

Territorial Impact Assessment of Policies and EU Directives

A practical guidance for policymakers and practitioners
based on contributions from ESPON projects and
the European Commission



Colophon

The ESPON 2013 Programme

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Foreword

It has long been recognised that sector policies have territorial impacts. Such territorial impacts, positive and negative, are often unintended or even unknown. There is a long standing demand, from policymakers and practitioners involved in territorial development to run quick, easy-to-use processes to provide a first indication of territorial impacts. This can support efforts to minimise negative policy outcomes and maximise territorial potentials.

Better availability of data and tools now makes such an approach possible. Two tried-and-tested tools for assessing territorial impacts from the ESPON Programme and operational guidance from the European Commission are ready to meet this demand and are included in this booklet:

- **A national and sub-national level ‘Framework for Assessing Territorial Impacts of European Directives’** providing national governments with an ex-ante procedure to assess the territorial impacts of EU directives.
- **Operational guidance on to how to assess regional and local impacts within the European Commission’s Impact Assessment System** presented from the Commission Staff Working Document, partly inspired by ESPON results.
- **A European level TIA ‘Quick check’** tool aimed at European-level policymakers and practitioners which ex-ante analyses the impact of EU policies and directives.

The ESPON Programme has continually strived to bridge the gap between scientific theory and evidence and the pressures of practical policy application. In June 2012, an ESPON workshop on assessing territorial impacts in Brussels collected the views of policy makers and practitioners. The workshop included representatives from the European Parliament, the European Commission and the Committee of the Regions. The general conclusion was that substantial progress has been achieved in assessing territorial impacts by different stakeholders at all administrative levels. This has allowed a better integration of territorial concerns into policy-making to secure effective and efficient outcomes. The crisis has only reinforced the need for efficiency.

ESPON projects ARTS and EATIA made important contributions to the progress of territorial impact assessments. They successfully bridged the gap between science and policy practice to provide useful tools for assessing territorial impacts.

A special thank you is due to everyone involved in these ESPON projects, including the project partners, lead stakeholders, the ESPON Monitoring Committee and other stakeholders who contributed their valuable time through workshops and review.

Peter Mehlbye

Director of the ESPON Coordination Unit

Acronyms

ARTS	Assessment of Regional and Territorial Sensitivity (ESPON Applied Research Project)
CAP	Common Agricultural Policy
CoR	Committee of the Regions
EATIA	ESPON and Territorial Impact Assessment (ESPON Targeted Analysis project)
EC	European Commission
EC DG REGIO	European Commission Directorate-General for Regional and Urban Policy
EC DG AGRI	Directorate-General for Agriculture and Rural Development
EEA	European Environment Agency
ESPON	European Observation Network for Territorial Development and Cohesion
Eurostat	Statistical office of the European Union
JRC	European Commission Joint Research Centre
TIA	Territorial Impact Assessment
TIPTAP	Territorial Impact Package for Transport and Agricultural Policies (ESPON Applied Research project)

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I - Introduction

Legislation and policy may often have, both directly and indirectly, unintended impacts on territorial organisation and development at European, (trans)national and regional level. Policy options can risk causing an unbalanced territorial or spatial distribution of costs and benefits for different types of territories. This can cause reduced support for the policy and/or problems/delays in implementation.

Carrying out an ex-ante assessment of territorial impact improves policy-making through reducing the risk of policy failure. By identifying and gauging territorial impacts, policymakers are presented with information needed to adjust, if necessary, the policy proposal or build in risk management measures and overall better ensure a successful outcome.

A clear policy demand to better understand territorial impacts

Since the 1990s, there has been a demand from both policymakers and Member States to better understand the likely territorial impacts of proposed EU sector legislation and policy, including how sector policies can reinforce each other, so as to ensure successful policy implementation.

The desire for tools to assess the territorial impact of EU policies was a key driver in policy processes leading to Territorial Cohesion being included as an objective in the Lisbon Treaty. This has brought the territorial perspective firmly into policy-making, bringing territorial impact considerations to the centre.

A major EU Seminar on Territorial Impact of EU policies in Amsterdam in 2009 provided further direction towards practical territorial impact assessment, specifying that assessment of the territorial impact of EU policies needed to take place at EU, national and regional levels.

The Territorial Agenda 2020, agreed by ministers in 2011, highlighted the role of identifying territorial impacts in the coordination of EU and national sectoral policies at all levels:

Most policies at each territorial level can be made significantly more efficient and can achieve synergies with other policies if they take the territorial dimension and territorial impacts into account... (it) can help to avoid creating barriers to implementation and unintended side-effects on other policy areas and on the territories.

Territorial Impact Assessment (TIA) has been seen as a method of meeting these needs for predicting territorial effects and providing useful insight that could be helpful and synergetic both for territorial and sector policy-making.

Among EU Member States there has been a strong recognition that territorial impacts need to be considered in European policy-making. It is considered that assessing territorial impacts needs to happen at the European level (led by the Commission), and at the national and sub-national levels (led by Member States).

A key moment in policy development

This booklet arrives at an opportune time for European and national policy-making. Both the European Parliament, the Committee of the Regions are considering the proposed EU budgets and CAP reform. These ESPON tools and European Commission guidance can assist in such considerations, identifying the capacity and potentials of regions.

For the European Parliament as a co-legislator of EU policy, this booklet may be particularly useful in supporting its considerations on EU budgets and their elements and their likely effects on different territories and countries in terms of growth and jobs, especially for young people. In terms of non-financial proposals, the guidance offered in this booklet can help policymakers identify territorial impacts in terms of environmental, social and economic effects – such as for example, the Commission's proposal to cap the use of food-based biofuels at 5% of transport fuel rather than 10%.

The Committee of the Regions (CoR) pays specific attention to the consequences that new legislation will have on regions and local communities and wishes to ensure effective and efficient policies through greater involvement of cities and regions in framing, implementing and evaluating EU policies with a territorial impact. This guidance and tools can support the CoR's aims and assist both the institution and its members at the regional level to consider likely impacts of proposed policies as wide-ranging as Common Agricultural Policy proposals to those concerning airport noise. They can strengthen multi-level governance through their participatory approach and improve the flow of useable territorial evidence between different levels.

For EU Member States this booklet may be useful in providing two related and complementary tools to identify territorial impacts at different territorial levels. Generic TIA may identify potential impacts on a range of territories, but without more detailed territorial knowledge may not provide the full picture. A participatory approach to identifying territorial impacts, using regional and local knowledge, could identify unintended consequences. For example, impacts for smart, sustainable and inclusive growth arising from directives on environmental impact assessment or protected sites, and their impact for delivery of renewable energy demands, or how the pregnant workers directive may impact unique and localised labour markets.

A set of useful tools ready to meet this demand

This booklet directly addresses the objectives for enabling assessment and consideration of territorial impacts. As demanded from stakeholders, it uses ESPON research to provide regional, national and European policymakers with tried and tested tools to gauge the territorial impacts of a proposed policy or directive ex-ante and to support the development of policy. This research was guided strongly by stakeholders to provide a bridge between the scientific tools already developed by ESPON and the need for a quick, easy-to-use and participatory process that could inform policy development.

