

The spatial pattern of the metropolitan systems is shaped by the transitions of society as a whole. In the urban areas both growth and decline occur at very short distances of each other.

Strongest growth and spatial dynamics are mostly concentrated at the urban fringes, leading to suburbanization. It is here, where urban and spatial developments are the most intense, that the authorities must intervene to control the negative effects of this phenomenon.

During the last decades, more and more attention has been paid to the process of the revitalization of the urban cores. Also here, the authorities play an important role, by enhancing the inner city attractiveness, in order to stimulate new growth and investments.

South-East

More and more efforts are being made to revitalize the core of Greater London, and to attract to or keep in this area an as wide as possible range of urban activities.

The best development potentials however are in the area to the west of Greater London, the so-called Golden Triangle, where especially the smaller cities are growing fast, and are some of the richest in the UK.

But also to the east of the City of London many restructuring efforts are being made (Docklands, City Airport, public traffic · infrastructure, etc.). Thus the eastern part of Greater London may become the link to the East Thames corridor.

In general, it is expected that the present pattern, with the core of Greater London as the most

important concentration of urban functions, will remain intact in the future.

Ile-de-France

This region evolves into a less monocentric agglomeration, as secondary poles of activity emerge around Paris, albeit still in the built-up area. In contrast to the South-East, and notwithstanding this, the current trend does not give much of an impetus to the development of urban areas outside Ile-de-France (e.g. Rouen, Amiens, Reims). The main reason to put all efforts into the development of the capital is the maintenance of its position as the only French city with a significant European and global role.

Rhine-Ruhr

Increasing pressure on the surrounding open areas is likely to happen, because of the growing population since German unification. Less well-off people are driven out of some of their traditional residential areas, and are not able to relocate in several newly-occupied urban areas.

The Ruhrgebiet is increasingly becoming divided into three socioeconomic entities: the least-effected by the *Hellwegzone* crisis is the southern part of the Ruhr area with gentrification in the inner cities; the *Emscherzone* in the middle of the Ruhr area, which is badly hit by recession, but where urban renewal is taking place on a large scale; and a growing more affluent suburban belt known as *Lippezone* in the north.

There are indicators pointing to a further urban development of the Rhine-Ruhr metropolis on the Eurocorridor to Hamburg, going as far as Bielefeld in the north-eastern direction, while in the southern direction, until recently, the main developments were situated in the Bonn-Bad Godesberg area.

Since the late 1980s, and apart from Bonn which has known a continuous growth since it became the capital of West Germany, the large and medium-sized urban areas within the Rhine-Ruhr metropolitan system show a clear growth. This growth is expected to continue in the years to come, and even Bonn, although it lost its status as the unique capital of Germany, may continue to grow.

Randstad

The Randstad metropolitan system is a horseshoe shaped structure, in which the most important developments take place both in the southern and in the northern wings of the horseshoe, in an eastern direction. Urban dynamics also concentrate alongside the inner fringes of the horseshoe.

Besides those more 'spontaneous' developments, the authorities invest a lot in city centre renewal. This is, amongst others, the case in Rotterdam, Utrecht and Amsterdam.

Considering the current recession, no programmes combating overheating are required. The Common Market creates new opportunities, as it can overcome the smaller local market constraints. On top of that, this will give the incentive for further development of the Randstad as the major goods handler of Europe. Continuous attention should be paid to land consumption for housing, in order to conserve the identity of the constituent urban areas. However, as upmarket residential areas sought for by the (inter)national highly qualified staff become rare, this could be a constraining factor for the development of the Randstad as international centre.

Just as in all other metropolitan systems, several Randstad activities, especially those needing a lot of space and/or those being transport-intensive, shifted towards the periphery of the system. Services, R&D and distribution activities were increasingly attracted to the (major) urban areas of the Randstad. The policy always stimulated the creation of different assets in different urban areas, so that all types of activities would find a location in the Randstad. This trend will continue to happen.

Although deconcentration processes have occurred in the recent past, there are tendencies of a growing interest in the central areas of the large urban areas, especially for the development of offices. In Rotterdam the results are visible, in

Utrecht and The Hague plans are presented, only Amsterdam has difficulties in realizing the plan for the development of the harbour front, adjacent to the inner city. The inner city itself is becoming more and more a cultural centre.

ABG-stad

In this metropolitan system the strongest developments are situated in the areas in between the three largest urban areas (Brussels, Antwerp and Ghent). As a recent trend, however, there is considerable urban growth in the eastern part of the metropolis (towards Leuven and Turnhout) and in a south-western direction, towards Kortrijk and Lille.

In the large and medium-sized urban areas here, many incentives are made for city renewal. In Brussels this is very much linked to the function of the city as one of the EU capitals. Besides that, the Brussels Regional Development Plan (1994) predicts in its scenario a further decline of the population, whereas its policy scenario proposes attracting people to the city centre through, among other things, city renewal.

In steering the urban dynamics in ABG area, interregional cooperation will be needed, because this metropolitan system lies in three regions (Flanders, Wallonia and Brussels).

Rhine-Main

This metropolis is expected to grow in the years to come, both in population and in economic activities. In general, the area around Frankfurt is expected to grow most, but especially the area between Frankfurt and Darmstadt is coming under heavy urbanization pressure.

Having said that especially the Frankfurt area will be under continuous suburbanization pressure, however, there are potentials for function and population sprawl in the metropolis, partly due to its political structure. The metropolis lies in two *Länder*, Hessen and Rhineland Pfalz. Mainz, capital of the Rhineland-Pfalz region, lies in the metropolis, and the urban area on the other bank of the Rhine, Wiesbaden, is the capital of Hessen. This gives the Wiesbaden-Mainz, although separated by both the regional border and the Rhine, additional weight to counterbalance the Frankfurt domination.

6.3. Key elements of a policy scenario

The CCC area faces both transition and internationalization. In this process the metropolitan systems are the major hinge points.

To achieve internationalization in the CCC area, strong cooperation between the metropolitan systems is required. This, however, doesn't mean that the metropolises are to become completely complementary. This would be neither realistic nor desirable. Competition between the metropolises should lead to a better rapport of their functions, so that every metropolis would get those functions in which it is strongest. The metropolis could then specialize further in these specific functions. This form of cooperation is sounder than one which is artificially imposed on the metropolitan systems.

In the field of European government, a good example of metropolitan cooperation is the assignment of different functions to the metropolises, e.g. Frankfurt becoming the European banking capital, The Hague becoming the seat of Europol and the Europol Drugs Unit, and London becoming the seat of the European Agency for the Evaluation of Medicinal Products.

The progressing internationalization can be the occasion for more intense cooperation, targeted on the harmonizing and spatial planning of border areas of two adjacent metropolitan systems, or on cooperation in common functions of metropolises.

This is what happened in the Rhine-Scheldt delta, where urban areas of both the ABG-stad and Randstad (Rotterdam, Antwerp and Ghent) seek harmonized strategies to cope with common problems in the fields of economics, environment and tourism.

Hot issues in intermetropolitan cooperation are the typical urban problems like accessibility of the

metropolitan systems, traffic congestion in the urban areas, inner-city decline and governmental reorganization.

The trend scenario leads to more spatial inequality, both between metropolitan systems and the surrounding areas and within the metropolitan systems themselves.

6.3.1. Social issues

Social challenges are an important issue, as they are a part of the general policy of revitalizing the urban areas and the strengthening of the metropolises.

In this respect, increased attention must be paid to municipal social housing and crime prevention policies, and to measures for the prevention of social inequality. In the ABG-stad for example, the actions foreseen will contain policy measures in order to encourage the re-use and the improvement of the existing housing stock, and to limit extensions on the urban fringes. This is supported by the general conclusion that the population is not expected to grow remarkably, but the changing household composition will induce increasing pressure.

In relation to social inequality, one can say that the attraction of more top-class functions to the larger centres of the metropolitan systems will increase inequality between the people living in these larger centres even more, leading to more segregation. It negatively affects the position of less trained people and people with skills which are not needed any more by employers, partly because of automation in industrial activities and partly as the result of an economy increasingly becoming based on services.

6.3.2. Economic issues

In order to deal with the first problem, the principle of ongoing 'selective growth' is introduced. It can also help to avoid overheating of the economy, as this sometimes occurs during boom periods, being at least partially responsible for some negative agglomeration effects.

This principle accepts that the larger centres of the metropolitan systems will continue to be the most important ones. In fact, it allows these cores to attract those functions which they can host best: top-class, internationally-oriented activities.

6.3.3. Issues in traffic

The first traffic policy goal on the international scale is the realization of high-level intermetropolitan connections. As cooperation between the metropolises is the main issue in the policy scenario, excellent communication between, as well as within them, is a top priority. This is important for flows of persons, goods and information.

This general traffic policy objective fits in with the Delors White Paper which pleads for tighter cohesion in the EU, and thus in the CCC area.

The pursuit of sustainability in this respect means that transport facilities must be fast and reliable (congestion free) on the one hand, but that they must be as environmentally-friendly as possible on the other hand.

This implies that common transport (public or private) and telecommunications, as these cause the least congestion and environmental nuisances, must be given priority and encouraged. These are important objectives, having their effects on the creation of Eurocorridors.

This, however, will also create new hierarchies in the CCC urban system, discriminating between the urban areas situated on traffic nodes and those which are not. In some cases this may be contradictory to the aim of the elimination of regional inequality.

Providing good links with the traffic nodes through the extension of secondary networks is necessary to temper or even to eliminate the negative effects of the new hierarchies. As every chain has the strength of its weakest link, it is essential that the regional networks are of the highest quality, for only then can the European network fulfil its main function as the structure responsible for European internal coherence.

Networking is also essential for the proper functioning of the different elements of each metropolitan system itself. Without this, no spatial organization envisaging deconcentration and complementarity is possible.

Physical expressions of this new constellation are the extended or improved infrastructures (road, rail, air and water), the more widely spread availability of existing telecommunication facilities and the stimulation of the development of new techniques. One can also introduce separate infrastructures for transit (long-distance traffic and regional and metropolitan traffic) reducing congestion potentials of roads nowadays used for both.

South-East

Although there is some reticence in the UK about the improvement of the link between London and the European continent, this is very important in view of European coherence. The realization of the HST link must be harmonized with the enlargement of the London airports. Especially the flights to nearby continental CCC destinations must be reconsidered.

It is crucial that regional and local public transport is increased further. Thanks to the specific pattern of the London metropolis (one dominant urban area surrounded by secondary urban areas), the public transport system, in which the London Underground becomes a regional railway outside the city limits and which is completed by the railway network, is well fitted to serve the London metropolis. Some improvements, however, should be made. Both infrastructure and rolling stock should be modernized, the system should be extended and cooperation between British Rail and London Underground authorities should be strengthened. This will support the revitalization policy of the inner city.

The current policy is also aiming at the encouragement of public transport instead of the expected growth of road traffic.

In addition to this, a complete road network development is foreseen, encompassing also the M25 and a set of trunk roads. But it is stressed that this will have to be accompanied by a series of traffic management measures, in order to discourage undesirable car commuting traffic and the subsequent congestion.

Ile-de-France

More and more, Paris is becoming the main node of the French and even Western European HST network. Destinations at a distance of 200 to 800 km should increasingly be served by HST lines, whereas air traffic should be reserved for long-distance travel.

The spatial pattern of the Paris metropolis is one of extreme monocentricity, which shaped the urban public transport system. The underground serves only the city, whereas the outer areas of the metropolis are served by an extensive regional railway system (RER). The planned massive extension of this system accords very well with the policy scenario.

Rhine-Ruhr

Given the polycentric pattern of this metropolis, the organization of an efficient public transport system is expensive, as relatively small flows of (especially) persons travel over relatively long distances. As this favours private transport this metropolis is very well-served by motorways.

The choice of the location for the main traffic node (e.g. close to a HST station) will have a structuring effect on the whole metropolitan system. To maximize its efficiency, this node needs excellent links with the rest of the metropolis. Given the relative great distance from Cologne (the future HST station) to the Ruhr-area, high-speed regional transport systems must be developed further, be it light rail or regional railways systems. This will enforce the internal coherence of the metropolis. A HST station at Düsseldorf airport must also be envisaged.

Even if current transport by waterways doesn't seem to have a growing perspective, the very important waterway infrastructure must not be neglected in this metropolis. Further investment to keep or to increase the already high standards of transport by waterways are of strategic impor-

tance, if in the future some road transport will choose the waterways again, to avoid high transportation prices and traffic congestion.

Randstad

Although there is more of a hierarchy between the urban areas in this metropolis, the same problems concerning public transport as in Rhine-Ruhr occur here. Incentives towards improved inter-urban connections are for the better, and must include tight links with Schiphol airport.

As, however, the *groene hart* of Randstad is situated in the middle of the metropolis, some traffic links will have to cross this open area. Here a careful weighing of priorities should be considered.

The continuing development of the seaports and inland waterways in and to this metropolis is vital to maintain its function of main port. In this respect the concept of the 'Rijn-Schelde delta' can be developed between the ports of the Randstad and ABG-stad. This would offer possibilities to create the major goods-handling centre of Europe.

In relation to the general strategic importance of international accessibility, the elaboration of the TGV line, but also of new rail infrastructure towards the Rhine-Ruhr metropolis, is becoming more and more important. Schiphol is considered as an important development node, not only in order to attract air traffic, but also as a growth node for specific new activities. Schiphol aims at becoming the fourth airport in Europe.

ABG-stad

Problems, similar to those of the Randstad and Rhine-Ruhr, occur also in the ABG-stad polynuclear metropolitan system. This metropolis will be particularly well-served by the HST network, as two stations are planned here, and if, and this would be desirable, Zaventem airport gets a HST station too, this metropolis will dispose of three stations. On top of that, the Lille TGV station is within reach of the western part of the ABG-stad.

Interurban connections are rather good, and will be improved when the Star 21 plan of the Belgian railways is executed. Although it contains many positive incentives, this plan will not be sufficient to resolve the congestion problems in general.

The planned regional railway (GEN/RER) system in Brussels will be a major improvement of public transport in and around this urban area.

In general, the urban areas of this metropolis have well-equipped urban public transport systems at their disposal. The major problem here, however, is their low speed. Many efforts are to be made to increase speed here, in order to make public transport more attractive.

As in Rhine-Ruhr and Randstad, an extended waterways infrastructure is available. To ensure the connections with northern France it is necessary to adapt the Scheldt and Leie rivers in France to higher tonnage standards.

In general, the proximity of the Randstad and Lille calls for close cooperation with them in matters of traffic planning.

One must keep in mind that, in the policy scenario, the aim of traffic planning in the ABG-stad is the strengthening of the internal cohesion of this metropolis.

A selective use of the existing infrastructure networks is promoted in the policy in preparation. Concerning air transport, almost all efforts will be concentrated on the Brussels airport, and small airports will lose their importance. The ABG-stad contains two ports (Antwerp and Gent) of which Antwerp is the largest. However, the connection with the port of Bruges is also becoming of major importance.

Rhine-Main

Having four HST stations and a major airport, and being linked to the extensive German motorway network and to the Rhine and Danube rivers, this metropolis already has excellent intermetropolitan connections. Also, the intrametropolitan connections are of high standards. In order to enforce the polynuclear development of the me-

tropolis, a fast interurban public transport link between Wiesbaden-Mainz and Darmstadt is required, as well as a direct link from Frankfurt airport to Darmstadt.

It is crucial that the improvements of the traffic infrastructures keep pace with the dynamic development of this metropolis. The planned HST link to Cologne and Brussels is an example in this respect.

Cooperation in matters of traffic planning with the Rhine-Neckar conurbation can lead to a comprehensive regional traffic system, with both public and private transport reaching the highest efficiency. It would be advisable to link Frankfurt airport with these conurbations with a HST line.

6.3.4. Environmental issues

As environmental quality is a major actor in sustainability of urban areas and metropolises, improvement of the metropolitan environmental quality is the second main target of the policy scenario.

Environmental quality in the urban areas is also the responsibility of the municipal authorities, and must become part of the general municipal policy. The environment of the (open) areas outside the urban areas must be protected by a comprehensive and coordinated policy of the municipal, regional and national authorities.

One of the main and most direct polluters (air and noise) is traffic, and especially cars. Although many efforts were made to restrict this form of pollution, it is obviously not enough. So here a wide range of measures must be taken, going from enhancement of public transport, over car-free zones to technical interventions to the cars themselves.

The more balanced distribution of metropolitan functions over several urban areas in the system will reduce pressure on its larger centres. Together with a policy to upgrade public transport, this will give an important impetus to reduce automobile congestion and pollution on the access roads towards these centres.

Another important point is the protection and creation of open spaces in and around urban areas. Both large open spaces at the fringes of the urban areas, and smaller green spots in the urban areas need to be protected and developed. An example is the ABG-stat, where the actual policy development is aiming at maximum protection of the open areas, and in some cases even the reparation of the open character of these areas.

Waste processing is a major issue, especially in the densely populated metropolitan systems. Solutions for the processing of solid waste lie more in the technical field, however some non-technical measures can ease this, e.g. selective garbage collection, which is already happening in many urban areas. Also concerning waste-water treatment, although here too many efforts are being made, much has to be done, especially in the Ile-de-France and ABG-stat.

6.3.5. Spatial issues

Looking at the actual policy developments it is clear that the unstructured expansion of urban areas is one of the major concerns of governments. It is essential that this concern is generalized over all governmental levels of all metropolitan systems, in order to reassess the urban areas and to protect the open spaces left around those urban areas. Attention must be paid to better effectiveness of the policies in these matters with, as the final goal, sustainable development.

The fact that population in the CCC area is not expected to grow much, and that the service sector, generally needing less space than the other sectors, will continue to grow, will lead to smaller demands on space in the future. This should ease policies restricting further urban development in open spaces.

This general policy should be applied in all CCC metropolitan systems, however, taking into account the specific characteristics of each metropolis.

In monocentric systems, all top-level activities are located in the same centre; in polycentric sys-

tems those functions are carried by several centres. If the presence of these functions creates too many negative effects (according to the carrying capacity), then secondary centres (other larger urban centres in polycentric systems and secondary centres already present in the monocentric systems) can function as overspill locations.

Each of these centres will specialize and excel in a limited number of activities, being rather a complementary partner than a bogeyman-like competitor, and this for the benefit of the system as a whole.

The smaller centres within the metropolitan system will also have a complementary function to the larger centres. They will specialize in lower level functions and activities of various kinds in order to relieve the larger centres from unnecessary pressures: back-office activities, specific contemporary and high-tech production facilities, specialized R&D activities.

Next to this, some of these selected urban areas will have to become real regional centres serving their immediate area by providing a whole range of functions (education, administration, culture, shopping, convention and exhibition facilities, etc.) previously situated in the dominant centre of the system.

This is especially necessary for monocentric systems. In polycentric systems, these functions are mostly present to a certain level in the smaller centres as well, especially when they have specific development potentials (culture, heritage, institutions). On top of that, real top-class metropolitan functions can be found in the larger centres, only at a short distance from these smaller centres.

In general, this model requires a specific organization of space. It will sometimes need enlarged systems, when compared to the systems covered by the trend scenario. The infrastructure network becomes more polycentric, both on CCC level and on the level of each individual metropolitan system, as a result of the deconcentration of economic activities towards cities outside the major agglomeration of the system. This allows a more fluent flow of goods, persons and information between the metropolitan systems as a whole, thus expressing the complementarity of the metropolitan systems in the CCC area.

This enlargement has to follow a comprehensive plan. Related to economic growth, housing schemes must be developed as well, in order to create self-sufficient entities, in order to prevent important commuting schemes in the opposite direction from that seen today. This will lead to important population shifts to these new growth centres. It will also give the opportunity to create a more efficient public transport network for these cities.

Monitoring and controlling urban growth also requires better use of the urban land areas which are not used to their full extent. Therefore derelict sites and the deprived parts need special attention. Important EU funds could be an essential element to give these areas new dynamism, and as they are already developed land, their re-entry in the current economy could save the use of undeveloped land from urbanization. This happens already today, but in a way that is too sporadic and fragmented to be effective on a metropolitan or CCC scale.

South-East

The trend scenario showed an imbalance between the eastern side and the western side of the London metropolitan system, which local and regional policy tries to dissolve. Recently, however, more attention is being paid to the inner-city renewal of Greater London.

As this trend fits into the general policy frame of protection of open spaces (here the green belt), this policy is supported in the policy scenario. This means, however, that building restrictions must be observed in the green belt parts of the East Thames corridor and of the Golden Triangle.

In this respect, specific attention must be paid to the developments induced by the future HST line London-Channel, and by the upgrading of the M25 motorway around London. These developments must accord with the general policy goals.

The same goes for the assignment of functions to the smaller centres outside Greater London. The

residential function must be protected there, while top level functions must go the London city centre. The (relative) monocentric pattern of the London metropolis eases this.

The London metropolis will evolve into a more polycentric constellation, and will gradually include other urban areas which were not a part of it under the trend scenario (Brighton, Southampton, Portsmouth, Oxford, Milton Keynes, Southend and Rochester). This trend must be controlled and steered and must fit the global view on the metropolis.

The regional planning guidance states that London's future depends on the initiative and energy of the private sector and individual citizens and on effective cooperation between the public and the private sectors, not on the imposition of a master plan.

In general, the accent of policy actions are on the improvement of spatial quality of the urban core, and the urban fringes. The town centres must be able to compete with greenfield alternatives and with urban areas in Europe as attractors of investment.

Ile-de-France

Considering the monocentric pattern of the Ile-de-France metropolis, the assignment of top-level functions to the urban centre of Paris is rather easy.

The danger of urban extension into the open space around Paris still exists, however. Traffic infrastructure works (the enlargement of airports, the building of new airports, the extension of the RER, the extension of the motorway network to relieve the *périphérique*) and other urban developments (e.g. Eurodisney in Marne-la-Vallée, Roissy, Saclay-Massy) may very well enhance urban growth pressure on the open space. This evolution also comes into conflict with the deconcentration policy of the Paris basin.

The main challenge here is to develop further the *couronne rurale* idea and the *trame verte* policy, in the spirit of the general policy goals as stated above.

An important issue here is the assignment of specific functions to the urban areas outside Paris, as this has happened at too slow a pace until now. The creation of a more polycentric pattern as proposed in Scenario 3 of the Paris basin, will help to decongest the French capital.

In the regional development strategy, the growth of the fringes of the metropolis is structured in development axes; a northern axis starting from Cergy Pontoise and from Roissy; an axis west-east, starting from Marne-la- Vallée towards Mantes la Jolie; and a southern axis encompassing St. Quentin-en-Yvelines, over Saclay-Massy towards Evry and Melun-Sénart.

Rhine-Ruhr

As this metropolis is a polynuclear one, the internal hierarchy of it is difficult to establish. The assignment of top-level functions to the urban areas here is not evident, and is subject to difficult negotiations between them.

In the short term, however, Cologne and Düsseldorf seem to have the best potentials to attract the high-level functions. A further distribution of functions to all the important urban areas in this metropolitan system is essential to profile itself as an important international metropolis. Given the many important urban areas in this metropolis, it might be advisable for each of the areas to specialize in some field, thus giving it an international reputation.

Urbanization of the open space in the direction of Bielefeld must be weighed against the advantages of the revitalization of the central part of the metropolis, as is already happening in the Emscher zone.

The Ruhrgebiet itself, even after the unification, has the largest concentration of population and activities and could be promoted as a location for the headquarters of German companies. However, fierce competition is to be expected from other cities, notably Frankfurt and Berlin. Industrial activities are crucial, though contemporary and high-tech plants need further stimulus. Some centres could be alternative locations for high-tech plants not finding adequate facilities in the

southern parts of Germany. Therefore, a further effort to raise environmental and quality of life standards to levels required by international service functions and contemporary and high-tech production facilities is necessary.

The spatial policy on the open areas in the metropolitan system, defined as the *Regionale Freiraumsystem Ruhrgebiet* (RFR), is a comprehensive approach, aiming at the improvement of the environment in available open areas and environmental values in the metropolitan area. This RFR foresees the development of large 'green' strings across the Rhine-Ruhr area, and corridors connecting them from east to west. Also a kind of green belt (*Ballungsrandzone*) around the core area of the Rhine-Ruhr, and a rural fringe area around the conurbation are planned to be sustained.

Within this general framework, specific actions should be foreseen in order to make the whole concept real.

By this way, the local governments try to induce an ecological renewal of the Rhine-Ruhr metropolitan system. Considering the general stress that is being laid on the environmental and spatial quality as a strategic element in regional development policy, these efforts could become very important. This concept is in harmony with the general aim for quality improvement of the Rhine-Ruhr metropolitan system.

Concerning the future of Bonn, the former capital of Germany, in relation with Berlin, the *Raumordnungspolitischer Orientierungsrahmen* foresees that Greater Bonn will continue to be shaped by function as the administrative centre of Germany, and by the development of Bonn as a 'science region'. Specific advantages are the nearness to the large European agglomerations and the attractive local conditions.

Randstad

As in the Rhine-Ruhr metropolis, the polynuclear pattern of the Randstad makes the assignment of top-level functions to the urban areas quite difficult.

However, important onsets were already given in the Vinex plan, in which the protection of the *groene hart* is given high priority.

Special attention must be paid to the international name of the Randstad, and to a more balanced development strategy. The actual main port function is still supported, and is to be supported in the future.

Another point of attention must be the urban developments at the end of both wings of the horsehoe, in the eastern direction. The extension of the Randstad concept in eastern and southern directions (e.g. Arnhem and Breda) is becoming an important policy item. These urban areas host evermore overspill functions from the western part, which go together with a growing population in these centres. In order not to create unsustainable commuting flows they have to be self-sufficient enough.

ABG-stad

The internal organization and spatial planning in this metropolitan system is a major challenge, especially as its area is divided over three regions each with their own authorities internal function assignments where harmonizing is difficult, but vital.

Important challenges are the controlling of urban expansion in the eastern direction, and on the axis running from Ghent over Kortrijk to Lille. One must keep in mind the probable genesis of the new metropolitan system of Lille-Kortrijk here. Coordination of spatial planning between the ABG-stad and the future Lille metropolis is required.

Protection of the open spaces left in the ABG-stad is very important in the present policy. However, the very complicated structure of the ABG-stad, with its high number of small and very small urban areas and the spread of (small) open spaces over whole area, makes the development of a planning concept such as the green belt (*groene hart*) very difficult.

Brussels, being the most important urban area of the metropolitan system, can concentrate on the

valorization of its potentials related to the increasing presence of international institutions. Some headquarters of Belgian and foreign firms could find an alternative location in the two other major centres of the system (Antwerp and Ghent).

In relation to the spatial organization of the metropolitan system, four main goals have been selected which are of the highest priority.

1. the protection of the open areas
2. optimization of the available and a selective development of new infrastructure
3. the revitalization of the urban centres
4. a stronger selectivity on the areas for economic-activities.

Attention has to be paid to the carrying capacity of the available space, and a lot of effort should be made in order to concentrate the investments in some selected areas.

The unstructured urbanization, especially in the north-east direction and in the south-east direction (towards Lille-Kortrijk) will become restricted if the new policy lines in preparation are adopted.

Rhine-Main

Although the pattern of Rhine-Main is a polynuclear one, there is a clear hierarchy in this system. A further internal structuring of this metropolis, in which Frankfurt continues to attract top-level functions, and in which Wiesbaden-Mainz and Darmstadt host overspill functions, is necessary and feasible.

As this metropolis is a very dynamic one, special attention must be paid to urban developments in the open spaces, especially in the region south of Frankfurt.

The presence of large woodlands (Spessart, Taunus and Odenwald) and the high sensibility of the population in the protection of these woodlands, are strong arguments to develop these areas in the framework of a planning strategy similar to the green belt or the *trame verte*.

South of the Rhine-Main metropolis, a large and complex urban system exists: the Rhine-Neckar conurbation, including, amongst others, Mannheim, Ludwigshafen, Worms, Heidelberg, Speyer and Bensheim, the latter being adjacent to the metropolis. Here too, coordination of spatial planning of both systems is required, assuming the cooperation of three regions: Hessen, Rhineland-Pfalz and Baden-Württemberg.

