

PART I - anonymous  
Tender for 2005.ESPON 2.4.1  
Territorial trends and policy impacts in the field of EU Environment Policy

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## 1. Introduction

The goals for European spatial development are based on the over all European aims of sustainable development and social and economic cohesion. This requires a balanced and sustainable spatial development between economic, social and environmental objectives. At the same time the territory of the European Union covers a large cultural variety, local and regional identities that must be retained. In this context the European spatial development perspective (ESDP) proposes to “*examine periodically and systematically the spatial effects of [European Community] policies*” including EU Environment Policy.

Regions with geographic handicaps have been highlighted in the European Commission’s 3rd Report on Economic and Social Cohesion. Many of these regions form an important part of the EU’s natural heritage and are the location for leisure, culture and other activities. It is important that the economic development path they follow respects their natural heritage and does not endanger the typical territorial features. A special political rationale for the ESPON 2.4.1 project can be found in policy option 42 of the ESPD. It aims at “*Preparation of integrated spatial development strategies for protected areas, environmentally sensitive areas and areas of high biodiversity such as coastal areas, mountain areas and wetlands balancing protection and development on the basis of territorial and environmental impact assessments and involving the partners concerned.*”

The ESPON 2.4.1 project will review EU policies in relevant environmental areas and develop tools and methodologies to assess the importance and influence of the environment as a spatial and economic development factor. The development of a territorial impact assessment (TIA) for European Environment Policy is assigned to the use by decision makers on different spatial levels who will then be able to better estimate territorial impacts and the interplay of policies.

The proposed project group represents very well the expertise required in carrying out a project in the second priority (policy impacts) of the ESPON 2006 programme. Many members of the foreseen multinational consortium have cooperated in earlier projects in the field of spatial development and in sectors having influence on territorial trends in the EU.

## 2. General objectives, literature and research review

General Objective of the ESPON 2.4.1 project is to assess the territorial impacts of European environmental policies. This will be achieved by a set of research steps along certain environmental test cases in selected case studies on different spatial levels. This approach requires at a first step the identification of the main fields of activity of EU environmental policy as well as an assessment base for territorial impacts that will be presented in the following literature and research review.

### 2.1. Environmental policies

When impacts of EU environmental policies shall be analyzed, the first question is which policies exist at all in this area. In the following, the main elements/instruments of EU environmental policies are described. For a deeper description of the policy areas please see Chapter 5.

#### 2.1.1. 6<sup>th</sup> Environmental Action Programme (6<sup>th</sup> EAP)

The 6<sup>th</sup> *Environmental Action Programme* has identified four priority areas for urgent actions which have to be tackled for improvements: *climate change; nature & biodiversity;*

*environment & health and quality of life; natural resources & waste.* Further, seven thematic strategies are developed for tackling particular complex environmental issues and determining the priorities for Community: *soil protection; protection and conservation of the marine environment; sustainable use of pesticides; air pollution; urban environment; sustainable use and management of resources; waste recycling.* These priorities and strategies are core elements of the EU environmental policies that – of course – have different effects on the spatial development.

The 6th EAP consists of four broad elements, which have to be considered for the test cases that are chosen for this project (see chapter 6.3.1):

- effective implementation and enforcement of environmental legislation;
- integration of environmental concerns into other policies, including infrastructure;
- use of a combination of means to achieve ends in the most efficient and effective way;
- and wide stakeholder involvement in the development and implementation of policies.

Especially the connection of environmental concerns and sectoral policies is a task of high importance in the ESPON 2.4.1 project. The 6th EAP states that the integration of environmental objectives into the early phases of the different sectoral policy processes is required as well as an ability to assess and make informed decisions over a much longer time horizon. The further development of indicators to monitor and report on the process of sectoral integration is mentioned as an action point (6EAP, p. 14f).

### 2.1.2. LIFE

In addition to the four elements of the EAP, the financial instrument for the environment (LIFE) should be explicitly named and considered. This Regulation repeals Regulation (EEC) No. 1973/1992 establishing the LIFE financial instrument. The objective of this financial instrument is to contribute to the development, implementation and updating of Community environment policy and environmental legislation, especially as regards the integration of the environment into other policies, and to sustainable development in the Community.

### 2.1.3. Environmental Assessments

The Environmental Assessment on the level of single projects as well as for plans and programmes can be characterised as important parts of EU environmental policy. In view of the ESPON 2.4.1 project focus on regions and larger territories in particular the SEA has to be taken into consideration.

The so far project-oriented Environmental Impact Assessment (EIA, EU directive 85/337/EEC in connection with EU directive 97/11/EC) was enlarged on a strategic level through the EU directive 2001/42/EC “Assessment of the effects of certain plans and programs [1] on the environment” [2], which came into force on 27<sup>th</sup> of June 2001. The directive mainly contains procedural requirements. The EC argued primarily, “*that “Environmental assessment is an important tool for integrating environmental considerations into the preparation and adoption of certain plans and programmes which are likely to have significant effects on the environment in the Member States, because it ensures that such effects of implementing plans and programmes are taken into account during their preparation and before their adoption.*” (Point 4 of the substantiation of the directive). This argumentation is based on the main lessons learned from practical experiences with the present environmental assessment on the project level. The main problems in dealing with environmental issues on the project level refer to the impossibility of assessing alternatives

and interactions between the effects of several projects. After the fundamental decision about a specific land use or an infrastructure investment has been made on the programme or plan level, only minor changes on the project could be taken into consideration as a result of an EIA.

The key task of the Strategic Environmental Assessment (SEA) is in accordance with Art. 3 EU directive 2001/42/EC the assessment of the “*significant effects on the environment, including issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors*” (Annex 1, letter f). The results of this assessment, summarised in the environmental report, have to be taken into account in decision-making about specific plans or programs (Art. 2 b and c EU directive 2001/42/EC).

The strategic environmental assessment directive has been implemented in the national law in the meantime. In consequence it will seriously influence planning procedures in spatial planning as well as all spatially relevant sectoral planning divisions. Even the programmes of measures and landscape plans have to be assessed. In view of the short time since the SEA came into force, only a few examples can be assessed in the case study areas in order to give a first impression about the impact of the SEA on territorial development.

## **2.2. Other EU policies with environmental goals**

### **2.2.1. ESDP**

The analysis of territorial or spatial impacts has to be seen on the background of the existing spatial policies. The policy framework of the *European Spatial Development Perspective* (ESDP) has three fundamental goals: *economic and social cohesion, sustainable development and the competitiveness of the EU territory*. These goals are pursued simultaneously with attention given to how they interact which requires a thorough consideration and coordination of all spatially relevant sectoral policies and various authorities. In the ESDP (p. 17) the following environmental policies are regarded to contain provisions which put particular emphasis on direct or indirect links with spatial development and, in particular, land use:

- EU-wide designation of protected areas (“Natura 2000”; see Chapter 5.1.4),
- EC Nitrate Directive which aims at reducing existing nitrate pollution from agricultural land and preventing further ground water pollution (see Chapter 5.1.6),
- Directive 85/337/EEC, which stipulates that environmental impact assessments for large projects have to be carried out and published (see Chapter 6.2.2),
- defining quality standards for areas close to natural surroundings,
- regulations aiming at reducing emissions,
- Integrated Coastal Zone Management (ICZM) which promotes sustainable management through co-operation and integrated planning, involving all the relevant players at the appropriate geographic level,
- legislation on waste and water treatment, noise and air pollution; limits that can have direct impacts on urban development and industrial areas (see Chapters 5.1.1, 5.1.5, 5.1.6),

- environment policy requirements are becoming important locational factors when it comes to setting up or relocating businesses and therefore may have considerable implications from an economic point of view (see Chapters 2.1.3 and 6.2.1, Table, Row 5).

Especially part 3.4.2 of the ESDP (“Preservation and Development of the Natural Heritage”) seems to be quite important for the ESPON project 2.4.1. Policy option 42 aims at the *“Preparation of integrated spatial development strategies for protected areas, environmentally sensitive areas and areas of high biodiversity such as coastal areas, mountain areas and wetlands balancing protection and development on the basis of territorial and environmental impact assessments and involving the partners concerned.”* This passage is a central political rationale for the ESPON 2.4.1 project.

Goals and concepts for the European territorial and spatial development, in particular territorial cohesion and polycentricity can be seen as helping to implement the more general goals of the European Union like mentioned above.

Further environmental policies, laid down e.g. in the Water Framework Directive or the Strategic Environmental Assessment Directive (WFD see part 5.1.11) are also important in this context. The rationale of the WFD has been already introduced by the ESDP, part 3.4.3 („Water Resource Management – a Special Challenge for Spatial Development”). It is from particular interest, that the ESDP has indicated explicitly the spatial relevance of water management.

## 2.2.2. Cohesion policy

*Territorial cohesion* is one of the main policy objectives within the European Union. Apart from economic and social aspects, this also has an environmental perspective which is supported by various policies. For example, the Structural Funds have an important environmental component.

The Structural Funds (and the Cohesion Fund) directly support environmental infrastructure within the eligible Member States or regions. Measures include the protection and management of water resources, the collection, treatment and recycling of waste as well as actions to clean up coastal areas and river basins.

In addition, investment in projects with a positive impact on the environment should be mentioned; besides the financial aid directly addressed towards the environment, support of productive investment can also have significant indirect positive effects on the environment. These measures by their distinct preventive nature are particularly valuable in terms of sustainability.

The Structural Funds incentives for the promotion of environmentally friendly products and technology illustrate an approach to economic development that is sustainable. The same is true for the promotion of renewable energy and the use of energy and water-saving technologies.

Environmental aspects can be found on all levels of programming and implementation of cohesion policy. The intensification of ex-ante and ex-post evaluation with special regard to environmental impact is central in this new approach. The consideration of environmental objectives in the programming documents (i.e. within the Community support frameworks and Single Programming documents) is compulsory.

Moreover the definition of certain environmental impact indicators has been improved. Environmental authorities have to be involved in the development and monitoring of the programmes as required by the revised regulations.

Finally, environmental concerns within project selection and implementation have been improved; improvement in terms of the environmental quality of projects will greatly contribute to sustainability and cohesion. There is a need to develop project eligibility and selection criteria that go beyond the basic environmental compliance dimension to reflect both economic and environmental sustainability. The EU Strategy for Sustainable Development (Gothenburg 2001) called for an Impact Assessment of all EU policy proposals in order to ensure that they include a sustainability impact assessment covering their potential economic, social and environmental consequences. Based on this the goal, the Commission, the EU Parliament and the Council have agreed on an Impact assessment in 2002.

All operational programmes within the EU regional funding (and the included projects as well) have to take into account environmental aspects which are a general goal of all operational programmes.

EU cohesion policy is financed to a large extent by the ESF and the ERDF which also point at environmental objectives:

- **The European Social Fund (ESF)** aims with objective 4 at “training related to the introduction, use and development [...] particularly with regard to the protection of the environment.” The current Regulation establishes that the ESF’s remit is among others to promote *sustainable development* and economic and social cohesion.
  
- One of **European Regional Development Fund’s (ERDF)** general objectives is fostering productive investment and investment in infrastructure aimed at environmental protection, in accordance with the principles of sustainable development, where such investment is linked to regional development.

### 2.2.3. Community initiatives

The structural funds finance four Community Initiatives of which the following three have environmental components that have to be considered:

- INTERREG (currently INTERREG III) is a Community initiative which aims to stimulate interregional cooperation in the EU between 2000-06. It is made up of 3 strands (A, B, C) and comprises also the ESPON (European Spatial Planning Observation Network) and INTERACT (INTERreg – Animation, Coordination, Transfer) programmes. In the lists of priority topics and eligible measures, environmental aspects play an important role as for Strand A (“Protection of the environment, energy efficiency and renewable sources of energy”) or for Strand B (“Promotion of the environment and good management cultural heritage and of natural resources, in particular water resources”) (European Commission 2004, Annexes II and IV).
- URBAN (currently URBAN II) is the Community Initiative of the European Regional Development Fund (ERDF) for sustainable development in the troubled urban districts of the European Union for the period 2000-06. In the URBAN programme, the improvement of infrastructure and environmental conditions and the rehabilitation of public spaces including green areas belong to the eligible measures.
- LEADER+ is designed to help rural actors to consider the long-term potential of their local region. It includes eligible environmental measures like the promotion of environmental measures including waste management, small scale habitat

conservation and river management as well as the promotion of renewable energy production and agri-forestry measures.

Environmental policies do not necessarily create the need for countries or regions being supported, but environmental protection may also create employment by investment that is associated with the Directives, e.g. in the areas of waste disposal, water supply, controls on air pollution, waste water treatment, control of airborne emissions or climate change agreements (3rd Cohesion Report). This estimation can be underlined by the results of 2003 study aimed primarily at an estimation of the economic benefits of the EU environmental policy: There are indeed considerable employment effects based on the EU environmental policy. In this context, it is remarkable that less rich Member States benefit more from environmental expenditure than richer countries, in the sense that more jobs are created per unit of expenditure. This fact can be explained through labour cost differences between Member States, since these costs tend to be higher in richer countries, which leads to lower job creation per unit of environmental expenditure (European Commission DG Regional Policy 2003).

Concluding this section in view of the ESPON 2.4.1 project it is important to point at the large variety of strategies and policies in the field of EU environmental concerns. The transnational project group (TPG) will take this into account by elaborating on the main areas of environmental policies (Chapter 5) and linking them with the objectives and measures of environmental and spatial policies (Chapters 6 and 7).

### **3. Interaction with other ESPON projects**

The already finalized ESPON projects provide an important methodological and data related reference basis for the ESPON 2.4.1 project. As described more closely in Chapter 6, elements of a Territorial Impact Assessment of EU environmental policy will be deduced from these experiences. Further, the large data base that has been developed of previous TPGs will provide project 2.4.1 with many of those indicators that will in many environmental areas help to draw a picture of the state of the environment and its changes as well as driving forces, impacts and responses. Existing gaps however have to be closed within the work of the project in order to develop environmental typologies for the ESPON area.

Thus, there will be intensive interaction with other ESPON projects. The results and findings from already finalised projects 1.2.1 “Transport trends”, 1.3.1 “Hazards”, 1.3.2 “Natural heritage”, 2.1.1 “Transport policy impact”, 2.1.3 “CAP impact” and 2.1.4 “Energy” will be examined and utilised.

The basic idea of the **ESPON project 1.2.1** “Transport services and networks: territorial trends and basic supply of infrastructure for territorial cohesion” has been to give an idea of the transport networks at European space by considering all models of transport. In the view of environment issues the project 1.2.1 has studied emission of air pollutants like CO and NO<sub>x</sub> emissions of trucks. The developed indicator “emission of air pollutants” gives an idea of the level of pollution induced by freight transportation.

#### Examples of suitable indicators of project 1.2.1:

Emission of greenhouse gases

Emission of air pollutants



**ESPON project 1.3.1** “The spatial effects and management of natural and technological hazards in general and in relation to climate change” has studied the spatial patterns of natural and technological hazards in Europe as an overview on all NUTS 3 areas and has identified possible impacts of climate change on selected natural hazards. Selected hazards are relevant for spatial planning concerns.

In order to determine a risk factor, the project has three dimensions of vulnerability: economic, social and ecological.

