TERMS OF REFERENCE

ESPON Project 2.1.2:
TERRITORIAL IMPACT OF
EU RESEARCH AND DEVELOPMENT POLICY
(2002-2004)

(o) Political challenges for the ESPON projects

The Second Report on Economic and Social Cohesion, published in January 2001, presented for the first time a third territorial dimension of the cohesion (beside the economic and social cohesion), which calls for a better co-ordination of territorially relevant decisions. Stressing the persistence of territorial disparities within the Union, the report stated the need for a cohesion policy not limited to the less developed areas as well as the need to promote a more balanced and more sustainable development of the European territory.

The Second Cohesion Report represents in that respect a follow up of the European Spatial Development Perspective (ESDP), adopted at ministerial level in May 1999, calling for a better balance and polycentric development of the European territory.

The projects launched under the ESPON programme shall follow an integrated approach and, seen together, cover a wide range of issues, such as:

- Identifying the **decisive factors relevant for a more polycentric European territory**; accessibility of a wide range of services in the context of enlargement; integration of wider transnational spaces; promotion of dynamic urban growth centres; linking peripheral and disadvantaged areas with those centres; etc.
- Developing **territorial indicators and typologies** capable of identifying and measuring development trends as well as monitoring the political aim of a better balanced and polycentric EU territory
- Developing **tools supporting diagnoses of principal structural difficulties as well as potentialities**, such as disparities within cities and regenerating deprived urban areas; structural adjustment and diversification of rural areas; strategic alliances between neighbouring cities at transnational, national and regional scale; new partnerships between rural and urban areas; potential support from infrastructure networks in the field of transport, telecommunication, energy; etc.
- Investigating **territorial impacts of sectoral and structural policies** in order to enhance synergy and well-co-ordinated decisions relevant for territorial development within policy fields such as Structural Funds, agriculture, transport, environment, research and development; developing methods for measuring the territorial impact of sectoral and structural policies; etc.
- Developing **integrated tools in support of a balanced and polycentric territorial development**; approaches to enhance the potential of cities as drivers of regional development, new tools for integrated urban-rural development and planning, etc.

With the results of all the ESPON projects, the Commission and the Member States expect in particular to have at their disposal: **a diagnosis of the principal territorial trends** at EU scale as well as the difficulties and potentialities within the European territory as a whole; **a cartographic picture of the major territorial disparities** and of their respective intensity; a number of **territorial indicators and typologies assisting a setting of European priorities** for a balanced and polycentric enlarged European territory; some **integrated tools and appropriate instruments** (databases, indicators, methodologies for territorial impact analysis and systematic spatial analyses) to improve the spatial co-ordination of sector policies.

In this respect, the ESPON projects will serve as a strong scientific basis for the propositions of the Commission in the Third Report on Cohesion, at the end of 2003, in view of the reform of post-2007 Structural Funds.

i) Relation to the ESPON 2006 Programme

The priorities describing the work-programme of the ESPON 2006 Programme are structured in four strands:

1. **Thematic projects** on the major spatial developments on the background of typologies of regions, and the situation of cities.
2. **Policy impact projects** on the spatial impact of Community sector policies and Member States' spatial development policy on types of regions with a focus on the institutional inter-linkages between the governmental levels and instrumental dimension of policies
3. **Co-ordinating and territorial cross-thematic projects** represent a key component of the programme. These projects evaluate the results of the other projects towards integrated results such as indicator systems and data, typologies of territories, spatial development scenarios. The cross section projects help to thematically co-ordinate the whole programme and add value to the results and to fill gaps, which are unavoidable when different themes are dealt with in different projects.
4. **Scientific briefing and networking** in order to explore the synergies between the national and EU source for research and research capacities.