7. The CCC urban areas outside the metropolitan systems

7.1. General perspectives

7.1.1. Population

General observations

The population of the non-metropolitan urban areas represents 27.3% of the total CCC area population living in urban areas of over 50 000 inhabitants, or 14.8% of the total population. These are relatively low figures, but they do exhibit a clear distribution pattern across the various classes of urban area (see Table 7.1).

This table shows that the population living in very large urban areas outside the metropolitan systems is a small percentage of the total population in that category: less than 4%. There is indeed only one very large urban unit outside the metropolitan systems, namely Lille. It must be stressed, however, that Lille is geographically situated very close to the ABG-stad and in the future could very well effectively become linked to the metropolis, so leaving no single isolated urban unit of over half a million population in the CCC area.

In the next category of urban area, composed of units of 300 000 to 500 000, the situation is very different. Nearly 62% of the population in that category lives outside the metropolitan areas. For the small and very small urban areas the percentage is more or less equal: in both types of urban areas about half the population lives outside the metropolitan systems (respectively nearly 48% and just over 52%).

Table 7.1: Non-metropolitan urban areas: Population numbers and percentages of each category living outside the metropolitan systems

Type of urban areas (size of the urban areas by population number)	Inhabitants of the urban areas outside of the metropolitan systems (in millions)	Percentage of total CCC urban areas population per category, living in urban areas outside of metropolitan systems
Small (50 000-100 000)	4.035	52.44
Medium-sized (100 000-300 000)	5.683	47.85
Large (300 000-500 000)	2.506	61.69
Very large (+500 000)	0.936	3,83
Total	13.161	27.33

Source: Settlements database, Eurostat; calculations by M+R.

To summarize, most of the urban population in the CCC area live in one or other of the metropolitan systems, while the importance of the very large urban category outside of the metropolitan systems is extremely low at under 4%. However, for the small and large urban population the balance is slightly in favour of the urban areas outside rather than within the metropolitan systems.

Continuing population growth

During the past two decades, taken as a whole, the large urban areas (300 000 to 500 000 inhabitants) have not shown population growth (Table 6.3 in the metropolitan systems chapter). The medium-sized urban areas show variable patterns, with both population growth and decline. The number of medium-sized urban areas with population growth is almost the same as the number of areas with a decline. In general it can be stated that the smaller the urban area, the stronger its population growth.

The tendency of urban dynamics has been to ossify existing spatial patterns of urban areas. The key is the slowing down of rates of population change, whether of growth or decline, a trend which seems clear despite the fact that time-series and definitional problems make exact measurement impossible. Since rates of decline were most applicable to the largest urban areas and dynamic growth was mainly experienced by small and medium-sized urban areas, the result is a pattern of more balanced urban dynamics for the whole CCC area. This stabilization tendency, together with its associated tendency towards stability in the form and distribution of settlements, is an important consideration for future spatial policy.

The CCC area population density reflected in the localization of the urban areas outside the metropolitan systems

As stated in the social issues chapter, the greater part of the urban CCC area population lives in the northern part of the CCC area. This is also reflected in the location pattern of the urban areas outside the metropolitan systems. Here a line can be drawn separating South-East England, the Dutch part of the CCC area, Flanders, the northern part of Wallonia, Nord-Pas-de-Calais, North-rhine-Westphalia, Hessen and the northern and eastern part of Rhineland-Pfalz from the rest of the CCC area.

To the south of that line, only two large non-metropolitan urban areas (300 000 to 500 000 inhabitants) can be found, and both are situated in France: Rouen and Nancy. Additionally, eight medium-sized urban areas are situated in this part of the CCC area. These large and medium-sized cities are dispersed. The only clustering is in north-western France where Metz, Thionville and Hagondange-Briey are situated. These three have organizational linkages with Saarbrücken and Nancy in order to stimulate economic development.

To the north of the line, 26 medium-sized urban areas, five large urban areas and one very large urban area (Lille) can be identified outside the metropolitan systems. The large non-metropolitan urban areas are concentrated in the south of England (Portsmouth and Brighton, Worthing, Littlehampton) and in northern France (Valenciennes, Lens). In Germany the rather more isolated Bielefeld is also classified as a large urban area.

Concentrations and spatial pattern of the urban areas outside the metropolitan systems

The urban areas outside the metropolitan systems are not just scattered around in the CCC area. There are some clear concentrations and patterns to see.

The most important concentration of urban areas is in the region around the largest non-metropolitan urban area, Lille. This area has two large urban areas, Lens and Valenciennes, and two medium-sized urban areas, Douai and Béthune. A second concentration of urban areas is the so-called MHAL-region, in the border region of Germany, the Netherlands and Belgium, comprising the medium-sized urban areas of Aachen, Liège and Maastricht. The third concentration of urban areas is the Saar-Lor-Lux region, which is the border region of Germany, France and the Grand Duchy of Luxembourg, comprising the large urban area of Nancy, and the medium-sized urban areas of Saarbrücken, Metz, Hagondange-Briey and Thionville.

The Lille region and the MHAL region are interconnected by an axis of small and medium-sized urban areas (Maubeuge, Namur and Charleroi), coinciding with an old industrial zone. The pre-

sence of natural resources (iron, coal) has stimulated the growth of the urban areas in this zone. These old industrial towns are now heavily under pressure because of economic restructuring processes.

Some non-metropolitan urban areas are, considered on the macro scale, situated rather near to the metropolitan systems. Others are linked to the metropolises through a highly urbanized area. In these cases, certain issues in urban planning of the non-metropolitan urban areas are to be considered commonly with those in the metropolitan systems.

This is the case for the large urban area of Rouen and the medium-sized urban area of Le Havre, linked with the Ile-de-France by the Seine river and the rather highly urbanized area alongside the river.

To the north-east of the Rhine-Ruhr area, the medium-sized urban area of Münster can be considered as being in the vicinity of the metropolis. The large urban area of Bielefeld and the medium-sized urban area of Paderborn are linked to the Rhine-Ruhr area through a range of small and very small urban areas.

Virtually the whole South-East is in the sphere of influence of the London metropolitan system. This concerns the large urban areas of Portsmouth and Brighton, and the medium-sized urban areas of Oxford, Southampton, Hastings and Thanet.

The situation around the Randstad is more complex. This metropolitan system is the core of a horseshoe shaped range of urban areas. This 'horse-shoe' runs eastward, with a northern wing running to the medium-sized urban areas of Arnhem and Nijmegen. The southern wing comprises the medium-sized urban areas of Breda and Tilburg.

Also the ABG-stad is the core for such a horse-shoe-shaped range of urban areas. The northern wing of it links this metropolis with Randstad via Breda, and the western wing links it with the Belgian coast via the medium-sized urban area of Bruges.

Charleroi is linked with the ABG-stad through the old industrial, and rather highly urbanized ABC-axis (Antwerp-Brussels-Charleroi).

Other urban areas, situated further away from the metropolitan areas, also show a specific pattern. The medium-sized urban areas of Troyes, Reims and Amiens, and the large urban area of Rouen are all situated at about the same distance from Paris as they are from each other, thus forming a big circle around the metropolis.

In Germany, the medium-sized urban areas of Koblenz, Gießen and Kassel are all at the same distance from the Rhine-Ruhr metropolis as they are from the Rhine-Main metropolis.

In the Netherlands the medium-sized urban area of Eindhoven is midway between Randstad and Rhine-Ruhr, whereas the medium-sized urban area of Apeldoorn belongs to an urban range with Arnhem and Nijmegen.

Besides the already mentioned urban areas of Southampton, Portsmouth, Brighton, Hastings, Thanet, and Le Havre, also the medium-sized urban areas of Calais and Dunkirk belong to the coastal cities.

As the medium-sized urban area of Ludwigshafen belongs to the conurbation of Mannheim-Ludwigshafen which lies for the largest part outside the CCC area, this city doesn't fit in any pattern of urban areas in the CCC area.

7.1.2. Complementarity between metropolitan systems and the non-metropolitan urban areas

This subsection of the report looks at the non-metropolitan urban areas and especially the medium-sized and small cities outside the conurbations. Their growth during the 1970s and 1980s enhanced the importance of the smaller urban areas in the urban system. This was caused by the relative advantage enjoyed by smaller cities over larger ones. The smaller non-metropolitan urban areas enjoyed improvements of mobility, accessibility and communication infrastructure, buttressed by the enlargement of the scale of operations of economic activities. The change in

scale of operations has also stimulated interaction between metropolitan areas. This offers new opportunities for the urban areas situated on or near the physical infrastructure between those metropolitan systems. A topical example is Lille, which is actively seeking to exploit its position as a key node in the TGV-Chunnel network, with consequential strengthening of its role as a regional capital for the interlinked urban areas in the region.

Governmental policies in a number of regions have tended to favour urban growth outside the metropolitan cores and areas in recent decades. Despite trends and policies, the generally favourable position of smaller urban areas has never been a threat to the metropolitan areas. The latter are and will remain at the top of urban hierarchies, especially in respect of international functions. Recent and future developments in communications and infrastructure seem, if anything, likely to stimulate this. The work of Cheshire (Cheshire, *et al*, 1986; Cheshire and Hay, 1989; Cheshire, 1990) has demonstrated that in the last two decades, *ceteris paribus*, in economic terms (as opposed to the developmental/population growth conclusions of earlier paragraphs) the larger cities have performed better than the smaller ones. Secondly, the work has shown that European economic integration is likely to be of greatest benefit to the most central cities. Thirdly, it has been concluded that successful cities tend to have a high proportion of their workforce in services, especially in advanced producer services such as finance and professional services.

It will be appreciated that there is a tension among the various conclusions. To a degree, the thesis seems to hold that the larger the size of an urban area, the greater the advantages. On the other hand, there seems to be a threshold above which traffic congestion, high space cost, and externalities such as pollution may more than offset those advantages.

It is to try to ease such tensions that the concept of the central urban ring has been introduced in the Netherlands. Relatively strong growth of population and economic activities in the eastern and southern sectors adjacent to the Randstad metropolitan area has led to the introduction of the concept of an enlarged economic centre. There is, however, a division of tasks. The large urban areas in the Randstad are part of an international system of urban areas. The other urban areas develop national level functions.

Notwithstanding the position of the metropolitan areas in the urban systems, the smaller urban areas have shown an increase in importance. As such the urban system in the CCC area has become somewhat more balanced, showing a diminishing of the differences between economic (metropolitan) centres and surrounding regions. Trends may not encourage this, on the whole desirable, tendency to persist. Within the urban system the smaller urban areas play their own role. Given the continuing strong position of metropolitan areas and the pressures for them to compete in increasingly internationalized markets, this role can be described in terms of complementarity rather than in terms of competition.

7.1.3. Functions: Networks, links to metropolitan systems

Large and medium-sized urban areas outside the metropolitan areas fulfil a role as service centres for their own hinterlands, and in so constitute one level in a hierarchy. In that division of tasks, cities of the same size tend also to be very similar in their service functions. In this model, each city has a function for its region, but each city also has a function on a higher (geographical) level within the national or international urban system. At the upper levels there is a general tendency that the larger an urban area, the more likely its functions are to include advanced financial and business services and decision-making. The smaller urban areas, especially those outside the metropolitan areas, generally concentrate to a greater degree on manufacturing firms and employment.

It is also interesting to note that most new non-service establishments (1987-90) of Japanese and American companies have not occurred in the six metropolitan regions. European headquarters and distribution excluded, most activities have found a location outside the six CCC area metropolises. This shows that, small and me-

dium-sized urban areas are by no means excluded from consideration by international firms (see Table 7.2).

Table 7.2: Location choices for international functions in the six metropolitan regions, 1978-90

(in %)

High-tech production	5%
Traditional production	4%
Research and development	29%
European distribution	68%
European headquarters*	58%

Source: Buck Consultants, 1991.
* European headquarters: on basis of total establishments (not available for 1987-90).

The hierarchical arrangement should not be seen as solely an economic one. The model is more informative and more types of functions are distinguished and included in the analysis, including, for example, education and culture. The mix of such characteristics gives an urban area a unique label or image, which will further stimulate the expansion of specialized functions.

Functional specialization and the integration of each urban area into the wider urban system can only be realized properly if adequate infrastructure is available to provide intra-regional links and to connect the supra-regional urban activities to other urban systems. Functional specialization, geographical position and the presence of good infrastructure in large measures determine the potentials of urban areas.

With regard to the above, the following distinction can be drawn between:

- urban areas situated on or in the vicinity of the main infrastructure between metropolitan systems in Europe; these zones can be called 'Eurocorridors' (the concept of a 'Eurocorridor' is based on infrastructure and is not predicated on stimulation of urban development along such an axis, although such development is possible and is even to be expected); and

- urban areas outside the main networks and which, therefore, have a relatively peripheral position: 'relatively' because the urban system in the CCC area is so dense that there are no wholly isolated urban areas.

Large and medium-sized urban areas in the Eurocorridors between the metropolitan areas can profit from the intensifying interaction between the metropolises. Many urban areas situated in a Eurocorridor have not only the potential created by their position but also identifiable potential for specialization: examples include Aachen (knowledge-intensive industries), Calais (transport and distribution) and Maastricht (culture, tourism, congress facilities). This could give these urban areas a stronger international strategic position.

The potentials for development are smaller if an urban area is situated in a depressed or declining region. For example, Liège and Bielefeld are both in Eurocorridors but they also face problems of restructuring which reduce the possibilities offered by this geographical position. These restructuring problems lie mainly in the lack of appropriate services to meet the needs of new activities in the poor environment associated with decline and at the pace at which resources to retrain and renew become available.

Urban areas outside the Eurocorridors may have problems encouraging economic growth. Their growth potentials strongly depend on the development of specific functions (niche-markets) and autonomous development. Adequate links, both physical and non-physical, with other urban areas and good internal conditions for the establishment of new firms and for the keeping and expansion of existing activities are necessities for the maintenance or improvement of position in the urban system. In this respect Luxembourg, with its specialization in financial and business services and tourism, is a good example, as is the cooperation between Ghent and Terneuzen to further stimulate their harbour and related activities. On the other hand, urban areas such as Saarbrücken and Charleroi face the combination of problems of restructuring their regional economies and of lacking a position on an important Eurocorridor.

In these respects, once again, there is a kind of north-south division in the CCC area. Most large

and medium-sized urban areas situated in a Eurocorridor can be found in the northern part. This is related to the high degree of urbanization in this part.

In the next two decades, new corridors are expected to develop (see flow systems chapter). One of the areas which could benefit most from the changes is the region of Lille. Some large and medium-sized cities in the vicinity of the Lille conurbation (including Roubaix and Tourcoing) could form one urban region with this area: Lens, Valenciennes, Béthune, Douai. The changes in the position of these urban areas within the urban system might help them in the ongoing restructuring of their economies.

On the other hand, the development of alternative routes or modes of transport, e.g. the Chunnel, the HST-network, constitute a serious threat to those urban areas which may be bypassed. For example the downgrading of the London-Zeebrugge-Brussels axis might have, at least initially, negative consequences for Bruges or Dunkirk.

So far as the south-western part of the CCC area is concerned, there is only a Eurocorridor from Lille to Paris and from Paris southwards. All large and medium-sized urban areas in the southern part are, to that extent, relatively isolated. That does not, however, classify them as genuinely peripheral as they are all integrated in wider urban systems, albeit at a national rather than international level.

In future, it may well be that the links between the ABG-stad and Nancy-Lyon come to be recognized as a Eurocorridor. The existing Eurocorridors in the southern parts between Rhine-Ruhr and Rhine-Main and from Rhine-Main to the south are expected to develop to a higher level. This may be expected to improve prospects for the axis linking Thionville and Hagondange to Briey, Metz and Nancy, and for the German city of Ludwigshafen which, though situated just outside the CCC area, is functionally a part of the Rhine-Neckar conurbation of more than a million inhabitants.

Although it is not to be expected that the urban areas in northern France will become one spatial conurbation, important linkages between these urban areas and possibly Luxembourg and Saarbrücken might develop. Economic growth in this region is currently hampered because of economic restructuring processes.

So far the matter of linkages has been addressed primarily in physical terms. There are of course equally important linkages which are mostly of an organizational nature. In recent decades, information exchange and cooperation between urban areas have increased enormously. The aims of these organizing links are often economic progress on the basis of exchange of knowledge and experience, working together to lobby policy makers, and bringing together knowledge and investments which can make some projects feasible and valuable.

Organizing links can occur at Europe-wide, national, regional and cross-border levels. They can link neighbouring cities as well as distant ones and cities in the new core with others in the old core and periphery. Many networks on the pan-European level receive financial and political backing from the EU because they respond to the Union's strategic need to reduce inequalities between core and periphery.

7.1.4. A favourable situation given their positive environmental qualities

Urban growth gives rise to particular pressures, both in terms of the environment within cities and of reduction in land available for other purposes. Even when population growth stabilizes, because of increasing demands for space per head of the population, urbanized areas do not necessarily stop spreading. Transport, energy, industry and in some cases tourism are the key activities which have an impact on the quality of the urban environment, resulting in congestion, pollution (water, air, soil, noise), deterioration of public space and heritage, and general loss of amenities.

Given the rather limited scale of the non-metropolitan urban areas, and their relatively lower levels of activity, pressures on such urban areas are smaller than on the metropolises. However, it needs to be said that, given their relative size,

their carrying capacity is lower as well, so that their balance is as easily upset.

Current policy and trends tend to focus on these smaller urban areas as alternative locations for activities which otherwise might well be located in the metropolises and their fringes. This evolution is due to their highly esteemed environmental qualities and the quality of life they are seen to offer. In the location of investment and new activities; attention is increasingly paid to the size and quality of urban areas and their 'look' as much as to the classic location factors such as a good accessibility. It must not be forgotten though that this evolution could destroy the original environmental qualities present in such urban areas and which made them initially attractive.

Free-standing towns and cities depend on their endogenous strengths such as tourist attractions, educational facilities, shopping facilities, cultural importance, valuable heritage, and diverse economic bases; on independent economic niches; and on a position of regional dominance. In these circumstances, besides the economic and functional position, 'image building' receives attention. The presence of important architectural and historic buildings, the organization of cultural events and conservation of environmental quality are seen as essential for a positive and attractive image. Such qualities are seen as important not only for their own sake but also as an important attraction for a highly-skilled labour force and in that way for new investments. Examples of urban areas which have these qualities are Oxford, Münster, Bruges, Namur, Reims, Amiens, Aachen, Maastricht, Nijmegen, Eindhoven and Kassel.

The continuing prosperity of the non-metropolitan urban areas will depend on the way they cope with a number of key issues: the regulation of urban land, the solution of urban congestion, enhancing the quality of urban environments, finding answers to growing social segregation and urban poverty. Up to now, they have not been confronted with the real impacts of the negative agglomeration effects, or this has been tempered by the economically buoyant situation of the 1980s. With the current recession, these urban centres will increasingly feel the impact of e.g. unemployment, segregation, increasing price levels, increasing crime. Urban renewal programmes — in these smaller urban areas more 'urban improvement' — will drive the vulnerable citizens out of their affordable areas and estates.

7.2. Key elements of a trend scenario

7.2.1. General trends: Other urban areas having diverse development perspectives

Economic trends

There are various reasons for the attractiveness of the 'other urban areas' as places for investment. The presence of research and development activities, cheaper land for companies, expansion possibilities, training institutes and educational facilities, accessibility, facilities for international meetings (conferences, hotels), environmental conditions and the whole 'image', often influenced by the presence of tourist activities and shopping facilities, are becoming increasingly important to the global development prospects of other urban areas. The presence of these factors, combined with the absence of many of the disadvantages typical of the metropolitan systems, make these urban areas an attractive location for (international) investors, especially for high-tech production plants.

The arrival of these new activities would dramatically change the economic structure of the urban areas and their hinterlands. While these regions have traditionally been characterized by a local economic network in order to supply a limited number of larger or, in some cases, even multinational enterprises, their future economy would form part of a higher, international level.

Trends in traffic

Given the trend towards the internationalization of the urban economies, the urban areas will try to become incorporated into the European traffic network. This leads to a growing difference of

economic opportunities between those urban areas which are connected to the trans-European network and those which are not. This could develop into a real threat to the economic well-being of the latter, especially in view of the growing European coherence which was described as a primary objective in the Delors White Paper.

The expected economic growth of these urban areas will lead to increased traffic volumes and to a need for more and faster connections between them. This will inevitably lead to an increase in road transport, causing additional pressure on the existing road network. Even an extended road network may not be able to cater for the enhanced demand for mobility.

Considering these constraints, especially in the field of freight transport, alternative modes will need to be sought. So, a modest shift from road to rail and water-related transport is expected.

Regional airports will also become more important as larger international airports in the metropolises become congested: this will create new growth incentives for those urban areas having regional airports, e.g. Lille-Lesquin.

Numerous improvements in public transport are planned, including measures to increase both speed and frequency, besides the expected extensions to private transport infrastructure.

Environmental trends

At present, environmental conditions in the free-standing urban areas outside the metropolitan systems are generally rather good. If, however, the expected growth of economic activities in these urban areas is not accompanied by the application of strict environmental standards, the environmental quality may deteriorate. There may be an increase in pollution levels arising as a direct result of industrial activity as well as indirectly through heavier traffic pressures and population growth.

Spatial trends

It is considered that, relative to a decreasing quality of life in some parts of the metropolitan areas, other urban areas will increasingly be regarded as attractive residential environments both in general but also for commuters working in the metropolitan systems.

An increase in house prices can be expected in the more attractive parts of the other urban areas, especially heritage centres and suburban areas within easy reach of the main transport facilities or in a green setting, arising from an influx of more affluent people. This will lead to push-out effects from existing built-up areas, and to the development of new residential areas on the urban fringe or in adjoining open areas.

Urban development for economic activities and for housing will enlarge the built-up area and change the structure and appearance of nearby villages in rural regions.

There are, however, national differences. Given the dominance of the Ile-de-France in the French part of the CCC area and the tendency to concentrate activities too much in the Ile-de-France, other urban areas in the neighbouring regions of the Paris basin will experience the phenomena described above but to a lesser extent than, for example, in Germany or the Netherlands. In the UK, the sphere of influence of the London metropolis extends to urban areas well beyond the limits of South-East England and is expected to increase even further in the future.

7.2.2. Developments in specific areas

Besides the general tendencies in the development of other urban areas, specific processes occur in some special subregions. These subregions were selected on the basis of common characteristics of the urban areas in those regions, and in view of common challenges and potentials for these urban areas. The following categories of urban areas were distinguished:

(i) related to their functional links with the metropolitan systems:
    the urban areas in the vicinity of metropolitan systems, and
    the freestanding urban areas;

(ii) related to transition:
the urban areas in restructuring areas;

(iii) in relation to the gradual removal of national borders:
the coastal urban areas, and
the urban areas in continental border areas.

It is not always possible to make clear delimitations of these specific areas. As a result, some urban areas are part of two or even more of these categories, and as such they show characteristics and have the potentials of the categories combined.

7.2.2.1. Urban areas in the neighbourhood of metropolitan systems: Overflow

The most important urban areas concerned here are the following.

- In the vicinity of the London metropolitan system, all the urban areas in the South-East. This does not exclude that certain urban areas can present themselves independently from London. Especially the coastal urban areas and Oxford have more potential than those exclusively depending on their position to London. There is even close cooperation between several urban areas in the vicinity of London, giving them a new, non-London-linked profile: Luton (which is a London metropolitan system urban area), Milton Keynes, Bedford and Northampton (the latter two outside the CCC area) are part of this.

- In the vicinity of the Paris metropolitan system: all the urban areas in the Ile-de-France, Creil, Beauvais and Compiegne in Picardy, and Evreux, Rouen and Le Havre in Upper Normandy.

- In the vicinity of the Rhine-Main metropolitan system: Gießen, and the urban areas of the Rhine-Neckar conurbation (Ludwigshafen and Worms in Rhineland-Pfalz), Neustadt an der Weinstraße is functionally linked to the Rhine-Neckar conurbation.

- In the vicinity of the Rhine-Ruhr metropolitan system: in a north-eastern direction, there is a whole range of urban areas going over Bielefeld as far as Minden. However, while overflow function from the Rhine-Ruhr can easily be located in Bielefeld, the distance between Rhine-Ruhr and Minden makes it very unlikely that this urban area will host much of the Rhine-Ruhr area overflow functions. Urban areas of the north-eastern range, in the 'functional' vicinity of the Rhine-Ruhr area are: Bielefeld, Gütersloh and Herford-Bad Salzuflen. Outside this range there are other urban areas in the neighbourhood of the metropolis: Lippstadt, Lüdenscheid, Arnsberg and Paderborn in the east, Düren in the south-west and Bocholt in the north-west.

- In the vicinity of the Randstad metropolitan system: Apeldoorn, and the cities of the 'Centrale Stedenring'; Arnhem, Ede, Nijmegen (all in Gelderland), and Eindhoven-Helmond, 's Hertogenbosch, Tilburg, Breda and Roosendaal (in Noord Brabant).

- In the vicinity of the ABG-stad metropolitan system: Charleroi, Roeselare and Bruges.

These urban areas are expected to attract to a high degree the more affluent people leaving the metropolitan areas in search of better living conditions. A strong population growth is expected here, leading to increasing house prices. The push-out effects will be strongest in other urban areas in the vicinity of the metropolitan areas.

These urban areas will increase their economic ties with the nearby metropolitan system. This may cause an enhanced dependency of these urban areas on the metropolis leading, at first, to a vulnerable economic situation.

As a result of the intensification of economic relations between these urban areas and a neighbouring metropolis, traffic in general, and especially traffic shuttling between them, is expected to increase, leading to more congestion in spite of improvements to traffic networks.

Pressure on the environment will increase as a consequence of the growth of economic activity and population and the increase in road traffic.

Strong overall growth in these urban areas would lead to a higher demand for space, inevitably

leading to the urbanization of open areas around them. Generally, one can expect increasing pressures on these urban areas as they have remarkable growth prospects.

7.2.2.2. Other free-standing urban areas

The most important free-standing urban areas are:

in France: Amiens, Reims, Troyes, Châlons-sur-Marne, Charleville-Mézières and Epinal

in Germany: Kaiserslautern, Koblenz, Siegen, Fulda, Kassel, Münster, Minden, Detmold and Marburg

in the United Kingdom: Oxford.

Much depends here on the economic future of these urban areas, for economic isolation can lead to social isolation. This does not mean, however, that these urban areas will necessarily become social backwaters.

Given their remoteness to the metropolitan systems, the growth potential of these urban areas is expected to be relatively low although strenuous efforts may well be made to attract new modern economic activities. The greatest assets which are likely to attract economic growth are environmental and spatial quality. Attempts to stimulate economic growth are mostly made on a stand-alone basis although the beginning of some co-operation can be identified.

These urban areas seek to become linked to the important European traffic and communication networks, although, initially, improved connections with the metropolitan systems will be the key objective.

These urban areas are often very attractive from the environmental point of view: not only are they surrounded by large open spaces but they often possess well-preserved heritage infrastructure.

As no significant level of growth is expected in these urban areas, urbanization of the open spaces around them is not likely to materialize. There will, however, be scope for further improvement of the spatial quality of the inner core.

7.2.2.3. Urban parts of regeneration areas: The transition process

The most important urban areas here are:

in Germany: Bielefeld, Herford, Bad Salzuflen, Gütersloh and Saarbrücken;

in France: Hagondange-Briey, Thionville, Maubeuge, Valenciennes, Douai, Lens, Béthune and Arras;

in Belgium: Mons, La Louvière, Charleroi, Liège and Hasselt-Genk.

The urban areas in the East Thames corridor are part of the London metropolitan system.

These urban areas are mostly situated in regeneration areas such as the old industrial Walloon axis, the East Thames corridor, the fringes of the Rhine-Ruhr (the area around Bielefeld), the industrial basins of Saarland and Lorraine, and the Lille agglomeration. In most cases, urban areas are located at short distances from each other. This pattern of concentration is typical of urban areas in regeneration areas and may be considered as one of their characteristics.

These urban areas are characterized by concentrations of social problems and, given rather pessimistic economic forecasts, youth unemployment levels tend to be high.