Hazard clusters shows the regions in Europe that are affected by certain (mostly interdependent) hazards. Main clusters which could be the basis for special policy recommendations and spatial planning response are among others coastal areas, Alpine areas, Mediterranean areas, river valleys, tectonic active zones and the “Pentagon Area”. These clusters and findings can be used when investigating the territorial trends of natural and technological hazards in European regions. The project 1.3.1 has several policy recommendations that are valuable and useful also for the project 2.4.1 as such, e.g. coordination of Structural Funds for risk management, implementation of the recommendations of the 6<sup>th</sup> Environmental Action Programme in broadening the scope of the SEVESO II Directive (Directive 1996/82/EC), ensuring the effective implementation of the Strategic Environment Assessment Directive (Directive 2001/42/EC), enhancing the use of Water Framework Directive (Directive 2000/60/EC) for integrating land use planning and water resources management.

#### Examples of suitable indicators of project 1.3.1:

Single hazard indicators, e.g. chemical plants density, major river flood events 1987-2002, oil transport, NUTS 3

Aggregated technological hazard indicator, NUTS 3

Aggregated natural hazard indicator, NUTS 3

Aggregated hazard indicator, NUTS 3

Vulnerability indicators, e.g. fragmented natural areas (degree of natural vulnerability), integrated vulnerability of Europe, NUTS 3

Climate change indicators, e.g. change of dry spell length or precipitation between present day and 2071-2100

Hazard interaction indicators, NUTS 3

The thematic scope and thematic context of **ESPON project 1.3.2** “Territorial trends of the management of the natural heritage” has been on natural heritage as an essential part of the environmental assets of each country. The European Landscape Convention, adopted on the 20<sup>th</sup> of October, 2000 in co-operation with the Council of Europe, states that the landscape contributes to the formation of local culture and is a basic component of the European natural and cultural heritage, promoting the consolidation of the European identity. Landscape is an important part of the quality of life of different areas of the European continent. It is also important to notice that Europe is very diverse from its physical structure. That leads to natural and cultural differences within the European territory.

Territorial trends, such as changes in agriculture, forestry and tourism or urbanisation, have been seen as a threat as well as a challenge to nature. These findings will be used also in

project 2.4.1 to better understand the distribution of environmentally important trends within Europe.

According to project 1.3.2 natural heritage of Europe includes all natural habitats and species in existence throughout Europe, within and outside recognised natural areas. Project 1.3.2 has collected European-wide information on landscapes, natural values, species diversity and richness as well as fragmentation of natural heritage. These findings will help the project 2.4.1 to make a proposal on feasible Territorial Impact Assessment of EU Environment Policy in a view of habitats and biodiversity. The recommended policy responses of project 1.3.2 and studies on exiting EU Environment Policy will also be examined and utilised when applicable.

#### Examples of suitable indicators of project 1.3.2:

##### Fragmentation of nature

The aim of the **ESPON project 2.1.1** “Territorial impact of EU transport and TEN policies” was to assess the territorial impact of EU transport and ICT (Information and Communication Technology) policies by defining the policy scenarios and evaluating the impacts of policies. The findings of project 2.1.1 can help to better understand the territorial trends, potentials and problems deriving from EU transport and TEN policies in different parts of enlarged European territory as well as the influences of these policies on spatial development. The environmental priorities have dominated discussions of transport policy. However, the discussion is not balanced and the emphasis varies between different member states from noise to safety and accidents to greenhouse emissions and air pollution. The project has found out three fundamental political goals: economic efficiency, spatial equity and environmental sustainability. These goals can raise different types of conflicts from which the conflict between spatial equity and environmental sustainability is also interesting in the view of EU Environment policy (also the conflict between environmental sustainability and economic efficiency is important but this conflict, however, was not studied by project 2.1.1.).

The key finding of the **ESPON Project 2.1.3** The territorial Impact of Common Agricultural Policy (CAP) and Rural Development Policy is that the CAP of the EU has worked against the European Spatial Development Perspective (ESDP) objective of balanced territorial development, and has not supported the ESDP objectives of economic and social cohesion. Pillar 1 (comprised of market support, mostly non-budgetary and direct payments) support mostly goes to the wealthiest regions of EU15. The Pillar 2 (agri-environmental and other ‘rural development’ expenditures) support was found to be higher in more peripheral regions of the community.

The project 2.1.3 has also discussed the territorial impacts of Agri-Environmental Programmes. A number of studies have pointed to evidence of environmental improvements generated by the programmes including reduction in soil erosion and pollution, limiting pressure from input use, conservation of habitats and maintaining cultural landscapes. But evidence of positive impacts on biodiversity is more limited. Besides, the programme’s effectiveness has in some cases been compromised by either poor targeting or implementation together with production linked support policies that associated with environmental problems.

There is no direct impact indicator created of the Agri – Environmental issue. This is probably because the environmental conditions vary widely from one area to another. One of the main tasks of project 2.4.1 will be the presentation of territorial trends in relation to the main

environmental issues like in this case the pressure from agriculture. The environmental issues classified by type together with the findings of project 2.1.3 will give more comprehensive picture of the territorial impact.

Examples of suitable indicators of project 2.1.3:

Total Pillar 1 support per agricultural work unit, NUTS2 (1999)

Total Pillar 2 support per agricultural work unit, NUTS2 (1999)

Value of fertilizer input per hectare of arable land, NUTS2 (Annual, 1990-2001)

Utilisable Agricultural Area (UUA) as a percentage of total land area, NUTS3, (2000)

Agricultural output per hectare, NUTS2 (Annual 1990-1997)

Agricultural output per AWU, NUTS2 (Annual 1990-1997)

FNVA (Farm Net Value Added) per AWU (Agricultural Work Unit), NUTS2, (Biennial 1990-1997)

**ESPON project 2.1.4** “Territorial trends of energy services and networks and territorial impact of EU energy policy” has provided the background for a more informed discussion of policy impact in Europe. Especially the links between EU Energy Policy and EU Environment Policy are also in focus of project 2.4.1. Based on the final report of project 2.1.4 the object of energy efficiency activities is to ensure rational use of energy resources and reduce adverse environmental effects of energy use. The development of renewable energy sources (wind, solar, biomass, hydro) is one of the most important challenges and objectives of EU Energy Policy based either on environmental concerns, but also on security of supply and reduction of energy dependence.

In the view of air quality the project 2.1.4 can provide the project 2.4.1 with useful information and indicators, i.e. the studies on Kyoto Protocol targets for greenhouse gas emissions and ceilings for acidification gases and development of renewable energy source along with the directive on “the promotion of production of electricity from renewable energy sources” (Directive 2001/77/EC). The developed environment related indicators greenhouse gas emissions and acidification gas emissions could help to monitor the existing air quality targets in Europe. Also the key policy recommendations of the project 2.1.4 on e.g. renewable energy development can be utilised.

Examples of suitable indicators of project 2.1.4:

Fossil fuels dependency

Greenhouse gas emissions

Acidification gas emissions

The other basic territorial analyses of ESPON key typologies such as the functional urban areas and socio-economic issues will also be used in purpose to combine them with environmental typologies

#### 4. Evaluation of data, spatial concepts and indicators

Under the ESPON 2006 programme one of the issues to be covered is the development of **integrated tools** and instruments for measuring and evaluate the territorial impact of **sectoral and structural polices in Europe** and improve the spatial coordination of sector policies.

**Indicators** have become a common tool to assess trends, impacts and the state of the environment. Combination of sets of variables leads to a single figure that can be compared to thresholds or measure the intensity of a process in different situations/environments/decisions. The trade off is the simplification of a complex process that may mask unwanted effects of certain practices or policies. Scale is an important driver behind different initiatives for two reasons: a) level at which process take place, and b) level of decision/management. Know-how built up on existing indicators at European, country and regional level should be the basis to identify possible synergies and gaps towards indicators to evaluate the impact of sectoral and structural polices in Europe.

Presentation of current territorial trends, structures and also territorial impacts of EU environmental policies is one of the primary issues in the applied research. To execute this objective the review of relevant data sets is a fundamental part of the work. *The first step* in the data evaluation procedure will be the assessment of data relevance for the objectives of the project. A list of key indicators envisaged related to the territorial situations and trends will be compiled. Control procedures to ensure robustness, consistency and comparability of the dataset are *the second step* of the evaluation process. This is the qualitative assessment, where the usability of the data will be evaluated in terms of accuracy (NUTS0-NUTS5), coverage (EU15-EU27+2), time period, reliability, etc. Depending of the type of the data different statistical tests and control procedures can be used in this evaluation work. In addition, quality assessment should include an analysis of the scientific soundness (scientific ground for the indicator), uncertainty derived either from the methodology or the data, and comparability to similar indicators.

Besides the relevance and quality assessment of data sets the characterization of data is increasingly important. As *the third step* a database will be developed in order to assist a comprehensive analysis of existing information on indicators, which should include as minimum requirements the following items:

- Indicator
- Owner (developer of the indicator)
- Data required and type of data (statistical, georeferenced)
- Update frequency
- Reporting unit
- Policies related to the indicator
- Economic sector/s
- Environmental issue/s (themes)

Existing ESPON metadata standards will be followed and the required notes of the data features will be made. Only this way it is possible for the user to assess if the indicator is suitable to be used in certain context.

As *a fourth step* in the data evaluation process a list of data gaps is created. Also a separate list of useful data where access has been denied or the costs were too high is necessary to be

documented for the future demands. The project group will be also responsible to elaborate a report on proposal for new indicators based on the integration of previous defined information/databases.

In order to include the environmental dimension in the study of the sustainable territorial development, the territorial trend analysis should be done below country level. This implies that the statistical and geographical data to identify positive and negative trends should be collected not only at country level (NUTS 0) level but also at regional level (NUTS2 NUTS3). Special attention will be paid on aggregation of data to higher levels, up scaling, retaining the most relevant information existing on the base. Also different type of reporting units will be considered according to specific policies analysed. Although the reporting unit may be NUTS3, the indicator will reflect different impacts or trends according to different land units.

The results based on these new indicators to define the spatial status, trend and territorial impact, and identify spatial disparities and imbalance of the EU territory could be used to monitor the political aim of a better-balanced and polycentric EU territory.

The environmental data, indicators and results to be reviewed are mainly coming from the following sources: EEA, OECD, EUROSTAT and ESPON. But also other possible sources are under the interest of project group. A short description about the different data sources to be used is presented below.

### **Evaluation of EEA indicators**

EEA publishes indicators on a regular basis, both in the annual "Environmental Signals" report and in indicator-based reports covering specific sectors and topics. The EEA has developed a Core Set of Indicators (CSI) with the aim to:

- Provide a manageable and stable basis for indicator reporting by the EEA
- Prioritise improvements in the quality and geographical coverage of data flows, especially priority data flows of the European environment information and observation network (Eionet)
- Streamline EEA/Eionet contributions to other European and global indicator initiatives, e.g. structural indicators and sustainable development indicators and OECD environmental indicators

Some relevant indicators of the EEA core set include:

- CSI05 - Exposure of ecosystems to acidification, eutrophication and ozone
- CSI08 – Designated areas
- CSI11 – Projections of green-house gas emissions and removals and policies and measures
- CSI14 – Land take
- CSI15 – Progress in the management of contaminated sites
- TERM – Fragmentation of ecosystems by urban areas and transport networks
- TERM – Land take by transport infrastructure
- TERM – Proximity of transport infrastructures to designated areas

### **Evaluation of OECD indicators**

Together with its member countries, the OECD has established a common approach and framework for developing, measuring and using environmental indicators: for instance the OECD Core Set and its Core Environmental Indicators (CEI), several sets of sectoral environmental indicators (SEI) (e.g. transport, energy), and a small set of key environmental indicators (KEI).

### **Evaluation of EUROSTAT indicators**

The ESPON project 3.1 has collected many of the relevant EUROSTAT data sets in the official ESPON data base. However, in case the some suitable data sets are not found there the following three EUROSTAT databases (REGIO, GISCO and SABE) are in use of ESPON partners.

### **Evaluation of ESPON indicators**

Besides the entire core set of ESPON indicators and typologies a special interest will be on the results of the ESPON projects 1.2.1, 1.3.1, 1.3.2, 2.1.1, 2.1.3 and 2.1.4 (hazards, natural heritage, CAP (Common Agricultural Policy) and energy). Discussion of some suitable findings and indicators can be found from this application in chapter 3. Other basic territorial analyses like ESPON key typologies such as the functional urban areas and socio-economic issues will also be used in purpose to combine them with environmental typologies.

## **5. Identification of relevant elements of the EU Environmental Policy**

The EU environmental policy is grouped into policy areas of the following environmental themes: Air, Biotechnology, Chemicals, Civil Protection and Environmental Accidents, Climate Change, Environmental Economics, Environment and Enlargement, Health, Industry, International Issues, Land Use, Nature and Biodiversity, Noise, Soil, Sustainable Development, Waste and Water. In some of these areas, the environmental strategies have an explicit spatial dimension and therefore are in the range of the ESPON research agenda.

The ESPON 2.4.1 project will review EU policies in relevant environmental areas and develop tools and methodologies to assess the importance and influence of the environment as a spatial and economic development factor. The themes of concern are described below.

**Table:** Overview of environmental themes that are part of the EU environmental policies (++: strong; +: moderate; o: low spatial planning relation)

<b>EU environmental theme</b>	<b>Explicit spatial planning dimension</b>	<b>Chapter in this tender</b>
Air	+	5.1
Biotechnology	+	5.2
Chemicals	+	5.3
<b>Civil protection and environmental accidents</b>	<b>++</b>	<b>5.4</b>
Climate change	+	5.5
<b>Land use</b>	<b>++</b>	<b>5.6</b>
<b>Nature and biodiversity</b>	<b>++</b>	<b>5.7</b>
Noise	+	5.8
<b>Soil</b>	<b>++</b>	<b>5.9</b>
<b>Waste</b>	<b>++</b>	<b>5.10</b>
<b>Water</b>	<b>++</b>	<b>5.11</b>
Environmental economics	o	5.12
Health	o	
International issues	o	
Environment and enlargement	Some, but very broad set of policies included which are also parts of other policy areas	
Sustainable development	Some, but very broad set of policies included which are also parts of other policy areas	
Industry	Some, but also part of other policy area	

## **5.1. Air**

In the 6th EAP, Environment and Health are included as one of the four main target areas of which air pollution is one of the issues highlighted in this area. A main target of the 6th EAP in this respect is to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment. The EU air quality policy acts acting on different levels to reduce the exposure to air pollution:

- EC legislation,
- work at international level to reduce cross-border pollution,
- co-operation with sectors responsible for air pollution,
- national, regional authorities and NGOs,
- research.

Concerning air quality, the following documents represent the basis for the EU air quality policy:

- *Air quality framework directive*: In 1996, the Framework Directive 96/62/EC on ambient air quality assessment and management was adopted which revises previously existing legislation and introduces new air quality standards for previously unregulated air pollutants, setting the timetable for the development of daughter directives on a range of pollutants.
- *Directive on air pollutant values*: This air quality framework directive was followed in 1999 by a “daughter Directive” (1999/30/EC) setting limit values for PM10 as well as the pollutants nitrogen dioxide, sulphur dioxide and lead. The limit values are to be met by certain dates (1 January 2005, with the exception of nitrogen dioxide).
- *Clean Air for Europe (CAFE)*: The aim of this programme is to develop a long-term, strategic and integrated policy advice to protect against significant negative effects of air pollution on human health and the environment. It will lead to the adoption of a thematic strategy on air pollution under the 6th Environmental Action Programme by mid 2005.

The EU air quality policy has an area-wide approach and contains a mix of instruments and measures. On the one hand, this applies for projects as sources of air pollutants. On the other hand land-use has influence on air-quality as it can interrupt and redirect fresh and cold air streams. This has influence on the concentration of substances that might be regulated (e.g. by the Directive on air pollutant values).