This project belongs to the second strand and therefore holds a key position for the elaboration of the whole programme by the preparation of the common ground for the investigation of the effects of sector policies on the spatial structure in Europe. Therefore a strong co-ordination with the all other projects in particular with the other project in the same strand on the methodological aspects of the impact analysis, with the relevant thematic projects on territorial trends under the first strand and with the coordinating and cross-thematic under priority three is required as well as with the Co-ordination Unit.

ii) Thematic scope and context

The advancements of the Information Society contribute to a more harmonious territorial development in Europe while at the same time having adverse effects, which are to some extend objected but also intensified by the R&D policy at EU level. The ESDP stresses the integrated approach for improved transport links, makes reference to the polycentric development model, highlights the efficient and sustainable use of infrastructure and refers to the importance of the diffusion of innovation and knowledge. Those effects need to be investigated by a methodology, which allows measuring and assessing the impact of public R&D programmes in different types of regions. R&D takes place most probably in those

regions where the central functions of companies are concentrated (usually in the metropolitan and urban centres). However, the new economy has developed a slightly different demand on location patterns avoiding old industrial areas and giving rise to some particular regions at the fringes of the EU and in central rural areas. Based on scientific excellence criteria, R&D policy does not primarily consider the location of private R&D investments and activities, but Community and the Member States' R&D policies could better take into account of some territorial factors, which allow a more balanced development in Europe. Therefore, it is important to develop appropriate tools for the observation of the territorial effects of the R&D policy, which would be able to focus on the specific demands of the EU. A better comprehension of the interaction between R&D policy, seed/venture capital availability and human resources development at the local or regional level, technology innovation strategies should allow refining the instruments of sector and spatial policies.

Particular co-ordination is necessary with the previous ESPON action 2.1.1. on Transport and TENs policies and action 1.2.3. on the spatially relevant aspects of the information society. Overlapping with the policies addressed under the measure 2.1. have to be taken into account.

iii) General objectives

a) To develop methods for the territorial impact assessment of sectoral policies;
b) To develop territorial indicators, typologies and concepts and establishing a database and map-making facilities and to sustain the project by empirical, statistical and/or data analysis;
c) To analysis of the territorial trends, potentials and problems deriving from the policy, at different scales, and in different parts of an enlarged European territory;
d) To show the influence of sector policies on spatial development at relevant scales;
e) To show the interplay between EU and sub-EU spatial policies and best examples for implementation;
f) To recommend further policy developments in support of territorial cohesion and a polycentric and better balanced EU territory;
g) To find appropriate instruments to improve the spatial co-ordination of EU sector policies and the ESDP;
h) To consider the provisions made and to provide input for the achievement of the horizontal projects under priority 3.

In the efforts to meet these objectives the project shall make best use of existing research and relevant studies.

iv) Primary research issues envisaged

- Identification, gathering of existing and proposition of new indicators and data and map-making methods to measure and to display the state, trends and impacts of the developments referred to above. Compilation of national studies with European focus;
- Operationalisation of the policy options developed in the ESDP relevant for a territorial impact analysis of the R&D policy, and development of a methodology for impact analysis at EU scale.
- Conceptualisation and elaboration of a territorial impact analysis for R&D policy with special consideration of the following points:
    - How far does the R&D addresses the emerging border and integration problems taking into account the variety of regions and the arriving

enlargement? Does the R&D policy provide adequate accessibility in the regions of the EU and in Europe?
  - What spatial effects are expected in terms of current and future R&D policy?
  - How far does the R&D policy support the concentration of development corridors, consider the concept of a polycentric development, and which further spatial effects are emerging?
  - How far does the R&D policy affect the spatial diffusion of innovation and knowledge in Europe?
- What kind of resources is available at the EU level in order to conduct the R&D policy? Does the necessary co-ordination with national policies take place?
- What are the territorial conditions to take better advantages of the R&D policy in terms of innovation and economic development?
- How should R&D policy at the EU and Member State levels be designed and co-ordinated to promote an equal access to knowledge infrastructures for all European territories?
- How could the Structural Funds and R&D policy develop a more coherent and effective approach in promoting R&D capacities and territorial cohesion?

v) Expected results and timetable

The research undertaken during the interim reports is supposed mainly to work on the data available at the national statistical offices, Eurostat and other national and European institutions, and normally be based on existing administrative units. From 2003 until August 2004, the research should complement the missing territorial/regional data and complement tools and territorial indicators if possible beyond the NUTS classification and the NUTS 3 level.