No massive emigration of low income groups occur in these areas and, in general, a low environmental quality results in few pressures on the housing market.

People with average incomes tend to leave the central parts of the city to move to the more attractive, green suburbs. Also, newly created small and medium-sized companies prefer a sub-urban location thereby intensifying the loss of attractiveness of the inner city.

Assuming the trend scenario to be a 'business as usual' scenario, without relevant interventions from national or international government levels, the prospects for urban areas in the regeneration areas can be described as rather pessimistic. Roughly, one can even say that the economic

problems in these urban areas are worse and will need more specific attention than in the regeneration areas of the metropolitan systems. Many reasons can be mentioned for this. First, their small scale does not allow them to become a metropolitan system. Another reason is that most of them fail to develop a contemporary economic structure. Their bad location (far away from the prosperous growth poles or in a peripheral position perhaps close to national borders) is also a disadvantageous factor.

The completion of the single market and the improvement of traffic networks reduce these constraints, yet fundamental changes in the prospects for these areas are not likely. These areas are confronted with some negative effects of the completion of the single market and the changing international situation. They also face increasing competition for their traditional products such as steel, energy and standardized mass-production articles.

The traditional economic conglomerates active in the coal and steel business will continue to diversify their activities. Small and medium-sized companies especially are newly-founded here, mainly in modern industrial activities and in the service sector. Only a few international companies are expected to locate themselves in these areas. This positive development, however, will probably be insufficient to solve structural unemployment problems.

There will be increased competition between the different urban areas within the same regeneration area to attract foreign investment, which is not the best strategy to uplift the area as a whole. The current economic recession may bring difficulties to the remaining companies which could lead to redundancies and to a weaker position after the crisis. It is uncertain whether regeneration areas will be able to profit from future economic growth.

However, many initiatives have already been undertaken or are in preparation, such as financial support for regional development, e.g. Objectives 1, 2 and 5b, but also national support measures funded by the Member States themselves. This could offset the rather pessimistic expectations.

It can be expected that, as a reaction to the economic challenges, incentives will be undertaken in order to improve the transport network from, to and in these urban areas.

Some regional airports are developing into international airports which are complementary to those in the metropolitan systems, e.g. Charleroi. Other airports associated with urban areas where economic growth is envisaged, e.g. Lille, will specialize in business-oriented flights.

Many of these urban areas are located on alternative transport routes which avoid congestion on the more traditional routes. These offer some economic prospects for those urban areas.

Environmental quality in these urban areas is often rather poor, but in many cases it is expected gradually to improve as a result of much effort on the part of local authorities. However, this could be counteracted by increased air pollution related to the expected increase in traffic.

A specific problem for urban areas undergoing regeneration is the presence of former urban land which is often contaminated and therefore not immediately able to accommodate new economic activity. In some areas, slag heaps dominate the landscape and need landscaping improvements. Several funds will deal with this problem in the years to come so that the environmental situation and general image will become more attractive for future investors.

In general, as these urban areas are not in a favourable position for economic growth, urban expansion pressure is expected to remain low. The emphasis in spatial planning will be on the maintenance and improvement of the built-up area of these urban areas.

7.2.2.4. Coastal urban areas

The main coastal urban areas are:

in France: Le Havre, Boulogne-sur-Mer, Calais and Dunkirk;

in Belgium: Ostend and Bruges;

in the Netherlands: Den Helder;

in Great Britain: Portsmouth-Eastleigh-Southampton, Bognor Regis, Brighton-Littlehampton, Eastbourne, Hastings-Bexhill, Hythe-Folkestone, Thanet and Whitstable-Herne Bay.

In many coastal urban areas there is an important immigration of grampies (growing retired active monied people in an excellent state), being relatively young, well-off, retired people. Where there is a concentration of grampies, it leads to the so-called Costa Geriatica phenomenon. This happens in parts of the south-east coast of England and along the Belgian coast. This trend is likely to continue, given the ageing of the population in the CCC area.

Given the growth in tourism in general, the coastal urban areas are also expected to witness a growth of their tourist activities.

The development of new and the extension of existing marinas offers new prospects for the coastal urban areas concerned. This is happening, or will happen in Nieuwpoort, Ostend, Blankenberge, the Southampton-Portsmouth area (Hamble), Chichester, Brighton, the Isle of Wight towns, the towns alongside the Scheldt Estuary in Zeeland (Vlissingen, Breskens, Terneuzen), etc.

The coastal urban areas with cross-Channel ferry ports will lose part of their attractiveness as a result of the opening of the Chunnel.

Prospects for the seaports of these urban areas are rather good, however difficult to predict, as they depend very much on international economic trends.

As, in general, the economic outlook for the coastal urban areas is positive, traffic is expected to increase both to and from the urban areas and within them. Given the existing heavy traffic pressure, especially in the tourist areas, an increase of traffic will lead to extreme congestion.

In areas where tourism, ports and industrial activity are well-developed, traffic flows are already heavy.

Urban growth will lead to enhanced urbanization pressure on open areas around these urban areas causing a further deterioration of the environmental quality, for example, a decrease of biodiversity, overexploitation of the natural water resources, and noise pollution. Environmental damage caused by heavy traffic flows will exacerbate this.

The ports are potential polluters, not only because of the massive traffic (on land and at sea), but also because of port-related industry. As always, new kinds of products are being developed and transported which have potential to harm the environment.

Many coastal cities are aware of the environmental problems and, on many occasions, large refurbishment programmes have been carried out. As environmental quality increasingly becomes important as a factor in tourism, more incentives in the field of environmental policy may be expected.

A clear example of growth in coastal urban areas is the Belgian coast, where the urban density is comparable to urban areas in metropolitan systems. But other coastal areas, for instance, along the south-coast of England are expected to face increasing pressures which will be an important topic in the future spatial policy of these areas.

In general, conflicting interests between environmental and economic goals are already present and could increase in the near future. In some urban areas, conflicts between functions occur, for instance, industry versus tourism in Zeebrugge. A clear and well-balanced development strategy is needed to overcome these conflicts whilst maximizing development potential.

7.2.2.5. Urban areas in border regions

The most important urban areas here are:

in France: Dunkirk, the Lille agglomeration, Valenciennes, Maubeuge, Charleville-Mézières and Thionville;

in the Grand Duchy of Luxembourg: Luxembourg;

in Germany: Saarbrücken, Trier, Aachen-Stolberg and Bocholt;

in Belgium: Kortrijk, Tournai, Mons, Verviers, Liège and Hasselt-Genk;

in the Netherlands: Roosendaal, Breda, Tilburg, Eindhoven, Maastricht, Heerlen, Venlo and Nijmegen.

The coastal urban areas can also be considered as border area cities, especially those on the Channel coast.

Although showing characteristics of urban areas in border regions, the urban areas of the *Brabantse stedenrij* (Breda, Tilburg, Eindhoven) are included in the paragraphs on urban areas in the vicinity of the metropolitan systems.

Urban areas in border regions often have cross-border links dating back decades or even centuries, resulting in a multicultural tradition and often in a mixed use of two or more languages. As the internal borders of the EU gradually disappear, multicultural interaction in these urban areas will intensify.

The border urban areas will take particular advantage of the gradual integration of the countries of the EU.

Economic specialization will occur as some functions, present in urban areas on both sides of the border, will be concentrated in one urban area. This will imply more economic cooperation between the urban areas on both sides of the border. This is especially true in border areas with a high concentration of urban areas. This is the case in the Lille region (between France and Belgium), in the Belgian-Dutch-German border region (MHAL-constellation) and in the French-German-Luxembourg border region (Saar-Lor-Lux). In those three areas, the economy developed at an unequal rate: in the MHAL-region, Maastricht is rather prosperous, while Hasselt-Genk and Liège are in the process of restructuring. The same difference in economic development can be seen in the Lille region, where the prosperity of Kortrijk is in contrast with the declining areas of Tourcoing and Roubaix, and also in the Saar-Lor-Lux region where Luxembourg shows a high vitality compared to the situation in, for example, Thionville.

Crossborder traffic between urban areas is expected to grow, not only because of increasing economic activity but also due to an extension of recreational and retailing activity.

Transborder public traffic facilities will improve: both infrastructure and schedules will be adapted to serve both sides of the (former) border. Also private traffic infrastructure will be improved.

The contrast between the environmental quality of urban areas in border regions is often wide-ranging. But, given the expected growth of road traffic, there will be a corresponding impact on the environment.

Much infrastructure, of a high risk or polluting nature (nuclear and waste treatment plants), is located in border areas which, by definition, are on the periphery of a particular country. These installations are not expected to be rapidly relocated.

Different changes will occur depending on the location of urban areas in border regions, for example, within or outside regeneration zones. It is not expected that the former will experience significant urbanization pressures. Outside the regeneration areas, the situation will evolve differently: as borders are no longer an obstacle to urban expansion, urban areas experiencing high growth pressures are expected to expand across the border putting additional pressure on the adjoining area.

Until now, spatial development of urban areas on either side of the border has often differed significantly as spatial planning fell under different regional or national authorities. This difference is expected gradually to diminish.

7.2.3. Conclusions on the trend scenario

As a result of growing internationalization, urban areas will undergo important changes in their economic structure and thus in the development of their traffic flows and spatial organization.

The other urban areas will face new challenges, but new opportunities will also occur. Most incen-

tives to maximize these opportunities will still largely be on a stand-alone basis.

As the impact of the abolition of the EU's internal borders will be felt most in the urban areas in border regions, these urban areas are likely to gain most.

In relation to transition, some of these urban areas are expected to show remarkable growth, offering opportunities to overcome interregional welfare inequalities. There are threats, however, arising from possible spatial or environmental damage caused by growth pressures.

7.3. Key elements of a policy scenario

A future in a common perspective

In general, one can say that urban areas cannot function on their own any more. Given the internationalization of society, and especially in the CCC area, urban areas are inevitably becoming a part of a much wider urban network. This will be the first and most general point to put in the policy scenario: whatever decision is to be taken by or for an urban area, cooperation with other urban areas with similar problems must first be sought. On this basis, the future of most urban areas will be prepared within a common strategy.

Aiming at coherence

In order to prepare a common future, the policy scenario for the urban areas outside the (new or existing) metropolitan systems envisages a more coherent and comprehensive development strategy. This cooperation can be general, but also related to specific common problems. Cooperation with the existing and developing metropolitan systems is also required. This would strengthen the integration of the urban areas outside the metropolitan systems in the urban network.

7.3.1. Urban areas outside the metropolitan systems realize their specific development potentials

Social issues

The ongoing growth of the urban areas outside the metropolitan areas offers many opportunities for a redistribution of the welfare within the urban areas. These opportunities must be used to their full potentials.

On a larger scale, the development prospects of these urban areas can be used to prevent inequalities between regions. Such a policy could lead to a more balanced spread of welfare over the different regions, allowing at the same time a better integration of the urban areas in the European urban network.

Economic issues

As the trend scenario generally envisaged positive economic prospects for these urban areas, the policy scenario can only aim at a strengthened and optimal support of these prospects.

This optimizing of the potential should be supported by increasing cooperation and an improved coordination of the economic policies between those urban areas. Given the remarkable diversity in this group of urban areas, this must happen by respecting, and by making use of, the specific potential of every urban area.

Such diversification and coordination should be incorporated into some kind of cooperative network between urban areas based on common problems and potential.

Issues on traffic

The policy scenario aims at an improved and well-balanced incorporation of these urban areas into the emerging network of Eurocorridors which cross the CCC area. This would help the integration of these urban areas into the European urban network. The relative prosperity of Namur

(compared to the other urban areas on the Walloon axis), partly due to its position at the intersection of the Walloon axis (with important transport infrastructure) and the Brussels-Arlon-Luxembourg axis, illustrates this point.

Therefore, many improvements to transport infrastructure, both private and public, need to be undertaken. Thus, the construction of the Ijzeren Rijn (B) or the Betuwelijn (NL) for rail freight would improve connections with Turnhout, Eindhoven, Breda, etc.

Besides the completion of the trans-European network, the organization of traffic within these urban areas is also a point requiring attention. Policy here should concentrate on ameliorating traffic congestion and the environmental consequences of traffic, Many urban areas, for example, Bruges and Oxford are already developing coherent and effective policies on these issues.

The policy scenario assumes a general and systematic approach to these issues in association with the expected growth of urban areas.

Environmental issues

Most of these urban areas, with the exception of those in regeneration areas, have relatively good environmental qualities.

The goal of the policy scenario is to maintain and improve environmental quality which will enhance the attractiveness of urban areas as a whole.

Spatial issues

As the positive growth prospects for these urban areas increase, a CCC-wide policy, in relation to the spatial development of these urban areas, becomes increasingly necessary.

Growth should be well managed, in order to improve and maintain the existing environmental and spatial qualities — two of the attractive elements of these urban areas.

7.3.2. Policy scenario for urban areas in specific areas

7.3.2.1. Urban areas in the vicinity of the metropolitan systems: Protecting their identity

Because of the vicinity of the metropolitan systems, the future development of many urban areas is considered together with the changes in the nearby metropolitan systems. This is clearly the case for urban areas in:

- the *Centrale Stedenring* in relation to the Randstad in the Netherlands;
- the Walloon axis and the Lille conurbation in relation to the ABG-stad;
- the north-east extension of the Rhine-Ruhr system (Bielefeld);
- the Seine axis (Rouen and Le Havre) in relation to the Ile-de-France metropolis;
- the Rhine-Neckar cities Ludwigshafen, Mannheim, Heidelberg, in relation to the Rhine-Main system, as well as Gießen, north of this system;
- the whole of South-East England, but specifically Milton Keynes and the cities of the Golden Triangle (west of London) in relation to the London metropolis;
- the Rhine-Scheldt delta (Breda, Terneuzen, Bruges) in relation to Randstad and the ABG-stad.

A policy must be developed which combats social exclusions caused by the attractiveness of these urban areas to affluent people coming from the metropolises.

Economic links with the nearby metropolis must be intensified. The metropolitan spill-over functions must be concentrated in these urban areas, to such a degree that these functions harmonize with the existing functions and economic structure here. This can lead to increasing cooperation and complementarity between these urban areas

and the metropolitan systems. However, the policy should aim at strengthening the identity of the urban areas so that they emerge from the shadow of the nearby metropolis. The spill-over effects should be used to maintain and improve their own development potential.

The policy scenario envisages action to manage the flow of traffic which is expected to increase as a result of the intensification of economic links with the nearby metropolitan system.

A remarkable share of the Dutch 'other urban areas' outside the metropolitan system is in the *Vierde Nota* designated as the *Centrale Stedenring Nederland* — considered to be the economic core area of the Netherlands. Some urban areas are indicated as *stadsgewest* (urban region), and many have the status of *Stedelijk Knooppunt* (urban node), for instance, Eindhoven-Helmond, Breda, Tilburg, but also Arnhem and Nijmegen. These indications are accompanied by the expected receipt of development incentives and new functions for their region.

Some of the urban areas outside the metropolises have a rather international character and are actively interested in cross-border cooperation, for example, Eindhoven and Breda.

In Belgium, the large concentration of activities in the Vlaamse Ruit and the ABG-stad, and their large surface area, allow the existence of only a limited number of urban areas outside the metropolis. In the group of other urban areas outside the metropolis, Bruges is selected as a regional urban complex of first order and Ostend, Roeselare, Turnhout are defined as centres of a second order. The definition of these levels should, in future, relate to the distribution of incentives between those urban areas.

The position of the other urban areas in South-East England is essentially related to the emerging changes in Greater London. In the 'New strategy for the South-East', Serplan stressed the role of these urban areas as overspill for Greater London with the development of East London and the East Thames corridor accorded the highest priority.

On the other hand, development in the Golden Triangle (to the west of London) will gradually be constrained to avoid further overheating and congestion effects and to aim at a more balanced spread of development throughout South-East England.

7.3.2.2. The free-standing urban areas

- **Free-standing urban areas in Germany**

Social and economic issues

In the CCC part of Germany, most of the remaining urban centres are designated as *Oberzentrum*, which means that they function as regional service centres and economic development poles, leading to a more equally spread welfare rate. This is the case for the free-standing urban areas of Kaiserslautern, Koblenz, Siegen, Kassel and Marburg. Some have specific functions which may offer an (inter)national fame, as for example Kassel (culture), and Koblenz (tourism). This spread of functions is a very positive development, and it must be continued in the future.

Traffic issues

Siegen and Koblenz especially are increasingly becoming interesting zones as they are located near to intense communication flows between metropolitan systems. Kassel is expected to take advantage of its strategic position in a unified Germany. Public transport within freestanding urban areas needs closer attention as road infrastructure is already satisfactory. Very encouraging is the fact that Fulda, Marburg and Wetzlar are part of the RMV (Rhine-Main Verkehrsverbund), allowing a coherent public traffic policy with the Rhine-Main metropolis.

Environmental issues

Environmental quality is mostly rather good here, so action in the environmental field must focus on the protection of the environment rather than further improvement. This does not mean, however, that environment is a less important issue: one must continuously be alert to new develop-

ments in order to anticipate possible environmental threats.

Spatial policy

Spatial policy must be one of the instruments to maximize the potential of urban areas, as it must allow for the development of new activities. However, cooperation with other urban areas must be emphasized, for free-standing urban areas tend to develop spatial policy alone.

The general framework for spatial policy (*Raumordnungspolitischer Orientierungsrahmen*) foresees the extension of urban networks as a concept to develop a spatial policy for these urban areas. Through these networks, it is expected that inter-municipal cooperation will be promoted, urban regions will be able to develop particular local advantages, there will be improvements to interregional infrastructure, and a greater impetus will be given to development beyond the narrow regional borders. This general idea is totally in harmony with the specific elements of the policy scenario proposed.

- **Free-standing urban areas in the Paris basin**

Social and economic issues

The general policy in the Paris basin is to reduce the overconcentration of functions and population in the Paris metropolitan system and to redistribute them to regional centres outside the Ile-de-France region. This would give an impetus to the growth of urban areas such as Reims, Amiens, Troyes, Rouen and Le Havre. This growth must be guided by the attraction of special service functions such as universities and R&D. Thus, they will become real regional activity and service centres, with their own hinterland.

The population of these urban areas is expected to grow further. However, the number of people involved is only small compared to the concentration of population and economic investment in the Ile-de-France.

The future of the free-standing urban areas in the Paris basin is strongly dependent on the general policy in relation to the Paris metropolitan area.

DATAR proposed, in *Le Livre Blanc du Bassin Parisien*, an ambitious trend-breaking scenario to combat the overconcentration of activities in the Ile-de-France, by encouraging development of *Territoires metropolitains* (Rouen, Le Havre and Reims, Epernay, Châlons sur Marne), *Pôles Structurants* (Amiens, Compiegne) and *autres pôles urbains* (Beauvais, St. Quentin, Soissons, Meaux, Chateau-Thierry, Evreux, Vernon, Dieppe, etc.).

However, this trend-breaking scenario, given the contrast with the 'business as usual' policy to concentrate on the Ile-de-France, is contested by these other urban areas and the regions involved, on the basis that this redistribution of development incentives is not ambitious enough and that decentralization should go further.

In relation to deconcentration in the Ile-de-France, a number of urban networks are being developed based on the common interests of individual urban areas (*Association des Villes a une heure de Paris*).

Traffic issues

The provision of a polycentric communication network is essential to the success of these expansion and deconcentration systems. Fast public and private transport facilities should link the regional centres to the Ile-de-France, but the connections between the regional centres themselves should especially be improved. This will help to avoid major congestion in the central part of the Ile-de-France, and it will enable the integration of the Paris metropolitan system into the polycentric network already present in the Benelux and Germany.

Environmental issues

As the policy scenario favours growth in these urban centres, accompanying measures must be taken to safeguard environmental quality.

Spatial issues

As in the German free-standing urban areas, policy must maximize the potential of the French free-standing urban areas whilst allowing for the introduction of new functions in these areas. Again, the stress is on inter-urban cooperation. It is clear that the spatial development of these urban areas will be dependent on the effectiveness of the proposed policy lines.

7.3.2.3. Urban areas in specific regeneration areas

In these paragraphs, the focus will be on the Walloon axis, as the urban areas in other regeneration areas have already been addressed: Bielefeld is dealt with in urban areas in the vicinity of metropolitan systems, the East Thames corridor is part of the London metropolitan system, and the Saar-Lor-Lux region will be dealt with in a separate chapter.

The required policy common in all the urban areas in regeneration areas is one of supporting the revitalization of the economy, as well as important environmental improvements with the aim of making them centres of regional economic development and regeneration.

- **The urban areas incorporated in the Walloon regeneration axis**

The policy scenario proposes the development of integrated measures at EU, regional and local level. Improved cooperation between the urban areas of Valenciennes, Mons, La Louvière, Charleroi, and even Namur, and the development of common strategies are important conditions for their renewed development. Common points of interest in such a cooperation can be the improvement of environmental quality, the development of new economic activities, the development of education facilities and a common approach to traffic problems.

Social and economic issues

Communication and cooperation between the entrepreneurs and the educational/R&D units could be improved. A technical university in Charleroi should be considered, in order to stimulate innovation and to create new networks within the existing economic base. Namur (regional capital of Wallonia) and to a lesser degree Mons ould specialize further in administrative functions.

Traffic issues

The presence of the Charleroi regional airport offers the opportunity to divert a part of the traffic that currently uses Zaventem international airport; although other small airports like Lille or Antwerp (in the ABG-stad) will compete for that traffic. In the long run, some spill-over functions from Brussels could be located in these centres. The west-east bound traffic in the CCC area could increasingly use the *autoroute de Wallonie* instead of the more congested roads between Rhine-Ruhr, the ABG-stat and the Lille area. It is, however, open to question whether this will benefit the Hainaut basin as it concerns mainly transit traffic. Therefore, local initiatives should be taken to bring about advantages from these flows.

Environmental issues

All the urban areas here should significantly improve their environmental quality and the quality of life. The relics of mining activities should either be demolished in order to provide space for new urban functions or maintained to add to the heritage of the region. Pollution from the remaining industry must materially be restricted.

7.3.2.4. In coastal areas: The ports outside the metropolitan areas

A common and transfrontier cooperation is becoming more and more desirable among the ports outside the metropolitan systems along the coasts of the Channel and the North Sea in the light of the increasing challenges. Cooperation between the five ports (Boulogne, Calais, Dunkirk, Ostend and Bruges) and those on the British side (especially those at the Channel coast like Dover, Folkestone, Hastings-Bexhill, Eastbourne, but also Thanet and Whitstable-Herne Bay) could enable them to operate as one large unit for mutual benefit.

Le Havre, the 'seaport of the Paris metropolis', is already included in the paragraphs of the urban areas in the vicinity of metropolitan areas.

Social and economic issues

The opening of the Chunnel means that some of these ports will have to reorient their long-term development strategy. New activities need to be found, and each port could specialize in certain markets. Boulogne could strengthen its position as a fishing centre, Calais can profit from activity related to the Chunnel, Dunkirk can aim to reinforce its position as a maritime industrial centre, Ostend could specialize in certain routes to the UK or offer luxury cruises as an alternative to mass transport through the Chunnel, while Bruges could specialize in transport and distribution and logistics activities.

On the other side of the Channel, cooperation among the ports in the South-East (Folkestone, Dover) is actually intensifying and should be encouraged.

In coastal areas where tourism is important, it would be advisable to strive for some mixture of the tourist population in order to avoid too large concentrations of 'grampies' or young people in urban areas. Specialization in only one tourist market would render urban areas too vulnerable to changes in holiday preferences and to society in general.

Traffic issues

Given the economic importance of traffic for these areas, both for tourist and for port-related areas, the policy scenario assumes an optimal embedding of them into the wider European traffic network.

As tourism is very much a seasonal activity, traffic congestion is especially heavy in summer. The economic justification of more infrastructure in these areas would be questionable, since it is only used at its optimal level for a comparatively short time of the year. Alternative solutions, like staggering of holidays, must be found.

Environmental issues

As traffic in some ports is expected to decrease due to the Chunnel, it is vital for them to have an excellent environmental quality: tourism may become the main new activity here, replacing the loss of some sea traffic.

In ports where no negative growth is expected, the environment must still be preserved. In these locations, the environment may be endangered by the movement of hazardous goods and the processing of dangerous products in industrial zones linked to port activities. Pollution restrictions will place the urban areas concerned in a poor competitive position: cooperation here will be absolutely necessary.

It is quite evident that in the tourist towns along the coast, preservation of the environment is a high priority.

Spatial issues

Solutions must be found to conflicts between tourist and industrial functions, and if no alternatives are available, one of the functions will have to cease. However, even without this competition between the functions, tourist development will have to be restricted, because in some areas pressures caused by tourism is so high that it endangers its own future (e.g. the Belgian coast). Planning solutions must lead to sustainability here.

7.3.2.5. Urban areas in Continental border areas

In general the urban areas in the vicinity of the national borders were peripheral to the rest of the country, and as such often somewhat neglected by the national governments.

With the 'fading away' of the national borders, the peripheral position of these urban areas in the national states turns into a more central position both in the CCC area as in the EU as a whole.

This dramatic change of their position gives these urban areas important new opportunities, which is even enhanced in regions where there is a concentration of urban areas. Given the impor-

tance of these urbanized regions, they will be discussed in the following, separate chapter.

7.3.3. The three potential transnational metropolitan systems

Several parts of the CCC regions which are outside the classic metropolitan systems are characterized by a denser than average pattern of smaller urban systems. Three such constellations can be recognized:

1. Lille and the surrounding urban areas Béthune, Lens, Douai, Valenciennes (Nord Pas-de-Calais), Kortrijk (Flanders) and Tournai (Wallonia);

2. the MHAL area with Maastricht (the Netherlands), Aachen (Germany), Hasselt (Flanders) and Liège (Wallonia);

3. the Saar-Lor-Lux with Nancy, Hagondange-Thionville, Metz (Lorraine), Saarbrücken (Saarland), Luxembourg (the Grand Duchy of Luxembourg), Trier (Rhineland Pfalz) and Arlon (Wallonia).

In order:

to take full advantage of their central position in the common market,

to overcome their restructuring problems,

to overcome their relatively smaller individual scale,

to make the CCC area less dominated by the six established metropolitan systems,

the policy scenario picks up the increasing cooperation initiatives between these urban systems to such an extent that they become alternative polycentric development poles.

These integrated systems could function as metropolitan systems, however, in a different way compared to the existing metropolitan systems. They should be oriented towards development of new activities, and aim to maintain and to improve spatial and environmental qualities.

It is remarkable that these proposed alternative metropolitan systems all contain some prosperous as well as regeneration urban areas.

A specific asset of these systems is that all urban areas within a cross-border system are likely to be more familiar with the way in which business is done in their partner's region/country than in other urban systems of their own region/country. Therefore, these multicultural entities are particularly well placed to become locations for joint initiatives between the regions/countries involved.

The policy scenario seeks to stimulate their own growth potential as the basis for new welfare for each of the urban centres, and the creation of new potential which could be used for the general welfare of the urban areas. Joint initiatives, which cannot be carried out by the individual urban areas, can become an essential part of this approach, for instance, for innovation centres of European importance. Every urban system of these transregional entities could specialize in different functions whilst being complementary to other centres in the system. This increases their chances in international competition in the field of new activities, makes them more attractive for investment, and will guarantee the coherence of these systems.

To succeed in this goal, the communication network has to be improved, especially the railways, airports and telecommunication facilities. National differences in the networks have to disappear in order to make them compatible.

Relations with the six metropolitan systems must not be neglected. The presence of contemporary transport modes, for example, HST, is essential for the accessibility of these systems, especially to and from the six metropolitan systems. This will allow them to become alternative locations for overspill activities from the six metropolitan systems.

7.3.3.1. The MHAL metropolitan system: A laboratory for international cooperation

Of the three potential transnational metropolitan systems, the MHAL area is the only one where

transnational cooperation has issued a common strategy document.[1] This cooperation involves all the political levels of the concerned countries, regions and cities, represented in an international coordination commission.

Social issues

The population of the MHAL region is estimated at about 3 million people, of which 2.5 million live in urban or peri-urban areas.