The tools in this booklet:

- Are quick and easy-to-use to meet the expressed needs of practitioners and policymakers for no new burdensome requirements;
- Can assist in identifying and potentially reducing negative and unintended consequences of policies, and help to understand potential positive impacts on a territory;
- Through their multi-level participatory approach, can improve co-operation between tiers in the context of multi-level governance, improving effectiveness, efficiency and overall governance, which is strongly desired in the current economic climate;
- Can have a longer term wider role in improving policy-making, its transparency and the vertical and horizontal coordination of policies and actions and developing policy synergies; and
- Should be seen as part of a process to realise territorial potentials and improve people's lives rather than as part of a compensation argument or settlement.

These straightforward tools are borne out of policy-led ESPON research projects. The ESPON "Assessment of Regional and Territorial Sensitivity" (ARTS) project has developed with European policymakers a quick and effective "TIA Quick Check" tool to deliver Territorial Impact Assessment. The "ESPO and TIA" (EATIA) project has worked with national policymakers to develop similar tools to enable Member States to provide quick and effective feedback on territorial impacts.

Along with these ESPON tools, the European Commission's "Commission Staff Working Document" (CSWD) on assessing territorial impacts, which has also used ESPON projects as inspiration, is included in this booklet. This CSWD provides a comprehensive view on the rationale and processes for European level actors to assess territorial impacts.

Using this booklet to support the assessment of territorial impacts

General readers and users should consider this booklet as an aid for policy-making rather than as a direct way to answer inherently political questions. The tools should be taken as giving part of the picture - a good start - in assessing who is affected by the problem and solution, how and where. And every policy proposal should be viewed as coming as part of a 'basket' of policies rather than as one-offs. A wide and rich range of resources are available to policy-makers, not least the extensive availability of Impact Assessment documents on the European Commissions website¹.

This booklet aims to create awareness in a simple and accessible format of the options for support delivered by ESPON as well as the overarching learning and good practice identified by the European Commission.

Firstly, a **national and sub-national level 'Framework for Assessing Territorial Impacts of European Directives'** is presented from the ESPON Targeted Analysis Project EATIA. This short guidance provides national governments with an ex-ante procedure that can be used to assess the territorial impacts of EU directives. It has been developed collaboratively by researchers with UK, Slovenian and Portuguese ministries, with over 60 spatial planning and policy-making practitioners from these countries also involved. The approach has been devised to be applied at the national level using a participatory process to gather information for regional and more local levels. This should enable the identification and evaluation of potential policy impacts at national, regional and local levels with the aim of better informing national negotiating positions and transposition strategies.

Secondly, **operational guidance on to how to assess regional and local impacts within the European Commission's Impact Assessment System** is presented from the Commission Staff Working Document. Partly inspired by ESPON results and responding to the same policy demand, it explains from an European Commission perspective why territorial impacts should be assessed, when, how and who should be involved in the process. It underlines that it has become easier to assess territorial impacts due to the creation of harmonised local and regional typologies, more data availability and new tools, including those present in this booklet.

Finally, a **European level TIA 'Quick check' tool** is presented from the ESPON Applied Research ARTS project. This is a succinct guidance tool which analyses the impact of EU legislation taking the sensitivity of regions into account. The analysis of regional sensitivity to EU directives and policies is intended as a simplified, evidence-based procedure of Territorial Impact Assessment (TIA). This is an essentially 'top down' tool aimed at European-level policy-makers and practitioners.

¹ http://ec.europa.eu/governance/impact/ia_carried_out/cia_2012_en.htm

II - A national and sub-national framework for assessing territorial impacts of European directives

This guidance is the output of the ESPON 2013 Programme 'ESPOON and Territorial Impact Assessment' (EATIA) Targeted Analysis project, led by the University of Liverpool with the University of Ljubljana, University of Porto and Delft University of Technology as project partners. The guidance was developed in collaboration with Department for Communities and Local Government (UK), Direção-Geral do Território (PT) and Ministrstvo za infrastrukturo in proctor (SI).

1. Introduction

EU directives, along with their transposition into national legislation, can have unanticipated and undesirable impacts on EU member state territories¹. These territorial impacts can include those on the use of space (e.g. new infrastructure or sprawl), governance, and wider social, economic or environmental dimensions. Although the ex-ante assessment of the potential impacts of EU initiatives is presently carried out, for example through the European Commission's Impact Assessment procedure and in some member states through national level impact assessment procedures, important impacts are still at times overlooked as impact assessments often fail to systematically take into account the spatial dimension and recognise the territorially heterogeneous nature of impacts within and between EU member states. These policies can subsequently come into conflict with national and sub-national development aspirations and can negatively impact member state territories.

This document provides guidance to EU member states on the application of an ex-ante procedure that can be used to assess the territorial impacts of EU directives².

The territorial impact assessment (TIA) framework presented here, is the outcome of an ESPON (European Observation Network, Territorial Development and Cohesion) financed project ('ESPOON and Territorial Impact Assessment' – 'EATIA'), which was supported by the ministries responsible for planning in the UK, Slovenia and Portugal. It has been developed collaboratively by these three ministries together with a project team, consisting of the universities of Liverpool, Ljubljana, Porto and Delft. Furthermore, over 60 spatial planning and policy making practitioners from the UK, Portugal and Slovenia were involved. The approach has been devised to be applied at the EU member state level and to enable the identification and evaluation of potential policy impacts at national, regional and local levels with the aim of better informing national negotiating positions and transposition strategies. Whilst it is anticipated that TIA would remain a non-mandatory requirement in most EU member states, it is expected to be beneficial:

- For national administrations in that they will be able to form national positions on draft directives, and transposition strategies, in a more effective way. They will be better informed of what the potential impacts of the initiative will be and will thus be able to formulate negotiating positions and transposition approaches that better support national policy aims and objectives.
- For regional and / or local administrations in that it provides them with a pathway through which they can feed their insight into the policy development process to flag-up potential issues in their regions and localities which may otherwise be overlooked. This will help them ensure that negative impacts on their areas are avoided and can promote the development of policies which better support their own regional / local policy development objectives. It may also help them identify new opportunities for regional and local development support by obtaining a better understanding of EU initiatives.

¹ The term 'Member State' is used throughout this document for convenience but should be taken to include any nation subject to the implementation of EU policies.

² Whilst this guidance focuses on assessing impacts of European draft directives, the approach outlined here can also be applied to other EU or even domestic policy proposals.

The approach has been designed to be simple, pragmatic and ‘policy-maker friendly’, and also highly adaptable to different member state contexts. It does neither necessitate (nor does it preclude) the collection and maintenance of expansive data sets, the acquisition of complex expert knowledge, nor the formation of new specialist bodies. Rather, it is a largely intuitive approach, designed to draw on the knowledge and insight of relevant national and sub-national stakeholders, and can be integrated into the working practices of existing bodies.

The framework has been developed around three complimentary strands; procedural, technical and governance. Procedural elements concern the stages of the TIA process, namely (1) screening, (2) scoping, (3) assessment and (4) evaluation. Technical elements encompass the methods and approaches applied in each of these stages.

The governance dimension concerns the allocation of tasks to different administrative levels and communication / collaboration between different partners. The first section of this document elaborates on these first two aspects, whilst section two is dedicated to outlining possible governance arrangements. The concrete nature of these will vary between member states, reflecting differing institutional arrangements. The Annex to this guidance provides for samples of the various techniques used.