One of the main objectives of the ESPON 2006 Programme is to focus on research with policy relevance and to contribute to the development of relevant policies. Therefore, the deliverables of the research project should be highly operational and coordinated in time, as far as possible, to fit into the relevant political agenda. The following timetable and specification of output is reflecting this objective:

September 2002 (first interim report):

a) Consensus on indicators and necessary data after a precise analysis of the availability and comparability of data at Community level. For these analyses, the results of the study programme and the results of the ESPON projects in course, in particular under priority 3.1, should be taken into account. This task should also define the appropriate geographical level and technology required for data collection, taking into account the availability of the data. A first detailed and comprehensive list of data mainly requests for statistical and geographical data should be collected from Eurostat, the EEA and National Statistical Institutes and National Mapping Agencies.
b) First outline of the methodology of the impact analysis and the structure of the description of the sector policy.

February 2003 (second interim report):

c) Development of the database, indicators and map-making considering the progress of the other research projects.

d) A second revised and extended request for further indicators should collected from Eurostat and the EEA by the end of 2002 (the latest).
e) Presentation of the methods for the territorial impact assessment;
f) Definition of appropriate indicators, typologies and instruments to detect regions and territories most negatively and positively affected by the identified trends with special reference to accessibility, polycentric development, environment, urban areas, structurally weak areas, and new methodologies to consider territorial information.
g) Presentation of hypothesis on the territorial effects of relevant measures of the investigated policy.

August 2003 (third interim report):

h) Application of the methodology, analysis of the hypothesis previously developed.
i) Presentation of a comprehensive working report on tentative results of the research undertaken so far giving a first analysis /diagnosis of the R&D sector in Europe as well as the existing territorial imbalances and regional disparities in R&D capacity and innovation as well as tentative results on the spatial effects at EU level and in Member States in terms of the economic relocation and other spatial criteria (including databases, indicators and maps);
j) First propositions on improvement of the sector policy and the instruments,
k) First proposition on the institutional aspects of the spatial co-ordination of EU sector policies.

August 2004 (final report):

l) Improvement of the methodology and the analysis taking into account the results of the third interim reports of the other projects in particular with regard to the candidate countries.
(m) Comprehe nsive presentation of territorial impacts related to the enlarged European Union (27 countries);
n) Formulation of conclusions and proposition of possible thematic policy adjustments regarding the sector policy in order to avoid unintended spatial effects in relation to the ESDP and the structural Funds policy.
o) Definition of institutional settings and instruments, which could support a better co-ordination of sector policies towards spatial concerns;
p) Presentation of new territorial indicators and EU databases including candidate and possibly neighbouring countries
q) Formulation of the further research necessary in the policy field.

vi) Rationale and structure

The following text has the role of shaping the mind of thinking in developing a proposal for undertaking the ESPON action 2.1.2.. The text is not meant to be exhaustive, but to serve the purpose of guiding the tenderer.

1. Elaboration of an appropriate methodology for the impact analysis/assessment of the R&D policy

The methodology should take account of the spatial concepts developed under priority 1 and 3. The methodology should also allow indicating different level policy in order to identify the relevant actors for as better territorially coordinated policy. What are the features of a R&D

policies mostly affecting the territorial distribution of R&D activities and which effects derive such as e.g. the pattern of investments, development of human capital a.s.o.. Is any model available to measure the spatial aspects?, and which are the most important determinants to consider?

At present some assessment methods and models are available (see point vii existing access points, for some examples). The aim of this study should be to draw these existing assessment methods together (addressing their weaknesses) into a tightly focused, operational assessment tool, oriented towards the needs of decision makers.
The methodology should also allow indicating different level policy in order to identify the relevant actors for a better territorially coordinated policy.

2. Presentation of R&D policy with reference to the territorial dimensions and the governmental level responsible

The structured presentation of the EU R&D policy should allow identifying the relevant parameters for the territorial impact assessment for all three dimensions, the policy (contents and strategies), polity (institutions, organisations) and politics (processes) regarding particularly spatial disparities and imbalance of the EU territory

At first the project should provide a short description of the present situation and future trends of research policy in the EU, particularly in terms of spatial disparities and imbalances within the EU territory, taking into account the variables mentioned below.