According to the settlements database and to the terminology given in the introduction of the metropolitan systems (Chapter 6), the MHAL-region includes three medium-sized urban areas: Liège, Aachen and Maastricht, and five small urban areas: Düren, Heerlen, Stolberg, Verviers and Genk, totalling 893 890 inhabitants (i.e. inhabitants of urban areas of 50 000 or more, according to the settlements database)

The development of new activities is already bringing about more social stress in the urban centres and some outward tendencies are already evident. In the policy scenario, such trends should be avoided, and a social policy should be considered an integral part of the development of metropolitan systems' 'new style'.

Economic issues

The MHAL system covers some regeneration areas, such as Liège, which are fully involved in the process of restructuring after the collapse of the old industrial steel production, as well as rather prosperous urban areas (Maastricht and Aachen).

Issues on traffic

In connection with the HST-network, but also in order to improve internal cohesion of the metropolitan system, an improved organization of the public transport network, for instance railway network, and the connection of these lines to the HST-network (with an alternating stop in Aachen and Liège) is necessary.

Freight transport by waterways and by railways must, as a general policy, be encouraged. In this trend, Liège must promote itself as a major freight handler, via the creation of a multimodal transport zone, in which the river port would play an important role. Cooperation with Maastricht, linked to Liège by the River Meuse, is advisable, and Maastricht airport could function as one of the feeders to the Liège transport zone.

The two airports will have to be complementary to each other. The connections to the major metropolitan systems (ABG-stad, Randstad and Rhine-Ruhr) must not be neglected.

Urban centres will have to improve their public transport systems, and a well-functioning regional transport system, linking the most important as well as the lesser urban areas with each other, would improve the internal coherence of this metropolitan system.

Environmental issues

Improvement of spatial quality will lead to a stronger external position and a better internal structure. Just as in the Randstad and ABG-stad, the 'green belt' policy could easily contain a 'green heart', as the geographical centre is the less urbanized part of MHAL. The diversity of the natural landscapes and the large area of open space in this metropolitan system must be seen as an opportunity for the integration of the open space into a strategic plan.

Water quality of the River Meuse and some of its effluent still need improvement. This is important especially because of the tourist potentials of this metropolitan system.

Renewal of the urban centres should emphasize the different characteristics of each centre, while former mine sites need environmental improvements in order to attract new urban functions.

[1] *Internationale Coördinatiecommissie: Ruimtelijk Ontwikkelingsperspectief,* Antwerp, June 1993.

Spatial issues

There is no real dominant urban system, although the MHAL region has established a tradition of transborder linkages. The individual urban areas become, by promoting their own economic potential, the instruments for up-grading the metropolitan system as a whole.

The system can also function as a location for overspill activities seeking locations in the vicinity of the major metropolitan systems of the Rhine-Ruhr, Randstad and ABG-stad. Therefore, the internal cohesion has to be improved: better infrastructure to improve accessibility, cooperation between industries and research institutions on different sides of the old borders, and coordination between environmental improvement and tourism schemes are important.

A specific aspect of spatial urban development in the MHAL region is described in the policy documents as an urban landscape park (*Stedelijk Landschapspark*), aimed at a well-defined and differentiated development strategy for the urban system as a whole.

The commonly accepted policy lines for the MHAL metropolitan system, as planned by the International Coordination Commission, are concentrated around improvement within the European constellation, internal cohesion at the functional and governmental level, and improvement of the internal spatial and environmental quality.

7.3.3.2. The Lille metropolitan system

Social issues

Again according to the settlements database, a narrow definition of the Lille conurbation would include one very large urban area, Lille, and two small urban areas, Kortrijk and Tournai, accounting for 1 103 575 inhabitants. The total population of this area is approximately 1 700 000 inhabitants (1 200 000 in France and 500 000 in Belgium). A broader definition includes the large urban areas of Valenciennes and Lens, the medium-sized urban areas of Béthune and Douai and the small urban area of Arras, more than doubling the Lille metropolitan system's urban population to 2 321 689 inhabitants.

The urban areas, added in the broader definition of the Lille urban system, are the continuation of the Walloon axis and, just like the latter, in a phase of economic restructuring.

A wide-ranging approach to social problems in the whole metropolitan system would solve, rather than, as has happened too often in the past, displace them. So here, the cooperation of the urban areas of the metropolitan system would help in sectors such as social development.

Economic issues

Although traditional manufacturing firms still have a relatively high share of total regional employment, some modern industries have come to the region (the car industry, food processing) and the service sector is growing. Recently, some head offices have become established in this region.

It is expected that development will create an economic structure with an emphasis on modern manufacturing, transport and distribution, and business services. At present, Lille is the third most important location for business services in France after Paris and Lyon.

Industrial activities remain important, but their structure should become more oriented towards modern and even high-tech production facilities. R&D, university education and other institutions have to be attracted or created in order to support this. All urban centres should have the functions that will enable them to become regional growth poles, and to increase the quality of life. Lille could function as a highly accessible service centre. The other centres could host overspill activities from Lille which do not need to be in an international location, for instance, back offices. This, however, requires massive financial, organizational and structural efforts.

The future of this potential metropolitan system will heavily depend on the way in which the region is able to break free from the image of an

old industrial area with a workforce having a low level of skills.

Traffic issues

Its strategic location in the European communication network now provides this metropolitan system with a high level of accessability and the prospect of further economic growth. It is particularly well placed to accommodate overspill functions from Paris, Brussels and even London.

Lille airport offers an alternative to the Paris and Brussels airports as these become ever more congested.

The centres of Béthune, Lens, Douai, Valenciennes, Tournai (Wallonia) and Kortrijk (Flanders) have to be complementary to each other and to Lille in terms of transport. Each of them should specialize in some activities (logistics, transport, distribution, telecommunications), without, however, taking the risk of becoming too monofunctional.

Within the metropolitan system, public traffic should improve with a view to creating a strong intra-metropolitan structure.

Environmental issues

Given the presence of many old industrial sites in this area, environmental improvement should become one of the main issues in the creation of this metropolitan system. Also, policies to cope with the enhanced traffic caused by the creation of the metropolitan system must be based on a sustainable transport strategy.

Spatial policy

Lille, being the largest urban area in the metropolitan system, should be the driving force behind the creation of this new system. This urban area already appears to be performing well and must continue to do so. The goal is to develop a coherent strategy in matters of urban development, economic planning and sustainability.

7.3.3.3. The Saar-Lor-Lux metropolitan system

Social issues

The constellation is rather extended and rather thin especially compared to the other proposed new metropolitan systems.

Nancy is the only large urban area here (again according to the settlements database). Saarbrücken, Metz, Thionville and Hagondange-Briey are the medium-sized urban areas, while Trier and Luxembourg are the small urban areas. These urban areas total 1 119 136 inhabitants.

The Saar-Lor-Lux constellation contains strong contrasts in population density, with very densely populated areas (on the axis between Luxembourg, Thionville, Metz and Nancy and the area of Saarbrücken and Neunkirchen) as well as very rural and 'remote' areas. A medium-sized population density is present in the eastern extension around Trier.

The differences in the welfare level of the urban areas is rather large and a closer integration of these urban areas must aim to create a better distribution of economic opportunities and welfare.

The scenarios developed in 'Lorraine, Horizon 2003', envisage that for the near future a further population decrease is to be expected. Only in the most optimistic scenario is population stabilization foreseen. The sectoral perspective on social issues anticipates a decrease and a remarkable ageing of the population in these regions.

Economic issues

The Saar-Lor-Lux-system covers rather prosperous urban areas, such as the Grand Duchy of Luxembourg, as well as urban areas in the full process of restructuring, such as Nancy, Metz and Saarbrücken. Integration in one metropolitan system must reduce the differences between the urban areas, although specialization in specific functions must be encouraged within the urban areas.

The constellation faces remarkable regeneration areas in Luxembourg, in Lorraine as well as in Saarland. They all face restructuring problems as the older industrial activities such as steel production has been declining for a long time.

For the future, efforts are being made to encourage the development of R&D activities (Pôle Universitaire Européen) for this area.

Traffic issues

In contrast to the other two proposed new metropolitan systems, this is not located on major international connections between the six existing metropolitan systems.

The growing significance of traffic loads on the road infrastructure between Paris and Frankfurt and between Brussels and the Rhone valley could create development potential for freight-handling in the Saar-Lor-Lux area, for instance, Thionville and Hagondange, and the arrival of the TGV is becoming extremely important for the whole area in relation to the development of new economic activities. As a result, the Saar-Lor-Lux area will increasingly become integrated in the polycentric structure itself. Related to this, the Eurocorridor network and the TGV network are important strategic policy elements linking urban areas within the metropolitan system and helping to create internal cohesion.

Luxembourg airport could become the international gateway to the metropolitan system. Plans for an airport in the Metz/Nancy area should complement the established airport in Luxembourg, rather than compete with it. The Metz/Nancy area could evolve into a multimodal transport node on the European level.

The transcity project, aimed at the development of a cross border rapid rail network between Luxembourg, Trier, Saarbrücken and Metz, may be regarded as remarkable, given the ambitious character of the whole project but, to some extent, the success of the development of the metropolitan system as a whole depends on it.

Environmental issues

Environmental improvement of the former mining districts is a prerequisite for the development of new (industrial) activities in these areas.

Moreover, the location of this metropolitan system in a rural context, with high ecological and agricultural values, is to be considered as an extra argument to guide the urban development.

The green buffers around the urban areas must be preserved as they enhance the quality of life within the urban areas.

Spatial issues

This constellation is the least recognizable of the three as a metropolitan system. The urban areas are rather small and they are located at some distance from each other and within rural areas with a low degree of human exploitation.

In this case, functional complementary is also a valuable contribution to the more equal spread of development potential in the region. Every urban system should have those elementary functions which enable them to become development poles in their own right, for example, a university, administrative functions. In order to guarantee the internal coherence of the system, functional complementarity becomes an even more essential asset. Higher education could be concentrated in Trier, Saarbrücken and Metz/Nancy.

Contemporary production facilities could go ahead in Thionville and Hagondange; whilst R&D activities could be supported in Saarbrücken and Metz/Nancy, in close relation with the technological divisions of the universities. Luxembourg could benefit from the further development of financial and business services.

Given the limited carrying capacity of the urban centre of Luxembourg, one should consider locating some future (back office) developments in the Luxembourg area to nearby urban centres such as Arlon, Thionville or Trier. This will limit commuting to Luxembourg city, and allow a more sustainable form of economic development.

7.4. Conclusions

The urban areas outside the metropolitan systems show remarkable development trends and positive development potential.

On the other hand, these urban areas are often situated in contexts of restructuring areas, border areas, the neighbourhood of metropolitan systems, etc.

The positive development potential should be used to overcome the specific problems of the areas. In this way, these urban areas become very relevant elements in a general policy on the overall transition process in the CCC area.

This development however should be guided, taking into account the principles of sustainable development, in order to avoid the negative environmental consequences of it.

The future of these areas however cannot be discussed any more on a stand-alone basis. Given the internationalization, the whole context of these urban areas is changing remarkably, and this goes for the urban areas in the border areas as well as for those not in border areas.

In order to prepare development strategies, the elaboration of new relationships between those urban areas, based on common characteristics, is extremely important. These cooperative relationships should be organized in such a way, that the identity and the inherent potentials of these urban areas will be safeguarded with respect to their autonomy concerning matters about their natural hinterland.

8. The CCC rural areas

Introduction: An area dominated by rural functions

The rural parts of the CCC area are characterized by specific land uses and ways of life but, more than in other regions of the EU, some of these specific rural characteristics are disappearing. This is particularly true of rural communities in 'rural areas under urban pressure' close to urban areas, where the boundary between rural and urban areas becomes increasingly blurred as a result of continuing suburbanization and of agricultural change.

About 33% of the population of the CCC area lives in rural areas, which is below the EU average of 44.3%: this illustrates the highly urbanized character of the CCC area. Agriculture represents 1.8% of the GVA of the CCC area economy, which is lower than the EU average of 2.6%. Agricultural employment represents 2.9% of the total employment in the CCC area, being substantially lower than the EU average of 8.6%.

• Spatial characteristics

Land use dominated by rural functions

Despite figures illustrating relatively low economic importance, it should be noted that 74.3% of the CCC area remains open countryside, (slightly lower than the EU average of 82.2%). There are, essentially, three types of specific rural land use in open areas: agriculture, forestry and other semi-natural open land. About half of all open land in the CCC area is used for arable purposes, approximately 30% is used for forestry (compared to 30% in the EU area) and 22% is used as commons and meadows (EU area: 32%). The following regional differentiation can be given (see Map 8.1).

1. The percentage of open countryside is higher than the EU average (82.2%) in Champagne-Ardennes, Picardy, Upper Normandy, Lorraine, the Grand Duchy of Luxembourg.

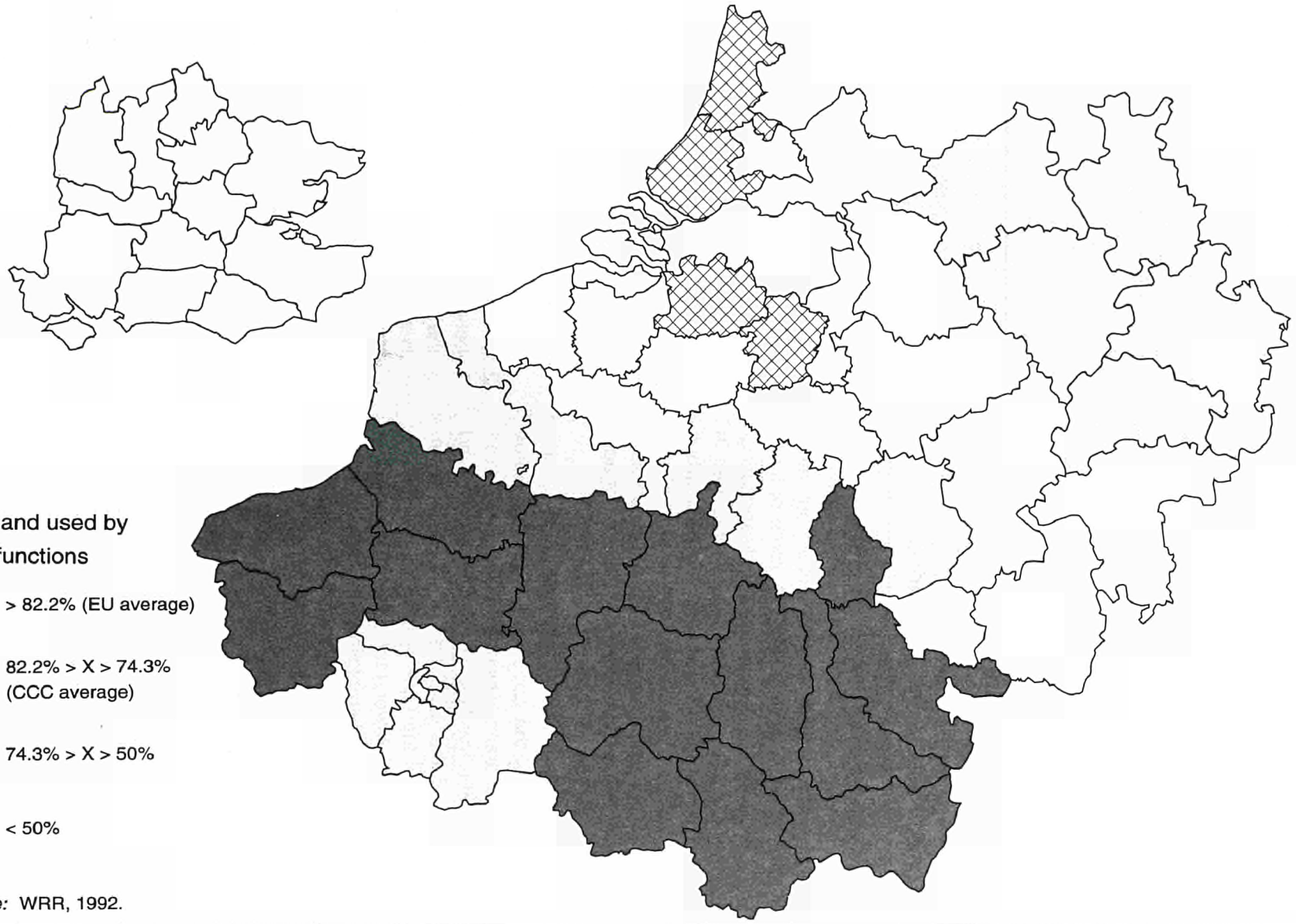
2. The percentage of open countryside is between the CCC area average (74.3%) and the EU average (82.2%) in Luxembourg (B), Namur, Münster, Detmold, Arnsberg, Gießen, Kassel, Trier, Ile-de-France and Nord-Pas-de-Calais.

3. The percentage of open countryside is between 50% and the CCC area average (74.3%) in Brabant, Hainaut, Liège, East Flanders, West Flanders, Düsseldorf, Cologne, Koblenz, Darmstadt, Rhineland-Pfalz, Saarland, South-East England, Gelderland, Utrecht, Zeeland, North Brabant, and Limburg (NL).

4. The percentage of open countryside is lower than 50% in Antwerp, Limburg (B), North Holland and South Holland.

Map 8.1

Land use in CCC



Source: WRR, 1992.

Loss of agricultural land in the CCC area

In 1990, agricultural land occupied only 92.8% of its 1974 area. However, there are large regional differences.

1. The agricultural area increased or remained the same in Champagne-Ardennes and Utrecht.

2. The agricultural area decreased by less than 10% in Hainaut, Limburg (B), Luxembourg (B), Namur, West Flanders, Ile-de-France, Picardy, Upper Normandy, Nord-Pas-de-Calais, Lorraine, the Grand Duchy of Luxembourg, Gelderland, North Holland, Zeeland, North Brabant and Limburg (NL).

3. The agricultural area decreased by 10 to 20% in South Holland, Rhineland-Pfalz, North Rhine-Westphalia, East Flanders, Brabant, and Antwerp.

In Saarland, only 60% of the 1974 area remains in agricultural use. This exceptional situation is explained by natural limits (soil, relief) to the development of intensive agriculture as experienced in other German regions of the CCC area. No comparable data are available for Hessen and the South-East.

- **Population dynamics**

A diverse population pattern

Compared to the overall average of 33% of people living in the rural areas in the CCC area, there are notable differences between the regions, as illustrated by Map 8.2 (population in the rural areas). At least 60% of the total population live in rural areas in Liège, Limburg (B), Gießen, Kassel, Koblenz, Trier, Luxembourg (B), Namur, West Flanders, Picardy, North Brabant and the Grand Duchy of Luxembourg. However, less than 20% of the total population live in the rural areas in the NUTS 2 regions of Düsseldorf, Cologne, Arnsberg and in the NUTS 1 region of the Ile-de-France.

While some parts remain relatively remote from urban areas, some are under substantial urban pressure. This can be seen through the occurrence of urban dynamics, such as 'rurbanization', or by changes from agriculture to (greenhouse) horticulture.

In recent decades, three types of processes can be identified as operating within rural settlements in the CCC area: counter-urbanization, processes leading to 'mosaics', and the combination of both.

1. A strong counter-urbanization, involving a shift of the population from urban agglomerations into the countryside, puts pressure on rural housing markets and is characteristic, though in rather complex forms, of South-East England.

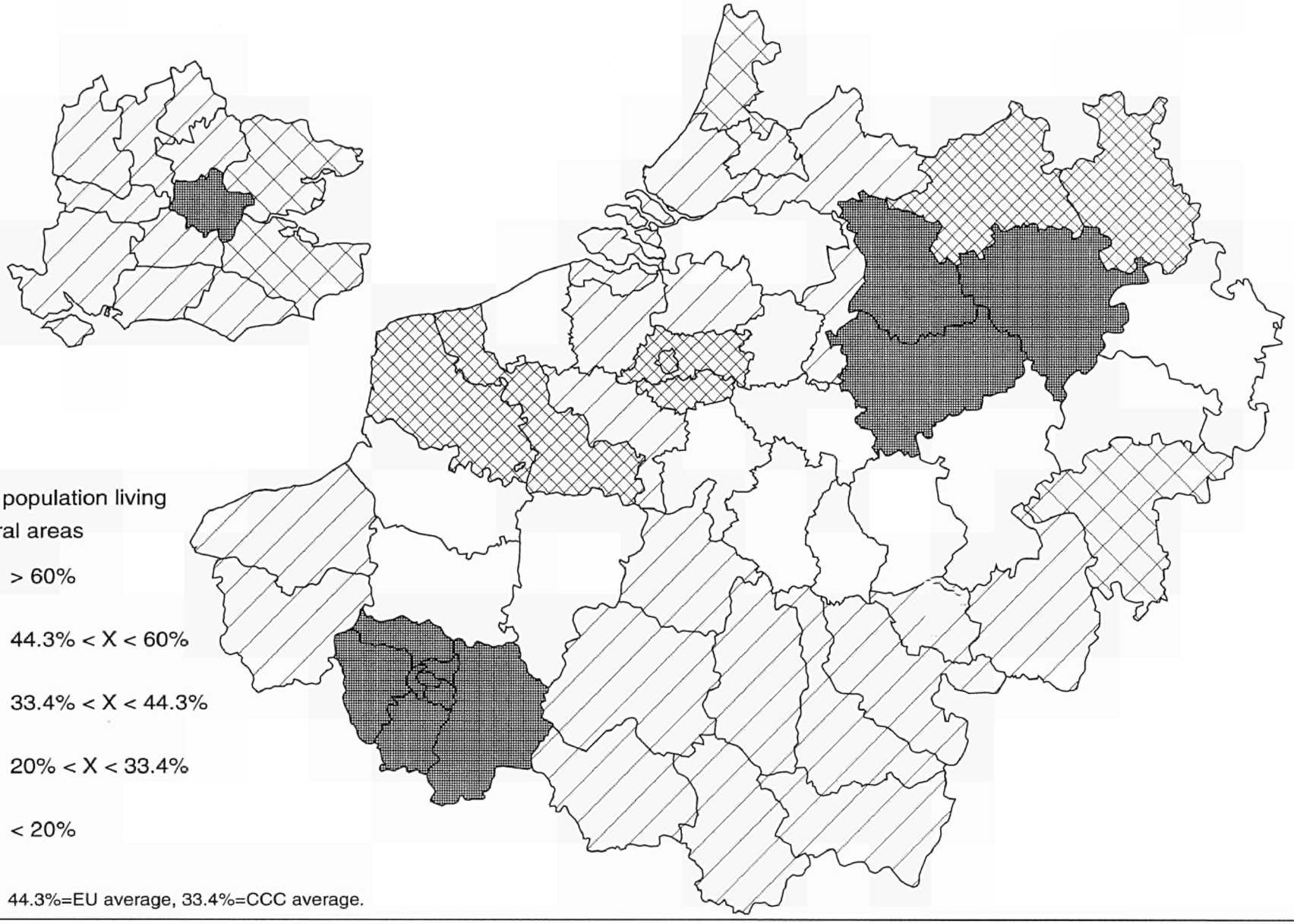
2. Mosaics or patchwork patterns are characterized by two processes. A selective process creates 'islands' of growth and islands of decline within the same region. Another process sees migration redistribute people around the region: much of this movement involves young people leaving the countryside for nearby urban centres. At the same time, some rural areas accommodate inflows, mainly of the elderly and of commuters, from the cities.

   Examples of regions with rural areas in which such patchwork patterns occur are Saarland, Rhineland-Pfalz, North Rhine-Westphalia, Hessen, Lorraine and the CCC area part of Benelux. In a number of these regions the patchwork pattern results from processes occurring within the rural areas themselves, rather than being driven by urban pressures into the open area.

3. In the Paris basin, a combined pattern occurs, characterized as a patchwork, where the growing parts of the region are fed by the counter-urbanization of Paris. The growing parts of the region are called the 'clips' and the declining parts of the region are known as 'décors'. The hills of Normandy and Nivernais are good examples of décors in the French part of the CCC area. These patterns of change are quite similar to those mentioned under 2, but on a much larger scale, and more related to agriculture.

Map 8.2

Population in the rural areas



Note: 44.3%=EU average, 33.4%=CCC average.

• The specific functions of rural areas

Besides the residential function in the rural settlements, as described above, the rural areas in the CCC area perform a broad variety of functions for society as a whole. As well as their internal roles as food producers or tourism providers, their functions are influenced by wider considerations. In providing, for example, clean water and air and attractive scenery, rural areas fulfil an important role, particularly in relation to the CCC area's most urbanized regions.

Producers of food and wood

Traditionally, agriculture and forestry have been seen as the basic functions of the CCC rural areas.

Agriculture, as a food provider, is characterized by decreasing economic weight and decreasing contributions to employment provision. It is subject to two marked tendencies, the first being 'intensification' and the second, concentration in relatively limited areas.

Given the internationalization and the growing interdependence of world markets, reflected in the GATT arrangements and CAP reforms, proximity of ports and large consumer markets is expected to become of major importance for producer areas. Broadening the economic base by implementing agro-tourism and other such measures must be expected as a response to the challenges to traditional agricultural economies. The various agriculture-related initiatives are, however, unlikely to fill the income/employment gap created by the run-down of agricultural activity.

The economic importance of forestry as wood producer is even more limited. This must firstly be seen as a strategic weakness of the CCC area. The extensive woodlands present in the CCC area are, of course, relevant for their timber production but are perhaps even more important to recreational provision, for maintaining ecological balances and as elements in the scenery of the CCC area.

Importance as resource function

The rural areas remain vital both for their inhabitants and for society as a whole. In CCC area terms, it is a weakness if the rural areas cannot or do not fulfil some vital functions and, in consequence, the area finds itself having to import, for example, North American grain, wood from Scandinavia or soya from developing countries.

Rural areas preserve the natural foundations of life, such as water, the soil and air and are the habitat of a large variety of animals and plants. In the CCC area more than in other parts of the EU, and especially in its 'intermediate' areas, the fragmentation of forests and nature reserves, combined with environmental pollution, threaten this function.

The rural parts of the CCC area are seriously affected by emissions from the urban agglomerations and other areas with a high concentration of industries, and by other economic activities, including agro-business, intensive agriculture and livestock rearing.

Rural areas shape the landscape

Landscapes vary markedly in scale within the CCC area. They range from the open, cereal-growing areas of Picardy and Champagne-Ardennes to the fragmented landscapes of Flanders, broken by hedges, rows of coppice and small patches of woodland. The area also has its hilly parts, for example in Lorraine and Hessen, characterized by open land and more extensive uses.

The familiar structure of the various regional landscapes is threatened in many ways: hedgerows are removed; open areas are increasingly urbanized or at least subject to visual or other intrusion; landscape conservation is not a first consideration in the provision or improvement of infrastructure networks; and streams are re-routed and regulated. Such actions are causing severe loss of identity in the different landscapes and, in turn, seriously threatening their tourism potential.

The recreational function of the rural areas

The rural areas, especially those within easy reach of the built-up areas, have important recreational functions for urban dwellers. Moreover, agro-tourism, for example, is growing significantly in a number of regions. If such roles are to be successful, three important conditions must be fulfilled:

(i) rural identity must be preserved;
(ii) there must be sufficient investment in agriculture itself; and
(iii) the diversity of the landscape (and thus of agrarian production) must be preserved.

It must be said that, given for example its loss of scenic quality, the CCC area is not satisfactorily meeting these conditions at present.

Towards a general typology of rural areas

Without neglecting the broad diversity of rural areas in the CCC area, a general typology, based on relief and land use characteristics, has been adopted for the purpose of this study. This typology is a very general one, encapsulating a lot of inherent diversity. Three important types of areas have been chosen from within the broad diversity but it should be noted that they are not exclusive. Map 8.3 represents a preliminary spatial view of the regions of the CCC area. The following three types can be identified:

(i) rural areas with low levels (whether for locational, natural or historical reasons) of human exploitation;

(ii) rural areas with higher levels of human exploitation: areas with more intensive human exploitation though still retaining a typical rural character;

(iii) rural areas under urban pressure, where there is intensive human exploitation but in a spatial context of urbanization and urban dynamics.