Air quality has some influence on the economic development especially in areas where the economy relies on sectors which are vulnerable towards a low air quality, like areas with a high share of agriculture or tourism. In these areas the quality of the products (agriculture) or the attractiveness of the area (tourism) might be reduced due to a low air quality. Further, a high concentration of particular matter (PM10) might affect the transport and logistic industry due to bans for trucks (see Framework Directive 96/62/EC and Directive 1999/30/EC).

A low air quality has indirect effects, as it is one factor (of many) that might encourage people to move to areas with better environmental conditions, but this is outside the spatial approach of the ESPON projects.

## **5.2. Biotechnology**

The rise of biotechnology and genetically modified organisms (GMOs) and the public concern about possible negative impacts have highlighted the need for policies at EU and international level to ensure that these concerns are addressed. Since the early 1990s the EU has adopted rules and regulations on GMOs which cover the use, traceability and labeling of GMOs or products and feeds containing GMOs. However, these policies do hardly have an explicit spatial dimension and are therefore not in the ESPON focus.

## **5.3. Chemicals**

Since many decades it is a common European sense that there is a need to protect the Community’s environment and to create common standards to protect consumers. Thus, the early environment legislation of the Community dealt with products, amongst them dangerous chemicals. In 2001, the European Commission adopted a White Paper describing the strategy for a future Community Policy for Chemicals. Although there might be some indirect connections to aspects of spatial development, these connections are too weak to be



considered as spatially relevant in the ESPON context. However, chemical accidents will be considered due to their relevance in the context of civil protection policy.

#### **5.4. Civil Protection and Environmental accidents**

The overall objectives of this policy element are “to ensure better protection of people, the environment, property and cultural heritage in the event of major natural, technological and radiological disasters, including accidental marine pollution, chemical spills as well as terrorist attacks, occurring inside or outside the EU”. In this context, a linkage to the water policy has to be pointed out, since a directive on flood risk management is under preparation (see also chapter 5.11.2).

For that purpose, attention will be paid to whole disaster circle (prevention, preparedness, information, intervention, post disaster analysis and recovery ([http://europa.eu.int/comm/environment/civil/prote/cp01\\_en.htm](http://europa.eu.int/comm/environment/civil/prote/cp01_en.htm)). More information can be found in particular in the final report of the ESPON 1.3.1 project (Schmidt-Thomé 2005) and the EEA Environmental issue report No. 35 “Mapping of impacts of recent natural disasters and technological accidents” (EEA 2004). Especially the management of natural hazards is named in the ESDP explicitly (goal 142 in connection with policy option 46 “Development of strategies at regional and transnational levels for risk management in disaster-prone areas”).

In particular, the solidarity fund, which has been created after the Elbe flood in 2002, can be seen as example for environmental policy which is already used integrative in order to cover environmental, social and economic consequences of occurred disasters. However, the solidarity fund works so far only reactive in order to give assistance to the recovery after an occurred disaster. A more proactive approach aiming at an improved disaster prevention could be a good example for integrating environmental aspects better in territorial development.

Disaster prevention is also an important part of the cohesion policy (Inforegio 12/2004). The following table indicates the strengthened role of risk prevention within cohesion policy:

	Period 2000 - 06	Period 2007 - 13
<b>Regional development</b>	<p><b>Revised strategic guidelines</b></p> <ul style="list-style-type: none"> <li>Realisation of geological or stabilisation studies</li> <li>Prevention plans for natural risks</li> </ul> <p><b>Interreg III</b></p> <ul style="list-style-type: none"> <li>Joint planning and guidelines for the improvement and management of border areas</li> <li>Highlighting sustainable development and conservation of cross-border forestry resources; disaster prevention</li> <li>Development of joint risk management strategies</li> </ul>	<p><b>“Convergence” and “Competitiveness” objectives</b></p> <p>Plans aimed at preventing and managing natural and technological risks</p> <p><b>“Territorial cooperation” objective</b></p> <p>Themes:</p> <ul style="list-style-type: none"> <li>Promotion of maritime security</li> <li>Protection against flooding and protection of internal maritime waters</li> <li>Prevention of and protection against erosion; earthquakes and avalanches</li> </ul> <p>Actions:</p> <ul style="list-style-type: none"> <li>Supply of equipment</li> <li>Development of infrastructure</li> <li>Drawing-up and implementation of transnational assistance plans</li> <li>Risk mapping systems</li> <li>Development of joint instruments for preventing, monitoring and combating risks</li> </ul>
<b>Rural development</b>	<p><b>EAGGF</b></p> <p>Prevention and repair of natural risks and forest fires affecting agricultural and forestry production</p>	<p><b>ERDF</b></p> <p>Prevention and repair of natural risks and forest fires affecting agricultural production and forestry production</p> <p>Development of forestry resources and improvement of their quality:</p> <ul style="list-style-type: none"> <li>Initial forestation of agricultural and non-agricultural land</li> <li>Strengthening of the protective role of forests in combating soil erosion</li> <li>Management of water resources and water quality</li> </ul>
<b>Fisheries policy</b>		<p>Reconstitution of the production potential of the fisheries sector damaged by natural or industrial disasters</p>

Source: inforegio No. 15, December 2004.

In addition to the so far described overall objectives, some specific tools exist for marine pollution and chemical accidents. Whereas the EU activities in the field of marine pollution are mainly not from spatial relevance, the SEVESO II Directive and its spatial relevance should be discussed more in detail.

On the one hand major accident hazards belong to some of the most important and best studied technological hazards. Within the European Union a specific directive, the SEVESO II Directive is responsible for these types of hazard. But on the other hand the consideration of technological hazards can be understood as a new task for spatial planning.

Council Directive 96/82/EC (SEVESO II) aims at the prevention of major accidents involving dangerous substances, and the limitation of their consequences. The provisions contained within the Directive were developed following a fundamental review of the implementation of Council Directive 82/501/EEC (SEVESO I). In addition, Directive 2003/105/EC of the European Parliament and of the Council of 16 December 2003 amending Council Directive 96/82/EC has to be considered. This first amendment of the SEVESO II directive was to cover risks arising from storage and processing activities in mining, from pyrotechnic and explosive substances and from the storage of ammonium nitrate and ammonium nitrate-based fertilizers.

The requirements for land-use planning (Art. 12 SEVESO II Directive) are newly introduced into Community legislation on major-accident hazards; the SEVESO I Directive did not contain such requirements. The context is elaborated by Recital (22) of the SEVESO II Directive which states: *“Whereas, in order to provide greater protection for residential areas, areas of substantial public use and areas of particular natural interest or sensitivity, it is necessary for land-use and/or other relevant policies applied in the Member States to take account of the need, in the long term, to keep a suitable distance between such areas and establishments presenting such hazards and, where existing establishments are concerned, to take account of additional technical measures so that the risk to persons is not increased.”*

Although land-use planning requirements are newly introduced into Community legislation, several Member States have established practices for achieving a degree of separation between SEVESO establishments and residential population (e. g. in Germany: so called “Abstandserlass”). In general, the methods used are disparate, ranging from explicit consideration of the risks of major-accidents in some cases to a generic ‘zoning’ approach based on distances derived historically, normally by taking into account various environmental factors such as noise, pollution, etc. which give separation distances which are sometimes perceived to implicitly also take account of accident hazards. Some Member States have not yet established a land-use planning policy and system that address major-accident hazards. However, a consideration on the upper level of planning is not yet established.

In general, the requirements of Article 12 of SEVESO II can be met using whichever method that fits best with the historical development and legislative style that has evolved for land-use planning in each Member State. All in all it can be expected that practices within individual Member States would yield broadly similar results in similar situations.

Keeping in mind that spatial planning is responsible for an entire area, a consideration of major accident hazards has to be spatial oriented and should not focus primarily on the permission of single facilities. The new Strategic Environmental Assessment (SEA; 2001/42/EC) offers a suitable instrument for dealing with hazards on a higher level of planning. Hazard related risk assessment and management of natural and technological hazards can be integrated into the SEA. Due to the given material and procedural similarities between the SEA on the one hand and risk assessment and management on the other hand such integration can be characterised as manageable and necessary at the same time for fulfilling the SEA requirements. Moreover, the important role of spatial planning as one of the main addressees of the directive as well as the risk management of natural and technological hazards has to be stressed.

## **5.5. Climate Change**

Climate change is one of the four priority areas for urgent action in the 6th Environmental Action Programme. Apart from the contribution to international efforts to combat climate change (United Nations Framework Convention on Climate Change and its Kyoto Protocol), the EU is taking serious steps to reduce its own greenhouse gas emissions. The EU strategy is laid down in the European Climate Change Programme:

- *European Climate Change Programme (ECCP)*: The goal of the ECCP is to identify and develop all the necessary elements of an EU strategy to implement the Kyoto Protocol. In a following ECCP report, 42 possible measures are identified, which could lead to some 664-765 MtCO<sub>2</sub> equivalent emissions reductions that could be achieved against a cost lower than 20€/tonne CO<sub>2</sub> equivalent. This was followed by the decision on measures to tackle climate change of which especially the emission trading system (Directive 2003/87/EC), which has started in 2005, will have some spatially relevant effects because certain businesses and industries are enabled to trade their allocations for CO<sub>2</sub> emissions.

These spatial effects are however only of indirect nature (e.g. increase of natural hazards like droughts and river floods). Therefore, climate change as such will not be in the focus of the ESPON 2.4.1 project. However, the areas of “civil protection and environmental accidents“, ”nature and biodiversity” or “water” will cover some of the indirect spatial effects.

## 5.6. Land Use

Land use can have major impacts on environmental conditions, which can be direct (e.g. destruction of natural habitats and landscapes, consumption of natural and agricultural land by urban sprawl) or indirect (e.g. increasing the amount of traffic on roads leading to more congestion, air pollution and greenhouse gases). With land use related environmental policy the European Commission tries to ensure that Member States take environmental concerns into account when setting up spatial planning documents. In the environmental theme of land use, the Commission has four major goals:

- Development of methods and tools to analyse the impact of future development, such as the *Directive on Environment Impact Assessment (EIA)* for projects and the *Directive on Strategic Environmental Assessment (SEA)* for plans and programmes, which might lead to serious impact on the environment. Relevant for spatial planning (land-use planning) as well spatially relevant sectoral planning
- Improvement of the information flow between policy-makers and citizens on land use issues by initiatives like *INSPIRE (Infrastructure for Spatial Information in Europe)* and *GMES (Global Monitoring for Environment and Security)*.
- Development and implementation of a European *urban environment strategy* for a sustainable and integrated approach to urban development and management that works in harmony with natural systems rather than against them.
- Improvement of planning, management and use of Europe's coastal zones where the EU is working to introduce a coordinated policy for the Union's coastal zone regions. Main instrument is the 2002 EU Recommendation that urges Member States to put in place national strategies for *Integrated Coastal Zone Management (ICZM)* which promotes an integrated territorial approach which covers coastal protection, landscape planning and spatial planning

With the instruments in these areas the EU explicitly tries to influence spatial development in a way that negative impacts on the environment will remain low. Thus, the environmental policy area of land use has to be seen as one of the core areas for the ESPON 2.4.1 project. However, the EU has no direct competences in the field of spatial planning. In consequence, spatial development policies like the ESDP have to be seen to a certain extent as substitute, although its objectives are not legally binding. Nevertheless, as the member states agreed voluntarily on the ESDP, a serious influence on national planning legislation and policy can be seen. In addition, the ESDP has to be understood as orientation for the community initiatives like INTERREG. In consequence, EU land use policy will not be treated particularly as test case, but it will be taken into consideration in other contexts of the project anyway (especially EIA and SEA).

## 5.7. Nature and Biodiversity

The Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (FFH directive) establishes a European ecological network known as "Natura2000". The Natura2000 network is the European ecological network of sites established under the Habitats Directive. Its main purpose is the protection of habitat types and plant and animal species of Community interest in the European Union. It comprises both special areas of conservation (SACs) designated under the 1992 Habitats Directive, and special protection areas (SPAs) classified under the Directive 79/409/EEC (EU Commission 2004, p. 4).

The EU Commission has recognised that the management of designated NATURA 2000 areas needs to be co-financed: *“It is therefore crucial that, as the designation process set out in the Habitats Directive nears its conclusion, attention now turns more towards management of the sites. The implementation of these management plans clearly raises the issue of the availability of the required financial resources for their implementation. Community funding is necessary in order to implement fully the network and provide support for the efficient management of the numerous sites of the network.”* (EU Commission 2004, p. 8.). As possible solutions for co-financing the implementation of Natura2000, three options have been discussed: make use of existing community funds, make LIFE-nature the delivery mechanism and create a new fund or initiative (EU Commission 2004, p. 23).

The Biodiversity Strategy of the Community (European Commission 1998) provides a framework for addressing objectives of sustainable use of biodiversity across the territories that do not constitute “protected areas”. The strategy defines a number of relevant territorial concepts including ecological corridors and buffer zones and rural areas that constitute an important factor for combining economic objectives with nature and landscape conservation.

## **5.8. Noise**

The European Commission developed a new framework for noise policy which shares the responsibility between the EU, the Member States and the local level. It includes measures like the creation of a Noise Expert Network, the Directive on Environmental Noise, the Directive on Equipment Used Outdoors and the follow-up and development of existing EU legislation relating to sources of noise.

## **5.9. Soil**

EU soil policy started relatively late compared to other environmental themes. The commission started a thematic strategy on soil protection in 2004, consisting of a legislation on a Community information and monitoring system on soil as well as a set of detailed recommendations for future measures and actions. The strategy is one of seven thematic strategies under the 6th EAP. A first step for the development of an EU policy to protect soils against threats such as erosion and pollution, the Commission has published a Communication “Towards a Thematic Strategy for Soil Protection” which will set the basis for more solid soil protection in the future. The Communication identifies eight threats: erosion, contamination (both local and diffuse), decline of soil organic matter, soil biodiversity, soil sealing, compaction, floods and landslides and salinisation. These threats have been discussed in five technical working groups lead by the DG ENV and in an Advisory Forum. In July 2005 the DG ENV launched a public consultation in Internet to gather opinions on possible elements of a Proposal for a Soil Thematic Strategy.

As this policy area is still at the beginning, it will be difficult to address spatial effects of the soil policy in the frame of the ESPON project 2.4.1, but it will be considered in the context of SEA and EIA.

## **5.10. Waste**

The waste management strategy of the European Union is based on the three principles of *waste prevention, recycling and reuse* and *improvement of final disposal and monitoring*. These principles are part of the Communication towards a thematic strategy on the prevention and recycling of waste (COM (2003) 301). This Thematic Strategy is one of the seven thematic strategies in the 6th Environmental Action Plan. The objective of this

Communication is to launch a process of consultation of the Community institutions and of waste management stakeholders to contribute to the development of a comprehensive and consistent policy on waste prevention and recycling. Similar to the policy area of soil, also the waste policy area is still at the beginning. Similarly to soil policy, waste will be considered indirectly by the SEA and EIA.

## 5.11. Water

Concerning water, the following documents represent the basis for the EU air quality policy:

- *EU Water Framework Directive*: On 23 October 2000, the “Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy” or short the *EU Water Framework Directive* (WFD) was adopted. The WFD aims at an integrated river basin management for Europe.
- *Forthcoming Directive on Flood Risk management*: Currently a directive on flood risk management is under development which aims at setting a framework for flood mapping and flood risk management plans in order to supplement the WFD in the areas of river and coastal flooding (European Commission 2005; 2005a; see also [http://europa.eu.int/comm/environment/water/flood\\_risk/](http://europa.eu.int/comm/environment/water/flood_risk/)).
- *Other thematic directives*: Urban Waste Water Treatment Directive(91/271/EEC), Nitrates Directive (91/676/EEC), Bathing Water Quality Directive (Council Directive 76/160/EEC concerning the quality of bathing water) and its proposed revision, Drinking Water Directive (98/83/EC).