Conducting a TIA can be a highly efficient exercise. Testing the approach against various directives in Portugal, Slovenia and the UK has shown that, if TIA is to be completed with only minimal resources being available, national screening and scoping can be completed during half day workshops. This would require a skilled interdisciplinary team, coming together in a co-operative spirit, reflecting a high level of familiarity with the policy area and territorial expertise. A similar amount of time is required for the assessment stage conducted at regional or local levels, whilst the overall evaluation might take as little as between half a day and a full day, depending on how many authorities are actually involved and how extensively technical elements are elaborated on. If more substantial resources are available, there are no barriers to conducting more comprehensive assessments, which may include e.g. the generation and presentation of territorial baseline data and the preparation of more elaborate TIA reports. In particular, this may enhance transparency.

2. The TIA process

This section provides a descriptive account of the procedural and technical aspects of the TIA framework. It is structured in terms of the four main stages of the TIA process; screening, scoping, assessment and evaluation.

2.1 Stage 1 - Screening (national government departments)

The aim of the screening stage is to determine the necessity for TIA on a case-by-case basis, that is, whether the approach should be employed or not employed for a specific policy proposal. This decision will be based on the perceived nature of the potential impacts that could arise from the adoption of the policy proposal. A TIA is likely to be desirable when major unintended or undesirable impacts are considered to be possible, particularly if these are likely to vary in nature across a MS territory. During screening, it is necessary to consider the potential for such impacts. This will necessitate the judgement of a multidisciplinary group with expertise in the policy field under consideration and also of spatial / territorial matters in the member state. This group should draw on available information and evidence when making their determinations, including outputs of the European Commission’s impact assessment procedure.

The following approaches can also be applied optionally and flexibly to facilitate the process:

a) **Logical chain / conceptual model approach**

The logical chain / conceptual model approach can essentially be seen as a form of 'sophisticated brainstorming'. It draws on expert knowledge to identify the potential consequences of a policy proposal and can serve as a relatively quick way of identifying potential impacts.

In employing this approach, assessors work from a description of a policy proposal and identify potential direct and indirect territorial impacts¹, depicting them diagrammatically and highlighting the underlying cause-effect logic or pathways. Whilst in principle this approach can be employed by a single individual, given the nature of the TIA exercise, it delivers the best results in an interdisciplinary group setting.

The format of this approach is highly flexible and the degree of complexity employed in developing these chains will depend both on the needs and resources available to the screening body. It can be anything from a hand drawn sketch on the back of an envelope to an elaborate computer designed figure (three examples with different degrees of complexity are shown in the Annex). It is important, however, to keep in mind the purpose of the screening exercise when using the approach. Resources should not be expended beyond what is necessary to come to an informed decision as to whether to proceed or not with a TIA.

b) **Screening checklist**

The screening stage can be facilitated by employing a simple checklist. The principle of a screening checklist is to ensure that impacts on important territorial characteristics are not overlooked and to promote transparency, particularly in cases where a decision is made not to proceed with a TIA. This approach can be used alone or in conjunction with the logical chain / conceptual model approach, which can facilitate its completion.

Central to the use of the checklist is the prior definition of territorial characteristics against which to consider impacts. These form the assessment criteria in the checklist. Criteria should be selected to cover a range of dimensions/characteristics of the territory², and, in accordance with the role of TIA in facilitating the identification of possible conflicts between EU policy proposals and national and sub-national political priorities or objectives, should closely relate to national and sub-national objectives.

Criteria can be developed on a case-by-case basis, or can be standardised through prior agreement between stakeholders in the member state.

In addition to nationally derived criteria, standardised criteria can also be developed at an EU level to enable the comparison of potential impacts between EU member states. This set would need prior agreement, but could, for instance, be based on Europe 2020 objectives (summarised in the Annex). Regardless of the criteria used, it is important that they are each clearly defined in order to avoid different interpretations and ensuing inconsistencies³. They should also not be excessive in number⁴. An example screening checklist, based on Europe 2020 related characteristics and some additional characteristics established through expert opinion in the UK, is presented in the Annex to Chapter II.

¹ A 'territorial impact' can be considered to be any impact on a given geographically defined territory, whether on spatial usage, governance, or on wider economic, social or environmental aspects, which results from the introduction or transposition of an EU directive or policy'.

² Including aspects related to e.g. spatial usage, governance, the economy, society and the environment.

³ e.g. in Europe 2020 'Investment in R&D is defined as 'business enterprise expenditure on R&D, higher education expenditure on R&D, government expenditure on R&D and private non-profit sector expenditure on R&D'.

⁴ For practical reasons criteria should not normally number more than 15 and 20.

2.2 Stage 2 - Scoping (national government departments)

If a decision is made to go ahead with conducting a TIA, the first task is to define its scope. Scoping is more rigid than screening and aims to steer the entire TIA process by determining:

- Whether major territorial impacts are likely to result from the proposed policy;
- What the nature of these impacts is; and
- Where these impacts are likely to emerge geographically.

The scoping stage is structured around a number of interconnected activities, as follows:

1. Completing a Scoping Checklist;
2. Developing an Impact Assessment Matrix for use at the next (regional/local level) TIA stage;
3. Identifying localities where impacts may be particularly noticeable.

Scoping should be conducted by a team which reflects the expertise required to confidently judge impacts on various territorial dimensions. It is important that such teams have the necessary baseline data and likely future development scenario knowledge to effectively complete scoping. Also, if the team consists of representatives from different departments / ministries, they need to be open to co-operation and collaboration. The following sections outline each of the three scoping related activities in detail.

2.2.1 Completing the scoping checklist

a) The scoping checklist is based on a template (See shaded areas in Annex). To complete the checklist, it is necessary to determine whether a policy proposal should be considered as a whole or whether it should be divided into a number of individual elements, each of which can then be assessed individually. Splitting a proposed policy into elements can be based on an article-by-article basis or by singling out just a few 'key' articles to consider individually, whilst considering others collectively. The main benefit of doing this is that it can enable decision makers to identify more precisely the origin of particular impacts and so can help direct the negotiation or transposition process. However, splitting a proposed policy into elements should only be done when there is clear added value in doing so. Using policy elements can increase the work required significantly, and unless justified, could discourage sub-national authorities from engaging in the subsequent assessment process which will likely be a voluntary activity in most member states. Regardless of the format chosen, it is vital to always consider cumulative impacts, particularly if a proposed policy is split into individual elements.

b) To complete the scoping checklist, the scoping team should consider the impact of the policy proposal (or each of the policy elements) against each of a number of important territorial characteristics. These characteristics form the criteria in the checklist and firstly need to be defined in line with the principles outlined in section 1.1b. If, however, the checklist was employed in the screening stage, the criteria developed at this point should be reused. In the checklist, whether the proposed policy is likely to have a major impact on criteria should be considered.

This should be indicated in terms of either 'yes' (✓), 'no' (x), or if it cannot be determined, 'uncertain' (?). The logical chain / conceptual model approach (see section 2.1 a) can be employed here, again, if necessary to help identify cause-effect relationships prior to completing the checklist. Other information sources should also be fully utilised, for example, the outputs of the European Commission's own Impact Assessment process.

c) For each potentially major impact, the scoping team should consider the features, or 'type', of area at the regional/local level in which these impacts are likely to emerge. In completing this section, it is important to consider, inter alia, geographical location (e.g. coast, mountain, border, peripheral, islands, densely/sparsely populated, urban/rural), the features or resources of the area (e.g. water, coal, peat, gas), and the activities that the area hosts (e.g. coal based power generation, education, agriculture, industry). For example, coastal regions may be more likely to be impacted than mountainous regions, or rural areas more than urban areas. When conducting this exercise, it is important to keep in mind that different areas may be susceptible to different types of impact on the same territorial dimension, resulting from the same policy or policy element. In such cases, it can be helpful to divide the relevant row in the checklist two or more times to accommodate this.

d) In the final column of the checklist, every 'yes', 'no' or 'uncertain' decision should be justified (written comment). In addition, where a major impact is considered likely, the nature of this impact should be described, e.g. referring to its anticipated magnitude, duration, probability etc.