These general types of rural areas are described in greater detail below. Having special characteristics, the rural areas in border areas and those in coastal zones will be commented on in the last paragraphs.

8.1. The rural areas under urban pressure

8.1.1. General perspectives

8.1.1.1. Spatial characteristics

These rural areas are mostly situated around the metropolitan areas in the CCC area, specifically around the Ile-de-France, the urban areas of the ABG-stad, the Rhine-Ruhr and the Rhine-Main conurbations, Randstad Holland and Greater London; they are also apparent around the Lille conurbation in Nord-Pas-de-Calais, and the city cluster of Metz, Nancy and Thionville.

It is worthy of note in passing, that such intermediate rural areas are not very apparent around the Wallonian cities, where the transition between urban and rural areas is rather abrupt.

Though rural areas under urban pressure are by definition not fully developed parts of the urban area, the visual, noise and other impacts of urban development tend to dominate the environment. The open elements of the landscape may typically consist of rather intensive agriculture interspersed with scattered and generally small-scale woodlands. These areas are under increasing reduction and fragmentation pressures from urban development.

Relief characteristics

The 'rural areas under urban pressure' in the CCC area are not very hilly, and consist mostly of lowlands, where rural areas are interspersed or even hemmed-in by towns and scattered urban development. Such areas cluster in the lower (West Netherlands, East and West Flanders) or lower-middle (Ile-de-France, North Rhine-Westphalia) courses of rivers such as the Seine and the Rhine.

Land use

The rural area under urban pressure supports the following land uses: 40% crops, 12% grasslands and 12% woodland. The latter figure for afforestation is lower than the 22% average for the CCC area as a whole. Altogether, 36% is in non-rural use, which is higher than the CCC area average of 25.7%. The overall percentage of land in agricultural use (51.8%) is close to the CCC area average of 52.3%. Grasslands, however, account for only 24.8% of agricultural land, which is noticeably lower than the 31.3% CCC area average.

8.1.1.2. Functions

Agriculture in the rural areas under urban pressure

Agriculture is of relatively limited economical importance in such rural areas as in North Rhine-Westphalia, South-East England and the Ile-de-France. However, in West Netherlands, Flanders, Nord-Pas-de-Calais and Lorraine, the share of agriculture in the economy is close to the EU average.

With the aid of high technology production facilities, these latter areas produce a broad variety of crops (e.g. chicory, flowers) for export as well as for consumption in the nearby important consumer markets of the large conurbations. Intensive rearing of pigs and poultry is concentrated in South and East Netherlands and Flanders, while horticulture is mostly concentrated around the capital cities (e.g. the Randstad and ABG-stad).

Agriculture is characterized by great dependence on external inputs, such as fodder, energy, oils and fertilizers, and by a very high level of base costs, such as high land prices, labour costs, etc. Fodder costs, for example, are responsible for 40% of the intermediate use per value of the production in these areas in Belgium and the Netherlands.

The value of production is higher than the EU average in a great part of the 'rural areas under urban pressure' in Flanders, North Rhine-Westphalia, Nord-Pas-de-Calais, South Netherlands and South-East England. This makes agriculture in these areas on the one hand highly dependent on access, for example to ports, and on the other hand in competition with other land uses.

Most of the rural areas under urban pressure are assumed already to have reached their stabilization point in terms of the run-down of agricultural employment.

Comparative data show that the 9.1% (or 326 000 ha) loss of agricultural land between 1974 and 1989 is in line with the figures seen in other types of open areas. Most of the area lost from agriculture has been developed for urban types of land use; much of it housing or industry, but also recreational areas or infrastructure.

Forestry in the rural areas under urban pressure

Woodlands are mostly small-scale components of the landscape in the rural areas under urban pressure. The rather more extensive areas around London, Brussels, Paris and Cologne are exceptions. In some regions, for instance Flanders, deforestation is a continuing problem. In the Netherlands and Germany, deforestation has stopped and some policy plans have been made to stimulate afforestation. Given their fairly restricted scale, the functions of woodlands in rural areas under urban pressure are primarily social and ecological, namely for recreation and for maintaining ecological values.

The relative lack of woodlands induces increasing pressures, especially for recreation, on those that do exist. Hence, the quality, biodiversity and productivity of the woodlands is decreasing. Those remaining, besides their social function, form buffer zones against visual or noise intrusion.

Ecological function and infrastructure

Semi-natural landscapes are scarce in the rural areas under urban pressure. Examples are parts of the dune coast in West Netherlands, the Seine valley (Ile-de-France and Picardy), the Moselle

valley (Lorraine), the Taunusgebirge (Hessen) and Ahrgebirge (North Rhine-Westphalia), the lower Thames Estuary (South-East England), part of Pas-de-Calais and small areas of Flanders.

The limited extent of these remaining ecological areas and their relationship to urban areas give them important social roles in education and in passive and active recreation. However, being situated close to the main urban areas of the CCC area, they are exposed to the pressures linked with urbanization, industrialization, port activities (Rotterdam and Antwerp), and to intensive agricultural practices.

In general, the ecological function of the ecosystems in this zone is seriously threatened by falling water tables, acidification, recreational pressures, fragmentation through road building and by all forms of pollution (air, water, soil).

The pollution of some rivers, for example, by heavy metals and organic compounds from industrial sources and from large population concentrations, tends to be concentrated in coastal areas, notably those of Flanders and the Netherlands and to an extent in the Thames Estuary. However, the Thames is not in the same league as the outlets of the Rhine, because London has effectively no heavy industry and not all that much manufacturing activity.

8.1.2. Key elements of a trend scenario

Agriculture is economically less important in the rural areas under urban pressure than in the other rural areas, although it is characterized by a strong spatial concentration (related to the proximity of urban systems, which they provide with food) and very high productivity levels.

Certain types of intensive agriculture are not dependent on the quality of the soil: in so far as they are 'footloose', their location is influenced by land prices, and it is generally expected that they will become more so in the future.

Agricultural development is characterized by strong competition with other forms of land use. In the natural course of events, this leads to the deterioration of both environmental and landscape quality, and to dramatic change in the functioning of the rural area itself, including its villages.

On the other hand, agriculture in the rural areas under urban pressure is to be considered as more resistant to the impact of the GATT agreement than in the other rural areas, due to the fact that these rural areas under urban pressure are close or very well-connected to the main urban areas and consumer markets, and close to the ports, which offers competitive advantages in export terms.

As a general trend it is expected that the rural areas under urban pressure will increasingly feel the influence of the expanding metropolitan areas. Hence, they will suffer from the negative urbanization effects which will affect their agricultural potential.

1. One can say that these areas remain attractive environments to host overspill effects from the nearby urban centres. Although some sorts of high-tech and R&D functions will seek well-located 'arcadian' settings, these areas are generally attracting production plants, rather than the more specialized high-tech productions or service activities. Changing company structures will be the result, with more international companies and take-overs of local companies. The Ile-de-France region is especially affected here. Although the green belt around London is under pressure as well, there is a strong policy to protect this open area.

2. Agriculture changes, with even more emphasis on intensive activities which are not soil-quality related, such as breeding stalls for chicken and pigs. This is especially the case in the Belgian regions, where intensive livestock and greenhouse activities already exist. Agriculture in the areas under urban pressure is becoming more and more urban oriented, as it specializes in providing for the nearby urban market. Spatially, this kind of agriculture requires more buildings and less open area, thus in a way helping in the effective urbanization of the open areas.

3. These areas become important commuter belts for the nearby urban centres. In this way,

use of land and buildings changes dramatically, for reasons largely unconnected with evolution of the rural economy itself. More land is used for allotments, and the existing dwellings are occupied by people not active in the agricultural sector. As new settlers are highly mobile, it is uncertain if all these settlements will be able to maintain their local services and facilities (such as shops), as new residents will be likely to maintain their urban life and shopping style (supermarkets). Here again, the Belgian regions may be most affected, especially as a result of the lack of a strong planning policy, resulting in an unstructured pattern of residential areas.

4. Related to the former point, it must be expected that road traffic will increase as a result of commuting links with the neighbouring urban areas, and the fact that the organization of public transport systems will not be able to keep pace. It is clear that growing traffic intensity will lead to a further increase of congestion problems.

5. Environmental conditions will deteriorate to a greater extent than in the recent past. Increased road traffic is only one explanation for this. Another is agricultural intensification, incorporating developments such as increased use of machinery and fertilizers, and with intensive stock rearing having particularly deleterious effects on ground water, soil and air conditions.

8.1.3. Key elements of a policy scenario

With a view to developing a policy scenario, inspired by the concern for sustainability and by the internationalization of common and transfrontier problems, some specific points have to be mentioned.

1. Focus on urban sprawl

Policy for the rural areas under urban pressure has to be coordinated with the evolution of and policy for the large metropolitan urban systems.

Urban sprawl (the dispersal of economic and residential functions) has to be restricted, in coordination with a policy of revitalizing potential within the urban areas themselves.

Economic as well as residential development in the rural areas under urban pressure needs careful steering, often leading to restrictions on further influxes from the metropolitan systems. Metropolitan functions needing a more open landscape (e.g. recreation), however, should not be excluded, although they should not dominate the landscape (e.g. concentrations of golf-courses).

Such policies, aimed at the creation of a 'green buffer', is generally well-known and commonly accepted by the public, and is already more or less present in South-East England, the Ile-de-France, Randstad, Rhine-Ruhr, Rhine-Main, etc. Even for the ABG-stad, one of the main issues is the protection of open areas and the concentration of specific activities in the urban areas.

Sometimes open areas mark the boundaries and form a buffer zone against the expansion of the urban area. The London metropolitan green belt, the Emscher Park, the green ring around Frankfurt, *La Trame Verte* around Paris, the *Groene Gordel* around Brussels and the *Randstad Groenstructuur* around Amsterdam are fine examples of this. Often being under heavy urbanization pressures, however, they are dependent on strong preservation policies.

2. Focus on quality improvement

Conservation of the quality of these areas is essential for the quality of life as well as the 'image' of the metropolitan systems as a whole. The open character of the metropolitan surroundings should be enforced and maintained and environmental conditions should be improved. More care has to be put into the maintenance of traditional landscapes, and, in due course, afforestation schemes should go ahead.

3. Focus on traffic flows

Road enhancement programmes should be restricted to those strictly needed for the local com-

munities or for their associated economic functions. On the other hand, telecommunications facilities should be of a sufficiently high level to reduce the need for physical transport.

Private road traffic should be restricted, on the one hand by policy constraints and on the other hand by policies favouring public transport and multi-modal transport, thus creating good connections with the nearby urban areas.

4. Support for 'sustainable' functions

Agriculture is a major element of landscape conservation: therefore, there is at least an argument that agricultural areas should not be reduced too rapidly. Unused former agricultural land should be kept in open use, either under afforestation programmes or for other functions related to the rural area.

Agricultural techniques should become more environmentally-friendly through the stimulation of low-input agriculture. This includes tighter standards on the use of chemicals and non-renewable energy, while intensive livestock (pork and poultry) industries, or at least the environmental damages they cause, should be restricted. Residual negative effects of these activities must be cleaned up. Other measures could strengthen food production for neighbouring urban consumption centres.

Farmers ought to have more opportunities to sell their basic products directly to the consumer. They should also be included in (existing or new) structures enabling them to process these basic products into new products which can be sold, for example; via small and medium-sized enterprises or cooperatives. Such 'value added' measures can help to provide a better income for farmers as well as limiting the quantum of goods transported for subsequent processing.

Woodlands become an essential part of the rural areas under urban pressure. They will have to fulfil a multifunctional role. They can function as green lungs for the nearby metropolitan systems and their urban areas and industrial estates. They are also recreation areas catering primarily for day trips for the metropolitan population, and they can separate urban from rural land uses in a structured way.

Woodlands can also function as main elements of the ecological network which should be set up in the CCC area (see below). In order to increase their vitality and their quality, they will have to be better cared for, by means of firm policies combating pollution and acidification and giving primacy to environmental considerations. In addition to what might be described as the 'grand design' this ecological network will also have to support the 'small' elements in the ecological and visual landscape such as hedgerows.

8.2. Rural areas with a high level of human exploitation

8.2.1. General perspectives

8.2.1.1. Spatial characteristics

These rural landscapes are characterized by intensive farming. However, the exact nature of that activity is influenced by soil type and quality in general. Such landscapes may typically consist of large areas of arable land with scattered woodlands and other natural reserves. Enlargement of the scale of farms and the reallotment of land have erased many traditional, small-scale, elements from the landscape. Even the relatively hilly areas of the heads of river basins, for example in Picardy, have been, for the greatest part, deforested as a result of human activity.

These rural areas are widespread and are to be observed in parts of South-East England, Upper Normandy, the Ile-de-France, Nord-Pas-de-Calais, Flanders, Wallonia, North Rhine-Westphalia and West, South and East Netherlands. In Champagne-Ardennes (except the Upper Marne) and Picardy, nearly all rural areas are of this type.

Relief

In general, these rural areas do not exceed 250 m, and they are mostly related to the middle courses of the rivers. The relief is fairly gentle.

Generally, agriculture occupies the lower land, except in some valleys where urban development has displaced agriculture. The easy relief, together with the relatively high soil quality explain the degree of human exploitation.

By way of example, the watersheds of the Scheldt, Sambre, Somme and Seine meet and accordingly transport pollution from Picardy to Rotterdam, Antwerp or Le Havre.

Land use

Rural areas with a high level of human exploitation are used for crops (47%), non-rural uses (24%), woodland (15%) and grasslands (14%). The proportion of agricultural land (63.9%) is higher than in the CCC area as a whole (52.3%), while the afforestation index (15%) is lower than in the CCC area (22%). The share of land in non-rural uses is 24.9%, which is close to the CCC area average of 25.7%. Grasslands comprise only 23.5% of the agricultural area; this is much lower than the CCC area average of 31.3%.

8.2.1.2. Functions

More than in the other categories of open area, agriculture is the predominant function. This is especially the case in the French regions. The influence of soil type and quality on agriculture can influence the landscape in two ways. Firstly, the type of agriculture (together with the underlying soil conditions) is reflected in the characteristics of the landscape. Such broad characteristics are then differentiated by the interplay of crop types, economics and farm organization together with the presence of non-agricultural landscape elements.

Agriculture

As already mentioned, agriculture is more important to the rural economy in these areas than in the CCC area as a whole. However, even here, large regional differences exist. Agriculture contributes more than 6% of the GVA of Picardy and Champagne-Ardennes. For the Dutch provinces, its contribution varies between 4.3 and 4.9%; it is 2% and 2.6% respectively in Wallonia and Upper Normandy; 0.7% in South-East England and 0.5% in North Rhine-Westphalia.

The rural areas of higher exploitation lost 6.6% of their agricultural land between 1974 and 1989, close to the CCC area figure of 7.2%. Belgian Limburg, Detmold and Münster lost more than the EU average, all the other intensive rural areas lost less than the EU average.

The changes in agriculture will especially affect such areas. Champagne-Ardennes, Aisne and Somme will suffer most from the continuing run-down of employment in agriculture. The expected loss of agricultural land will be up to 33%.

Taking into account latest EU (milk, beef, grains) and GATT (grains) arrangements, Upper Normandy and Hainaut are expected to encounter particular problems.

In general, different types of agricultural production can be distinguished.

- In Champagne-Ardennes, Picardy, parts of Upper Normandy, Ile-de-France and Nord-Pas-de-Calais, agriculture is dominated by large-scale farms (cereals and pasture) and has a relatively large share in the economy of the region. Considerable reductions in employment and agricultural area are commonly expected, and agriculture seems to be leading important changes in these areas.

- In Flanders, Hainaut and Zeeland, agriculture is an important activity. However, because of its coincidence with a lot of other important economic activities, agriculture figures are only modest in the overall regional economy. Agriculture is dominated by medium-sized farms, has a high input of means of production and is not all that vulnerable to the effects of the international trade fluctuations. Two very different developments seem to be apparent: in some areas, agriculture is tending towards marginalization, while in other areas there is an agricultural revival. The combination of these opposing developments is reflected in a spatial mosaic, and will lead towards a general enlargement of the scale of agricultural activities. Much agricultural land is

polluted by residues of pesticides and manure, affecting not only soils but also water quality.

- In South-East England, the Netherlands and North Rhine-Westphalia, agriculture is similarly an important economic sector, but a relatively limited part of the regional economy. It is characterized by a relatively stable structure. However, a loss of agricultural land can be expected, due to the regime changes and to general intensification. The expectations in these areas tend towards a bi-modal system, with a limited number of highly-productive, intensive farms, complemented by 'landscape parks'. Environmentally, soils are becoming seriously polluted by the build-up of pesticides and fertilizers. It is expected that wherever agricultural intensification takes place, this problem will increase and in turn will adversely affect water quality.

Forestry

With an afforestation rate of 15.5% in the most agriculturally developed areas, wooded areas cannot fulfil the multiple functions, such as wood producer, ecological and recreational resource, etc, which they have to play. In this zone the woodlands are threatened by fragmentation and intensive recreational use. The German regions and Champagne-Ardennes have higher afforestation rates of up to 27%. For Champagne-Ardennes, this is due to the presence of extensive, heavily-wooded, rural areas in Haute Marne and the Ardennes.

Ecological function and infrastructure

The ecological contribution of the more highly exploited rural areas is restricted in two senses. Firstly, agriculture itself contributes to pollution through pesticides and manure. Secondly, existing woodlands, wetlands and ecosystems are suffering from the splitting up of the land. Moreover, the enlargement of scale of and within farms is tending to erode small distinguishing features of the landscape.

The ecological structure of this zone has largely been defined by long-established agricultural activities. Hence, the ecosystems vary considerably and are, according to their characteristics, sensitive to varying pressures and threats. The result is a patchwork of different ecosystems, in many cases formed by the intervention of man (e.g. heathlands). Even the so-called agricultural landscape takes many different forms: open landscapes of rolling arable land in Picardy and Champagne-Ardennes; polders in Flanders and the Netherlands; *bocage* landscape and its typical hedgerows in Normandy; park landscapes with a variety of open fields, meadows and small woodlands in the UK and Germany.

Heathlands (*Kempen* and *Veluwe* in Benelux) are typical man-made landscapes. They need continuous human management, lacking which they rapidly become overrun by grasses and shrubs and lose their character. Successful management is becoming increasingly difficult, and air pollution, recreation and military activities add to the threat to existing heathlands in many areas.

Ecosystems with undisturbed plant communities still exist here and there. Coastal and inland wetlands persist in various guises: there are river deltas such as those of the Scheldt, Meuse and Rhine; the mouth of the Somme has freshwater marshes; the Netherlands has a number of blanket bogs and wet heathlands; and there are a number of relatively undisturbed ecosystems especially in undeveloped coastal areas of South-East England.

8.2.2. Key elements of a trend scenario

1. Urban Sprawl

Some parts of these areas have had a growing number of jobs in the manufacturing sector (e.g. Kempen in South Netherlands and Flanders), as they have become increasingly attractive for the location of plants producing standardized mass-produced goods. This has been stimulated by their good accessibility by car and lorry, the availability of cheap land, (national) grants and by lack of objection to environmentally less-than-friendly production facilities.

Such places will increasingly face tough competition (e.g. from southern and East European pro-

duction centres). Within the CCC area, this evolution leads to a functional differentiation between rural areas.

To the extent that areas must be seen as the extended hinterland of the metropolitan systems (e.g. ROSE area in South-East England), they continue to profit from the influence of metropolitan attractions.

On the other hand, really 'rural' areas not closely associated with a metropolitan system (e.g. parts of Champagne-Ardennes and Rhineland-Pfalz) will have to try increasingly hard if they are to cope with foreign competition. It has to be said that such areas often place more emphasis on the development and maintenance of the 'urban facilities' in their regions, for example, by offering opportunities for the location of modern industries, research and development activities, than they do on maintaining or developing their agricultural base.

Real estate and land price levels in rural areas are much lower than in the rural areas under urban pressure. There is no shortage of land capable of development for housing purposes. Therefore, these areas become increasingly interesting as potential residential areas. Where the rural area is relatively close to or well-connected with the urban systems, they could become new commuting belts. This will be accompanied by the traditional negative effects (rising price levels, changing land use, growing traffic). In some circumstances, they will cater for the housing needs of some of the residents of metropolitan systems driven out of their traditional quarters by the economic restructuring of European cities (this is already happening for example, in Germany).

Remoter rural areas, where land and house prices remain lowest, may be expected to become zones with an increased number of second homes. This in its turn gives an increasingly urban flavour to the functioning and character of even the most 'rural' areas.

2. Emerging road networks

The continuous expansion of road and especially motorway networks will certainly be expected to improve the accessibility of these rural areas. However, the position of public transport in these areas becomes more and more endangered, as railway companies concentrate all their efforts on the improvement of the more profitable connections between the major centres (HST or traditional rail links), or on the feeder lines to those larger centres. Such discrimination can both marginalize the more rural areas on the one hand, and on the other hand cause them to experience an increase of road traffic and its accompanying pollution.

3. Deteriorating environmental conditions

As a consequence of various factors, environmental conditions are gradually worsening. Firstly, agricultural changes (e.g. intensive livestock) tend to be harmful. The location of polluting production plants and unwelcome major projects puts the environment under pressure, as claims for a rural location for many such activities is bound to persist. This can threaten the ecological balances in areas essential for the support of the metropolitan systems (e.g. for their drinking water, food and timber supply).

4. Agriculture facing major challenges

Although continuing urbanization occurs, agriculture will remain important to the development of the economy and to the shaping of the landscapes. Agriculture is facing change brought about by organizational as well as evolutionary developments.

There is a distinction here between internal dynamics and external factors. Internally, many farms cease to be viable and go out of production, leading to a reduction of agricultural area and employment. Decreasing profits make many other existing farms extremely marginal. Continuing pressure decreases the area actually farmed and modifies traditional landscape features. Apart from this, external factors such as the influence of the changing CAP (like temporarily taking arable land out of production) and the results of the GATT arrangements, exaggerate regional differences according to the proximity and accessibility of the main markets and outlets.

Reduced real prices and squeezed profits again cause the loss of many farms.

In general, rural areas with a high level of human exploitation are characterized, compared with the 'intermediate' areas, by a greater reliance on livestock and on crops sensitive to soil type and quality. They are accordingly more vulnerable to changes in agriculture itself and in the international trade of agricultural products (e.g. GATT agreement). The introduction of the CAP standard of two heads per ha of grasslands and green fodder will lead to the extensification of livestock in some regions, and to intensification of livestock in other regions. Within this trend scenario, distinctions must be drawn between three sub-categories.

1. A first sub-category (category IIa on Map 8.3) describes those rural areas (e.g. Picardy) in which agriculture is expected to face transition. These areas are often characterized by large-scale farms (cereals and pasture). A reduction of both agricultural area and employment is to be expected. The combination of the relatively high importance of agriculture in the regional economies and the internationally orientated production makes them very sensitive to the effects of the GATT agreement. In general, most of the regions with such a profile in the CCC area will be affected in a negative way.

2. The second sub-category (category IIb on Map 8.3) is made up of those rural areas where agriculture is already undergoing or facing transition, and concerns mainly Flanders, the Netherlands and North Rhine-Westphalia. They are characterized by medium-sized farms with high input operations and are less vulnerable than the previous set to the effects of international trade fluctuations. Two divergent futures can be seen: marginalization of agriculture or revival of agriculture, depending on differences in production systems, crop types and distance/accessibility to ports and urban systems.

   Areas which are well-removed from the main consumption centres and the ports will marginalize their production, whilst regions which are better located will maintain their positions. This will create a regional mosaic. The same will be seen on the level of the individual company. Mixed companies increasingly become important, with intensifying 'footloose' agriculture leading to a decrease in scale; and extensifying crop agriculture probably leading to scale enlargement.

   Especially with respect to CAP, regional differences of climate and pedology will be significant. The imposition of the CAP standard of two heads per ha will have opposite effects in different areas: despite 2.5 heads per ha being ecologically sustainable, the standard may nevertheless be met in order to obtain subsidies. On the other hand, some who stay above the standard may have to compensate for the loss of subsidies by actually raising their numbers, perhaps even to above the regional sustainability level.

3. Finally, some rural areas, notably those in South-East England, form a specific category, characterized by an already transformed agriculture (category IIc on Map 8.3). The structure of the agricultural sector in the South-East is rather stable. This does not mean that agriculture will not change in time, as a further decline in the farmed area is to be expected. This is the result of the bi-modal system which has already emerged. On the one hand, those areas designated for agriculture experience continuing intensification; on the other hand, areas designated otherwise, experience nature development and landscape management.

Regarding spatial quality, agricultural soils will increasingly become more polluted because of the accumulation of pesticide and fertilizer residues. This will be aggravated wherever intensification takes place.

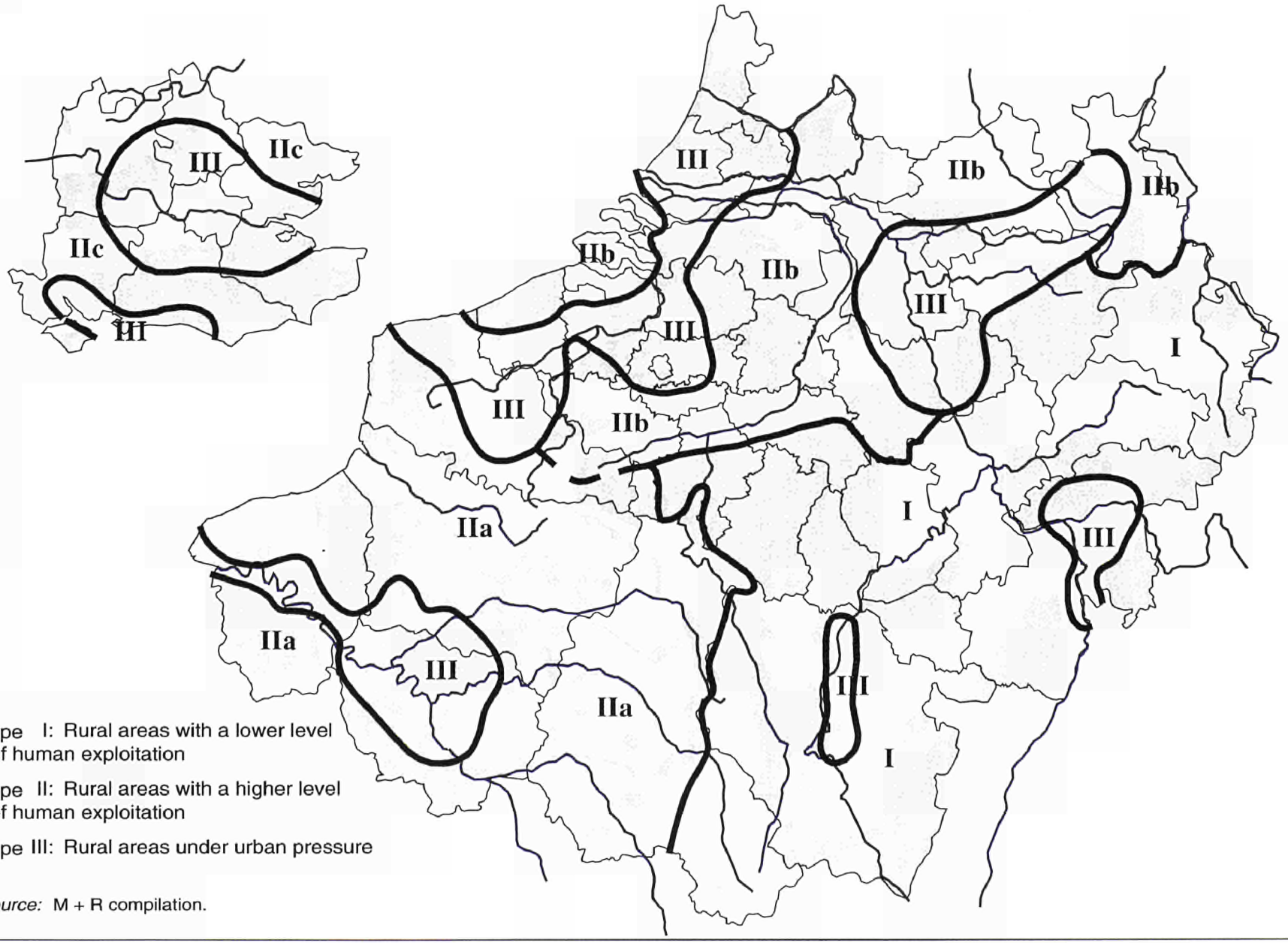
8.2.3. Key elements of a policy scenario

1. Policy in relation to the agricultural function

The rural areas with a high level of human exploitation show a more diverse image, as a result of the existence of three sub-types of such areas.