### 5.11.1. Directive 2000/60/EC (Water Framework Directive)

The river basin approach aims at congruence between the ecosystem water (ground water, surface water) and the institutional arrangements created to manage human activities affecting the water system. The WFD offers for the first time integrated instruments and procedures (e.g. river basin management plans including a program of measures) in order to take care for a comprehensive river basin management within the whole EC. These instruments will be binding for all public authorities. In consequence, water management will influence spatial as well as economic development seriously. From an economic point of view Art 9 “Recovery of costs for water services” is probably the most important issue. In accordance to § 1 “*Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle.*”

The discrepancies between the water basin approach on the one side and legislative and administrative jurisdictions on the other side indicate the need for going beyond territorially based, hierarchical forms of governance. The integration of water basin oriented planning and policy at different spatial scales can be seen as one starting point for integrating policies and planning in complex, multi-agent settings. This should not mean that more traditional forms of regulation (“command and control”) are totally obsolete or outdated. After all, instruments such as legally binding plans and project related permissions are important for fulfilling the main objectives of the WFD, determined mainly in Art. 4. The protection of water is often contradictive to several kinds of spatial development like further settlement, infrastructure and intensive agriculture, and thus require clear regulatory measures.

However, integration and cooperation across scales helps to address the problem of compatibility between the scope of the river basin approach and the institutional arrangements (e.g. of the present water management authorities). According to Meadowcroft (2002) it has

to be pointed out that “*There are many inconsistencies in this formal hierarchy of scale. [...] And territorially rooted institutions are constantly being stretched to engage with issues which escape their jurisdiction or infiltrate their frontiers.*” Other authors highlighted, that the effectiveness of the implementation of an EU-directive depends in the first instance on the fitting of the directives approach (here: the water basin approach) on the one hand and the existing institutional arrangements on the other hand (Knill/Lenschow 2000: 30).

In this context, research on the institutional dimensions of environmental change has identified three “cutting-edge” themes that are known as the problems of fit, interplay, and scale. Young (2002: 19 ff.) gives a closer description:

- *Problem of fit*: The problem of fit deals with congruence or compatibility between ecosystems and institutional arrangements created to manage human activities affecting these systems. Overall, the presumption is that the closer the fit between ecosystems and institutional systems, the better the relevant institutions will perform.
- *Problem of interplay*: Most institutions interact with other similar arrangements both horizontally and vertically. Horizontal interactions occur at the same level of social organisation. Vertical interplay is a result of cross-scale interactions or links involving institutions located at different levels of social organisation. Interplay between or among institutions may take the form of functional interdependencies or arise as a consequence of politics of institutional design and management. The problem of interplay is a consequence of the existence of a multitude of actors.
- *Problem of scale*: Scale has to do with the levels at which phenomena occur in the dimensions of space and time. Much work on regimes dealing with common-pool resources, for example, is based on the study of small-scale, typically local arrangements devised to deal with human uses of natural resources. At the same time, many observers have noted the fact that some global systems like the Earth’s climate system, also exhibit the defining features of common-pool resources. Therefore it has to be asked whether propositions derived from the study of small-scale systems apply to global common-pool resources as well and vice versa. The problem of scale can be seen as already identified and to a large extent solved by the WFD itself and the national water management authorities. In the consequence, a detailed system of achievements on the several spatial levels (river basin district, sub basin) was carried out.

### 5.11.2. Forthcoming Directive on Flood Risk management: Flood mapping and flood risk management plans

The forthcoming directive will consist of a flood mapping and a flood management part. General purposes of *flood mapping* (which consists of flood hazard maps and flood risk maps, where required) are to

- increase public awareness of the areas where floods can occur, the nature and degree of danger and what the consequences of floods can be,
- support the processes of prioritising, justifying and targeting investments and developing sustainable policies and strategies in order to manage the risk to people, property and the environment and
- support the flood risk management plans, spatial planning and emergency plans.

The principal purpose of the *Flood Risk Management Plans* will be to identify and address flood risk management objectives and promote sustainable flood management policies (European Commission 2005).

The development of a Directive on Flood Risk management aims at supplementing the WFD and at an integration of both directives on the level of river basins. In its article 1 the WFD refers to “*contributing to mitigating the effects of floods and droughts*”; however, in its operational objectives (inter alia articles 4, 11, 13) it has no operational obligations as regards flood prevention or protection, with the exception of an obligation to provide for precautionary measures against pollution in the case of floods (article 11(3)l) (European Commission 2005a). By the Council Conclusions of 14 October 2004 it was reconfirmed that “*the development of river basin management plans under the Water Framework Directive and of flood risk management plans are elements of integrated river basin management; the two processes should therefore use the mutual potential for synergies*”.

To achieve this objective, the Commission does not intend to propose an amendment of the WFD, but to propose a separate Floods Directive whilst ensuring the necessary linkages by legislative measures (within the Floods Directive) as well as informal implementation measures (to be guided by the EU Water Directors, cf. inter alia Council Conclusions) (European Commission 2005a). In this context, the close linkage of the water policy (Flood risk management directive) to the environmental policy “civil protection” is clearly visible.

It is of great interest that a new working document, elaborated by the Directorate-General Environment of the Commission, has highlighted the potential relevance of the SEA for risk assessment: “*Community legislation already provides that major projects or programmes have to be accompanied by an environmental impact assessment. It is also important to ensure that projects and programmes do not unduly increase the risk to people or the environment. For this reason, a flexible tool should be conceived to ensure that proper account has been taken of the risk.*” (European Commission 2003, 4, subchapter safety impact assessment).

## **5.12. Policy areas with no specific spatial relevance or covered by other policy areas**

*Environmental Economics, Health and International Issues* also belong to the EU environmental policy areas. These have no or only very indirect spatial relevance and will therefore not be considered in ESPON 2.4.1 project.

Concerning the policy areas of *Environment and Enlargement, Industry and Sustainable Development* the case is different: These environmental policies do have some spatial effects. But in the case of Environment and Enlargement and Sustainable Development the areas comprise a very broad set of policies which make it difficult to extract those elements which are responsible for certain spatial effects. Further, these policies (also in the area of *Industry*) are also a part of other more specific policy areas (e.g. the Directive on the control of major-accident hazards as a part of the civil protection and environmental accidents policy area). A consideration of these would lead to some duplication.

## **5.13. Selected elements of European environmental policy**

The ESPON 2.4.1 project will consider three test cases of EU Environmental Policy issues for the assessment of territorial impacts. The issues will be finally selected in the beginning of the project in a thorough evaluation. Based on the preliminary review of the elements of environmental policy the following issues considered to be important for territorial development are envisaged as test cases:

- *Habitat/Biodiversity*: These elements will be examined together. Habitat can be seen as example for environmental policy that concentrates on certain areas (coherent net of



protected areas, NATURA 2000). Since the reporting process is mainly completed, the influence of the protection of certain areas on territorial development can be examined. In addition, the starting management process allows to analyse the economic aspects of the directive, in particular the financing of the continuing fostering of the areas. The strategy is in the first instance command and control oriented. Habitat is complemented by the more programmatic biodiversity strategy.

- *Water management*: The WFD directive possesses a comprehensive spatial approach. It makes use of a broad mix of instruments and measures. Although at a present stage the monitoring process is in the focus of the responsible authorities, the coming programmes of measures and management plans will seriously influence territorial development. In addition the directive owns an economic aspect (Art. 9).
- *Civil Protection*: This policy contains the whole disaster circle. In particular disaster prevention is of highly relevance for territorial development (see final report ESPON 1.3.1). In addition, instruments like the solidarity fund can be understood as possibility for the integration of environmental aspects in territorial development. The ecologic, social and economic impact of environmental policy could be assessed by this example properly. In addition, the SEVESO II directive contains with Art 12 a spatial and environmental component.

As already stated in chapter 2.1 the following list of elements of EU Environmental Policy will be considered for the three test cases:

- The 6th EAP. Priority will be given to effective implementation and enforcement of environmental legislation and integration of environmental concerns into other policies, including on infrastructure. Additionally some attention will be paid to the use of a combination of means to achieve ends in the most efficient and effective way and wide stakeholder involvement in the development and implementation of policies.
- LIFE.
- Environmental assessments with a focus on the SEA.

## **6. An appropriate methodology for the territorial impact assessment of European policy**

The term „Territorial Impact Assessment“ is used in the ESDP and understood as an assessment tool for evaluating major projects. It is defined as “a tool for assessing the impact of spatial development against spatial policy objectives or prospects for an area” (ESDP Action Programme Progress Reports). In particular, the ESDP mentions the Territorial Impact Assessment mainly in the following policy options:

- *Policy option 29*: Introduction of territorial impact assessment as an instrument for spatial assessment of large infrastructure projects (especially in the transport sector).
- *Policy option 52*: Application of environmental and territorial impact assessments for all large-scale water management projects.

In the ESPON programme it was intended to develop such kind of tool for EU *policies* and *programmes* which – although not having explicit territorial development goals – might however influence spatial development. One of the core aims of the ESPON programme is to assess how and to what degree these policies and programmes are affecting territorial development. Due to foreseeable methodological difficulties and the complexity of the assessment of policies it was agreed to use a different term in the ESPON context: Territorial

*Impact Analysis.* In the ESPON project 3.1 (Final Report) it is shown that a Territorial Impact Assessment (TIA) is also restricted to two major areas:

- a compilation of the policy measures in certain regions (input side, e.g. financial interventions), recording what spatial development goals they follow and
- the structural status/changes in these regions (output side) evaluated against the chosen spatial development goals.

The **addressees of this methodology** are decision makers on different spatial levels who will then be able to better estimate territorial impacts and the interplay of policies.

- On the *EU level* the methodology will help those who decide upon the design of policies which are always in danger to contradict with other policies, at least when it gets down to the local level. Here a territorial impact analysis helps to see if the environmental policy supports certain spatial goals on the EU level and to estimate if certain policies contradict with each other.
- On the *transnational and national level* a TIA can help to improve the adjustment of EU and national policies as well as policies from neighbouring countries.
- The *regional and local level* is always where things finally have to be decided, where contradictions become manifest and where decisions have to be communicated with the public. At the same time, the complexity is enhanced because on the regional and local level a multitude of influences has effects on the spatial structure, namely the different sectoral planning activities. These can be EU policies, national policies but also decisions that are made on the regional and local level. Often it is difficult to identify those forces that have the main influence. This is however important in order to make appropriate decisions in order to reach spatial objectives. In this context, a TIA helps to analyse and identify the main factors of influence.

## **6.1. Guidelines, principles and context of the methodology**

The methodology for the territorial impact assessment of EU environmental policies will be designed in a way that ESDP policy options can be operationalised. In general, one could of course ask how EU environmental policies influence any of the 60 policy options that are mentioned in Part A of the ESDP. However, the methodology to be developed in ESPON project 2.4.1 will concentrate only on policy options concerning the areas which explicitly point at the spatial objectives “polycentricity” and “cohesion” as well as of the environment. These policy options can be seen as an assessment basis for the application of the territorial impact assessment method (see Chapter 6.3). The methodology to be developed will be described below and takes into account the following principles:

- *TIA minimum requirements* (as shown by ESPON project 3.1, Final Report, Part C, Annex 7),
- *Three-level-approach* as the appropriate typology group for the analysis of environmental policies (as shown in the Crete Guidance Paper, p. 11 and the Matera Guidance Paper, p. 10f).

### **6.1.1. Territorial Impact Analysis of EU Environmental Policies**

The development of a methodology for a territorial impact assessment of European Environmental policy can be regarded from two perspectives: (1) Environmental policy perspective: Which are the main environmental policies in the EU and which goals and effects

do they have on spatial development? (2) Spatial development perspective: What are the goals of European spatial development and how they are influenced by the EU environmental policy? A TIA can assess the policy impacts at the intersection of both perspectives.

In the introduction, the ESDP and the objectives of the EU cohesion policy were already introduced as the assessment base for territorial impacts. Therefore, the TIA has to assess the effects of EU environmental policy on the goals and objectives of European spatial development as laid out in the ESDP and the Cohesion Report. This is the macro level of the analytical approach that will be described below.

In the first phase of the ESPON programme, all TPGs developed their own TIA approach. The Final Report of the 3.1 project (pp. 433ff) shows the large variety of approaches that has been developed in the ESPON policy impact projects. Parallely, ESPON project 3.1 developed minimum requirements for a TIA which however could not always be taken into consideration by all projects.

The advantage of the ESPON 2.4.1 project is that it can build upon the experiences of the previous policy impact projects and will be able to take into account several requirements and could be oriented at certain goals and quality levels that have been established in the meantime:

- Territorial Impact Assessment Manual including minimum requirements for a TIA (as developed by ESPON project 3.1, Final Report, Part C, Annex 7);
- Findings about the implementation of Territorial Impact Analysis in the ESPON programme (as described by Schindegger & Tatzberger in the 3.1 project Final Report, pp. 425ff);
- Taking into account and use elements of already applied TIA approaches of previous ESPON projects (e.g. 2.1.2 – EU Research and Development Policies, 2.1.3 – CAP and Rural Development Policy, and others).

The ESPON 3.1 project has developed TIA minimum requirements which can be considered as a check-list for the ESPON priority two projects. These requirements are also a result of the experiences from other TPGs which have developed very different approaches and methods to analyse impacts of policies and programmes. The following box summarises the requirements:

### **Scoping**

#### **(1) Reference to policy interventions**

Designation of the causing interventions assignable to EU budget lines

*Question to be answered: What is causing the impacts?*

#### **(2) Hypothesis on cause-effect-relations**

Basis: hypothesis concerning cause-effect-relations (with varying empirical proof),

*Question to be answered: What is changed by the intervention(s)?*

#### **(3) Regional scale of observation**

Designation of geographic reference to be used: regions concerned by intervention/effect; territorial level(s) of

observation; covering all or selected (by what criteria) regions cause-effect relations

*Question to be answered: Level of observation and analysis?*

#### **(4) Reference to past and future**

Cause-effect relations in the past as the basis for predicting the effects of future interventions; empirical experiences as well as outlooks to the future crucial for analytic treatment and political perception

*Questions to be answered: What has happened, what may happen in future?*

### **Analysing**

#### **(5) Interventions and effects measured**

Implementation of the hypothesis concerning cause-effect-relations

*Question to be answered: What is registered, measured, appraised?*

#### **(6) Quantitative/qualitative appraisal**

Designation of type of indicators selected

*Question to be answered: By what kind of indicators the topic is described?*

#### **(7) Technique of analysis**

Designation of type of analysis used

*Question to be answered: How is the analysis performed?*

### **Assessing**

#### **(8) Goals referred to**

Designation of criteria for evaluation derived from the two ESPON key concepts focusing on the spatial dimension

##### **– Polycentric spatial development**

- at European level: several metropolitan regions as global integration zones instead of only one
- at transnational level: enforcement of a polycentric system of metropolitan regions, city clusters and city networks
- at national level: systems of cities including the corresponding rural areas and towns open for application at lower levels, e.g. for the development within city regions (intraregional)

(polycentric development at one level does not necessarily go along with the same at the other levels)

##### **– Cohesion**

- Economic: balanced territorial development concerning economic performance
- Social: balanced territorial development concerning employment, income, education, population change
- Territorial: fair access for citizens and economic operators to services of general economic interest; balanced distribution of human activities

Other goals derived from official documents may also be taken into account if they are related to types of regions or particular spatial entities mentioned below (9)

*Question to be answered: What goals are referred to?*

**(9) Applied meaning of 'spatial/territorial'**

Designation of the concept of 'spatial/territorial' used according to the policy area concerned

*Question to be answered: What concept of 'spatial/territorial' applied?*

**(10) Territorial coverage of outcome**

Designation of the general format of results covering the whole territory (referring to each region) or a selected sample of regions (case studies)

*Question to be answered: What do the results look like?*

**Box 1:** Minimum requirements for TIA in ESPON 2006 projects (Schindegger & Tatzberger in ESPON project 3.1)

### 6.1.2. Applying the ESPON three-level-approach for policy analyses

According to the three-level-approach as described in the Crete Guidance Paper (and ESPON 3.1 project) the analysis of the effects of EU environmental policies will be done along the following spatial levels:

- *EU level:* Environmental policies have effects on the spatial goals of the ESDP and the Cohesion Report (mainly polycentrism and cohesion) on the European level.
- *Transnational/national level:* At the same time, European environmental policy also has effects on spatial goals and objectives on the Member State level.
- *Regional/local level:* At the regional/local level the entirety of European, national and regional spatially relevant policies converge. At this level it becomes clear if certain policies are complemented, contradicted or duplicated.