This section of the checklist will be a valuable resource for those at the sub-national levels who will be expected to conduct the next stage of the TIA process and who will use this as a starting point for considering impacts¹.

2.2.2 Developing an Impact Assessment Matrix (IAM)

The scoping checklist is used to prepare the Impact Assessment Matrix (IAM). This forms the basis for the assessment stage at the regional / local level. To prepare the IAM, the scoping team should use the template provided in the Annex to Chapter II and populate the matrix's axes with (a) the assessment criteria/characteristics employed in the scoping checklist and, (b) if utilised, the identified policy elements.

2.2.3. Identifying types of regions / localities where impacts may materialise

Whilst it is preferable for the subsequent assessment exercise to encompass all sub-national areas in a territory in order to develop a comprehensive picture of the potential impacts, this will not always be possible². In some member states the sub-national geography may be hostile towards a comprehensive approach because, for instance, the need to engage an infeasible number of sub-national authorities. In these cases, instead of engaging all areas in the assessment process, the assessment can be focused in the areas most likely to be impacted owing to their characteristics or type. In these situations, such localities should be identified in the scoping process. This identification process should be based on the information defined in the scoping checklist during activity 2.2.1c³, and whilst all localities should have access to the scoping outputs and should be given an opportunity to participate in the TIA⁴, the identified localities should be approached directly and encouraged to conduct the assessment based on the IAM⁵.

¹ Except potentially for smaller MS, where the national level may conduct this stage in collaboration with regional and / or local authorities.

² This will be more realistic in smaller EU member states with few regions.

³ Any quantitative TIA modelling exercises conducted at the EU level can also be used to aid this process (e.g. the approach developed in the ESPON ARTS approach).

⁴ To gain a comprehensive a picture as possible it is clearly desirable to engage as many regions / localities as possible in the assessment.

⁵ In some circumstances it may be desirable to also contact adjacent areas due to the potential for spill over effects.

Although, whenever possible this ‘targeting’ approach should be adopted, in some situations it may not be realistically possible to identify specific regions or localities corresponding with the characteristics identified in 2.2.1c due to data limitations (e.g. ‘coastal areas’ can be readily identified using a map, but ‘areas with a high proportion of circa 1900 residential building stock’ may be more problematic/resource intensive).

In these situations, the outputs of scoping should be widely advertised and the responsibility can be left to regions / localities to identify themselves as fitting the characteristics identified in the scoping process. In this context, it is important to note that whilst it is unlikely that a contribution to TIA will be compulsory for regional / local authorities, the possibility of being particularly negatively affected by the proposal or the possibility of being able to tap into specific sources of funding (e.g. regional development funds or LIFE) will mean that it is in their best interests to get involved.

2.3 Stage 3 – Impact Assessment (regional or local administrations)

Following scoping, the scoping body will release information on the proposed directive¹ and the outputs of the scoping process (possibly on a dedicated website) and will alert all regions / localities in the MS to its presence. Localities should then proceed to conduct the assessment as outlined below².

If a non-comprehensive approach has been adopted (see 2.2.3), following the alert from the scoping body, regional/local authorities will firstly consider whether they are likely to be susceptible to impacts from the proposed EU directive based on the information produced in scoping, before proceeding as follows if they consider this likely.

In the impact assessment stage, assessors need to complete the impact assessment matrix (IAM) (Annex to Chapter II), developed during scoping, by considering the impact of the policy proposal (or of each policy proposal element) on the locality in question in terms of the territorial characteristics used in scoping and possibly other, local characteristics (see section 2.4.1). Any quantitative modelling exercises conducted at the EU level can support the assessment here. When potential impacts are identified, following the format of the IAM, they should be described with reference to the following three characteristics³ and should be fully justified to facilitate later interpretation and processing:

- **Magnitude:** This refers to the expected size or scale of the impact and should be defined numerically (0 = no impact, 1 = some impact or 2 = major impact); no intermediary values should be used (uncertainties can be reflected in the comment section);
- **Orientation:** This refers to the impact’s direction of action in relation to the baseline condition, for instance, will it act to increase soil pollution or decrease soil pollution;
- **Temporal distribution:** Refers to the duration of the impact; this should be described in terms of; short term (e.g. up to 5 years), medium term (e.g. up to 10 years) or long term (e.g. over 10 years); in cases where the nature of the impact varies over time, this can also be outlined.

¹ This is the object of the assessment and the scoping body should define it clearly. If not, there is a risk that inconsistencies will be introduced into the assessment process as assessment teams interpret it differently.

² If suitable, regional (or Land / devolved administration) levels may co-ordinate local level assessments. Certain bodies may be particularly suited to fulfil a co-ordination role, e.g. in Scotland the SEA Gateway or in the Netherlands the EIA Commission.

³ These characteristics can however be reduced or supplemented with others (e.g. impact probability) as seen necessary in a particular member state.

Throughout this exercise, it is important to consider potential indirect and possible spill-over effects from impacts in adjoining localities, in particular in cases when these could be particularly influential - for instance, if an externally located yet important local employer was to close as a result of a proposed policy.

It is also important to utilise all available sources of information and evidence. This in particular will include the outputs of the scoping process, which can provide a valuable source of insight, especially when the proposed directive is highly technical. Additionally, whilst extensive baseline data compilation exercises are not necessary when the exercise is done within the context of a workshop attended by expert representatives of different departments coming together routinely for e.g. local spatial plan making and associated strategic environmental assessment purposes, detailed supporting studies can be conducted, if deemed necessary and resources permit.

2.4 Stage 4 – Impact Evaluation

The central aim of the evaluation stage is to be able to determine whether the potential impacts identified in the assessment stage are significant¹, both, positively and negatively, and to comment, in particular, on how any undesirable impacts could be avoided or mitigated though e.g. changing the wording of a directive proposal or altering the transposition approach.

To do this, the impacts identified and described in the IAM(s) should be interpreted in terms of their compliance/conformity with various territorial policy objectives using an Evaluation Table (Annex to Chapter II). Whilst the impact evaluation exercise should always be conducted at the national level, it may also be appropriate to undertake this at the regional / local level, in order to establish impact significance in terms of regional / local policy objectives². The procedure is outlined in full below:

2.4.1 Completing the national level Evaluation Table

a) Prior to beginning the national level evaluation process, it is first necessary to collect and amalgamate the outputs of the IAMs completed at the sub-national level. Various techniques can be employed to facilitate this process (see Annex to Chapter II), but thematic mapping can be particularly useful, highlighting the spatial distribution of the anticipated impacts. Maps can be created to show the anticipated impacts of the policy proposal on each of the territorial dimensions considered in the assessment stage.

b) The Evaluation Table is based on a template (Annex to Chapter II). Using this template requires that suitable nationally relevant policy objectives against which potential impacts can be evaluated are firstly identified. These should be those from which the criteria employed in the assessment process were initially derived in stage 2.1b and 2.2.1b (for instance the Strategy for Spatial Development of the Republic of Slovenia). Once these have been identified, they should be used to populate the relevant column of the Evaluation Table template provided.

c) Following the structure of the Evaluation Table, for each of the identified objectives, the significance of the impacts detailed in the completed IAMs should be defined. In each case the significance should be determined by considering both, the nature of the policy proposal's potential impacts (e.g. magnitude, direction of action), as well as the nature of the objective itself. Impacts should be defined in the Evaluation Table, using a 5 point scale (-2, -1, 0, +1, +2), reflecting whether the potential impacts are considered to be positive or negative for the objective concerned and the impact's degree of significance (neutral to high).