Map 8.3

Tentative ecological structure with regard to typology of rural areas



Type I: Rural areas with a lower level of human exploitation

Type II: Rural areas with a higher level of human exploitation

Type III: Rural areas under urban pressure

Source: M + R compilation.

In general, one can say that:

(i) the agricultural functions must be conserved;

(ii) there should be a concerted effort to encourage environmentally-friendly agricultural activities through reduction of external inputs and a reduced use of chemicals and non-renewable energy;

(iii) non-traditional crops must also be encouraged, aiming at a diversity of agricultural products (e.g. hazelnuts, herbs, medicinal plants) and implicitly, at economic sustainability;

(iv) from an ecological point of view, limitations on intensive livestock rearing are advisable, in coordination with the encouragement and application of specific environmentally-friendly production techniques. Intensification of the production system is possible, however, not by external input but by internal input (labour, production systems);

(v) an increased vertical integration between production and the processing of agricultural products would make production systems more viable, both economically and environmentally. Stimulation of mixed and integrated farms would reduce the strategic weakness of agriculture, especially in the regions facing transition; and

(vi) as most of these areas do not have good links with seaports, it is not advisable that they concentrate too much on selling on the world market. It would be better for them to focus on the EU or even CCC area markets. The same goes for inputs, such as manure. Here the farmers should focus on their own regional, or European market. This would make them less dependent on non-EU products and decisions. It is considered that closer cooperation among rural areas with a low level of human exploitation would be beneficial to both areas.

2. The elaboration of a European ecological network

In general, it should be considered how land which no longer has a farming function can best be integrated into the European ecological network. Such a policy will need to be accompanied by a set of economic support measures to make it acceptable from a socio-economic point of view. It will be equally important that regional identity and culture should be conserved for the benefit of local communities, at the same time avoiding pushing these communities into becoming open-air museums.

All the 'natural' ecosystems are habitats of extreme importance as breeding grounds for special and threatened species. They are also links in a worldwide chain used by migratory birds.

Traditional landscapes are gradually being lost. In recent decades, human activities which for centuries shaped rural landscapes, changed dramatically. Drainage, the removal of hedgerows, mechanization of agriculture and the increasing use of fertilizers and pesticides affect every landscape in qualitative and quantitative ways. It is hardly surprising then that, where ecological structure proposals for the European ecological network exist, typically they do not comprise coherent entities, but consist of scattered areas. The plans and proposals themselves, of course, are prepared under different statutes in the various countries.

In France (Normandy, Picardy, Nord-Pas-de-Calais, Champagne-Ardennes) the ecological structure is categorized as 'zones of remarkable biological interest' and 'larger natural areas with an important biological potential'. All qualifying areas have been listed, but only a few of the larger areas, for instance, a regional natural park in Nord-Pas-de-Calais, enjoy legal protection.

In the United Kingdom, the ecological structure is protected by designation under a number of headings. 'Heritage coasts' are stretches of protected coastline; 'areas of outstanding natural beauty' (AONB) largely remain in the hands of farmers and landowners but are identified in statutory development plans, with local authorities and rural communities primarily responsible for their protection; and by a network of statutory designations specifically directed to nature conservation and including national nature reserves, sites of special scientific interest and marine nature reserves.

The parts of the network situated in Belgium and the Netherlands comprise existing protected nature areas, and possible additions to those areas and proposals for areas of protection to be linked together. In the Netherlands, much of the chosen area already has legal protection; the proportion in Belgium is considerably lower and the proposed structure still has little statutory backing.

3. Forestry

Afforestation is generally less important in these areas. Afforestation is nevertheless desirable, even if on a smaller scale than in the rural areas with a low level of human exploitation. Specifically in some French regions, afforestation could support the filter function of the Somme, Sambre, Seine and Scheldt basins by providing water as well as by filtering it before it enters the rivers.

Environmental policy should support and safeguard forest vitality. Viability of timber production should be improved through a closer integration with the existing agriculture.

The main functions of the woodlands are maintaining the ecological balance, accommodating recreational activities and the screen function. A rigid policy combating pollution and acidification can increase the quality and viability of the forests. Landscape improvement will require the revaluation of intrinsic qualities, for example small-scale landscapes, hedgerows, etc. This will be a good basis for the development of day-trip tourism. In relation to the ecological network, the 'small' elements in the landscape, as well as the aquatic ecosystems, need support and quality improvement.

4. Scenery and landscape protection

Improvement of intrinsic qualities and stimulation of extensive agro-tourism are elements of a policy stimulating sustainable tourist development. Measures should be taken, however, to stop tourism damaging landscapes and endangering ecological balances.

5. Protection of villages

Villages are key centres for the provision of services to farmers and other country dwellers and should remain so. They should have adequate accessibility, both physical and via telecommunication techniques. Successful conservation, particularly in France and some German regions, will require that the attractiveness of the villages should be strengthened in order to prevent population losses. On the other hand, to avoid breaching the capacity of villages in other areas, measures should be taken to reduce, or even to halt, population influxes.

8.3. Rural areas with a low level of human exploitation

8.3.1. General perspectives

8.3.1.1. Spatial characteristics

These tend to be upland areas of fairly strong relief and hence with limited agricultural potential. Most landscapes are characterized by a high degree of pasture and woodlands. The classification takes in the heads of the main river basins of the CCC area, except the Thames. The woodlands have an important role, not only to protect the topsoil, which might otherwise be vulnerable to erosion, but in relation to the whole river basin. Actions in this zone have an influence on the other types of open areas, because of the waterways. Whatever finds its way into the water at the head of the river basin may well pass through a number of regions until it eventually discharges into the sea.

This type of rural area makes up 30% of the CCC area, and may be recognized in Arnsberg (North Rhine-Westphalia), Hessen, Rhineland-Pfalz, Saarland, the Upper Marne in the Champagne/Ardennes region, Lorraine, the provinces of Luxembourg, Namur, Liège and the Grand Duchy of Luxembourg. Its economic functions are based on forestry, tourism and the more extensive forms of agriculture. Although most of the CCC urban areas are surrounded by rural

areas under urban pressure, three urban areas are surrounded by rural areas with a low level of human exploitation: Nancy/Metz/Thionville/Luxembourg, Frankfurt and Liège.

Though the rural areas with a low level of human exploitation generally form coherent entities, they do contain some rural areas under urban pressure, notably the area around the Moselle between Metz and Nancy and a larger area between Frankfurt, Mainz and Mannheim.

Relief

These areas are mostly situated above the 250 metres contour. Such upland regions are the source of many of the important rivers, among them the Weser, Meuse, Moselle and Marne. The Rhine itself rises in the Swiss Alps but collects several tributaries from Lorraine, Saarland and Rhineland-Pfalz. The watershed between three major European rivers (Rhine, Meuse and Seine) is located in Lorraine and Haute-Marne.

Land use

Land occupation is characterized by woodland (38.2%), non-rural uses (21.5%), crops (22.9%) and grasslands (17.4%). The non-rural figure is lower than both the CCC area average (25.7%) and the EU average. Agricultural land, at 40.2%, is lower than the 52.3% average of all CCC regions. Grasslands make up 43.1% of the agricultural area, which is higher than the CCC average of 31.3%. In comparison with the EU there is less agricultural land and grassland. The afforestation index (38.2%) is higher than in either the CCC area (22%) or the EU (23.8%), and none of the regions has an afforestation index lower than 29%.

With the exception of Lorraine and Luxembourg, all the regions in this category have lost more agricultural area than the CCC area as a whole in the last 20 years. About 89% of the 1974 agricultural area was still in agricultural use in 1990, which is lower than the equivalent CCC area figure of 92.8%.

8.3.1.2. Functions

Agriculture

The contribution of agriculture to the economy of these regions is at best limited. Only in Lorraine is the share of agriculture in the regional GVA larger than the CCC average of 1.8%. The profitability of agriculture is rather low (see 'Economic issues, agriculture and forestry'). Moreover, beef and milk, the two most important agricultural products, are especially affected by changing agricultural policies in the EU.

It is an interplay of soil, climate and location that limits agricultural potential in these regions, and the requirements of, for example, intensive horticulture are better satisfied elsewhere. Admittedly the Grand Duchy of Luxembourg and Rhineland-Pfalz produce wine as well as the characteristic beef and milk. Hessen, Rhineland-Pfalz and parts of Wallonia produce important quantities of grain.

Even if the rate of agricultural employment is higher in these regions than in the CCC area, the expected reduction, except in Wallonia and Rhineland-Pfalz, is modest. The latter, facing both loss of agricultural land and unemployment, has the most acute problems in the group.

Forestry

The ecological function of the forests in rural areas, with a low level of human exploitation, is diverse, but relevant for the whole CCC area. The protection of the heads of the most important river basins plays a crucial role in the regulation of river flow, in the prevention of further deterioration of the water supply, and in avoiding erosion in these areas of pronounced relief. Additionally, woodlands in these areas have strategic sponge (providing enough water) and filter (providing clean water) roles (see also 'Environmental potentials and threats').

These 'less exploited' areas are responsible for 62% (or 13 350 m^3/year) of total CCC timber production. This production is achieved on 12.5% (3 400 ha) of the total CCC area.

The general lack of woodlands in the CCC area as a whole and the attractiveness of those in the rural areas under consideration, lead to their degradation. These areas, to a degree unmatched by any other rural part of the CCC area, are increasingly attracting tourists. Official the Grand Duchy of Luxembourg reports for example indicate that, in recent years, the increase in visitors to its forests has caused remarkable soil degradation. The Hessen forests are amongst the largest in the CCC area. The Waldecker, Kurhessen, Ederbergland, Rhön and Taunus mountains are used as *Luftkurort* (notable for their air quality). Large numbers of urban dwellers visit the vineyards of Rheingau and the Odenwald, one of the most attractive German natural reserves in the CCC area (see Map 8.4).

8.3.2. Key elements of a trend scenario

The following points concerning the rural areas with a low level of human exploitation are worth highlighting:

1. Decreasing importance of agriculture

The farmed area continues to shrink. Relative profit and rent levels will continue to decrease. This is accentuated by the GATT agreements, which do not favour areas such as these which are remote from the ports.

Regarding agricultural employment, it is expected that Wallonia and Rhineland-Pfalz will suffer particularly sharply from a loss of employment in agriculture while, after a period of decline, agricultural employment levels in the other regions will tend to stabilize.

In general, the impact of the changing CAP will be limited and high concentrations are not expected to disappear completely.

2. Decreasing forest vitality

Forest vitality is decreasing and will suffer from the global acidification of the CCC area. Water quality is mostly threatened in rivers such as the Moselle, where significant pollution of the river-heads is a fact of life.

8.3.3. Key elements of a policy scenario

1. Elaboration of the European ecological network

The rural areas with a low level of human exploitation are essential in relation to the European ecological network, developed by DG XI. This network should be improved and supported, by the linking of the existing parts of the network and the improvement of their environmental qualities.

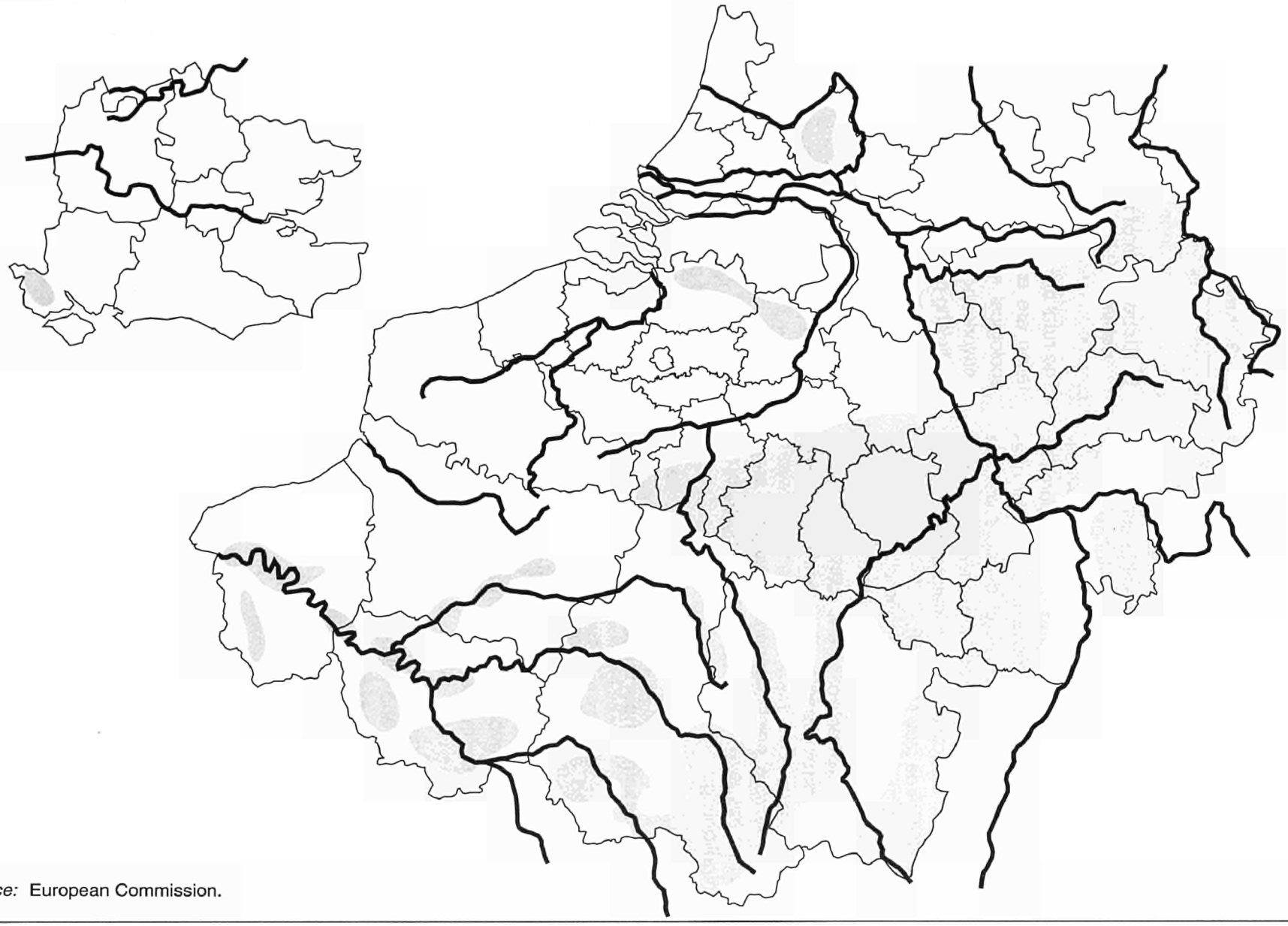
In part as a result of their variety of relief, the rural areas with low levels of human exploitation have important ecological functions and include perhaps the most important part of the ecological structure in the CCC area (see Map 8.3, 'Ecology: A tentative structure'). The structure contains almost all the upland zones in the CCC area: the Ardennes in Belgium; Eifel, Hunsrück Nordpfälzerbergland, and Westerwald in Rhineland-Pfalz; Taunusgebirge, Odenwald and Vogelsberg in Hessen; Ahrgebirge and Rothaargebirge in North Rhine-Westphalia; and Monts Faucilles and Vosges in Lorraine. Most of the important rivers of the mainland CCC area (Weser, Meuse, Main, Marne, Moselle) either originate in, or have tributaries originating in this part of the CCC area.

In this hilly and upland landscape, the most extensive ecosystems are those of wooded areas, mixed with arable land and grassland, several types of wetland being represented in the valleys. There are also some examples of the original edaphic vegetation, for example, raised bogs in Belgium.

Woodlands can be an important cradle for animal and plant species, especially where the natural processes of decay and regeneration can still take place, and even more when they are interspersed with open spaces such as pastures. Few woodlands in the CCC area are entirely natural in origin. Despite human intervention in planting and management in the past, however, many have developed and maintained their biodiver-

Map 8.4

Main Woodlands



Source: European Commission.

sity. The remaining woodlands are the largest areas with the single use of still having an original fauna and flora.

The actual situation, however, is that most of the remaining woodlands are semi-natural and not well managed, affecting their vitality. All this is leading to decreases in biodiversity. Nor is there any consistency in the approach concerning their protection, each country having its own statutes.

In Germany, most parts of the ecological network already have 'nature park' status; nature parks being defined as 'large areas which, on the basis of their inherent characteristics, are particularly suitable for recreational activities'. As such, they are designated for recreation or tourism in accordance with the principles and objectives of regional and land-use planning. Within the broad envelope of the nature parks, *Naturschutzgebiete* (nature reserves, protected forests or forested nature reserves) are more heavily protected to safeguard plant and animal species and their natural habitats. In Hessen, the 'Rhön biosphere reserve' has been designated as a part of an international network (Man and the biosphere Unesco programme).

In France, parts of the ecological network are included within state-owned forests and 'communales', owned by the municipalities. In each case, they are subject to formal 'forest management' regimes.

In Belgium, the forests of the Ardennes are state or privately owned. Statutory protection is available only to the former.

2. Focus on agriculture

Livestock and agriculture can be organized in a more sustainable way, the latter by lower external inputs, reduced use of chemicals and non-renewable energy. Measures need to be taken in order to bring the supply of and the demand for manure into balance. This applies to the local as well as the regional level. On a local level, a farm can move into mixed production; where the manure produced can be used on crop-growing fields.

The same goes for the regions, where an enhanced cooperation between the farms within the region, as well as between the farms in different regions, would lead to a better use of the potential of those farms. Also cooperation between the rural areas with a low level of human exploitation and the rural areas with a high level of human exploitation is advisable. This would enable corn-producing regions to cooperate more intensively with other regions in the CCC area (e.g. livestock regions). Increased cooperation of the CCC regions could enhance the internal cohesion and reduce dependency on the world market.

The production, processing and commercializing should become vertically integrated, allowing a higher quality of processing agro-pastural production.

3. Focus on the resource function

A crucial characteristic of the rural areas with a low level of human exploitation, especially in the context of internationalization and aiming at sustainability, is their transnational and transregional sponge and filter function. This function concerns the quantity of water, as the soil is to be considered as a sponge soaking up precipitation (e.g. Sauerland), feeding the subterranean water basins. Grasslands and forests, widely present in this type of rural area, are most useful to assist in this function. The filter function concerns the quality of the water which is stored in the basins, as purification processes take place during its trip through the various soil layers. Therefore, these land uses should be stimulated when agricultural land becomes vacant. However, such a policy should be accompanied by economic measures in order to make it realistic.

4. Focus on forestry

As it is a crucial aspect of environmental quality, forestry should be improved. The quality and vitality of the existing woodlands should improve through specific actions in relation to pollution and acidification, and a true woodland management policy should be organized. As wooded areas in the CCC area tend to decrease, afforestation programmes need to be set up as well,

stressing timber production and increasing rentability. In order to sustain agro-tourism, the safeguarding of traditional landscapes and scenery is becoming ever more strategically important.

5. Scenery functions

The traditional landscapes should be cared for and improved (restoration must be sought as well as mere maintenance), and this has to be considered as a prerequisite for the stimulation of agro-tourism.

Improvement of surface and source water quality is needed for environmental, quality of life and tourist (and thus also economic) reasons. It may be linked with water-related forms of tourism, and could restore river and pond life. Agro-tourism facilities should be integrated into local communities, rather than being provided in separate or purpose-built 'resorts'.

In this context, the rural population should be encouraged to preserve and maintain the fundamentals of their regionally differentiated culture and entrepreneurship. This would enhance the attractiveness of the rural areas, reducing the emigration of the young to urban areas by offering them a good balance between regional identity and contemporary technological opportunities. It would also create new opportunities for agro-tourism, being quite different from the 'folk and country dance' style activities traditionally provided for visitors.

8.4. Rural areas in specific locations

8.4.1. The specific border areas

The following are the main rural areas to be mentioned under this heading.

1. The Ardennes-Eifel area, dominated by forestry rather than agriculture.

2. The Wallonia — Nord-Pas-de-Calais area, dominated by agricultural activities.

3. The Dutch-German border area, where agriculture is the main activity.

4. The Flanders-Netherlands area, where agriculture and forestry are both important activities.

8.4.1.1. Key elements of a trend scenario

In general, it is not expected that the effective removal of borders will lead to abrupt changes caused by disturbing the internal dynamics of the affected rural areas. However, care has to be taken, perhaps by special control measures, in those rural areas close to urban areas where substantial development may be stimulated by removal of borders, for instance, close to the metropolitan systems of Lille, Saar-Lor-Lux and MHAL.

Such rural border areas are often also characterized by tourism and recreational activity, as well as by concentrations of power plants (especially nuclear power plants), waste disposal and other uses associated with environmental damage. The combination must be seen as an important potential threat to future development. In the trend scenario, there are no important indications that such threats will be counteracted, and an international policy, for inclusion in a policy scenario and aiming at sustainability, should pay specific attention to this point.

The rural areas on the Netherlands/Flanders, Wallonia/Nord-Pas-de-Calais and German/Dutch-/Belgian border regions are rural areas under urban pressure or rural areas with higher levels of human exploitation, characterized by diverse environmental problems as a result of high levels of agricultural activity.

The rural areas in the Grand Duchy of Luxembourg/France/Germany/Wallonia border regions are rural areas with a low level of human exploitation. The rural areas of Ardennes/Eifel, Hunsrück/Nordpfälzer Bergland, Pfälzerwald/Nordvogesen and the plateau of Lorraine are sparsely populated areas with weak economic structures. These areas do, however, have high agro-tourism development potential, which could be further exploited.

8.4.1.2. *Key elements of a policy scenario*

In the policy scenario, water management and the elaboration of a European ecological network are taken to be important for the entire CCC area and, in support of this, cross-border approaches will be required, since many areas of ecological importance are cut by borders. Such a policy will inevitably encounter difficult legislation problems, given the significant cross-border differences that exist in the protection of natural areas and habitats.

Water quality and supply, at least, are already the subject of political negotiations in the CCC area, between for example France, Wallonia, Flanders and the Netherlands.

8.4.2. The coastal zones

The rural coastal areas of the CCC area are of great importance for ecology, the environment and tourism. They represent a variety of biotopes, some having unique characteristics. Coastal dunes, cliffs, wetlands in river deltas, fresh water marshes and blanket bogs are the most important types.

Semi-natural landscapes in the rural areas under urban pressure are rather scarce though there are examples in part of the dune coast in West Netherlands, the Thames estuary, parts of the Pas-de-Calais and small areas in Flanders. Situated close to the main urban areas of the CCC area, they are exposed to the high pressures linked with urbanization, tourism, industrialization, port activities (Rotterdam and Antwerp), pollution of seawater and intensive agricultural practices. On the other hand, natural ecosystems with undisturbed plant communities still exist, for example, along some coastlines.

The undeveloped coastal areas include sand coasts and dunes in Flanders and West Netherlands, having high and very specific biodiversity, and the cliff coasts of the United Kingdom (South Foreland, Dover and Folkestone, Sussex heritage coast, the heritage coast of the Isle of Wight) and France (Cap Gris Nez, Cap Blanc Nez, and the Normandy coastline).

The coastal and inland wetlands appear in different forms such as river deltas (Scheldt, Meuse and Rhine), fresh water marshes (the Somme estuary), blanket bogs and wet heathlands (the Netherlands) as well as low-lying grasslands (South-East England). The estuaries are biologically unique and a major habitat for a rich fauna and a productive biotope. The tidal marshes have been reduced to a fraction of their former extent through conversion to human occupancy.

All these ecosystems are extremely important habitats as breeding grounds for threatened species, and they are part of a worldwide chain used by migratory birds. From the Netherlands to Upper Normandy, most of the coastal areas in the CCC area are used by migratory birds.

Despite ongoing economic and demographic growth, leading to a decreased abundance and diversity of wildlife and natural habitats, zones of specific ecological interest are still present in the coastal areas.

8.4.2.1. *Key elements of a trend scenario*

In the trend scenario, it is obvious that the causes contributing to a decline of natural areas will tend to be concentrated and accentuated in the CCC area even more than in other parts of the EU. That decline and loss of natural ecosystems has a quantitative and a qualitative aspect.

Quantitatively, urbanization, road building, port expansion industrialization, changes in farming practices are eroding the number and area of natural habitats. Through fragmentation and isolation, this disrupts the existing natural habitat chain. The result is that the CCC area has relatively few natural reserves left, and that most of them are situated in the mountains or the coastal areas, supplemented by just a few small areas of wetlands or infertile areas unattractive for farming or development.

Qualitatively, the reduction of general environmental quality as a result of a number of factors (industry, traffic, agriculture) also affects natural habitats and leads to their degradation. The ecological function of the ecosystems situated in this

zone is seriously threatened by all forms of pollution (air, water, soil), by falling water tables, acidification, recreational pressures and fragmentation by road infrastructure.

The pollution of some rivers situated in this area, for example by heavy metals and organic compounds from industrial sources, tends to be concentrated in coastal areas such as those of Flanders and the Netherlands. Elsewhere eutrophication, drainage, canalization, recreation and military activities reinforce this pressure.

8.4.2.2. Key elements of a policy scenario

In the policy scenario, further and increased attention should be paid to the protection of the environmental qualities of the coastal areas, and to the common international responsibility for this issue, for example, by reducing water pollution and protecting seawater quality. This topic is relevant both because of its international dimension and its close relationship to the principle of sustainability.

This item clearly exceeds the competence (and indeed the capabilities) of individual regions and countries involved. Accordingly, broader approaches, for example by way of production of environmental guidelines have begun to be developed. However, paying more attention to the relationship between water quality and general environmental policies must be seen as a key element of the policy scenario. It should not be overlooked that, in the longer term, the coastal zones could well be threatened by rising sea levels!

9. Relationships and contrasts in the trend and policy scenarios

The scenarios represent the working out of various urban and rural futures that are not really separate or separable. The intention of this short synthesis and review is to allow them to be considered together, in the context of the report's overall sectoral and spatial findings.

As the studies have established, the CCC area has a set of regions with a great deal in common in terms of development history, and where some very strong common trends are evident. Most regions, even the agricultural regions, have been through a full cycle of industrialization and are now faced with specialization that, to a degree, has seen them lose some of their traditional functions, but more especially the jobs associated with those functions.

In compensation, particularly the metropolitan and other major urban centres have been able to develop new service roles. As for the former rural functions, they are increasingly sustained through capital substitution and agricultural intensification but the rural areas themselves must increasingly look to new functions and activities to sustain their overall viability.

As for the populations of the CCC area, the main era of growth is well behind them, but while numbers are fairly stable, they are showing marked tendencies to age, to split into more and smaller households and to disperse in ways that see homes separated from workplaces, social contacts increasingly dependent on personal mobility and with consequent pressures for suburbanization and reduced density levels in general.

Such trends are not entirely natural and the impulses behind them are not confined within the borders of the CCC area. As set out in the conclusions of the sectoral studies in Part I, the changes within the CCC area are being driven and shaped by wider forces such as 'globalization' and the removal of EU internal borders.

9.1. The trend scenarios

The result of all this is to see the emergence of fresh geographical differentiations across the CCC area.

The trend scenario shows the metropolitan areas, which have tended to experience population and physical decline, at least in their inner cores, in recent decades, now facing the prospect of a new growth phase as a result of their advantages arising from implementation of the single market, and of prospective developments in transport and telecommunication networks. Their abilities to benefit fully, however, are threatened by inertia, the failure of their fabric and people to adapt; and by congestion, not only the physical consequences of movement but the economic results in terms of the price of land, buildings and labour. Current policies, even where desirable in themselves or specifically devised to meet some of these threats, may be seen as only variably help-

ful. Lacking inter-policy and inter-area coordination, both global approaches ('environment first') and area specific measures (e.g. road pricing) may either work against each other or do no more than move investment or problems from one place to another.