The project should focus on both, on the dynamics of the spatial distribution of private R&D and interactions with patterns of change in the public sector, as well as on the extend to which policies to develop knowledge based industries in more peripheral regions can mobilise EU funding to develop new R&D capacities.

3. Data, spatial concepts and indicators

3.1. Territorial typologies

3.1.1. R&D typologies

Which kind of typologies of regions with regard to R&D activities is appropriate in order to investigate the effects of the R&D policy?

3.1.2. Relation to other important territorial typologies

Territorial and regional disparities, contributions of research policy to the European Spatial Development Perspective: The project should provide an in-depth analysis of territorial and regional disparities in research infrastructure and innovation capacities. Further the contribution of research policy to the following spatial planning objectives laid down in the ESDP (not exhaustive, the project under measure 3.1. will provide further spatial typologies) should be examined.

3.1.3. Polycentrism and urban-rural relations

Polycentric Spatial Development and a New Urban-Rural Relationship: With the intention of fostering polycentric and balanced spatial development in the EU, cities which are relatively far apart should co-operate in networks - for example co-operation between universities and research centres - aimed at solving common problems (ESDP policy aim, paragraph 77). The diversification of the rural economy, especially in structurally weak areas, also includes research and technology in small and medium sized towns leading to extra-regional links and networks, access to information and knowledge, etc (ESDP policy aim, paragraph 96). To what extend could R&D Policy contribute?

3.1.4. Parity of Access to Infrastructure and Knowledge

In the policy aim "Diffusion of Innovation and Knowledge" it is pointed out that access to knowledge and the capacity for innovation are still spatially unbalanced. Regionally interdependent labour markets and production and service locations require dynamic innovation systems, effective technology transfer, institutions for training their workforces and as well as access to an adequate supply of high-quality training and to research. Therefore one policy option (n° 35, paragraph 131) recommends "Wide-ranging integration of knowledge-relevant policies, such as the promotion of innovation, education, vocational training and further training, research and technology development, into spatial development policies, especially in remote or densely populated areas."

3.1.5. R&D and territorial cohesion

The Second Report on Social and Economic Cohesion[1] highlights crucial issues for research in lagging regions: attempt to increase the capacity of businesses to absorb new technology and know-how developed elsewhere, the capability of the work force to use this technology and adapt to new techniques, the entrepreneurial spirit to seek out new market opportunities and the availability of risk capital for innovation. In less favoured regions the (business) environment is often characterised by a combination of structural weaknesses, such as lack of a dynamic business services sector, a poorly developed financial system, weak links between the public and private sectors, sectoral specialisation in traditional industries with little inclination to innovate, low levels of public support for innovation and aid schemes which are poorly adapted to the needs of local SMEs. Therefore developing new forms of organisational and institutional co-operation as well as deploying resources in dynamic and innovative areas seems to be essential.[2]

3.2. Indicators and data collection

The project should quantify the territorial and regional disparities in research within the 15 Member States as well as for the 12 candidate countries. The collection of data for the basic indicators should take place on the NUTS III level. (non exhaustive list)[3].

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1 p. 59, p. 62

2 see also the Communication from the Commission: The Regional Dimension of the European Research Area

3 Where harmonised (Eurostat) data sources do not provide the data for the indicators at the appropriate geographical level, the consultant will have to examine national and possibly regional data sources to try to complete the data sets. The collection of these data should be done in co-ordination with data collection provided by the contractant/s of ESPON works under priority 4.