¹ The significance of an impact depends both on its nature (e.g. magnitude, temporal distribution, etc) and the context in which it occurs, defined by adopted (territorial) policy objectives. Impacts can be positive or negative, recognising that in policy negotiations being aware of the favourable aspects of a policy proposal can be as important as being aware of the negative.

² Evaluation/s should be conducted at the most appropriate level/s depending on the administrative framework and distribution of competences for establishing territorial policy objectives in different countries (in-keeping with the principle of subsidiarity).

If completed in a group setting, as is preferable to enhance objectivity, if different opinions are expressed, these should be reconciled through discussion. Each determination in the table should be accompanied by a written commentary and justification which should include, in each case, an explanation of the specific policy impacts that have led to the significance determination given in terms of each objective, and if possible any suggestions of how negative impacts may be avoided or mitigated or potentially positive impacts maximised.

d) Following the evaluation process, best practice dictates that a written summary of the results / outputs of the overall TIA process should be prepared and sent to local / regional level partners who participated in the TIA, if not to all regional / local authorities. This should include any proposed changes to the policy proposal.

2.4.2 Completing a regional / local level Evaluation Table

a) Sub-national evaluation can be completed by regions/localities in countries where the administrative framework and distribution of competences for establishing territorial policy objectives means that these are appropriate levels at which to evaluate impacts on the resilience and future evolution of places. The process should follow an identical procedure to that outlined above, however it should precede it in time, and the objectives used in the Evaluation Table should be regionally or locally specific. These objectives can be derived from a variety of sources but would most likely be drawn largely from regional/local planning documents. The key qualifying characteristic for these objectives is that they must outline a desired state or an agreed line of action relevant to the region / locality, and should normally cover social, economic, environmental and governance dimensions.

b) In situations where, as a result of the assessment criteria employed in the assessment process, impacts are not defined in a manner suitable for evaluation against particular sub-national objectives, additional more appropriate assessment criteria can be defined and introduced into the impact assessment process through the IAM. In this respect, it is important to note that the assessment and evaluation stage is not a strictly one way process.

c) If sub-national evaluations are carried out, in order to allow for the integration of these outputs at the national level, the national level Evaluation Table should include the additional objective along the lines of minimising negative and maximising positive impacts at the local / regional level.

3. TIA governance arrangements

This section provides suggestions and an outline of the principles that should be followed when considering the implementation of TIA in the administrative and institutional context of an EU member state. These are presented in terms of the four stages of the TIA process.

To supplement these arrangements, in some member states, the establishment of a web-based platform for TIA may be desirable to facilitate the operationalisation of the approach. This could, for instance, incorporate a means of alerting relevant stakeholders to the TIA, an information repository, a means of uploading assessment information, and basic data analysis tools. This will help facilitate efficient information exchange between parties.

3.1 Screening and Scoping

Screening and scoping activities should be carried out at the national level, ideally in a multidisciplinary setting. Conducting these activities will, in particular, require expertise in the policy area under consideration and also of territorial matters in the member state. In most member states this will mean that the responsibility for these activities will most appropriately be assigned to the government department responsible for negotiating or transposing the policy area under consideration, supported by the department responsible for spatial planning / impact assessment (e.g. SEA) and also possibly other departments as relevant.

Particularly in smaller MSs, it may also be desirable to involve sub-national representatives (devolved administration/ Land etc.). In member states with existing impact assessment procedures for EU measures (e.g. the UK), it may also be possible to embed TIA activities within these existing arrangements.

3.2 Impact Assessment

The impact assessment stage needs to engage with sub-national authorities at either the regional or local levels with operational familiarity with the sub-national territorial units in the member state. This in particular will include agencies with spatial planning responsibilities. The assessment can be undertaken directly by these authorities (e.g. devolved administrations/ Land, local planning bodies/agencies), or in smaller member states, by central government departments in consultation with these authorities. If a non-comprehensive assessment approach is adopted (see section 2.2.3), regional (devolved administration / Land etc.) / local planning bodies / authorities would either be:

- Contacted directly by the scoping body and encouraged to participate (i.e. 'targeted'); or be
- Responsible for taking the initiative themselves based on their own interpretation of the scoping outputs; if this was the case, a centrally managed web-based system could be used, sending out e.g. alert emails.

These bodies / authorities would be responsible for completing Impact Assessment Matrices and for communicating this information to the national level. Support for this could be provided by any suitable national or regional (devolved administration / Land) agencies.

3.3 Impact Evaluation

Evaluation is necessary at the national level. In most cases it will be most appropriate for this to be led by the government department responsible for negotiating or transposing the policy, coordinating with the department responsible for spatial planning and other departments.

These departments will be responsible for receiving, amalgamating and analysing the assessment information generated at the sub-national levels and for feeding this into the policy negotiation and transposition process. Where impact assessment procedures already exist for EU measures, these evaluation activities could be integrated within these arrangements.

The evaluation stage can also be conducted on an optional basis at the sub-national level. In these cases it should be conducted by the same body that undertook the assessment stage (e.g. agencies with spatial planning responsibilities).

III - Assessing territorial impacts: European Commission operational guidance

European Commission (2012)

Commission Staff Working Document



“Assessing territorial impacts: Operational guidance on how to assess regional and local impacts within the Commission Impact Assessment System”

The Commission’s Impact Assessment guidelines (2009) give general guidance to the Commission services for assessing potential impacts of different policy options. This Commission Staff Working Document, presented fully below, complements these guidelines with operational guidance on assessing territorial impacts. Assessing territorial impacts can enhance the policy coherence of policy proposals. Taking into account potential asymmetric impacts can increase the effectiveness and the efficiency of the policy. It can increase political support for a policy, boost the benefits while addressing excessive spatial concentrations of the costs.

1. Introduction

This document explains what it means to assess territorial impacts, why it can be useful, when to use and how to do it.

The Impact Assessment guidelines¹ contain many references to the territorial dimension. For example, the guidelines ask the following questions (emphasis added):

- Will it have a specific impact on certain regions?
- Is there a single Member State, region or sector which is disproportionately affected (so-called 'outlier' impact)?
- Does it affect equal access to services and goods?
- Does it affect access to placement services or to services of general economic interest?
- Does the option affect specific localities more than others?
- Does the option have the effect of bringing new areas of land ('greenfields') into use for the first time?
- Does it affect land designated as sensitive for ecological reasons?
- Does it lead to a change in land use (for example, the divide between rural and urban, or change in type of agriculture)?

This document provides operational and methodological guidance on how to answer these questions. This guidance only complements the Impact Assessment guidelines¹ and does not create additional reporting requirements. It is a tool that can be helpful to enhance policy coherence of policy proposals.

The objective of assessing territorial impacts is essentially to do an impact assessment with a territorial focus. It is not limited to a specific policy domain. As a result, the assessment of social impacts² and competitiveness proofing³ are entirely compatible with an assessment of territorial impacts.