While the metropolitan systems have been experiencing some problems of growth or even actual decline, many smaller settlements, trading on their accessibility and the quality of life they can offer, have been improving their position. What the spatial studies in particular have shown very clearly is that, unless steps are taken to prevent it, these could be the losers in the coming phase of change. They will tend, unless fortunate enough to be situated in a Eurocorridor, to be isolated from the new flow patterns and will be left to compete with each other for local or niche roles.

For the two more developed rural types, the desirable future might be described as seeing an enhanced degree of sharing of opportunities and experiences, so promoting a synergy between the need of the areas under urban-related pressures to have those pressures eased and of the currently well-exploited but still distinctly rural areas to diversify their economies and to replace some of the jobs lost from agriculture. However, ultimately the trend scenario offers yet further polarization. The areas already under metropolitan/urban pressures are precisely those whose location close to markets and within easy reach of the ports, means that they are expected to remain competitive under the new GATT and CAP regimes, while the well-exploited areas, reliant on the quality of their infrastructure and landscape, are more likely to experience disinvestment, the abandonment of agricultural land and an overall loss of income and jobs.

Only for the least exploited areas, then, with their crucial future ecological roles does trend and desirable future seem to be altogether compatible, and even here, for such areas to fulfil those roles adequately and to fit fully into an EU ecological network, much remains to be done to coordinate policy and applicable measures from region to region and state to state. For the rest, the trend scenario leaves us with:

- a set of metropolises competing, largely against each other, for investment and facilities, and condemned to continuing compromise of the quality which they need not only for the satisfaction of their inhabitants but in order to have a viable future in an increasingly global economy;

- other significant urban places of great quality and potential facing at best uncertain futures; and

- a polarization of rural areas between the increasingly urbanized and those threatened with losing not just population, income and visual/environmental quality, but their very basis for existence.

9.2. Vision for the policy scenarios

Consideration of the trend scenarios leads naturally to views about what a developed set of policy scenarios should be seeking to achieve.

In the first place, for its own sustenance and as a contribution to wider interests, the CCC area needs to focus on how to earn itself a living in the future. It can no longer simply look to the combination of its productive and consumer capacities, backed up by availability of raw materials and other resources from elsewhere, to give it an unquestioned and dominant position. Instead it must seek to sell its political and financial stability and its organizational skills in a global marketplace, buttressing this by maintaining its roles in fields such as culture and tourism. This will require attention both to its external positioning and to the environmental and other qualities it can offer.

The six current metropolitan systems are, to varying degrees, crucial to the achievement of such goals. Their successful restructuring and economic revitalization will certainly require that full use be made of the reserves of land and labour that are currently under-utilized in their core areas. In turn, that should allow some easing of the pressures towards peri- and suburbanization with benefits both for such built-up areas and for the rural areas around them under the most pressure.

A successful policy scenario needs also to have identified suitable economic and other conditions to ensure the vitality of the urban areas away from the metropolitan systems and of the hitherto important but now threatened 'exploited' rural areas, which need to be seen neither as simply food producers nor just as green backdrops for towns but in their own right as constituting a thriving, multi-purpose countryside, catering in part for food production but also for other activities such as timber growing; for associated sustainable and generally small-scale industries; and for a wide range of leisure and ecological projects.

The context for all this change, which again must be fully reflected in an adequate policy scenario, must be a concentration on environmental and ecological quality. This obviously confirms the role already assumed by the important upland areas and heads of river basins. It needs to be supported though by the improvement of environmental conditions, for example, air and water quality right across the CCC area; by establishment of an ecological network enabling conservation of habitat and wildlife diversity; and by preservation and improvement of specific landscapes and uses, for example semi-natural and coastal regimes.

9.3. The approaches adopted in the policy scenarios

The main challenges for policy scenarios are motivated, as described earlier, by transitional change aggravated by internationalization on a global or international cross-border scale. Two broad policy solutions, both of them with spatial effects, have been applied in the development of the various policy scenario approaches. They are applicable because there are many common problems across the very different areas and circumstances evident in the CCC area, so offering opportunities for international and interregional cooperation; and because the nature of the problems, which are to do with restructuring of an already developed area rather than guiding initial investment, encourage the optimal use of complementary opportunities. The suggested solutions lie in attempting to:

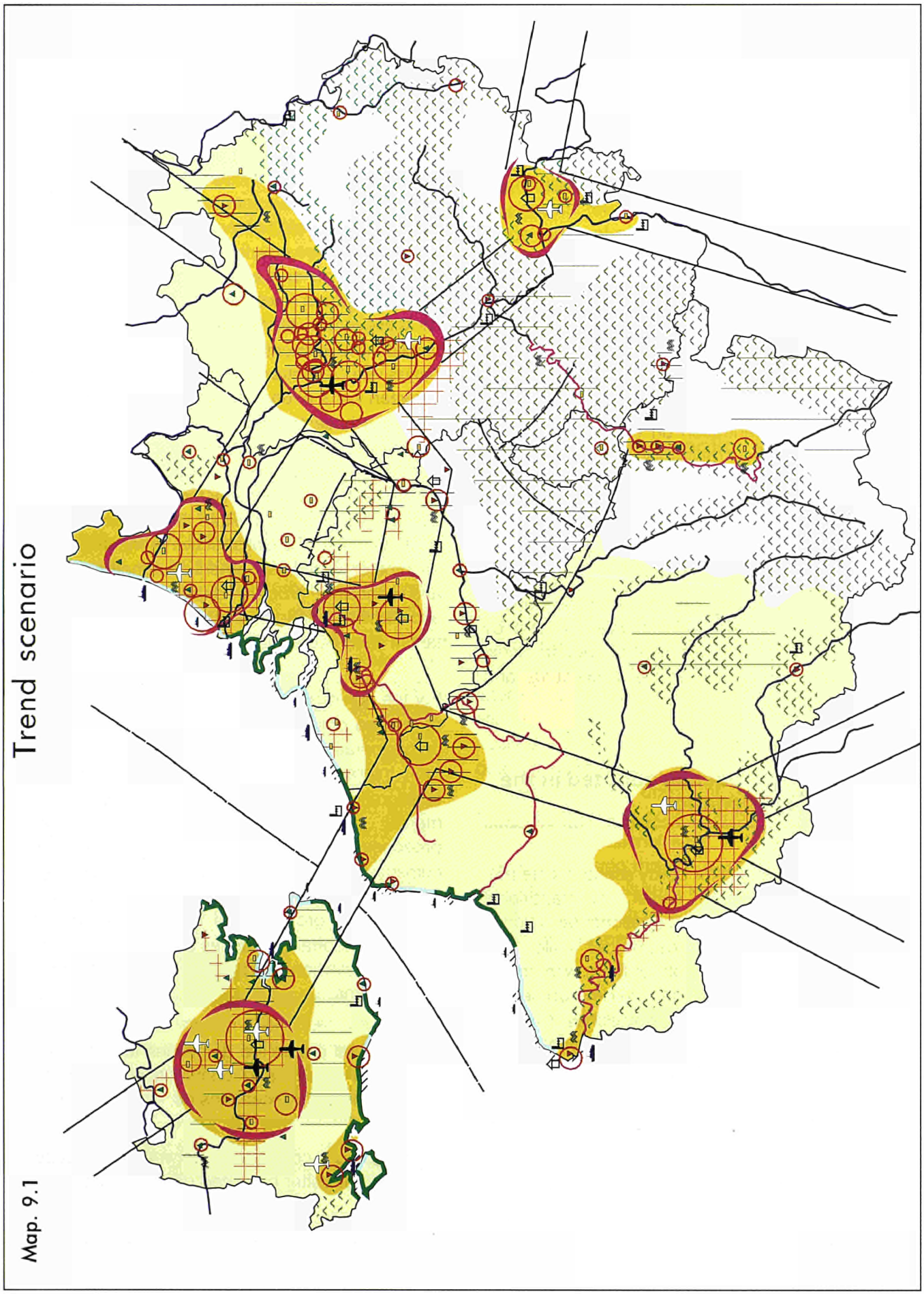
- strengthen cohesion; and
- seek sustainable development.

In the metropolitan case, this implies, in the first place, international cooperation and a recognition of some degree of complementarity among them. They will need, for example, to address the question of reducing or managing their car traffic: it is difficult to see how this can be achieved if say road pricing in one area is merely seen as an opportunity for a 'rival' to try to poach investment or activity. The improvement of internal quality (social, environmental and spatial) in turn depends on a better balance of development between parts of each metropolitan system, and through concentration on functions requiring a metropolitan location. There is a particular problem for the polycentric metropolitan systems in this respect, where not only the core/suburbs but also separate centres within the system tend to exist in a state of unconstructive competition with each other. The development of complementarity and cohesion, crucially dependent on internal accessibility arrangements, is especially important in such circumstances.

For the non-metropolitan urban areas, in the light of the two policy guidelines, the focus is placed on cooperation between centres, based on common interests, but complementary capabilities; amelioration of inequalities and potential environmental problems through coordinated approaches to development; and in appropriate circumstances, the formalization of these approaches through the emergence of new style, cross-border groupings of towns amounting in the most important instances to recognition of the effective definition of additional low-end metropolitan systems.

For the rural areas, the guidelines to optimizing CCC area quality and contribution, are to be found in the policy scenarios in:

- transborder cooperation between rural areas, aiming at better balanced development;
- objectives for maintenance and improvement of specific qualities and resource functions.


Trend scenario
Map. 9.1

Trend scenario

Demography:

- Urban growth
- Stationary or recovering
- Dominant patterns of decline
- Urbanization in progress

Urban areas:

- Metropolitan areas
- Cities
- Inner-city decline
- Urban and semi-urban reconversion areas

Rural areas:

- Intensively used by agriculture facing economic threats
- With limited agriculture
- Under urban pressure
- Main woodland
- Areas with rural tourism

Coastal areas:

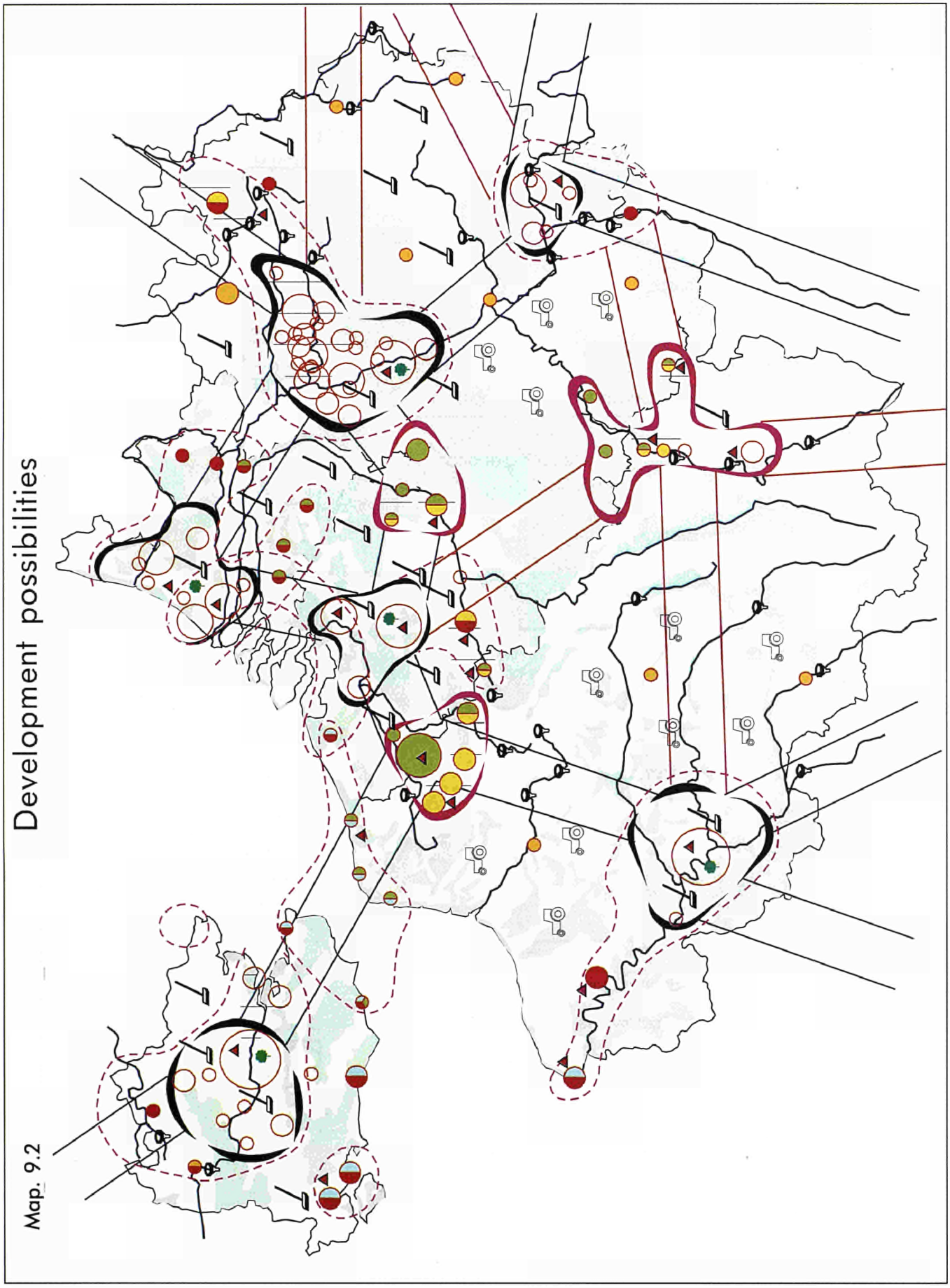
- Coastal areas with concentrations of human activity
- Natural and semi-natural coastal areas

Infrastructure:

- Eurocorridors in formation
- Airports
- Seaports
- Congestion in air traffic
- Barriers to integration

Environmental issues:

- Concentration of urban environmental problems
- Concentration of safety risks (nuclear, Seveso, ...)
- Main rivers
- Most polluted rivers
- Coastal pollution


Development possibilities
Map. 9.2

Development possibilities

Metropolitan cooperation and connectivity to be improved

Eurocorridors to be developed

Existing metropolitan areas, need:
- internal restructuring
- quality improvement
- reduced congestion

Potential for crossborder metropolitan development to be planned

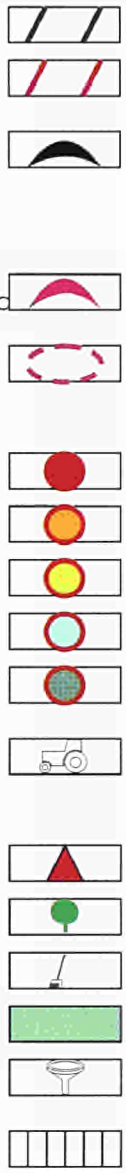
Cluster of urban areas for coordinated planning

Urban areas with different development characteristics
- near a metropolitan system
- 'freestanding' urban areas
- in reconversion areas
- in coastal areas
- in border areas

Rural areas with agriculture to be regenerated

Environmental issues
- Improvement of urban environment recommended
- 'Green Belt' strategy
- Environmental sanitation in rural areas
- Tentative main ecological structure
- Increased inter-regional water management

Accelerated economic restructuring necessary



Spatial policy contains a lot of opportunities to support the development goals set out above, and the main agenda behind the policy scenarios is:

- the exchange and improvement of knowledge and experience in order to combat the common problems, in line with the general aim of sustainability and based on improvement of cooperation networks between different regions and urban areas;

- further coordination of spatial development strategies between regions and areas of similar or complementary character, not least through extension of cross-border initiatives;

- the improvement of relations between places in the whole CCC area 'space' in order to take full advantage not just of similarity of experience but also of diversity of capacity and culture.

Though not strictly part of the policy scenarios themselves, a very clear comment should be made at this point that delivery of the coordinated solutions based on complementarity and sustainability does assume the existence of an adequate transnational and transregional platform for the formulation and implementation of policy. If the current studies, in what is undoubtedly the most populous, politically and in other ways varied, of the transregions, have demonstrated anything it is how equally varied are the measures, institutions, powers and even the data available to address what in so many respects are all too similar problems. If opportunities for cooperation are indeed to be seized, then it is of primary interest that such issues should be addressed, and this is a role where the European Commission might consider taking the lead as it is difficult to see any other agency being well-placed to do so.

General conclusions

Despite elements of stability, recognition of change and its dynamics are the key to understanding the CCC area. That change is a result of transition in economic, social, environmental and many other fields. It is being pushed forwards and given significance by internationalization of issues and activities both on a global scale and, especially in the context of the single market and European Union, on a transnational scale.

Transition and internationalization are threads that run through the sectoral studies. Having spatial aspects and consequences, they figure equally in the parts of the report covering spatial perspectives.

It is not surprising then, that the main thrust of policy thinking, derived from comparison of a set of 'business as usual' trend scenarios with policy scenarios intended to solve some of the problems, should be directed to addressing the issues raised by transition and internationalization. The keywords shaping policy in these respects are 'sustainable development and cohesion'. The role of spatial policy is seen to be to create optimal conditions for attainment of those ends. The CCC area, with the maturity and diversity of its settlement patterns, can effectively be characterized as a laboratory for the study and development of sustainability and cohesion.

Sustainable development and cohesion

Sustainable development, as an answer to the challenges of the transition process, can be supported by:

(i) attention to wider consequences of actions and attention to long-term goals in meeting the challenges of change;

(ii) aiming to safeguard the basis and long-term future of economic and environmental development in a broad sense;

(iii) focusing on equity and social justice, in the sense that unacceptable social inequalities be avoided.

Internationalization, particularly in the economic field, is creating new divisions of labour and specializations between places, in the process favouring some areas and groups and disadvantaging others. Actions seeking to improve cohesion, through cooperation and coordination of effort on common and transfrontier issues, and through developing concepts of complementarity, which will enable all places to find full and satisfying roles in the new urban systems, are seen as an answer to the fragmentation and inequalities accompanying internationalization. More than that, such approaches are seen as ways of positively seizing the opportunities offered by transition, to move to a better future.

Concrete issues certainly include:

(i) the optimization of economic development and exchange of knowledge, education and 'best practice';

(ii) the organization of trans-European infrastructure planning;

(iii) common and coordinated efforts to combat existing and emerging environmental problems;

(iv) the equitable if not altogether equal distribution of regional welfare.

The spatial outcomes

The six CCC area metropolitan systems, to the extent that they are involved with the world scene, are crucial to the future not only of the CCC area but for the EU as a whole. Their viable future is also critical because they provide the 'home space' for a significant proportion of the CCC area population. Policy, therefore, needs to ensure that they remain externally competitive and, internally, that they can restructure their economies, renew their urban fabric and provide improved environmental conditions for all who use them. The policy scenario is thus based on improved international cooperation and coordination between them. The challenges are to sustain their corporate competitive power, and to deal with internal environmental and social issues. Contributions to meeting these challenges are seen to lie in improvement of intra-metropolitan and other communications, and in an enhanced contribution to delivery of some of their present functions by some 'new style' proto-metropolitan groupings and from other well-located urban centres.

Regarding the other urban areas, the aim is the definition of the common nature of challenges and the avoidance of a 'stand alone' view, while at the same time fully respecting and indeed strengthening the identity of these urban areas. Beyond those broad objectives, the embedding of these urban areas into the trans-European network, the sustenance or, better still, improvement of their environmental and spatial qualities and the steering of future growth to support appropriate and desirable regional developments are the main points of interest. An explicit point, supporting the comments made in the previous paragraph, concerns the development of emergent metropolises in a 'new style', covering trans-border, restructuring and environmental aspects.

For the rural areas, the main task is also the development of a more balanced and comprehensive approach.

A common strategy for the rural areas under urban pressure can offer relevant and interesting policy actions.

A common strategy for the rural areas, with high as well as with a lower level of human exploitation, should be developed. Regarding the economic challenges, an improved coordination between the different types of rural area is seen to offer opportunities, in the context of the threats posed to many such areas by international and worldwide competition. Regarding the environmental issues, the development of a common ecological network and a common strategy on water provision and quality are proposed as the main relevant domains of common and transfrontier action. To be successful, policies across the board for the rural areas will have to encourage a better, more even and more thoughtful use of space, enabling the development of a diverse and multi-functional countryside that is neither dominated by all sorts of urban pressure nor liable to abandonment and degradation according to the dictates of the latest agro-economic fashion.

Bibliography

Ache P., Blaffert S., Grüßen C., Kunzmann K. R., Lang M. and Pohl I. Institut für Raumplanung Universität Dortmund (IRPUD), I, February 1991.

Ache, Bremm, Kunzmann and Wegener. *Die Emscherzone, Strukturwandel, Disparitäten- und eine Bauaustellung*, Blaue Reihe, Dortmunder Beiträge zur Raumplanung 58, Universität Dortmund (IRPUD), Dortmund, 1992.

ACT Consultants, IRPUD and ME&P. *The regional impact of the Channel Tunnel throughout the Community, final report*, for DG XVI of the Commission of the European Communities, 1992.

Agence de Developpement et d'Urbanisme de la metropole Lilloise, *Economie, le développement de la métropole Lilloise: approche stratégique des dossiers prioritaires*, Lille, 1992.

Agence de Developpement et d'Urbanisme de la metropole Lilloise, *Environnement, propositions stratégiques pour la métropole Lilloise*, Lille, 1992.

Agence de Developpement et d'Urbanisme de la metropole Lilloise, *Lille, devenir une métropole internationale*, Lille, 1991.

Agence de Developpement et d'Urbanisme de la metropole Lilloise, *Le schéma directeur d'aménagement et d'urbanisme de l'arrondissement de Lille, 20 ans après*, Paris/Lille, 1991.

Agence de Developpement et d'Urbanisme de la metropole Lilloise, *Métropolisation, dynamiques de métropolisation, hypothèses pour la métropole Lilloise*, Lille, 1992.

Akademie für Raumforschung und Landesplanung, *Arbeitsmaterial, Entwicklungsperspektiven für ländliche Räume, Thesen und Strategien zu veränderten Rahmenbedingungen*, Hannover, 1993.

Arkesteijn L. A. G., Goedman J. C., van Essen A. A. and Verhaar L. *Ruimtelijke verkenningen hoofdinfrastructuur*, Rijksplanologische dienst, Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, The Hague, 1986.

Ashworth G. J. and Tunbridge J. E. *The touristic-historic city*, London, 1990.

Bade F. J. *Changes in the Structure of Economy and its Spatial Implications*, Deutsches Institut für Wirtschaftsforschung, April 1985.

Bertelt M. and Gruber R. *Tendenzen der regionalen Bevölkerungsentwicklung in Nordrhein-Westfalen*, 1980-1986-2000, ILS Schriften 37, 1989.

Boo E. *Ecotourism: the potentials and pitfalls*, Lancater Pennsylvania, World Wildlife Fund, 1990.

Bos H. *Revitalization of coastal resorts, Toerisme in Noord-west Europa: vandaag en morgen*, Conferentie voor regionale ontwikkeling in Noordwest Europa, Dortmund, 1989.

Brake K. and Bremm H. J. *Services and regional Development — an empirical investigation in North Rhine-Westphalia*, Department for Urban and Regional Planning of the University of Oldenburg, September 1991.

Brown L. *The changing world food prospect*, Worldwatch Paper 85, Worldwatch Institute, Washington DC, 1989.

Brusselse Hoofdstedelijke Regering, *Ontwerp gewestelijk ontwikkelingsplan Brussel*, Brussels, 1993.

Bruhat T. *Les technopoles en France, état des lieux*, Urbanisme, March 1993.

Bruinsma F. R. and Rietveld P. *Stedelijke agglomeraties in Europese infrastructuurnetwerken, Stedelijke Netwerken*, Economisch en Sociaal Instituut Vrije Universiteit Utrecht, Werkstukken 36, March 1992.

Bruyelle P. *La communauté urbaine de Lille, métropole de Nord-Pas-de-Calais*, Paris, 1991.

Buck Consultants International B.V. *Centrale Europese distributie bij Japanse en Amerikaanse bedrijven*, November 1990.

Bundesforschungsanstalt für Landeskunde und Raumordnung, *Accessibility and peripherality of Community regions: the role of road, long-distance railway and airport networks*, Bonn, 1992.

Bundesminister für Ernährung, Landwirtschaft und Forsten, *National report on the state of the forests in the Federal Republic of Germany*, Weltforstkongres 1991, 1991.

Bundesminister für ernährung, Landwirtschaft und Forsten, *Waldzustandsbericht des Bundes, Ergebnisse der Waldschadenserhebung*, Bonn, 1991.

Bundesministerium für Raumordnung, Bauwesen und Städtebau, *Raumordnerische Aspekte des EG-Binnenmarktes*, Forschung 488, Bonn-Bad Godesberg, 1992.

Bundesministerium für Raumordnung, Bauwesen und Städtebau, *Raumordnungsbericht 1993*, Bonn, 1994.

Cadmos S. A. *European scenarios on technological innovation and social and economic cohesion (1991)*, Commission of the European Communities, Vol. 16 FAST program.

Cambridge University, Department of Geography, *Peripheral regions in a Community of twelve Member States*, Cambridge, 1986.

Charbit, C. *Modes of usage and diffusion of new technologies and new knowledge, local systems of innovation in Europe (1991)*, Commission of the European Communities, Vol. 11 FAST program.

Charlie Roger H. and de Meyer Christian P. *Tourism and the Coastal Zone: The Case of Belgium*, Ocean & Coastal Management 18, 1992.

Cheshire P. *Explaining the recent performance of the European Community's major urban regions*, Urban Studies, 1990.

Cheshire P. and Hay D. *Urban problems in Western Europe*, London, 1989.

Cheshire P. et al. *Problems of urban decline and growth in EEC countries: or measuring degrees of elephantness*, Urban Studies, 1986.

Commissie van de Europese Gemeenschappen, *De toestand van de landbouw in de gemeenschap, Verslag 1991*, Brussels/Luxembourg, 1992.

Commissie van de Europese Gemeenschappen, *De toestand van de landbouw in de gemeenschap, Verslag 1985*, Brussels/Luxembourg, 1986.

Commission of the European Communities, Directorate-General for Energy, *Energy in Europe. Energy for a new century: the European perspective*, special issue, July 1990.

Commission of the European Communities, Directorate-General for Science, Research and Development, *Fast forecasting and assessment in science and technology, the present and future role of services in regional development*, January 1986.

Commission of the European Communities, Directorate-General XVI, *Impact of a package of EC-measures to control CO_2 emissions on European industry*, Brussels, January 1992.

Commission of the European Communities, *Europe 2000, Outlook for the development of the Community's Territory*, Brussels, 1991.

Commission of the European Communities, *The tourism sector in the Community. A study of concentration, competition and competitiveness*, Luxembourg, 1985.

Conference permanente de Presidents de Regions du Grand Bassin Parisien, *Scénario des huit, une réponse au livre blanc du bassin parisien, le scénario de l'équilibre*, Document de travail provisoire version 5, 1993.

Conseil Economique et Social de Lorraine, *Lorraine, horizon 2000, synthèse et orientations, dix ans pour réussir*, 1993.

Conseil Regional de la Region Nord-Pas-de-Calais, *Le IVe plan régional, 1994-98*, sl, sa.

Conseil Regional de Lorraine, *2e plan régional de la Lorraine 1989-93, la stratégie et les objectifs*, 1988.

Conseil Regional de Picardie, *Le livre vert de sud de l'Oise, le scénario proposé*, Bagneux, 1991.

Coopers & Lybrand Management Consultants, *Internationale vergelijking kwaliteit infrastructuur*, June 1990.

Cortie C. *De dynamiek van stedelijke systemen*, Assen/Maastricht, 1991.

Daniels P. W. *Internationalisation, telecommunications and metropolitan development: the role of producer services*, Brunn Stanley D. and Leinbach Thomas R. *Collapsing space and time*, London, 1991.

Daniels P. W. *Services and metropolitan development, international perspectives*, London and New York, 1991.