3.2.1. Research and innovation[4]

- "Investment in knowledge" – public and private investment in RTD
- Scientific and technological productivity

3.2.2. Innovation capacity[5]

- business expenditure on RTD,
- government expenditure on RTD,
- loan activities of the EIB number of patent applications,
- share of participating SMEs

3.2.3. Human resources and mobility[6]

- Level of education and training
- Career possibilities,
- training and mobility incentives
- number of places in universities,
- share of the resident population who have completed tertiary education leading to a first university degree or equivalent[7],
- number of re-integration grants

3.2.4. Research infrastructures, access to infrastructure, co-ordination of research activities

- PC equipment,
- internet sites,
- telephone lines, etc.
- number and type of networks

4. Quantification and analysis of the effects of the research policy on the balanced and sustainable development of the territory

4.1. Quantification of the effects of the R&D policy

Based on the indicators elaborated above, the task of the study is to examine the effects of the sectoral policy, thus research policy, on overall regional and territorial development. The project should evaluate and quantify the effects of research investment and the result of

[4] see the latest figures in "Key Figures 2001" and the special CORDIS web-site http://www.cordis.lu/rtd2002/indicators/home.html

[5] see Annex 2: European Innovation Scoreboard (innovation indicators)

[6] The Commission has an ongoing exercise on Benchmarking National RTD policies with 5 expert groups (on the topics Public and Private Investment in RTD, Human Resources, Scientific and Technological Productivity, Impact of RTD on Competitiveness and Employment and Public understanding of Science and Scientific Culture); these groups will complete their work in mid 2002. See the latest progress report (Commission staff working paper: Benchmarking National RTD Policies: first results. SEC (2002) 129).

[7] see Urban Audit: list of indicators

research policy on spatial typologies provided from the projects under ESPON priority 1 and 3 also using the following indicators (at NUTS III level not exhaustive list)[8]

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4.1.1. Demographic indicators

- migration trends
- population changes, population groups[9]
- population density
- trends linked to urban poles

4.1.2. Regional economic strength

- Attractiveness (number of created SMEs, etc.)[10]
- GDP
- Growth rate of labour productivity

4.1.3. Labour market, training and education

- (Un)employment rate and trends
- Level of training and education

4.2. Setting the link to spatial concepts

A more complex task is to analyse the effects of the R&D policy within the typology of regions developed by other ESPON projects in particular describing the territorial trends in different thematic fields such as accessibility and polycentrism. Are counter-weighting processes visible, how far are on-going polarising territorial trends supported or is a more complex picture visible?

5. Analysis of the interactions between Research Policy and other territorially relevant Community policies

5.1. Structural Funds Policy

For the establishment and strengthening of a "European Research Area" the following aspects should be taken into account: policies on finance, human resources, the relationship between the public an the private sectors, the creation of a common reference framework and values, and regional aspects ("territorialisation" of research policies).[11] Innovation has become a key element in economic development; special attention to this factor has to be drawn in lagging regions.

[8] These basic data are to be developed by contractor/s of works under priority 4 of ESPON programme

[9] Attention is to be drawn to possible "brain drain" effects through increased mobility of researchers.

[10] It should be taken into account in the assessment that there is not necessarily a link between an increase in RTD resources and personnel in Objective 1 regions and the innovative capacity of businesses situated there (see studies of RTD expenditure from the Structural Funds, Second Report on Economic and Social Cohesion, p. 102).

[11] Second report on Economic and Social Cohesion 2001, p. 99

5.2. Environmental policy

Research activities undertaken within the environment framework programme sustainable development and the territorial effects; where are these activities located and why?

5.3. Other territorially relevant policies

- Enterprise policy: importance of the (regulatory, institutional, organisational) environment to operate, firms, especially SMEs; link between scientific system and business, the role and effects of R&D policy?
- Competition policy: the capacity to innovate belongs to the vital factors for competition, where are the most competitive firms located, how far is this related with the distribution of the most innovative firms?

6. Orientations for policy recommendations

6.1. Improvements of the R&D policy for a better territorial cohesion

The results should also address the assessment of how R& D policies,

- Underpins regional development;
- Enhance R&D human resources and infrastructure potential;
- Monitors the synergies between economic actors and academic institutions; public and private sectors, local, regional, national and European levels of organisation;
- Builds pertinent and comparable indicators in order to evaluate RDI in regions.