The ESPON 2.4.1 project will address these three levels by assigning different levels of assessment to each of the three levels.

## 6.2. Elements of the TIA methodology

The elements of the TIA methodology consist of the ESPON principles which the methodology will take into account (Chapter 6.2.1) as well as of procedural steps that are considered important when applying the TIA (Chapter 6.2.2).

### 6.2.1. ESPON principles referred to

As described before, the methodology to be developed will be guided by two principles: the ESPON TIA minimum requirements and the ESPON three level approach. These two principles can be shown in a matrix. Looking at this matrix (see table below) it becomes obvious that the minimum mean different aspects for the spatial levels:

**Table:** Matrix of TIA minimum requirements on different spatial scales

	<b>EU level</b> (EU wide assessment)	<b>Transnational and national level</b> (case studies Northern Europe and South Eastern Europe)	<b>Regional and local level</b> (case studies Central Europe and South Western Europe)
<b>(1) Reference to policy interventions</b> Designation of the causing interventions assignable to EU budget lines	Which environmental policies and their elements have an	Which environmental policies and their elements have an impact on	Which environmental policies and their elements have an

<i>Question to be answered: What is causing the impacts?</i>	impact on EU level?	transnational and national level?	impact on regional and local level?
<b>(2) Hypothesis on cause-effect-relations</b> Basis: hypothesis concerning cause-effect-relations (with varying empirical proof), <i>Question to be answered: What is changed by the intervention(s)?</i>	What can environmental policies change on EU level? (identification by policy impact models, heuristic approaches)	What did environmental policies change on transnational and national level? (identification by policy impact models, heuristic approaches)	What did environmental policies change on regional and local level? (identification by thorough case study analysis, qualitative approaches like interviews etc.)
<b>(3) Regional scale of observation</b> Designation of geographic reference to be used: regions concerned by intervention/effect; territorial level(s) of observation; covering all or selected (by what criteria) regions; cause-effect-relations <i>Question to be answered: Level of observation and analysis?</i>	NUTS 2 level (eventually also NUTS 3 level)	NUTS 3 level	Sub-NUTS 3 level (regional and local context)
<b>(4) Reference to past and future</b> Cause-effect relations in the past as the basis for predicting the effects of future interventions; empirical experiences as well as outlooks to the future crucial for analytic treatment and political perception <i>Questions to be answered: What has happened, what may happen in future?</i>	Possible on a general level (e.g. How did/does a change in policies affect spatial goals on EU level in the past/in the future in comparison to the development without intervention?)	Difficult because on national level goals and objectives overlap as well as EU policies and national policies (for the future only possible if national variables are stable and EU variables change)	Almost impossible because EU, national and regional/local objectives and policies overlap; thus it will be difficult to identify/predict which EU policy has influenced/will influence spatial structures
<b>(5) Interventions and effects measured</b> Implementation of the hypothesis concerning cause-effect-relations <i>Question to be answered: What is registered, measured, appraised?</i>	Quantitative indicators: e.g. km <sup>2</sup> of NATURA 2000 areas per NUTS 2 (NUTS 3) region; water quality in rivers; number of new created jobs due to certain policy/directive etc.	Quantitative indicators: e.g. km <sup>2</sup> of NATURA 2000 areas per NUTS 2 (NUTS 3) region; water quality in rivers; number of new created jobs due to certain policy/directive etc.	Quantitative indicators: e.g. km <sup>2</sup> of NATURA 2000 areas in case study region; water quality in rivers; number of new created jobs due to certain policy/directive etc.; qualitative indicators
<b>(6) Quantitative/qualitative appraisal</b> Designation of type of indicators selected <i>Question to be answered: By what kind of indicators the topic is described?</i>	Quantitative	Quantitative	Quantitative and qualitative
<b>(7) Technique of analysis</b> Designation of type of analysis used <i>Question to be answered: How is the analysis performed?</i>	Classification of regions, input-output model, aggregate statistical analyses	Case studies (case studies Northern Europe and South Eastern Europe)	Case studies (case studies Central Europe and South Western Europe)
<b>(8) Goals referred to</b> Designation of criteria for evaluation derived from the two ESPON key concepts focusing on the spatial dimension – Polycentric spatial development – Cohesion <i>Question to be answered: What goals are referred to?</i>	Cohesion, polycentricity, ESDP guidelines/objectives	Cohesion, polycentricity, sustainability	Cohesion, sustainability
<b>(9) Applied meaning of 'spatial/territorial'</b> Designation of the concept of 'spatial/territorial' used according to the policy area concerned	Regions with highest environmental problems (regional disparities in the	Regions with highest environmental problems (regional disparities in the	Inner-regional disparities in environmental quality; areas of

<i>Question to be answered: What concept of 'spatial/territorial' applied?</i>	environmental quality)	environmental quality)	policy conflicts
<p><b>(10) Territorial coverage of outcome</b></p> <p>Designation of the general format of results covering the whole territory (referring to each region) or a selected sample of regions (case studies)</p> <p><i>Question to be answered: What do the results look like?</i></p>	Typology of regions (environmental quality and economic performance; environmental and other sectoral policies and regional or CAP policies)	Types of complementation or contradiction of different policies on the transnational/national level	Types of complementation or contradiction of different policies on the regional/local level
<p><b>(new) Interlinkages of policies</b></p> <p>Relation between environmental and (other) sectoral policies on different spatial level; their complementation, contradiction or similarities</p> <p><i>Question to be answered: How do EU, national and regional/local policies relate to each other?</i></p>	-	Complementation, duplication or contradiction of EU environmental (and other sectoral) and national environmental (and other sectoral) policies	Complementation, duplication or contradiction of EU environmental (and other sectoral), national environmental (and other sectoral) and regional/local environmental (and other sectoral) policies

The aspects shown for each of the three spatial levels characterise the assessment framework of territorial impacts of EU environmental policies on each of these levels. The following table lists the key questions for assessment of EU environmental policies on the different spatial scales.

**Table:** Key questions for assessment of EU environmental policies

	<b>EU scale</b>	<b>Transnational/national scale</b>	<b>Regional/local scale</b>
<b>Key questions for assessment</b>	How will the equity of environmental quality across the EU be affected by EU environmental policies?	Do EU environmental policies contribute to the development of successful inter-regional co-operation arrangements? Do these arrangements contribute to the development of equal environmental quality?	How will the environmental quality be influenced by EU environmental policies but also national environmental policies? Do contradictions or complementary effects exist between different EU policies on the regional/local level?

## 6.2.2. Integration of TIA and test cases

In the previous sub-section a matrix showing the minimum requirements of a TIA on different spatial scales was introduced. This following section will be based on the structure described above and will take into consideration the three identified test cases (habitat/biodiversity, water management and civil protection). For each of these cases the questions will be (preliminarily) answered on the European, transnational/national and regional/local level. In this way, the requirements for a TIA and the test cases can be integrated into the three spatial levels that are of major concern in the ESPON context.

### TIA for the selected test cases on European level

**Table:** Minimum requirements of a TIA for the selected test cases on European level

	<b>Habitat and Biodiversity</b>	<b>Water management</b>	<b>Civil Protection</b>
<p><b>(1) Reference to policy interventions</b></p> <p>Designation of the causing interventions assignable to EU budget lines</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What is causing the impacts?</i></li> <li>– <i>Which environmental policies and their elements have an impact on each spatial level?</i></li> </ul>	To be answered in the project's work packages	<p>What can environmental policies change on EU level? (identification by policy impact models, heuristic approaches)</p> <p>New environmental objectives</p> <p>New instruments</p>	To be answered in the project's work packages
<p><b>(2) Hypothesis on cause-effect-relations</b></p> <p>Basis: hypothesis concerning cause-effect-relations (with varying empirical proof),</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What is changed by the intervention(s)?</i></li> <li>– <i>What can environmental policies change on EU level? (identification e.g. by policy impact models, heuristic, qualitative approaches)</i></li> </ul>	To be answered in the project's work packages	<p>NUTS 2 level (eventually also NUTS 3 level)</p> <p>Water basin</p>	To be answered in the project's work packages



<p><b>(3) Regional scale of observation</b></p> <p>Designation of geographic reference to be used: regions concerned by intervention/effect; territorial level(s) of observation; covering all or selected (by what criteria) regions; cause-effect-relations</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>Level of observation and analysis? (NUTS 1, 2, 3, ...)</i></li> </ul>	To be answered in the project's work packages	Possible on a general level (e.g. How did/does a change in policies affect spatial goals on EU level in the past/in the future in comparison to the development without intervention?)	To be answered in the project's work packages
<p><b>(4) Reference to past and future</b></p> <p>Cause-effect relations in the past as the basis for predicting the effects of future interventions; empirical experiences as well as outlooks to the future crucial for analytic treatment and political perception</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>What has happened, what may happen in future?</i></li> <li>- <i>How did/does a change in policies affect spatial goals on each level in the past/in the future in comparison to the development without intervention?</i></li> </ul>	To be answered in the project's work packages	Quantitative indicators: e.g. km <sup>2</sup> of NATURA 2000  Better: percentage of reported areas of the overall territory  areas per NUTS 2 (NUTS 3) region; water quality in rivers	To be answered in the project's work packages
<p><b>(5) Interventions and effects measured</b></p> <p>Implementation of the hypothesis concerning cause-effect-relations</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>What is registered, measured, appraised? (indicators)</i></li> </ul>	To be answered in the project's work packages	Quantitative	To be answered in the project's work packages
<p><b>(6) Quantitative/qualitative appraisal</b></p> <p>Designation of type of indicators selected</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>By what kind of indicators the topic is described? (quantitative, qualitative)</i></li> </ul>	To be answered in the project's work packages	Classification of regions, input-output model (?), aggregate statistical analyses (?)	To be answered in the project's work packages
<p><b>(7) Technique of analysis</b></p> <p>Designation of type of analysis used</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>How is the analysis performed? (classification of regions, statistical analyses, case studies?)</i></li> </ul>	To be answered in the project's work packages	Cohesion, polycentricity (?), ESDP guidelines/objectives	To be answered in the project's work packages
<p><b>(8) Goals referred to</b></p> <p>Designation of criteria for evaluation derived from the two ESPON key concepts focusing on the spatial dimension</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>What goals are referred to? (polycentric spatial development, cohesion, balanced territorial development, other goals)</i></li> </ul>	To be answered in the project's work packages	Regions with highest environmental problems (regional disparities in the environmental quality)	To be answered in the project's work packages
<p><b>(9) Applied meaning of 'spatial/territorial'</b></p> <p>Designation of the concept of 'spatial/territorial' used according to the policy area concerned</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>What concept of 'spatial/territorial' applied?</i></li> <li>- <i>Which are the regions with highest environmental problems? (regional disparities in the environmental quality)</i></li> <li>- <i>Which are inner-regional disparities in environmental quality; areas of policy conflicts</i></li> </ul>	To be answered in the project's work packages	Typology of regions (environmental quality and economic performance; environmental and other sectoral policies and regional or CAP policies)	To be answered in the project's work packages
<p><b>(10) Territorial coverage of outcome</b></p>	To be answered in the project's work	-	To be answered in the project's work

Designation of the general format of results covering the whole territory (referring to each region) or a selected sample of regions (case studies)  <i>Question to be answered:</i> – <i>What do the results look like? (typology of regions, types of complementation or contradiction of different policies on different levels)</i>	packages		packages
<b>(new) Interlinkages of policies</b> Relation between environmental and (other) sectoral policies on different spatial level; their complementation, contradiction or similarities  <i>Question to be answered:</i> – <i>How do EU, national and regional/local policies relate to each other? (complementation, duplication or contradiction of EU environmental (and other sectoral), national environmental (and other sectoral) and regional/local environmental (and other sectoral) policies)</i>	To be answered in the project's work packages	What can environmental policies change on EU level? (identification by policy impact models, heuristic approaches)  New environmental objectives  New instruments	To be answered in the project's work packages

### TIA for the selected test cases on transnational/national level

**Table:** Minimum requirements of a TIA for the selected test cases on transnational/national level

	Habitat and Biodiversity	Water management	Civil Protection
<b>(1) Reference to policy interventions</b> Designation of the causing interventions assignable to EU budget lines  <i>Questions to be answered:</i> – <i>What is causing the impacts?</i> – <i>Which environmental policies and their elements have an impact on each spatial level?</i>	To be answered in the project's work packages	What did environmental policies change on transnational and national level? (identification by policy impact models, heuristic approaches)  Reorganisation of water management  New environmental objectives  New instruments	To be answered in the project's work packages
<b>(2) Hypothesis on cause-effect-relations</b> Basis: hypothesis concerning cause-effect-relations (with varying empirical proof),  <i>Questions to be answered:</i> – <i>What is changed by the intervention(s)?</i> – <i>What can environmental policies change on EU level? (identification e.g. by policy impact models, heuristic, qualitative approaches)</i>	To be answered in the project's work packages	NUTS 3 level  Water basin	To be answered in the project's work packages
<b>(3) Regional scale of observation</b> Designation of geographic reference to be used: regions concerned by intervention/effect; territorial level(s) of observation; covering all or selected (by what criteria) regions; cause-effect-relations  <i>Question to be answered:</i> – <i>Level of observation and analysis? (NUTS 1, 2, 3, ...)</i>	To be answered in the project's work packages	Difficult because on national level goals and objectives overlap as well as EU policies and national policies (for the future only possible if national variables are stable and EU variables change)	To be answered in the project's work packages
<b>(4) Reference to past and future</b> Cause-effect relations in the past as the basis for	To be answered in the project's work packages	Quantitative indicators: e.g. km <sup>2</sup> of NATURA 2000	To be answered in the project's work packages