This type of assessment has become more realistic due to the substantial increase in regional, local and spatial data. This increase in data has many sources, including the use of register data, the use of geographical information systems and satellite imagery.

¹ SEC(2009) 92 http://ec.europa.eu/governance/impact/commission_guidelines/docs/iag_2009_en.pdf

² Guidance for assessing Social Impacts within the Commission Impact Assessment system <http://ec.europa.eu/social/main.jsp?catId=760&langId=en>

³ Operational guidance for assessing impacts on sectoral competitiveness within the commission impact assessment system SEC (2012) 91 http://ec.europa.eu/enterprise/policies/smart-regulation/impact-assessment/competitiveness-proofing/index_en.htm

The growing awareness of and the interest in the territorial dimension has also helped to boost the production of more sub-national indicators. In addition, the European Commission, with the help of the OECD, has established a wide range of harmonised regional and local typologies, which can be an extremely useful tool for this type of work.

The guidance provided here responds to a request from the Member States, expressed in the debate¹ following the 2008 Green Paper on Territorial Cohesion² and under the Polish EU Presidency in 2011 as part of the Territorial Agenda process³.

Several good examples of Commission impact assessments with a strong territorial dimension can be found on the Impact Assessment website⁴. In particular, the assessments of the Common Agricultural Policy for 2014-2020 and of the White Paper: Roadmap to a Single European Transport Area include detailed assessments of territorial impacts.

2. What does assessing territorial impacts mean?

Assessing territorial impacts helps to identify whether a policy option risks having a large asymmetric territorial impact, also known as an 'outlier' impact.

Territorial means primarily using a more spatial approach to analysing the impacts. It refers to a number of different spatial angles:

- Administrative or political levels such as: macro-regional, national, regional or local level
- Types of regions or areas such as: border regions, rural areas, coastal areas
- Functional areas such as: river basins, labour market areas, service areas

Asymmetric means that there is highly unbalanced spatial distribution of the costs and benefits. This is important as a large asymmetric impact may reduce support for the policy and can create problems and delays during the implementation.

3. Why assess territorial impacts?

Commission policies can benefit from assessing territorial impacts. Before deciding on a particular policy, assessing territorial impacts could show in a quantitative or qualitative manner which areas or regions may face the highest costs or benefits. If these costs are distributed in a highly asymmetric manner, the policy could be adjusted to reduce the costs of the policy on the most affected regions. If the policy itself cannot be adjusted, mitigation measures including the creation of another instrument to reduce the burden on these regions or areas should be investigated. Three short examples can illustrate the potential regional differentiation of impacts:

1. Reducing the concentrations of an airborne pollutant in cities to uniform level within a single deadline may be more difficult to achieve in some cities than others. Concerns about such difficulties may lead to pressure to allow higher concentrations. Assessing territorial impacts could identify such risks and ensure that the policy grants cities with very high concentrations a longer time frame to reach the necessary quality threshold.
2. State aid policy also differentiates its approach according to the level of development of a region and to the size of the market. For example, different possibilities to award state aid apply to areas with an abnormally low standard of living, to outermost regions, to regions with low population density.

¹ COM (2009)295 http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/interim6_en.htm

² COM (2008)616 final http://ec.europa.eu/regional_policy/archive/consultation/terco/index_en.htm

³ <http://www.eu-territorial-agenda.eu/PresidencyConclusions/Forms/AllDocs.aspx>

⁴ http://ec.europa.eu/governance/impact/ia_carried_out/cia_2012_en.htm

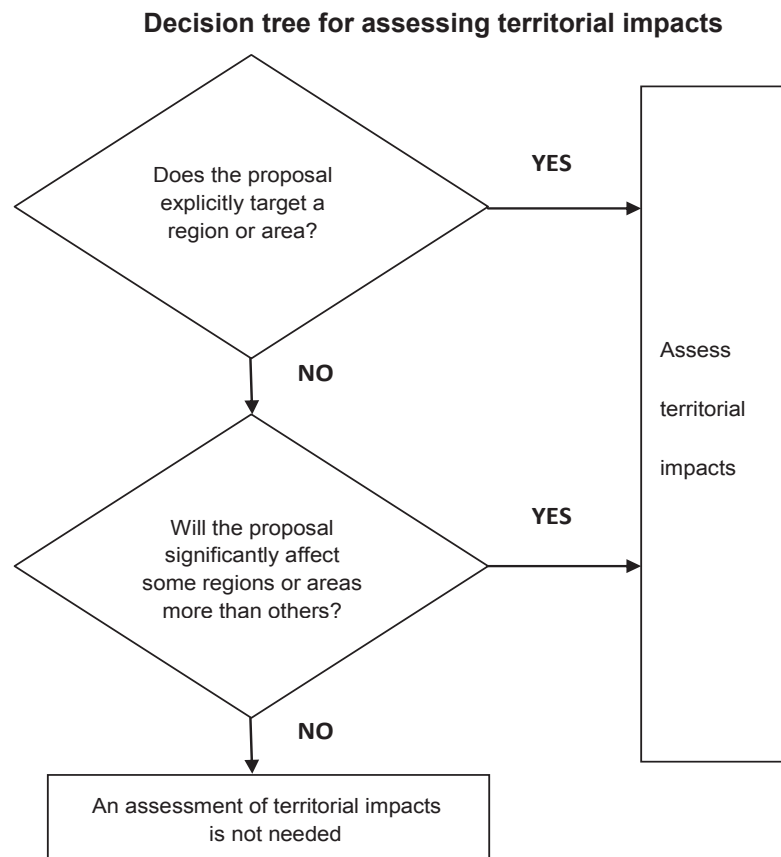
3. Growing global trade integrations tends to benefit the EU, but some regions specialised in a sector vulnerable to further trade integration/globalisation may face a high number of redundancies. The European Globalisation Adjustment Fund (EGF) was set up, in part, to address such negative asymmetric impacts. The EGF provides one-off, time-limited individual support geared to helping workers who have suffered redundancy as a result of globalisation¹. A Member State can apply for funding when at least 500 redundancies were caused by globalisation within four months. If the redundancies primarily occur in SMEs, specific sectors or regions, the time frame is extended to 9 months.

Taking into account potential asymmetric impacts can increase the effectiveness and the efficiency of the policy. It can increase political support for a policy, boost the benefits while addressing excessive spatial concentrations of the costs.

4. When should an assessment of territorial impacts be considered?

There are two types of policies for which an assessment of territorial impacts should be considered. The first type explicitly targets or differentiates by specific (type of) regions or areas. This type is easy to identify. The second type addresses issues that are not evenly distributed across the Union. This type is more difficult to identify (see 'decision tree' below).

If the issue (or industry) is spread evenly across the Union and the policy is applied in an identical manner to the entire Union, it is unlikely that some regions or areas will be significantly more affected than others. In these cases, there is no need for a territorial dimension in the impact assessment. In many cases, a territorial impact assessment will not be needed.



¹ The scope of the EGF was broadened from 1 May 2009 to 30 December 2011 to provide support to workers made redundant as a direct result of the global financial and economic crisis.

4.1 Policies that explicitly focus on specific territories

These policies can be easily identified as the proposal mentions the type of territory. Some policies only apply to one type of area, for example urban or rural areas. Other policies cover a broad issue but differentiate by type of area, for example cohesion policy or state aid policy.