6.2. ESDP

Reference should be made to all policy options in the ESDP dealing with the question of research and development. Recommendations should address institutional and procedural aspects of the R&D policy in order to achieve a better balanced spatial development of the EU territory. Proposal should make reference to the ESDP policy options and to the context of the proposal mentioned above. In addition, reference should be made to the current transnational areas under Interreg III B.

6.3. Structural Funds Policy and other policies

Contributions should also be made to the integration in Structural Funds Policy as well as co-ordination and coherence with other territorially relevant policies. Reference should be made to the relation between the 6th Framework Programme, Structural Funds interventions as well as national and regional research programmes.

Territorial impact: in order to ensure synergy between Community and national programmes, it would be desirable to incorporate impact analyses into the various regional development programmes. These analyses could form part of a strategic spatial development planning at national, regional or local level, and of strategies within Structural Funds programmes. Guidelines on how to implement Territorial Impact Assessment of research policy at regional level (spatial planning, institutions, practitioners, etc.) should be considered. Particular attention should be paid to issues arising from the principle of subsidiarity. Case studies for specific regions should be provided.

vii) Existing access points

The access points listed below can serve the purpose of providing the tenderer usefull information for preparing a proposal. It is by no means meant to be exhaustive, but only as information that can be helpful in tracing additional useful background information.

The SPESP report on economic strength[12] and spatial integration already identifies the problem of lack of data, data which is essential in order to identify the effects of R&D policies, such as the location of company headquarters, persistence of enterprises with IT branches and the location of foreign direct investments. Empirical work under action 1.2.3. (scheduled to be launched in 2004) on the information society will provide inputs for the investigation of the R&D policy. Also the DG RTD GMES initiative could provide important inputs.

Other useful documents:

- European Governance: A White Paper. COM(2001) 428 final.
- Agence Européenne "Territories and Synergies" (Co-ordination): Spatial Impacts of Community Policies and Costs of Non-Co-Ordination. June 2001.
- Communication from the Commission: The Regional Dimension of the European Research Area. COM(2001) 549 final.
- COM (2001) 94 final
    - Proposal for a decision of the European Parliament and of the Council concerning the multi-annual framework programme 2002-2006 of the European Community for research, technological development and demonstration activities aimed at contributing towards the creation of the European Research Area.
    - Proposal for a Council decision concerning the multi-annual framework programme 2002-2006 of the European Atomic Energy Community (EURATOM) for research, technological development and demonstration activities aimed at contributing towards the creation of the European Research Area.
- For the latest information on the European Research Area and the Framework Programme consult the following web-sites:
    - http://www.cordis.lu/rtd2002/home.html
    - http://europa.eu.int/comm/research/index_en.html
- European Innovation Scoreboard – Innovation indicators:[13]
    - Human resources: share of S&T graduates among all post-secondary graduates; percent of workforce with a tertiary education; percent of total employment in medium-high and hi-tech manufacturing; percent of total employment in high-tech services
    - Knowledge creation: government R&D funding as % of GDP; business expenditure on R1D as a percentage of GDP; number of patent applications in high tech classes per million population

[12] SPESP 2000 CD report of working group on economic strength, p. 114f.

[13] Communication from the Commission to the Council and the European Parliament: Innovation in a knowledge-driven economy. COM (2000) 567 final.

- Transmission and application of knowledge: percent of manufacturing SMEs that innovate in-house; percent of manufacturing SMEs involved in co-operative innovation; total innovation expenditures in the manufacturing sector as a percentage of total turnover
- Innovation finance, output and markets: venture capital investment in technology firms as a percent of GDP; capitalisation of new (new, parallel, secondary) markets as a percent of GDP; sales share of products new to the market in the manufacturing sector; internet users per 100 inhabitants; share of ICT markets as a percent of GDP; change in share of total OECD production in hi-tech sectors (1992-96)

In addition, an ESPON Data Navigator creating an overview, a handbook, giving information on principal data sources, contact points etc, is under elaboration. The Data Navigator is expected to cover, in principle, all countries in an enlarged European Union as well as neighbouring countries. The Data Navigator is scheduled to be finalised by August 2002.