<p>predicting the effects of future interventions; empirical experiences as well as outlooks to the future crucial for analytic treatment and political perception</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What has happened, what may happen in future?</i></li> <li>– <i>How did/does a change in policies affect spatial goals on each level in the past/in the future in comparison to the development without intervention?</i></li> </ul>	packages	<p>areas per NUTS 2 (NUTS 3) region; water quality in rivers</p> <p>Improvement of the good ecological status of a water body or certain parts of it(in 2015) in comparison to the current status</p>	packages
<p><b>(5) Interventions and effects measured</b></p> <p>Implementation of the hypothesis concerning cause-effect-relations</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What is registered, measured, appraised? (indicators)</i></li> </ul>	To be answered in the project's work packages	<p>Quantitative</p> <p>See annexes to the WFD directive</p>	To be answered in the project's work packages
<p><b>(6) Quantitative/qualitative appraisal</b></p> <p>Designation of type of indicators selected</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>By what kind of indicators the topic is described? (quantitative, qualitative)</i></li> </ul>	To be answered in the project's work packages	Case studies (case studies Northern Europe and South Eastern Europe)	To be answered in the project's work packages
<p><b>(7) Technique of analysis</b></p> <p>Designation of type of analysis used</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>How is the analysis performed? (classification of regions, statistical analyses, case studies?)</i></li> </ul>	To be answered in the project's work packages	Cohesion, polycentricity (?), sustainability	To be answered in the project's work packages
<p><b>(8) Goals referred to</b></p> <p>Designation of criteria for evaluation derived from the two ESPON key concepts focusing on the spatial dimension</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What goals are referred to? (polycentric spatial development, cohesion, balanced territorial development, other goals)</i></li> </ul>	To be answered in the project's work packages	<p>Regions with highest environmental problems (regional disparities in the environmental quality)</p> <p>e. g. river basin with the highest amount of heavily modified water bodies</p>	To be answered in the project's work packages
<p><b>(9) Applied meaning of 'spatial/territorial'</b></p> <p>Designation of the concept of 'spatial/territorial' used according to the policy area concerned</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What concept of 'spatial/territorial' applied?</i></li> <li>– <i>Which are the regions with highest environmental problems? (regional disparities in the environmental quality)</i></li> <li>– <i>Which are inner-regional disparities in environmental quality; areas of policy conflicts</i></li> </ul>	To be answered in the project's work packages	Types of complementation or contradiction of different policies on the transnational/national level	To be answered in the project's work packages
<p><b>(10) Territorial coverage of outcome</b></p> <p>Designation of the general format of results covering the whole territory (referring to each region) or a selected sample of regions (case studies)</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What do the results look like? (typology of regions, types of complementation or contradiction of different policies on different levels)</i></li> </ul>	To be answered in the project's work packages	<p>Complementation, duplication or contradiction of EU environmental (and other sectoral) and national environmental (and other sectoral) policies</p> <p>e. g. realtion between NATURA 2000 and WFD/Flood risk management</p>	To be answered in the project's work packages

		directive	
<p><b>(new) Interlinkages of policies</b></p> <p>Relation between environmental and (other) sectoral policies on different spatial level; their complementation, contradiction or similarities</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>How do EU, national and regional/local policies relate to each other? (complementation, duplication or contradiction of EU environmental (and other sectoral), national environmental (and other sectoral) and regional/local environmental (and other sectoral) policies)</i></li> </ul>	To be answered in the project's work packages	<p>What did environmental policies change on transnational and national level? (identification by policy impact models, heuristic approaches)</p> <p>Reorganisation of water management</p> <p>New environmental objectives</p> <p>New instruments</p>	To be answered in the project's work packages

## TIA for the selected test cases on regional/local level

**Table:** Minimum requirements of a TIA for the selected test cases on regional/local level

	Habitat and Biodiversity	Water management	Civil Protection
<p><b>(1) Reference to policy interventions</b></p> <p>Designation of the causing interventions assignable to EU budget lines</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What is causing the impacts?</i></li> <li>– <i>Which environmental policies and their elements have an impact on each spatial level?</i></li> </ul>	To be answered in the project's work packages	<p>What did environmental policies change on regional and local level? (identification by thorough case study analysis, qualitative approaches like interviews etc.)</p> <p>e. g. restrictions for arable land in order to avoid diffuse settlement restrictions in water protection or flood protection areas</p>	To be answered in the project's work packages
<p><b>(2) Hypothesis on cause-effect-relations</b></p> <p>Basis: hypothesis concerning cause-effect-relations (with varying empirical proof),</p> <p><i>Questions to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>What is changed by the intervention(s)?</i></li> <li>– <i>What can environmental policies change on EU level? (identification e.g. by policy impact models, heuristic, qualitative approaches)</i></li> </ul>	To be answered in the project's work packages	<p>Sub-NUTS 3 level (regional and local context)</p> <p>Sub-basin</p>	To be answered in the project's work packages
<p><b>(3) Regional scale of observation</b></p> <p>Designation of geographic reference to be used: regions concerned by intervention/effect; territorial level(s) of observation; covering all or selected (by what criteria) regions; cause-effect-relations</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>– <i>Level of observation and analysis? (NUTS 1, 2, 3, ...)</i></li> </ul>	To be answered in the project's work packages	<p>Almost impossible because EU, national and regional/local objectives and policies overlap; thus it will be difficult to identify/predict which EU policy has influenced/will influence spatial structures</p> <p>Expert interviews?</p>	To be answered in the project's work packages
<p><b>(4) Reference to past and future</b></p> <p>Cause-effect relations in the past as the basis for predicting the effects of future interventions; empirical experiences as well as outlooks to the future crucial for</p>	To be answered in the project's work packages	<p>Quantitative indicators: e.g. km<sup>2</sup> of NATURA 2000 areas in case study region; water quality</p>	To be answered in the project's work packages

analytic treatment and political perception <i>Questions to be answered:</i> – <i>What has happened, what may happen in future?</i> – <i>How did/does a change in policies affect spatial goals on each level in the past/in the future in comparison to the development without intervention?</i>		in rivers ; qualitative indicators	
<b>(5) Interventions and effects measured</b> Implementation of the hypothesis concerning cause-effect-relations <i>Question to be answered:</i> – <i>What is registered, measured, appraised? (indicators)</i>	To be answered in the project's work packages	Quantitative and qualitative Expert interviews	To be answered in the project's work packages
<b>(6) Quantitative/qualitative appraisal</b> Designation of type of indicators selected <i>Question to be answered:</i> – <i>By what kind of indicators the topic is described? (quantitative, qualitative)</i>	To be answered in the project's work packages	Case studies (case studies Central Europe and South Western Europe)	To be answered in the project's work packages
<b>(7) Technique of analysis</b> Designation of type of analysis used <i>Question to be answered:</i> – <i>How is the analysis performed? (classification of regions, statistical analyses, case studies?)</i>	To be answered in the project's work packages	Cohesion, sustainability Regional plan	To be answered in the project's work packages
<b>(8) Goals referred to</b> Designation of criteria for evaluation derived from the two ESPON key concepts focusing on the spatial dimension <i>Question to be answered:</i> – <i>What goals are referred to? (polycentric spatial development, cohesion, balanced territorial development, other goals)</i>	To be answered in the project's work packages	Inner-regional disparities in environmental quality; areas of policy conflicts  Urban sprawl  Percentage of reported "heavily modified water bodies"	To be answered in the project's work packages
<b>(9) Applied meaning of 'spatial/territorial'</b> Designation of the concept of 'spatial/territorial' used according to the policy area concerned <i>Questions to be answered:</i> – <i>What concept of 'spatial/territorial' applied?</i> – <i>Which are the regions with highest environmental problems? (regional disparities in the environmental quality)</i> – <i>Which are inner-regional disparities in environmental quality; areas of policy conflicts</i>	To be answered in the project's work packages	Types of complementation or contradiction of different policies on the regional/local level	To be answered in the project's work packages
<b>(10) Territorial coverage of outcome</b> Designation of the general format of results covering the whole territory (referring to each region) or a selected sample of regions (case studies) <i>Question to be answered:</i> – <i>What do the results look like? (typology of regions, types of complementation or contradiction of different policies on different levels)</i>	To be answered in the project's work packages	Complementation, duplication or contradiction of EU environmental (and other sectoral), national environmental (and other sectoral) and regional/local environmental (and other sectoral) policies	To be answered in the project's work packages

<p><b>(new) Interlinkages of policies</b></p> <p>Relation between environmental and (other) sectoral policies on different spatial level; their complementation, contradiction or similarities</p> <p><i>Question to be answered:</i></p> <ul style="list-style-type: none"> <li>- <i>How do EU, national and regional/local policies relate to each other? (complementation, duplication or contradiction of EU environmental (and other sectoral), national environmental (and other sectoral) and regional/local environmental (and other sectoral) policies)</i></li> </ul>	<p>To be answered in the project's work packages</p>	<p>What did environmental policies change on regional and local level? (identification by thorough case study analysis, qualitative approaches like interviews etc.)</p> <p>e. g. restrictions for arable land in order to avoid diffuse settlement restrictions in water protection or flood protection areas</p>	<p>To be answered in the project's work packages</p>
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### 6.2.3. Procedural assessment steps of the TIA

The procedural assessment steps of the TIA will take into account findings and experiences from three different areas where impact assessments have been used in practice:

1. Findings and experiences from ESPON policy impact projects like 2.1.1 *Transport Policy impact*, 2.1.2 *R&D Policy impact*, 2.1.3 *CAP impact*, 2.1.4 *Energy*, 2.1.5 *Fisheries* or 2.2.1 *Structural Funds impact*.
2. Procedural steps and experiences from the Environmental Impact Assessment (EIA) and the Strategic Environmental Assessment (SEA).
3. Commission Guidelines on Impact Assessment which have recently been updated (15 June 2005; see European Commission 2005e).

Whereas the “Matrix of TIA minimum requirements on different spatial scales“ (see table above) lists minimum requirements in terms of a certain quality of the territorial impact analysis, the following part has to be seen as a framework how to carry out a TIA in practice. Thus it relates more to the procedural requirements of such an analysis.

#### **ESPON policy impact project experiences**

Although Chapter 9.3.2 of the ESPON project 3.1 draws a rather sceptic conclusion about the application and the approaches of the TPGs concerning the Territorial Impact Analysis in the policy impact projects, there are nevertheless interesting attempts which are worth being considered as a basis for the development of procedural steps for a TIA for EU environmental policies, especially from the 2.1.2 *R&D Policy impact*, the 2.1.3 *CAP impact*, and the 2.1.5 *Fisheries* projects (orientation at ESDP goals, testing of hypotheses etc.).

#### **Environmental Impact Assessment (EIA) Strategic Environmental Assessment (SEA) steps and experiences**

Certain assessment steps of the TIA for EU environmental policy can also be taken from the frameworks of the EIA Directive (85/337/EEC) and the SEA Directive (2001/42/EC). The table below also shows the equivalent parts as mentioned in the SEA and EIA Directives.

**Table:** Possible assessment steps of a TIA for EU environmental policies

Possible elements of a TIA for EU environmental policies	SEA Directive equivalent	EIA Directive equivalent
1. Description of the intervention (environmental policy) and identification of significant effects of environmental policy on the spatial structure	Art. 5, p. 1	Annex III (1)
2. Consultation of authorities	Art. 6, p. 3	-
3. Description of significant effects of environmental policy on the spatial structure	Art. 5, p. 1	Annex III (3)
4. Evaluation of significant effects of environmental policy on the spatial structure	Art. 5, p. 1	Annex III (4)
5. Consultation of the public	Art. 6, p. 4	-
6. Assessment of significant effects	Art. 3	Annex III (4)
7. Integration of territorial/spatial considerations into the programme or policy	Arts. 8, 9	-
8. Identification of reasonable alternatives aiming at a better coordination of environmental policies with sectoral policies	Art. 5, p. 1	Annex III (2)
9. Measures envisaged to reduce or eliminate contradictory or negative effects on the territorial/spatial structure	Art. 7, p. 2	Annex III (5)
10. A non-technical summary of the information provided under the above headings	-	Annex III (6)
11. Monitor the significant effects of the implementation of environmental policy on the spatial structure	Art. 10, p. 1	-

These 11 steps ideally shall be taken into consideration when carrying out a TIA on the three levels, especially in the case studies (EU, transnational/national, regional/local). The applicability of all of these steps for a certain level however has to be proven and eventually adapted in the case study work.

### Commission Guidelines on Impact Assessment

The European Commission has taken several concrete actions to improve the way it designs policy, of which one of these is *impact assessment*. For the impact assessment of its policies the Commission introduced a new method in 2002, integrating and replacing previous single-sector type of assessments (see website “Impact Assessment in the Commission”, available at [http://europa.eu.int/comm/secretariat\\_general/impact/index\\_en.htm](http://europa.eu.int/comm/secretariat_general/impact/index_en.htm)).

The Commission’s internal Guidelines on Impact Assessment have been updated on 15 June 2005 (European Commission 2005d). This thoroughly revised document provides a useful step-by-step guidance to carry out the impact assessments of major legislative and policy-defining initiatives set out in the Commission’s annual Work Programme.

The Commission’s approach to impact assessment involves the following key steps:

1. Analysing the issue/problem, what causes it, who it affects, and if the EU level is the appropriate level to deal with it (in line with the principle of subsidiarity);
2. Defining some key objectives to tackle the problem; and ensuring that these are consistent with other EU policies and strategies, such as the Sustainable Development and Lisbon Strategies;

3. Looking at possible policy options to meet the objectives, making sure to always consider the option of taking no action at all at EU level, and examining alternative approaches to regulatory actions;
4. Assessing the possible impacts of short-listed policy options, intended and unintended, across the social, economic and environmental dimensions; the analysis should also consider impacts that fall outside the EU;
5. In the light of the impact analysis, the options should then be compared to see if it is possible to rank them and identify a ‘preferred’ option.
6. The new Guidelines also, for the first time, set out a procedure for completing an Impact Assessment Report in those cases where a decision is taken, possibly as a result of the impact assessment, not to proceed with the proposal.
7. Throughout the process, there should be close contacts between Commission services to ensure that all relevant factors are taken into consideration. The requirement to consult with stakeholders also ensures that a full picture be developed of potential impacts.

Together with the ESPON policy impact experiences and the EIA and SEA procedural steps and experiences, the EU guidelines for policy impact assessment are a third basis from which the procedural steps of the TIA for EU environmental policies can be developed from.

### **6.3. Test of “TIA of environmental policies” in the case studies**

The TIA addresses the impact of environmental policies on different sectors of society within a given territory and leads to integrated conclusions on the impact on economic, social, cultural and environmental issues related to the policy objectives of territorial cohesion and territorial balance of regions. After the TIA framework has been decided upon, it will be tested for different elements of EU environmental policies and on the three spatial levels.

#### **European level TIA of environmental policies**

On the European level a TIA will be carried out for the entirety of the ESPON countries. Here, a qualitative policy analysis will be carried out which analyses if the environmental policies support the spatial development goals as outlined in the ESDP.

#### **National/transnational level TIA of environmental policies**

Since the EU environmental policy aims at all Member States in the same manner, these effects can be assessed on the Member State level. Here, two country case studies are planned (Northern Europe, South Eastern Europe).

#### **Regional/local level TIA of environmental policies**

The effects on the regional level cannot be traced back directly to the EU policies as they are also influenced by the specifics of the Member State like political and administrative structure of the State or the planning system and national funding. Such complex connections and interdependencies cannot be assessed in detail on a European level. Therefore, on this level, two regional case studies will be carried out (Central Europe, South Western Europe).

##### **6.3.1. EU environmental policies by case studies**

The following table lists which elements of EU environmental policies will be covered by which case study.



**Table:** Elements of European environmental covered by case studies

<b>Elements of EU environmental policies envisaged as test cases</b>	<b>EU level</b>	<b>Transnational/national level</b>	<b>Regional/local level</b>
<b>Habitats and biodiversity</b>	– EU level case study (whole ESPON area)	– South Eastern European case study – Northern European case study	– Central European case study – South Western European case study
<b>Water management</b>	– EU level case study (whole ESPON area)	– South Eastern European case study – Northern European case study	– Central European case study – South Western European case study
<b>Civil protection</b>	– EU level case study (whole ESPON area)	– South Eastern European case study – Northern European case study	– Central European case study – South Western European case study

### 6.3.2. Role and testing of existing and new of indicators

Indicators play an important role to monitor the performance of a TIA on different spatial levels and for different decision makers. The ESPON 2.4.1 will make use of the following existing indicators:

- ESPON database (indicators from other projects as described in Chapter 3 of this tender.
- EEA/ECTCE indicators (as described in chapter 4).