Daniels P. W. and Moulaert F. *The changing georgraphy of advanced producer services*, London and New York, 1991.

Daniels P. W., O'Connor K. and Hutton T. A. *The Planning Response to Urban Service Sector Growth: an International Comparison*, 1991.

Daniels P. W., van Dinteren J. H. J. and Monnoyer M. C. *Consultancy services and the urban hierarchy in Western Europe*, Environment and Planning, 1992.

Datar. *Le Bassin Parisien, système productif et organisation urbaine*, Paris, 1992.

Datar. *Les dossiers de la prospective interrégionale de Chantier Grand Nord, éléments de scénarios prospectifs pour le Chantier Grand Nord*, 1993.

Datar. *Les territoires du futur*, 1993.

Datar. *Les villes, lieux d'Europe*, 1993.

Datar. *Livre blanc du Bassin Parisien*, Paris, 1992.

Datar. *Une nouvelle étape pour l'aménagement du territoire*, Paris, 1990.

Dawson J. *Urbanisation and the function of cities in the European Community*, Liverpool, 1991.

De Baets D. *Evolution des utilisations de l'espace en Belgique: approche typologique*, L.E.I.-rapports. 539, 1992.

Department of the Environment, *The East-Thames Corridor, the government's approach,* consultation paper, 1993.

Devas E. *The European Tourist: a market profile*, Tourism Planning and Research Associates, Londen, 1991.

Drewett R., Knight R. and Schubert U. *The future of European cities*. Brussels, Commission of the European Communities.

DRI. *Impact of a Package of EC-measures to control CO_2-emissions on European industry*, Final report prepared for DGXI, January 1992.

Eurostat, Energy balance sheets 1989-90, Brussels, 1992.

Eurostat, National accounts ESA. *Aggregates*, Brussels, 1992.

Eurostat, National accounts ESA. *Detailed tables by branch, 1984-89*, Brussels, 1992.

Eurostat, *Structure and activity of industry.* Data by regions *1987/88,* Brussels, 1992.

Eurostat, *Toerisme in Europa; Ontwikkelingen in 1989*, Luxemburg, 1990.

Eurostat, *Tourism 1990: annual statistics*, Brussels/Luxembourg, 1992.

Everaet H. *De structurele bedrijfsveranderingen in de Belgische landbouw*, L.E.I.-Publikaties 530, 1991.

Federal Ministry for Regional Planning, Building and Urban Development, *General principles for Spatial Development in the Federal Republic of Germany*, Bad Godesberg, 1993.

Federal Ministry for the Environment, *Environmental protection in Germany*, Bonn, 1992.

Fitzpatrick J. et al. *Travel and Tourism in the single European market*, Special Report No 2014, Londen.

Fontela E. and Hingel A. *Scenarios on economic and social cohesion in Europe*, Futures, March 1993.

Goldsmith E. et al. 'World Agriculture: Towards 2000, FAO's plan to feed the world', *The Ecologist*, Vol 21, No 2, March/April 1991.

Goossens M. 'Het Rijn-Ruhrgebied in transformatie', *Leuvense geografische papers 2*, KUL, Leuven, 1990.

Goossens M., Tibau G. and Vanderhallen D. 'Saar-Lor-Lux, grensregio in het centrum van de EG, *Leuvense geografische papers 4*, KUL, Leuven, 1992.

Government Statistical Service, *Regional trends 27*, London, 1992.

Gretz W. and van den Busch U. 'Hessenreport '92, Prognose der wirtschaftlichen Entwicklung in Hessen bis 2010', HLT Report 350, Wiesbaden, 1992.

Gritsai O., Treivish A. and Vandermotten C. *Les vieilles régions industrialisées européennes dans la perspective historique globale des rappports 'centre périphérie'*, Revue belge de géographie CXVI 1-4, 1992.

Hessisches Ministerium des Innern, *Regionaler Raumordnungsplan Nordhessen 1988*, Wiesbaden.

Hessisches Ministerium des Innern, Abteilung Landesentwicklung, *Landesentwicklung in Hessen, demographische Rahmendaten zur Landesentwicklung*, Wiesbaden, 1990.

Hessisches Statistisches Landesamt, *Energiebilanz Hessen*, 1992.

Hetsen H. and Hidding. *Landbouw en ruimte in Nederland*, Landinrichting, 1992/323.

Hilpert U. *Archipelago Europe, Island of Innovation (1992)*, Commission of the European Communities, Vol. 18 FAST program.

Hingel, A. *Science, technology and Community cohesion, Research results and RTD policy recommendations*, Commission of the European Communities, FAST program, 1992.

Hingel A. *The prime role of regional coopertion in European integration*, Regional networks, border regions and European integration, 1993.

Hottes K., Wever E. and Weber H. U. *Technology and Industrial Change in Europe*, 1986.

IEA. *Energy policies and programmes of IEA-countries,1988 Review*, Paris, 1989.

IEA. *Quarterly oil statistics and energy-balances. Second quarter 1991*, Paris, 1991.

Illeris S., *Services and Regions in Europe*, Avebury, 1989.

Institut d'Amenagement et d'Urbanisme de la Region d'Ile-de-France, 'Vers un projet régional d'aménagement', Supplement to *Les Cahiers 91*, October 1989.

Institut für Landes- und Stadtentwicklungsforschung des Landes Nordrhein-Westfalen, *Grensoverschrijdend ontwikkelings- en handelingsconcept van de regio Rijn-Waal.*

Institut für Landes- und Stadtentwicklungsforschung des Landes Nordrhein-Westfalen, *Perspektiven der Landesentwicklung Nordrhein-Westfalens im neuen Europa*, ILS Taschenbücher, Dortmund, 1991.

Institut für Landes- und Stadtentwicklungsforschung des Landes Nordrhein-Westfalen, *Wohnen und arbeiten, Anwendungsbeispiele und Arbeittshilfen zum Planungserlaß Nordrhein-Westfalen*, Dortmund, 1986.

Internationale Coordinatiecommissie MHAL, Maastricht/Heerlen, Aachen, Liège, Hasselt /Genk, ruimtelijk ontwikkelingsperspectief ontwerp, 1993.

Katholieke Universiteit Brabant, 'Toeristische bedrijfsvoering in Europees Perspectief', 10th VITE-Congres, Tilburg, 1991.

Kayser B. 'L'avenir des espaces ruraux, Choix de société et volonté politique', Futuribles No 167, July-August 1992.

Kisseler W. 'Beiträge zur Raumbeobachtung in Hessen, Wirtschaftsbedeutung der Hessischen Gemeinden, Struktur 1987 und Entwicklung 1970-87', HLT Report 379, Wiesbaden, 1993.

Kolpron Consultants, *Stedelijke netwerken in Europa*, Rotterdam, 1991.

Kormoss I. B. F. 'Future developments in North-West European tourism, Impact of transport trends, Tourism management, Dec. 1989.

Kunzmann K. R. and Wegener M. *The pattern of urbanization in Western Europe 1960-90.* Dortmund Universität, for DG XVI, Dortmund, 1991.

Lambooy J. G. *Stedelijke netwerken en economische groei*, Universiteit van Amsterdam, Amsterdam, 1991.

Lecomte D. and Gollain V. La position concurrentielle de l'Ile-de-France en Europe, les cahiers de l'IAURIF 100, March 1992.

Lewis G. J. *Counterurbanization in rural Britain: some recent trends*, 1992.

Lutter. *Accessibility and peripherality of Community regions: The role of road, long-distance railway and airport networks, final report for the Commission of the European Communities*, Bonn, 1992.

Martin S. *The Europeanization of local authorities: will rural areas lose out?* Aston University, Birmingham, 1992.

Martins-Cruz J. *L'agrotourisme dans la CEE: utopie ou réalité?*, Bureau Européen de l'agrotourisme (Euragritour), Brussels, 1991.

Meeus J. Aantekeningen bij een typologie, Landschap 7, 1990.

Mens en Ruimte. *The Impact of the European Institutions in Brussels*, Brussels, 1992.

Mens en Ruimte. *Structuurplan Vlaanderen. Structuurschema energie. Probleemformulering en doelstellingen*, Brussels, 1987.

Mens en Ruimte. *Thematische studie SST-projekt Parijs/London-Brussel-Keulen/Amsterdam, i.o.v. de Nationale Maatschappij der Belgische Spoorwegen*, Brussels, 1989.

Ministere de l'Amenagement du Territoire et de L'Environnement (GD Luxembourg), *Rapport d'activité* 1991-92.

Ministere de l'Industrie du Commerce Exterieur, Several publications and statistics concerning energy in France, 1992.

Ministere de L'Environnement (F), *Etat de l'environnement* 1990-91.

Ministère de l'Agriculture et de la Forêt, France, Direction de l'Espace Rural et de la Foret, *Espace rural et forêt*, 1991.

Ministere d'Etat, Ministere de l'Amenagement du Territoire et de l'Environnement, GD Luxembourg, *Programme directeur de l'aménagement de territoire, horizon 2000*, 1990.

Ministerie van Economische Zaken Nederland, Different documents concerning energy production and demand in the Netherlands, 1992.

Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, *Randstad internationaal, eenheid in verscheidenheid*, The Hague, 1991.

Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, *Vierde nota over de ruimtelijke ordening extra, ontwerp planologische kernbeslissing*, The Hague, 1990.

Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Rijksplanologische Dienst, *Nadere uitwerkingen van de Vierde Nota over de Ruimtelijke Ordening*, The Hague, 1991.

Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Rijksplanologische Dienst, *Ruimtelijke verkenningen 1993, jaarboek RPD*, The Hague, 1993.

Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Rijksplanologische Dienst, *Perspectieven in Europa, een verkenning van opties voor een Europees ruimtelijk beleid*, The Hague, 1991.

Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Rijksplanologische Dienst, *Platteland op weg naar 2015, achtergronden van de koersbepaling landelijke gebieden in de Vierde nota Extra*, The Hague, 1990.

Ministerium Für Umwelt Saarland, *Landwirtschaft und naturschutz*, Saarbrücken, 1991.

Ministerium Für Wirtschaft, Mittelstand und Technologie des Landes Nordrhein-westfalen; *Mit Gemeinschaftsprogrammen den Strukturwandel meistern, Zwischenbilanz der Zusammenarbeit des Landes Nordrhein-Westfalen und der Europäischen Gemeinschaft in der regionalen Strukturpolitik*, Düsseldorf, 1991.

Ministerium Für Wirtschaft und Verkehr Rheinland-Pfalz, *Energiebilanz 1990*, 1991.

Ministerpräsident des Landes Nordrhein-westfalen, *Landesentwicklungsbericht Nordrhein-Westfalen, Perspectiven und Initiativen am Beginn der 90er Jahre*, Düsseldorf, 1992.

Musterd S. and de Pater B. *Randstad Holland, internationaal, regionaal, lokaal*, Assen/Maastricht, 1992.

Nederlands Bureau voor Toerisme, *Toerisme, trends en toekomst. 20 jaar NBT 1968-88*, Leidschendam, 1989.

Nederlands Research Instituut Voor Recreatie en Toerisme, *Toeristisch-recreatieve ontwikkelingen binnen het EG-gebied, samenvattend rapport*, Breda, 1991.

Nederlands Research Instituut Voor Recreatie en Toerisme, *Trendrapport Toerisme 1990*, Breda, 1991.

Noll W., Rechmann B. and Proll H. *Strukturwandel im Ruhrgebiet*, Kommunalverband Ruhrgebiet, Essen, 1992.

Nonn H. *Projet de Livre Blanc du Grand Est, présentation de trois images prospectives de Grand Est*, for DATAR, sa.

OECD, *Economic Outlook (1993)*, Paris.

OECD, *Science and technology indicators report No 3 (1989)*, Paris.

OECD, *Technology and the Economy (1992)*, Paris.

Parkinson M. et al. *Urbanization and the functions of cities in the European Community*, John Moores University, for DG XVI, Liverpool, 1992.

Perrier-Cornet P. *Opvolging en vestiging in de landbouw in de Europese Gemeenschap*, for the Commission by INRA, PRAP/1128, 1991.

Port of Rotterdam, Gemeentelijk Havenbedrijf Rotterdam, *Overslag goederen naar land van herkomst en bestemming in de Hamburg-Le Havre range*, 1986-90, June 1992 .

Quevit Michel *et al. Impact régional 1992. Les Régions de tradition industrielle, Ouvertures économiques*, Brussels, 1991.

Rabbinge *et al. Grond voor keuzen, Rapporten aan de regering*, for Wetenschappelijke, Raad voor het Regeringsbeleid, 's Gravenhage, 1992.

Reclus, *Les villes européennes*, for DATAR, Paris, 1989.

Regierungspräsidium Darmstadt, Obere Landesplanungsbehörde, *Gutachten zum Landschaftsrahmenplan, Planungsregion Südhessen*, Darmstadt, 1992.

Regierungspräsidium Darmstadt, Obere Landesplanungsbehörde, *Raumordnungsgutachten, Planungsregion Südhessen*, Darmstadt, 1992.

Research Voor Beleid, Geografisch Instituut RU Utrecht, *Kantoren in metropolen, internationaal vergelijkend onderzoek naar toplocaties voor de kantorensector,* i.o.v. RPD, Leiden, 1989.

Rietveld P. *International transportation and communication networks in Europe, the role of barrier effects*, Department of Economics Vrije Universiteit, Amsterdam.

Rural Commission of the EC; *De toekomst van het platteland*. Bulletin of the EC supplement 4/88, 1988.

Secretary of State for the Environment, Department of the Environment, South-East Regional Office, *Regional planning guidance for the South-East*, RPG 9, London, 1994.

Sleegers W. F., Van Der Knaap G. A. and Tortike B. J. L. *Economic potential for the central and capital city regions*, Erasmus University Rotterdam, 1992.

Sortia J. R., Vandermotten Ch. and Vanlaer J. *Atlas economique de l'Europe*, ULB, Bruxelles, 1986.

Staatskanzlei Hessen, *Regionaler Raumordnungsplan Mittelhessen 1987*, Wiesbaden.

Staatskanzlei Hessen, *Regionaler Raumordnungsplan Südhessen 1986*, Wiesbaden.

Staatskanzlei Rheinland-Pfalz, *Handbuch der grenzüberschreitenden Zusammenarbeit in Rheinland-Pfalz*, Mainz, 1992.

Staatskanzlei Rheinland-Pfalz, *Landesentwicklungsprogramm Rheinland-Pfalz III (Entwurf, Stand 12/92)*, 1992.

Staatskanzlei Rheinland-Pfalz, *Raumordnungsbericht 1989 der Landesregierung Rheinland-Pfalz*, Mainz, 1989.

Statistisches Landesamt Saarland, *Energy balance*, 1992.

Stuurgroep Rom-Rijnmond, *Plan van aanpak en beleidsconvenant ROM-project Rijnmond*, 1993.

Tepro, Casini, Varaldo *et al. The tourism sector in the Community*, Luxembourg, 1985.

The London and South-East Regional Planning Conference, 'A new strategy for the South-East, regional statement', London, 1990.

The London and South-East Regional Planning Conference, 'A regional profile of the South-East 1993', London, 1993.

The London and South-East Regional Planning Conference 'Into the next century, review of the South-East regional strategy', consultation paper, London, 1989.

The London and South-East Regional Planning Conference, 'Regional trends in the South-East, the South-East regional monitor 1989-90', London, 1990.

The Roundtable of European Industrialists. 'Need for renewing transport infrastructure in Europe, proposals for improving the decision-making process'.

Uittenbogaart DRS. P. J. 'Database Transport en infrastructuur Noordwest-Europa', Nederlands Economisch Instituut, May 1990 .

Umweltbundesamt. *Daten zur Umwelt, 1988-89*, Berlin, 1989.

Ungerer, Herbert (red.) (1990). *Telecommunications in Europe, European perspectives*, Commission of the European Communities, Brussels, .

United Nations *FAO/ECE. European Timber trends and prospects to the year 2000 and beyond*, New York, 1986.

University of London, King's College, London. Different letters and comments concerning energy by Dr M. E. Frost, London, 1992.

Vandermotten C. Documents de travail, 1992.

Vandermotten C. *L'Europe et ses régions*, Charleroi/Bruxelles, 1990.

Van Hecke, *Etienne. De evolutie van de migratietendensen 1977-90 in de Belgische ruimte*, Bevolking en gezin 2, 1992.

Verbaan A. A. *Perspectives in Europe, a survey of options for a European spatial policy*, Rijksplanologische Dienst, 1991 .

Verbaan A. A. et al., *Perspectieven in Europa, Een verkenning van opties voor een Europees ruimtelijk beleid voor Noordwest-Europa*, Rijksplanologische Dienst, September 1991.

Verlag Gluckauf GMBH, *Jahrbuch Bergbau, Öl und Gas, Elektrizität, Chemie, Essen*, 1991.

Volkers K. and de Vocht A. *Changing rural areas and low-level analysis*, State University of Utrecht, 1992.

Witt S. F. and Martin C. A. 'Forecasting future trends in European tourist demand', *Revue de tourisme, No 4,* 1985.

XII News. 'RDT and the European Space of the "Chemins de Compostelle" of modern times, results from the FAST Research Project (1991)', December 1991.

Zonneveld W. *Perspectieven in Europa, ruimtelijke concepten voor Noordwest-Europa*, for RPD, Amsterdam, 1989.

ANNEXES

Annex I: Pollution ranking per region (see Map 5.8)

	Air		Water		Soil				Industrial risks		Noise	Total score	Class
Regions	Acidification composition (1-4)	Ozone (1-3)	Groundwater (1-3)	Rivers (1-3)	Landfill (1-4)	Agriculture N (1-3)	Pesticide (1-4)	Contaminated sites (1-2)	Seveso (1-4)	Nuclear (1-2)	(1-3)	(11-35)	(1-5)*
Normandy	2	1	2	2	2-3	1	2	1	4	2	2	21-22	2-3
Nord-Pas de-Calais	2	1-2	3	2	3-4	1	2	2	4	2	3	25-27	3-4
Picardy	2	1-2	2-3	2	2-3	1	3	1	1	2	1	18-21	2
Ile-de-France	2-3	1	3	2	3-4	1	2	2	2	1	3	22-24	3
Champagne-Ardenne	1	1-2	1-2	2	1-2	1	3	1	1	2	1	15-18	1-2
Lorraine	2	2	1-2	2	2-3	1	1	2	1	2	2	18-20	2
South-East	3	1	3	2	4	2	3	2	?	2	3	25**	4
Vlaanderen	3	2	3	3	4	3	3	2	4	2	3	32	5
Brussels	3	2	?	3	?	?	?	1	1	1	3	14***	3
Wallonia	3	2	2	2	3	2-3	2-3	2	1	2	2	23-25	3
West-Neth.	3	1	2-3	2	4	3	4	2	3	1	3	28-29	4
East-Neth.	3-4	1-2	3	2	3-4	3	4	2	2	1	2	26-29	4
South Neth.	3-4	2	3	3	4	3	4	2	2	2	2	30-31	4-5
Luxembourg	2	2	2	2	1	2	2	2	1	1	1	18	2
Saarland	2-3	2	2	2	4	2	3	2	1	2	2	24-25	3
Hessen	3	2-3	3	2	3-4	1-2	3	2	4	2	2	27-30	4
Rhineland-Pfalz	3	2	3	2	3-4	2	3	2	4	2	2	28-29	4
Nord Rhine-Westphalia	3-4	2	3	2	4	2-3	3	2	4	1	2	28-30	4

* Score:	1. (11-16)	poorly-threatened regions	
	2. (17-21)	moderately	
	3. (22-26)	highly	
	4. (26-30)	very highly	
	5. (31-35)	critically	
** Total:	(10-31)	1. (10-14)	poorly-threatened regions
		2. (15-18)	moderately
		3. (19-22)	highly
		4. (23-26)	very highly
		5. (27-31)	critically
*** Total:	(7-21)		

AIR

Acid compounds (in mol/ha/yr)

1. 1 400-2 400
2. 2 400-3 400
3. 3 400-5 400
4. >5 400

Ozone (in ppb/hours)

1. 5 000-10 000
2. 10 000-15 000
3. >15 000

WATER

Groundwater (exceedance of critical levels for sustainable use of groundwater)

1. exceedance
2. high exceedance
3. very high exceedance

Rivers

1. acceptable level of pollution
2. polluted rivers
3. heavily-polluted rivers

SOILS

Landfills (relative area per indicated region (NUTS) in %)

1. <1
2. 1-2
3. 2-5
4. >5

Agriculture

Nitrogen (in kg/ha/yr on agricultural soils)	1. <170 2. 170-250 3. >250
Pesticides (average load in kg/ha/yr)	1. <2 2. 2-3 3. 3-10 4. >10
Contaminated sites (estimation)	1. low number 2. considerable number

INDUSTRIAL RISKS

Seveso-plans (number)	1. <10 2. <20 3. <50 4. >50
Nuclear plans	1. no nuclear plans 2. nuclear plans

NOISE

	1. low level of noise pollution 2. 3. high level of noise pollution

Annex II: Synoptic table of demographic and socioeconomic indicators

NUTS	Region	(1) Overall population No	(2) Overall population %	(3) Population density per km²	(4) Population in urban areas	(5) Employment by branch (in %) Agriculture	(6) Industry	(7) Services	(8) Unemployment rate	(9) Gross regional product
		1990	1990	1990	1981	1989			1991	1988
R511	Antwerp	1 597 300	1.8	557.055	55.6	2	34	64	6.5	126
R502	Brabant	2 243 000	2.5	667.937	67.1	1	18	81	6.9	117
R523	Hainaut	1 278 000	1.4	337.586	50.1	3	29	68	13.3	78
R524	Liege	998 200	1.1	258.440	27.2	2	30	68	11.3	96
R515	Limburg	745 000	0.8	307.572	28.8	3	40	57	8.0	104
R526	Luxembourg	230 800	0.3	51.984	9.9	10	19	71	5.9	85
R527	Namur	421 200	0.5	114.897	30.3	5	22	73	10.1	83
R518	East-Flanders	1 331 600	1.5	446.516	40.9	4	36	60	5.3	100
R519	West-Flanders	1 102 500	1.2	351.742	38.9	5	35	60	4.0	107
R51	Vlaams gewest	5 739 700	6.4	424.800	38.6	3	34	63	5.5	106
R52	Wallonia	3 243 700	3.6	192.600	34.7	4	27	69	11.0	85
R53	Brussels	964 400	1.1	5 990.000	100.0	0	13	87	9.9	166
R5	**Belgium-CCC**	**9 947 800**	**11.2**	**325.957**	**46.7**	**3**	**28**	**69**	**7.7**	**105**
R151	Düsseldorf	5 167 700	5.8	977.269	98.0	2	41	57	6.1	124
R152	Cologne	3 963 100	4.4	537.851	88.0	1	38	61	5.3	114
R153	Münster	2 437 800	2.7	353.417	79.9	4	39	57	5.5	96
R154	Detmold	1 849 700	2.1	283.918	68.0	3	45	52	4.2	107
R155	Arnsberg	3 685 200	4.1	460.713	88.3	2	46	52	6.0	105
R15	Nordhrein-Westfalen	17 103 600	19.2	502.000	87.8	2	42	56	5.6	112
R16A	Darmstadt	3 491 400	3.9	468.978	63.5	3	37	60	2.8	158
R16B	Giessen	981 500	1.1	182.408	26.5	5	39	56	3.9	95
R16C	Kassel	1 187 700	1.3	143.297	29.7	5	37	58	4.9	104
R16	Hessen	5 660 300	6.3	268.100	49.9	4	37	59	3.4	135
R171	Koblenz	1 377 000	1.5	170.155	24.0	5	38	57	3.3	95
R172	Trier	478 000	0.5	97.040	20.3	11	31	58	4.0	89
R173	Rheinhessen-Pfalz	1 846 700	2.1	270.404	40.4	7	42	51	3.7	114
R17	Rheinland-Pfalz	3 701 700	4.2	186.500	31.7	7	39	54	3.6	103
R1A	Saarland	1 064 900	1.2	414.471	53.0	2	44	54	6.1	109
R1	**Germany-CCC**	**27 530 700**	**30.9**	**354.782**	**71.1**	**3**	**40**	**57**	**—**	**115**
R754	Essex	1 535 700	1.7	418.219	56.1	2	24	74	7.1	89
R751	Beds.-Herts.	1 522 800	1.7	530.777	49.1	1	28	71	6.0	105
R755	Greater London	6 762 700	7.6	4.282.901	100.0	0	14	86	10.4	156
R757	Kent	1 526 600	1.7	409.66	57.9	4	21	75	7.3	92
R753	Surrey, E./W. Sussex	2 425 800	2.7	444.042	52.3	3	17	80	5.4	101
R756	Hamps., Isle of Wight	1 679 500	1.9	403.042	55.4	2	23	75	6.8	100
R752	Berks. Bucks., Oxfordshire	1 961 300	2.2	341.096	54.9	2	22	76	5.0	113
R7	**United Kingdom-CCC**	**17 414 400**	**19.5**	**639.718**	**77.6**	**1**	**18**	**81**	**7.8**	**121**

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
NUTS	Region	Overall population		Population density per km²	Population in urban areas	Employment by branch (in %)			Unemployment rate	Gross regional product
		No	%		%	Agriculture	Industry	Services	Total	(EC = 100)
		1990	1990	1990	1981	1989			1991	1988
R21	Ile-de-France	10 660 100	12.0	887.439	92.4	1	20	79	7.9	166
R221	Champagne-Ardenne	1 347 800	1.5	52.637	42.6	11	29	60	9.7	112
R222	Picardy	1 810 700	2.0	93.338	25.1	8	31	61	9.8	96
R223	Haute-Normandie	1 737 200	1.9	141.036	45.8	5	30	65	11.1	106
R23	Nord-Pas-de-Calais	3 965 100	4.4	129.667	70.6	5	28	67	11.5	91
R241	Lorraine	2 305 700	2.6	97.917	46.5	4	30	66	7.8	98
R2	**France-CCC**	**21 826 600**	**24.5**	**184.918**	**70.9**	**3**	**24**	**73**	—	**131**
R6	**Luxembourg**	**378 400**	**0.4**	**146.304**	**28.4**	**5**	**34**	**61**	**1.8**	**124**
R424	Gelderland	1 804 200	2.0	350.739	40.2	6	29	65	7.3	87
R471	Utrecht	1 015 500	1.1	724.426	45.6	3	22	75	6.0	95
R472	North Holland	2 376 000	2.7	649.891	60.7	3	22	75	7.3	118
R473	South Holland	3 219 800	3.6	958.559	55.3	5	24	71	7.6	109
R474	South West Netherlands	355 900	0.4	117.072	55.0	8	30	62	5.6	110
R47	West Netherlands	6 967 300	7.8	608.100	52.6	4	23	73	7.1	110
R451	North Brabant	2 189 500	2.5	430.741	38.7	7	35	58	6.1	95
R452	Limburg	1 104 000	1.2	499.887	44.7	6	34	60	7.5	94
R45	South Netherlands	3 293 400	3.7	451.700	40.7	6	35	59	6.5	95
R4	**Netherlands-CCC**	**12 064 900**	**13.5**	**504.968**	**49.3**	**5**	**27**	**68**	—	**102**
CCC	**Total-CCC**	**89 162 600**	**100.0**	**324.982**	**66.5**	**3**	**29**	**68**	—	**117**
EC	**Total-EC (without former GDR)**	**327 280 900**		**145.500**	**55.7**	**3**	**29**	**68**	**8.7**	**100**

Sources: Columns 1, 2, 3, 5, 6, 7, 8, 9: Eurostat, regional statistics.
Column 4: Settlement database.

European Commission

Regional development studies
The perspective development of the central and capital cities and regions

Luxembourg: Office for Official Publications of the European Communities

1996 — 266 pp. — 21 x 29.7 cm

ISBN 92-826-8808-9

Price (excluding VAT) in Luxembourg: ECU 25

Corrigendum

Title page,
Running title (even pages),
Cataloguing data page,

replace:

'The perspective development of the central and capital cities and regions'

with:

'Prospects for the development of the central and capital cities and regions'

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