The territories mentioned in the policy can be in one out of four situations. They can be defined by the Commission or by the Member States. The territories can be already defined or still to be defined (see table).

	Territories are to be identified by	
Territories ...	Member State	European Commission
... have been identified.	1	3
... will be identified.	2	4

Examples of all four situations can be easily found.

- The Air Quality Directive 2008/50¹ is an example of situation 1. Member States had identified the zones and agglomerations where air quality should be monitored following the adoption of an air quality directive in 1996. This new directive followed the same approach, thus the territories were already identified by the Member States.
- Areas facing natural constraints in the Common Agriculture Policy will be delimited by Member States based on EU common criteria after the adoption of the post-2013 EAFRD regulation. This is an example of situation 2.
- The Baltic Sea region strategy adopted in 2009² specified the geographical coverage in relation to the issues to be coordinated. This is an example of situation 3.
- The draft Cohesion Policy regulation explained the methodology to be used to determine regional eligibility, but the final regional eligibility was not yet known. This is an example of situation 4.

These four situations are ideal types and some situations are a hybrid. For example, in some policies the Commission may determine the territories in a dialogue with a Member State, in others the Member State identifies the territories but based on criteria established by the Commission.

How can an impact assessment deal with the different situations? If the territories have been identified, they can obviously be used in the impact assessment. If the territories are still to be determined, the impact assessment can use territories which are likely to be similar to the final territories. In the case of Cohesion Policy, the regional eligibility criteria were applied to the most recent data available, knowing that the final criteria would be applied to updated indicators. In other words, the most recent data was used as a proxy for the final data.

A wide range of harmonised regional and local typologies are also available to use in impact assessment. These can also be used as a proxy when the final selection of regions or areas is still to be determined. For example, a policy targeting issues in cities could use the harmonised definition of cities. A policy addressing cross border health problems could use the border region definition. For a full list of European harmonised regional and local typologies see Sections 1 and 2 in the Annex.

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:152:0001:0044:EN:PDF>

² COM (2009)0248 http://ec.europa.eu/regional_policy/cooperate/baltic/index_en.cfm

4.2. Policies that have an asymmetric territorial impact

These policies are less straight forward to identify. Such policies typically deal with issues that are concentrated in space. It is impossible to provide an exhaustive list of issues here, but many policy issues have consequences that mainly impact on particular regions.

In some situation, the issue itself may not be concentrated, but the actors involved in the policy response might be. For example, during the preparation of the policy on the marketing and use of explosives precursors, it became apparent that although the marketing and use of these products occurred throughout the union, the producers of these products were geographically clustered.

In some cases, the risk of asymmetric territorial impact is obvious. In other cases, only experts familiar with the issue can assess the risk of such asymmetric impacts and whether this merits an assessment of territorial impacts.

Some policies will be relevant everywhere, but more so in some regions or areas than in others. For example, the reduction of poverty and social exclusion is a Europe 2020 objective, but it is particular relevant in areas with high levels of poverty or exclusion.

A short number of checks can help to assess the potential of an asymmetric territorial impact:

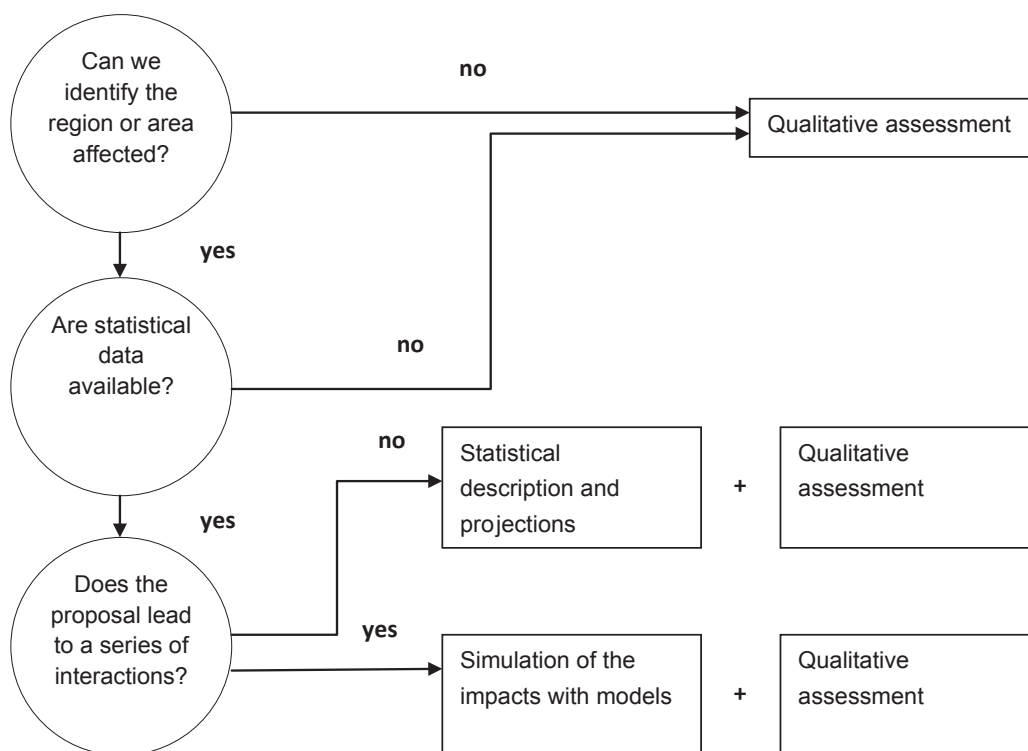
- Is the problem or driver to be addressed concentrated in some (types of) areas or regions?
- Are the actors involved in the policy response concentrated in some areas or regions?
- Ask stakeholders whether they think the problem or the actors are spatially concentrated (see below).

5. How to assess territorial impacts?

This chapter explains the different methods which can be used to assess territorial impacts. It covers qualitative and quantitative methods, specific tools developed to support impact assessments and the consultation process.

Including an overall qualitative assessment of territorial impacts is recommended for all methods (see illustration below) If the affected regions and areas can be identified and appropriate regional or local data is available, then a quantitative method is also recommended.

What method to use?



The qualitative approach relies on a description of the spatial distribution of four items:

1. the main problem or driver,
2. the capacity to respond to the problem / implement the policy
3. the actors involved in the policy response
4. the potential impact, which is a combination of the former issues.

The text should explain the logic linking the problem/driver, the adaptive capacity, the actors and the potential impact.

The example of the impact assessment of the 2009 White Paper: Adapting to climate change may help to highlight these steps. This impact assessment discussed the spatial distribution of climate change (item 1). It identified the Southern Europe and the Mediterranean Basin, mountain areas, in particular the Alps, coastal zones, densely populated floodplains and the Arctic region as the most vulnerable to climate change.

For the capacity to respond (item 2) it cover both ecosystems and human systems. The adaptive capacity of the ecosystems depends on their diversity and health. For human systems, it depends on a wide range of issues including economic wealth, technology and infrastructure, information, knowledge and skills, institutions, equity and social capital.

The document also discussed the actors (item 3), including those at the local and regional level, involved in setting up adaptation strategies. It highlighted the possible lack of funding, information, knowledge and expertise for some of these actors/areas as bottlenecks.

Therefore, the potential territorial impact (item 4) of adapting to climate change depends on the spatial distribution of vulnerability, adaptive capacity and the actors in policy implementation. The assessment highlighted that the climate change will have different spatial effects and strong variability and stressed that EU funds, including Cohesion Policy, could help to address these concentrated spatial impacts.