In many cases however, necessary indicators will not be available. In these cases, own indicators will be developed and tested in the case studies.

## 7. Maps Related to Environmental Trends and Territorial Situation

The evaluation and development of indicators and the implementation of the Territorial Impact Assessment (TIA) in case study areas request spatial analysis. This will be done with the help of GIS instruments. Comprehensive presentations of the case studies including the main findings and methodological questions will be reported in the final interim report.

The results of the TIA for the case studies and the results on the European level are going to be presented suitable as input for political debates concerning European Environmental Policy. A focus will be on the crossing of environmental and socio-economic issues by overlay techniques or more sophisticated approaches amalgamating the input to new typologies. The other basic territorial analyses like ESPON key typologies such as the functional urban areas will be also combined with environmental analysis to explore new spatial structures in EU territory. These results/findings will be reported in the final report.

## **7.1. Northern European Case Study - Nutrient Loading from Agriculture**

Northern European countries are rich in surface waters. Although there is plenty of water visible on the surface, most of these waters are not very deep. Shallow lakes are easily contaminated by pollution. Even relatively low concentrations of excess nutrients, acidic deposition or other harmful contaminants can easily disrupt their sensitive aquatic ecosystems.

Groundwater is widely used by local residents and by waterworks, since it is often much purer and better protected from contamination than the water in lakes and rivers. It can usually be safely consumed without any treatment.

Groundwater reserves are particularly widespread in areas with extensive deposits of permeable sands and gravels formed during the last ice age. The depth of the water table may vary from less than a metre to more than thirty metres, but is typically about 2–5 metres below ground level. Groundwater reserves can be significantly depleted, and the water table lowered, due to the excessive use of groundwater, or after major groundwork or excavation, as well as following droughts.

Groundwater reserves in Northern Europe do not normally suffer from contamination on a wider scale, since individual aquifers tend to be small. The risk of contamination is highest in areas where soil consist of coarser sands and gravels. Groundwater reserves are also vulnerable to acidification in the same areas where there have been acidification problems in lakes.

The EU Water Framework Directive aims at standardising water protection activities within EU. Its main target is to reduce the surface- and groundwater pollution in European countries. The main targets of the directive are: 1) to prevent degradation of the quality of water ecosystem, 2) to promote sustainable use of water resources, 3) to reduce groundwater pollution, 4) to strengthen water protection via reducing the emissions of harmful substances, and 5) to reduce effects from floods and droughts.

### **Nutrient loading from agriculture**

The amounts of nutrients (nitrogen and phosphorus) discharged to surface waters have decreased in many Northern European countries during the recent decades. This has been achieved by considerable investments in water protection, mainly by improving municipal and industrial wastewater purification. However, similar decreasing nutrient load has not been reported for non-point loading from agriculture. The EEA indicator called ‘WEU2c: Statistically significant trends in concentrations of nutrients at river monitoring stations’ did not show generally better trends in the North compared to the rest of Europe. One reason for the slow response to the quality of surface water quality is the pool of nutrients in agricultural soils. Even when most of the farmers are participating in the agri-environmental support, the response of water quality is very low and it will take years to achieve a clear reduction in nutrient loading.

One of the targets of European agri-environmental managements contracts is to ensure the development agricultural practices towards higher sustainability and reduce nutrient input from the farm land. According to the European Environment Institute, more than 20% of the EU15 farm land was covered by agri-environmental management contracts (EEA indicator YIR01AG11 Area under agri-environmental management contracts). In the North, the coverage of the agri-environmental measures was one of the higher than in most of the other Member States.

The implementation of the Water Framework Directive will be reflected in the future environmental support scheme. Especially the main targets one, two and three have to be taken into account regarding agri-environmental management.

### **Mining activities and environment protection programmes**

The largest natural areas in Europe can be found from Northern Europe (mainly extensive forests). Northern Europe also has a lot of semi-natural areas (or forest) and the degree of fragmentation of these areas is low. Northern Europe is rich from its nature but also from its mineral resources. This situation can arise a question in which terms exploration and mining activities can be possible and feasible at nature conservation areas. There exist national and international legislations and regulations of exploration and mining activities within or near the NATURA 2000 Network or other nature conservation areas. Especially the areas that belong to EU's NATURA 2000 Network usually have European wide protection interest. The effects of mining on the balance between the three dimensions of sustainable development (social, economic and ecological), becomes manifest not only in the relation to NATURA 2000 areas but as well to the main targets of the Water Framework Directive. However, mining industry could be a significant benefit for the economy of northern periphery. According to Court of Justice of European Communities social and economical benefits are justified motives to consider exploration and mining activities even at nature conservation areas. One speciality in Northern European countries is the original Lappish people whose source of livelihood, i.e. fishing, hunting and reindeer management, must not be endangered.

## **7.2. South Eastern European Case Study**

One of the main objectives of European transport policy is the support to **modal shift from road to rail transport, as the transport mode causing less damage to the environment**. Many of the priority projects along the TEN/TINA corridors are therefore dedicated to the development of new rail infrastructure and particular attention in the framework of TEN policies goes to the development of high speed railway (HSR) network.

In many of the countries in South Eastern Europe investment in infrastructure has focused on the construction of motorway networks in the last decades. As a result motorway networks are now rather well developed while rail infrastructure was slowly deteriorating over the same period of time. Competitiveness of road over rail transport has thus increased greatly. Even though rail has now gained importance in EU policies, **the competitive advantage of road is still increasing** due to inertia of investment cycles.

EU environmental policies have an interesting role in this respect. As most of the motorways were constructed in the period when many measures of environmental policies have not been implemented yet, their planning and construction processes were quicker and cheaper compared to more recent rail projects, that have to take into account also measures designed to protect the environment. This is **indirectly helping road transport keep its competitive position**, causing also many damaging effects on the environment in the long term.

In this case study the **planning process of one HSR section** will be examined in detail. Planning started already in early 80s, and it has intensified after 1993. A number of studies initiated in this period as a basis for national transport plans and other strategic documents. Some studies took into account both EU transport policy at that time and national accession strategy, others reflect needs and desires of neighbouring countries that were indirectly dictating dynamics of planning activities. The result was the proposal of constructing the HSR for combined freight transport – speed of 250 km/h – which should takeover an important portion of highway transport.

In 2002 three alternative routes of HSR were chosen for further examination. All three were mostly underground in this section. From 2002 to 2004 a **Strategic Environmental Assessment was made** for this section of HSR. The conclusions of the study stated that a new HSR infrastructure, which would enable speeds of 250 km/h for combined freight transport and at least 300 km/h for passenger transport, is problematic from environmental point of view and none of the three alternative routes was assessed as suitable.

Main environmental reasons for such a conclusion are on the one hand multiple uncertainties connected with building tunnels through the Karst terrain present in this section, which make environmental predictions limited and construction costs uncertain, and on the other hand conflicts with Natura 2000 and groundwater/drinking water resources protection.

The study also concludes that HSR may not be a necessity from economic point of view, therefore it seems reasonable to focus on the modernization of existing railway infrastructure, although on the other hand, seen in the context of the EU, networking of urban, logistic and multimodal transport nodes as well as transit flows from West to East, the opposite conclusion is reached, namely that the connection is a political responsibility and obligation to support such networking which makes HSR a necessity especially for passenger transport.

On the basis of this case study an analysis of conflicts between transport and environmental policies will be made and a case for better horizontal coordination will be elaborated.

### **7.3. South-western European Case Study**

The degree and type of land utilization can produce conflicts of interest, like in dynamic urban zones where urbanisation competes with agriculture, pastures or protected areas. **Urban sprawl** together with increasing the requirements for transport infrastructures, can be considered as one of the most important land use pressure in Europe leading to permanent conversion of land to **built-up area**. This is especially true in the **coastal zone** where many land uses are competing for space leading to a high densification of the human activities along the coast (tourism, ports and harbours,...)

A wide variety of EU policies and measures exist to contribute to the protection of the coastal environment, but there is **no integrated policy** that focuses on such a complex system as the coast to protect it from **the increase of built-up and the loss of natural and semi-natural habitats**.

In that way, new forms of regulation and planning of land use are based on a need for a sustainable growth with restriction on development, together with the protection of natural resources. For example, the Urban Thematic Strategy asks for a “sustainable urban design” to control the diffuse sprawl in the territory. LIFE Nature programmes and Rural Development Plans under the CAP offer important possibilities with regard to funding for European ecological networks as proposed by NATURA2000. Environmental priorities for sustainable development are also targeted in the FP6 programmes with special priority to maintain and preserve biodiversity and ecosystems. Finally the **Structural Funds and Cohesion Funds** set out conditions for awarding financial support for compliance with Natura2000 and support LIFE projects, but also will provide significant financing to stimulate changes to encourage economic growth. The **Cohesion Fund** supports environmental and transport projects in the least prosperous Member States trying to vitalise economies in marginalized regions.

As detailed information, the Structural Funds absorb approximately one third of the EU budget. Their allocation for the 2000-2006 period is EUR 195 billion for the EU 15, plus 15 billion for the new Member States between 2004 and 2006. The Cohesion Fund receives EUR 25.6 billion for the EU 25

([http://europa.eu.int/comm/regional\\_policy/atlas/factsheets/pdf/fact\\_eu25\\_en.pdf](http://europa.eu.int/comm/regional_policy/atlas/factsheets/pdf/fact_eu25_en.pdf))

When looking at the resources committed by area of intervention by EU Cohesion Funds, 4 countries appear as the main receivers of funds during the last period (Greece, Spain, Portugal and Ireland) and **Mediterranean** is the dominant Regional Sea. The funds are distributed between transport and environment, practically in a 50% proportion.

Due to the strong emphasis on infrastructure, the EU structural policies should be more sensitive to the **potential impact** they are causing in increasing the infrastructure network, causing uncontrolled urban sprawl and **artificial pressures** on valuable landscape. Even if it need to be found which part of the funds goes to the coast and which not, in the countries that received a huge amount of EU Cohesion funds we can observe a **coastal artificialisation** process based on the CLC 90-2000 analysis.

From several reports it's shown that the **transport infrastructure** development is a main driver of **artificial sprawl** at the **coast**. Therefore it is not only the quantity of land takes by artificial that is a problem but also the quality of the urban forms and the way in which urban is articulated to its rural surrounding that makes artificial a crucial issue. In last decade, most of the coastal areas have been under a continuous urban growth, which does not show any other logic than the expansion along main new infrastructures, affecting specially pastures, mixed agriculture areas and semi natural and natural areas, and also landscapes without dominance. These dominant landscape types are the most heterogeneous landscapes, therefore the one that are more important in term of biodiversity and need to be protected.

The aim of the proposed work is to define in a **coastal area in the Mediterranean Sea** under **priority 1** of the Cohesions funds 2004-2006 (catch-up for regions lagging behind in development) how the **built-up trends and transport infrastructure** have progressed based on spatial data from CLC90 (Corine Land Cover, a European-wide harmonized land cover inventory based on satellite image interpretation) and CLC2000, and to analyse how it can be related to the **Structural Funds and Cohesion Funds** given by EU for infrastructure development and environmental objectives.

This work can be completed by the analysis of the effects of EU **protection policies** such as **NATURA2000** in the **surroundings** of the protected areas. The built-up in the buffer zone (1km) of NATURA2000 designated sites can be assessed from spatial data from CLC90 and CLC2000 at NUTS3 level. A significant increase of artificial surfaces in the neighbourhood of designated sites would imply a strong pressure on the site and might indicate the need for additional restrictions outside the actual protected site.

## **7.4. Central European Case Study - Peripheral Rural Area in Central Europe**

### **7.4.1. Description of the case study area**

The case study area is located in central Europe. The landscape can be characterised as typical lowland area, dominated by a river which flows from the south to the north of the region. The territory encompasses 2.880 km<sup>2</sup>, the population is about 310,000. The region can be characterised as peripheral rural border area as its whole.

The area represents one NUTS3-region, since it corresponds to one county. A county has to be understood as a commune, governed by a direct-elected chief officer and a regional council. Regional planning belongs to the own self-governed competences of the county. In the opposite water management and natural protection have to be seen as under the authority of the state administration. Nevertheless, the county administration is responsible for the

operational work since the county is at the same time a commune and the lower state administration.

This type of organisation can be understood as possible way to overcome the so called “problem of interplay” (Young 2002, p. 19 ff.). Most institutions interact with other similar arrangements both horizontally and vertically. Horizontal interactions occur at the same level of social organisation. Vertical interplay is a result of cross-scale interactions or links involving institutions located at different levels of social organisation. Interplay between or among institutions may take the form of functional interdependencies or arise as a consequence of politics of institutional design and management. The problem of interplay is a consequence of the existence of a multitude of actors. This means in the context of EU environmental policy on the horizontal level the spatial planning on the one hand and the sectoral planning divisions on the other hand (Water management, natural protection, agriculture). On the vertical level the coordination of regional planning (the county is responsible for) and the local land-use planning which is under the authority of the municipalities has to be analysed. In addition, the relationship between the higher sectoral planning authority (the different state ministries) and the lower authorities, which are part of the county administration, are from interest.

The county administration has already agreed on a close cooperation in the context of ESPON 2.4.1.

#### 7.4.2. Impact of EU environmental policy

*COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora*

The Natura 2000 network is the European ecological network of sites established under the Habitats Directive. Its main purpose is the protection of habitat types and plant and animal species of Community interest in the European Union. It comprises both special areas of conservation (SACs) designated under the 1992 Habitats Directive, and special protection areas (SPAs) classified under the 1979 Birds Directive (EU Commission 2004, p. 4).

The EU Commission has recognised that the management of designated NATURA 2000 areas needs to be co-financed: “It is therefore crucial that, as the designation process set out in the Habitats Directive nears its conclusion, attention now turns more towards management of the sites. The implementation of these management plans clearly raises the issue of the availability of the required financial resources for their implementation. Community funding is necessary in order to implement fully the network and provide support for the efficient management of the numerous sites of the network.” (EU Commission 2004, p. 8.). As possible solutions for co-financing the implementation of NATURA 2000, three options have been discussed: make use of existing community funds, make LIFE-nature the delivery mechanism and create a new fund or initiative (EU Commission 2004, p. 23).

Exactly the question how implement the designated NATURA 2000 areas is on the top of the actual political discussion in the county. Since the agricultural sector has still to be understood as important economic factor in the county, the NATURA 2000 areas causing permanent controversies. In this context, especially the economic implications of different possible preservation instruments should be discussed and analysed in the case study. Whereas in the case of the one instrument the county has to take the financial burden, in another, the state would be responsible.

Aside the discussion about the management of reported and designated NATURA 2000 areas, some problems have been arisen in the context of the reporting procedure.

Most of the reported NATURA 2000 areas belong to the river valleys and one great heath area.

In addition, a flood lock seriously affects a potential NATURA 2000 area in the north of the case study region. The official rationale for this construction was a given need for an improved coastal protection. However, the main political reason for this lock has to be seen in regional business investments. Up to now, the state government has successfully avoided to report the upper river to the commission as NATURA 2000 area.

*DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy*

The river basin approach aims at congruence between the ecosystem water (ground water, surface water) and the institutional arrangements created to manage human activities affecting the water system. The WFD offers for the first time integrated instruments and procedures (river basin management plans, which includes a program of measures) in order to take care for a comprehensive river basin management within the whole EC. These instruments will be binding for all public authorities. In consequence, water management will influence spatial as well as economic development seriously. From an economic point of view Art. 9 “Recovery of costs for water services” has to be seen as the most important issue. In accordance to § 1 “Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle.“

Therefore, the ongoing implementation of the water framework directive has to be seen as a very interesting point from the ESPON 2.4.1 perspective. Again, the case study area can be seen as a adequate case study area.

The main river in the case study region is a relatively small water body (overall length 371 km) with a catchment area of about 18.100 km<sup>2</sup>. The river basin is divided into eight sub basins, of those one is administrated by the water management authority, which is part of the county administration of the case study region.

The agricultural sector is most likely the greatest opponent to the water management divisions. The agricultural sector is the main causer for the anthropogenic pressures from diffuse sources. This is especially from importance in the case study region, because of its important agricultural sector. In opposite to this contradiction, the landscape planning can be surely an ideal partner for the protection and the development of ecosystems which are dependent from water.

The water management authority as well as the landscape planning and the agricultural sector are willing to cooperate in the ESPON 2.4.1 project.

*EU directive 2001/42/EC Assessment of the effects of certain plans and programs on the environment*

The so far project-oriented Environmental Impact Assessment (EIA, EU directive 85/337/EEC in connection with EU directive 97/11/EC) was enlarged on a strategic level through the EU directive 2001/42/EC “Assessment of the effects of certain plans and programs [1] on the environment” [2], which came into force on 27<sup>th</sup> of June 2001. The directive mainly contains procedural requirements. The EC argued primarily, “that

*“Environmental assessment is an important tool for integrating environmental considerations into the preparation and adoption of certain plans and programmes which are likely to have significant effects on the environment in the Member States, because it ensures that such effects of implementing plans and programmes are taken into account during their preparation and before their adoption.”* (Point 4 of the substantiation of the directive). This argumentation is based on the main lessons learned from practical experiences with the present environmental assessment on the project level. The main problems in dealing with environmental issues on the project level refer to the impossibility of assessing alternatives and interactions between the effects of several projects. After the fundamental decision about a specific land use or an infrastructure investment has been made on the programme or plan level, only minor changes on the project could be taken into consideration as a result of an EIA.

The key task of the Strategic Environmental Assessment (SEA) is in accordance with Art. 3 EU directive 2001/42/EC the assessment of the *“significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors”* (Annex 1, letter f). The results of this assessment, summarised in the environmental report, have to be taken into account in decision-making about specific plans or programs (Art. 2 b and c EU directive 2001/42/EC).

The strategic environmental assessment directive has been implemented in the national law in the meantime. In consequence it will be seriously influence planning procedures in spatial planning as well as all spatially relevant sectoral planning divisions. Even the programmes of measures and landscape plans have to be assessed. The real influence on decision-making in Germany can be studied by the example of the case study region.

## **8. Orientation and policy recommendations**

The results of the qualitative and quantitative analysis and especially the application of the TIA in the three case studies will enable the TPG to formulate policy recommendations which at the same time have to be reflected against the objectives in existing policy documents.

### **8.1. Most recent European policy documents related to territorial cohesion**

Territorial cohesion has to be seen as part of the central aim of the EU. Art. III (“The Union's objectives”) paragraph 3 of the Proposal for an EU Constitution Treaty points out, that the Union *“[...] shall promote economic, social and territorial cohesion, and solidarity among Member States.”* (CONV 850/03 from 18.7.2003).

Territorial cohesion adds an extra dimension to economic and social cohesion (SUD 2003, 20). It covers the territorial dimension of social and economic cohesion and is closely linked to the fundamental EU objective of “balanced and sustainable development” (Art. II). It demands a more integrated approach, from a territorial perspective, to both EU investments directly relevant to the cohesion of the European territory (structural funds/cohesion fund) and other EU policies also relevant to territorial cohesion.

The recent EU commission document “Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013” pays attention to the territorial aspect: “The aim of the new cooperation objective is to promote stronger integration of the territory of the Union in all its dimensions. In doing so, cohesion policy supports the balanced and



sustainable development of the territory of the Union.” Moreover, the commission clearly proclaims that “the concept of territorial cohesion extends beyond the notion of economic and social cohesion, its objective being to help achieve a more balanced development, to build sustainable communities in urban and rural areas and to seek greater consistency with other sectoral policies which have a spatial impact. This also involves improving territorial integration and encouraging cooperation between and within regions.” In particular this document has to be understood as appeal for cooperation on all spatial scales, since a multi-disciplinary or integrated approach is needed for improving territorial cohesion.

It is quite remarkable that the commission obviously agree one of the main results of the ESPON programme, a lack of the territorial dimension of the several sector policies. The new Community Strategic Guidelines for 2007-2013 pay attention to the territorial dimension of cohesion, since “one of the determining features of cohesion policy - by contrast with sectoral policies - is its capacity to adapt to the particular needs and characteristics of specific geographical challenges and opportunities.” (EU Commission 2005c).

The EU Strategy for Sustainable Development, adopted by the European Council in 2001, also called for a “more balanced regional development by reducing disparities in economic activity and maintaining the viability of rural and urban communities, as recommended by the European Spatial Development Perspective.” (EU Commission 2001, p. 12). The ESDP proclaimed previously even in its subtitle (“Towards Balanced and Sustainable Development of the Territory of the EU”) this aspect and underlines it with goal 3: “more balanced competitiveness of the European territory” and subchapter 1.2 (“Spatial Development Disparities”).

Early in 2005 the Commission has launched “The 2005 Review of Sustainable Development Strategy”. The revision process should be completed later in 2005 with the adoption of the revised Sustainable Development Strategy. The “Draft Declaration on Guiding Principles for Sustainable Development”, which was released in May 2005 as part of the revision process, sets territorial cohesion as one of the aims of sustainable development when stating that “Sustainable Development is a key objective for all European Community policies, set out in the Treaty... It seeks to promote a dynamic economy with a high level of employment and education, of health protection, of social and territorial cohesion and of environmental protection in a peaceful and secure world, respecting cultural diversity.” (EU Commission 2005d, p. 3). Also two out of ten Policy Guiding Principles in their content correspond to objectives of territorial cohesion, although territorial aspect is not mentioned explicitly:

- Policy Coherence and Governance: Promote coherence between all European Union policies and coherence between local, regional, national and global actions in order to increase their contribution to sustainable development.
- Policy Integration: Promote integration of economic, social and environmental considerations so that they are coherent and mutually reinforce each other by making full use of instruments for better regulation, such as balanced impact assessment and stakeholder consultations. (EU Commission 2005d, p. 5)

Several studies address the impact of EU as well as national policy on territorial cohesion. Especially the given differences in national policies should be highlighted in this context: In countries where territorial policy is devolved, giving sub-national government the main responsibility, the impact tends to be more on intra-regional cohesion than inter-regional (e. g., Austria). Similarly, if there are large inter-regional differences as in Italy or Germany, it is more likely that national policy will explicitly address these disparities. Spatially targeted economic development policies have an impact on territorial cohesion by focusing on specific

spatial imbalances, but the priorities vary greatly from Member State to Member State (London School of Economics 2004).

Well balanced territorial development perspectives are aspired for the whole European territory. Taking into account the diversity of the European territory, the different characteristics of the several spatial structures have to be taken into account.

The Third Report on Economic and Social Cohesion (3<sup>rd</sup> Cohesion Report) refers to territorial cohesion in an own subchapter in Part 1 (“Cohesion, competitiveness, employment and growth”). Although the territorial dimension is missing in the title of the report, it argues persuasible that several aspects of the ongoing union’s spatial development could lead to a more unbalanced a not-sustainable Europe and “affect the overall competitiveness of the EU economy” (p. 28). For that reason it becomes clear, why a balanced territorial dimension has been seen as crucial for Europe’s future.

In particular the following aspects have to taken onto account:

- the high concentration of economic activity in the pentagon area;
- the persistence of economic imbalances between metropolitan and the rest of the countries;
- at regional level a number of territorial disparities such like urban sprawl on the one hand and a tendency to falling population and a decline in the availability of basis services in peripheral rural areas and certain, disadvantaged parts of cities.
- Areas constrained by their geographical features (islands, ultra peripheral regions, mountainous regions). Especially this aspect can be seen as rationale for the ESPON 2.4.1 project.

In particular for areas constrained by their geographical features, the accessibility and the availability of essential services have to be maintained or developed. However the need to safeguard the environment has to taken into account in this context as well as for development strategies for other spatial typs. This means first the integration of environmental aspects in investment decision-making processes. Second, development options have to be identified which both improve the environment and strengthen regional competitiveness (European Commission 2005a). Such options should be generated from a TIA. This approach has to be seen in line with the Lisbon strategy, which has identified environmental protection as priority “the more so since it stimulates innovation, and to introduce new technologies, for example, in energy and transport (European Union 2000).

The 3<sup>rd</sup> Cohesion Report states that environmental problems are particularly acute across the EU both in areas where there is a high concentration of population, and in areas where the pressure on natural resources from agriculture especially but also from mining and similar activities. These areas are not evenly distributes across the EU. There is a need in these areas to clean up the environment and to prevent any further damage. It is, however, also important to prevent any further deterioration of the environment in natural or semi-natural areas. According to the 3<sup>rd</sup> Cohesion Report these aims need to be an integral part of economic development strategy across the EU to ensure the sustainability of development.

## 8.2. High level of return following territorial cooperation + ideas for strategic projects

Territorial cohesion has to complement the sustainability agenda and to promote greater coherence and co-ordination of policies with a substantial territorial impact. In this sense is also related with territorial cooperation or in words with governance. Governance of territorial and urban policies is the capacity of actors, social groups and institutions to build an organizational consensus, to agree on the contribution of each partner also as on a common spatial vision (University of Valencia 2005).

Today, modern urban systems are characterised by complex patterns of interdependencies between actors, institutions, functional activities and spatial organisations. Controlling, managing or even steering the complex, fragmented and often competing societal interests is beyond the capacity of the state as an agent of authority.

In order to foster territorial cooperation and governance, a territorial policy co-ordination method as a territorial development planning condition is needed.

This is in particular valid for the local and regional level, spatial planning and its instruments have to be seen as most promising instrument for integrating environmental issues in territorial development.

Especially for the inter-regional level, which is aside from administrative boundaries and access to formal instruments, the economic development is in focus of cooperation (See findings of the ESPON project 1.1.1., p. 198): “Results indicate that cross-border regions find it easier to co-operate on economic issues than on spatial development or, surprisingly on transport.” This phenomena is most likely caused by the need to develop complementarities and to exploit the broader marketing potential of two or more centres in the often polycentric regions which are cooperating with each other.

In consequence, there is still a predominant organization of sectoral policies and plans with unequal presence of policy packages, depending on tradition and style of planning. Despite calls for policy integration, policies often remain sectoral, and even more their implementation. For this reason, the TIA seems to be quite important especially for sectoral policies, plans and spatially relevant projects.

The recent EU Commission document “Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013” also stresses the importance of European territorial cooperation and governance in separate chapters. While the latter is described as a complex multidimensional concept, the former is dealt with in a straightforward manner. Besides promoting stronger integration of the territory of the EU in all its dimensions and supporting the balanced and sustainable development at the level of macro-regions, especially the reduction of “barrier effects” through cross-border cooperation and the exchange of best practices is stressed (EU Commission 2005c, p.10).

Strategic projects can be thus seen as **shared development strategies of the territories concerned** (either national, regional or local) and as **networking of the key stakeholders**. They are therefore an important instrument for promoting coherence between different policies as well as coherence between local, regional, national and global actions. They can be on the one hand test cases for integration of environmental policies with other policies and on the other hand they also implement policies in an integrated manner.

### **8.3. Crossing of findings on environmental elements with socio-economic factors of the development of regions and larger territories**

The proposal should promote the crossing of findings on environmental elements with more socio-economic factors of the development of regions and larger territories. This approach is in line with Article 6 of the European Community Treaty: “Environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities (...) in particular with a view to promoting sustainable development.

The Sixth Community Action Programme on the Environment sets out the priorities for the European Community up to 2010. Four areas are highlighted: climate change, nature and biodiversity, environment and health and the management of natural resources and waste.

The new EEA report “Environmental policy integration in Europe” follows this approach and calls for an “Environmental policy integration.” The EPI concept aims at “a continual process to ensure environmental issues are taken into account in all policy-making, generally demanding changes in political, organisational and procedural activities, so that environmental issues are taken on board as early as possible and continuing during implementation.” (EEA 2005, p. 11).

As a kind of ex ante assessment of policy proposals, the SEA has to be understood as one element of an EPI.

In particular spatial planning at various levels can be seen as important instrument to deliver EPI (EEA 2005, p. 25) by means of bringing together policy and decision-makers from different sectors. Due to the fact that EU has limited competence to intervene in spatial planning directly the EU has used alternative means to promote its planning objectives. In particular the EU funding and specifically the Structural Funds and the Rural Development Fund have been used to promote integrated spatial development plans. In this way, the EU has also supported innovate sustainable development projects, for example, under the Urban community initiative (EEA 2005, p. 40).

In addition, the ESDP as well as the ESPON programme have developed spatial typologies which have to be considered in this context.

The concept of Functional Urban Areas refers to agglomerations of municipalities that are grouped together according to their functional orientation in order to reflect the actual daily operational conditions of people, enterprises, and community organisations. The concept goes beyond administrative boundaries. *The three dimensions of the polycentricity of FUAs are size, location and connectivity Polycentricity tends to a more sustainable development (ESPON project 1.1.1, Figure 3.13).* The total energy consumption for transport (in oil equivalent) was taken as an indicator of environmental sustainability. The ESPON project 1.1.1 concluded from the indicator a clear correlation between polycentricity and energy consumption: more polycentric countries use less energy for transport per unit of GDP than do monocentric countries. Most likely, a similar connection does exist between polycentricity and land consumption. A more polycentric development leads to less consumption of land in terms of transport areas, settlement areas. In addition, polycentricity promotes a more balanced territorial development. Polycentricity fosters a minimum level of services in and connectivity to rural areas and offers in so doing economic development chances outside of the big MEGAs in second and lower tier cities. Attention is to be given to making available higher order services and developing functional specialisations. This contributes to a balanced development, reducing the urban sprawl of monocentric capital cities, as well as broadening of the economic base of areas such that they are capable of competing internationally.

The ESPON project 1.1.2 explored relations between urban and rural areas in terms of exchange processes, institutional links and interdependencies. It identified a harmonized urban-rural typology, based on the three indicators *population density*, the *hierarchy of urban centres*, and *land cover*. The typology is based on the idea of two main dimensions, that is, *degree of urban influence* on the one hand, and *degree of human intervention* on the other hand (Bengs/Schmidt-Thomé 2005).

According to the 3<sup>rd</sup> Cohesion Report, urban policies tend not to take sufficient account of relations between urban and rural areas. The high population growth and pressure from urbanisation in rural areas that are situated generally close to an urban centre but at the same time most of the land is used for agriculture are seen challenging. In these areas there is a need for better management of land use and environmental degradation and conflicting usage.

A possible ecological indicator is mentioned by the project 1.1.2 by discussions the policy implications of the project results: *“The degree of human intervention was judged by the relative share of artificial surfaces of the total land cover. On the average, this criterion correlates with population density, but there are remarkable deviations, which are closely connected to national territories. The east of Europe, (excluding Poland) as well as Sweden, Denmark, Belgium and parts of France are characterised by a high share of artificial surfaces per capita: degree of human intervention is considerably higher than population density would indicate. This could be conceived as an ecological indicator, which places the mentioned countries in an unfavourable position, and should initiate new policies for a more prudent management of land. A high share of artificial surfaces also indicates a high share of discontinuous urban land, which indicates urban sprawl.”*

Such negative trends could be assessed by a Territorial Impact Assessment which makes use of this indicator.

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