If the spatial distribution of an issue cannot be measured directly, it can sometimes be derived from case studies or the scientific literature. In some cases, another measure with a similar spatial distribution can be used as a proxy indicator. For example, opening up trade in textile sector may mean that regions with an uncompetitive textile industry will see high redundancies in that sector. If no data is available on the regional competitiveness of the textile industry, regional employment growth in that sector may help to assess which regions could be more vulnerable.

5.1. Statistical description

A description of the issue at stake can be quite helpful. For example, for a policy to improve the labour market integration of people born outside the EU, a map with this target population as a share of total regional population would show which regions are concerned by this and which not at all. The impact assessment of an air quality directive could be supported by a mapping which (urban) areas are exposed to high levels of air pollution.

Sources of sub-national data have increased substantially over the last decade. This has been achieved through a variety of techniques, including using register-based data, creating multi-year averages and remote sensing. As a result, more issues can be measured and described at the sub-national level. A list with sources of sub-national data is included in the Annex (Section 3).

5.2. Projection

If the data allows, a projection would show to what extent this issue is likely to grow in the future. In other words, an assessment should be done of how the situation would develop if relevant policies were left unchanged (so called baseline scenario). For the example above of labour market integration, a projection showing the share of people born outside the EU and their children as a share of the regional population in 2020 and 2030 together with a projection on how this share would change if a policy option was implemented, would be a useful input into the impact assessment.

Other projections with a sub-national component including demographic, economic and land use projections can help to show the likely evolution of the issue at stake. Although these do not show the impact of the different policy alternatives, they can still show how the context of the policy is likely to change. European wide territorial projections are available from multiple sources:

- Eurostat publishes regional population projections¹.
- The Directorate-General for Employment, Social Affairs and Inclusion has a new instrument that can make regional population, education, employment and unemployment rate projections².
- The RHOMOLO³ economic model can add a regional component to the QUEST's model long term projections (see Annex Section 5.3).
- The LUMP model can make land use projections using population and economic projections (see Annex Section 5.1).
- The CAPRI⁴ model makes ex-ante analyses of the CAP and policies affecting the agricultural sector (see Annex Section 5.4)
- The European Environmental Agency publishes spatial environmental and climate change past trends and projections.
- ESPON has published several regional population projections as part of the DEMIFER project. (www.espon.eu)

¹ Eurostat regularly publishes regional population forecasts. Contact: Eurostat, Demography Unit.

² http://www.migrantempl.eu/DOC%20Peschner_F.pdf Contact: DG Employment, Social Affairs and Inclusion, A1 - Employment Analysis.

³ This is a regional economic model that can simulate the impact of a number of policies.

⁴ CAPRI is an economic model designed specifically to assess regional impacts of the common agricultural policy and trade policies.

5.3. Modelling interactions

A model can support an impact assessment, especially if the policy addresses a problem driver that is strongly linked to other issues. For example, trade policy can have an impact on the agricultural sector or new transport infrastructure can influence economic growth and land use changes.

The Joint Research Centre has developed six models with a sub-national component. A fiche describing each model can be found in Annex Sections 5.1 to 5.6.

For more information on the models, please check: <http://intranet.jrc.es/cfapp/models/> (not accessible from outside the Commission).

An interesting overview of regional models used in (national) impact assessments is included in the 2010 report 'Review of Methodologies applied for the assessment of employment and social impacts'¹.

5.4. Tools to support the quantitative assessment of territorial impacts

The methods described above can generate a large amount of information about the different policy options and their impact on regions and areas. Two tools have been developed to help summarise this information into an overall impact: ESPON ARTS and QUICKScan.

The ESPON ARTS instrument assesses policy impacts using a vulnerability approach. This approach uses three elements: exposure, sensitivity, and impact (see Annex Section 4.1):

- 'exposure' identifies the regions which are exposed to a policy option, for example urban areas;
- 'sensitivity' assesses how strong the impact of a policy option could be based on quantitative information or expert judgement; for example number of days with low air quality.
- 'territorial impact' is the combined result of exposure and sensitivity.

This excel-based instrument allows to get a quick impression of the overall impact based on exposure and sensitivity. Different combinations of exposure and sensitivity can easily be tested. In addition, the tool allows multiple territorial impacts to be aggregated.

QUICKScan, developed by the EEA and Alterra, is a toolbox similar to ESPON ARTS but uses a geographical information system (GIS) approach. The tool can use GIS layers such as land use, climate or population distribution. The tool is designed to facilitate impact assessments and policy making. It allows the users to combine quantitative information with expert judgement. The estimated impacts can be easily mapped and different options can be compared and tested. (see Annex Section 4.2).

For a more thorough investigation, a spatial sensitivity analysis can show to what extent the estimated impacts are the result of the underlying data or the assumptions made in the calculations. The Econometric and Applied Statistics Unit in the Joint Research Centre can carry out such analysis.

5.5. Consultations can help to reveal asymmetric impacts

The stakeholder consultation process foreseen in the impact assessment can be used to collect data and information about the issue to be addressed and the impact of the policy option from outside the European Commission. Stakeholders may have access to more information and thus be in a good position to judge the risk of an asymmetric impact.

¹ <http://ec.europa.eu/social/main.jsp?catId=760&langId=en>

Therefore, the consultation could include a question to check whether the public or the stakeholders expect the policy to have an asymmetric impact. For example:

Do you expect that this policy will have a disproportionately large impact on certain areas, regions or Member States? If yes, please indicate which ones and why.

According to your knowledge and information, is this problem concentrated in certain areas, regions or Member States?

Under the 'Protocol on Cooperation between the Commission and the Committee Regions' (2012) the 'Commission services may ask for support from the Committee in preparing its assessment'¹. This may be particularly useful if the consultation investigates asymmetric impacts on regions or local authorities.

6. Conclusion

This document aims to facilitate the inclusion of a territorial dimension in Commission impact assessments of policies that:

1. explicitly target some (type of) region or area or
2. have a high risk of affecting some (type of) regions or areas more than others, i.e. risk having a highly asymmetric territorial impact.

Assessing the territorial impact of a policy can improve the effectiveness and efficiency of the policy. If the territorial impact is highly asymmetric, the policy can be adjusted to reduce this imbalance. Examples of five different types of response to potential asymmetric territorial impacts are provided in this document:

1. Adjust the policy for the entire Union or some of its parts
2. Grant more time to implement a policy in some parts of the union
3. Exempt some parts of the union from the policy
4. Use existing policies, including Cohesion Policy, to address asymmetric territorial impacts
5. Create a new instrument to address asymmetric territorial impacts if/when they arise

Policies which explicitly target some regions or areas should base their impact assessment on these regions or areas (if they have already been identified). If the regions or areas have not been yet been identified, the impact assessment can rely on a) a proxy for the final regions or areas or b) a harmonised definition of a specific type of area.

Assessment of territorial impacts can be carried using both qualitative and quantitative methods based on the intervention logic. The spatial distribution of the problem combined with the regional sensitivity to the policy response can show the territorial impact. For policies that lead to significant amount of interaction between different domains, a modelling approach is recommended.

¹ See point 23 in the protocol: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2012:102:0006:0010:EN:PDF>

IV - A tool for quick check at European level

This guidance is the output of the ESPON 2013 Programme 'Assessment of Regional and Territorial Sensitivity' (ARTS) Applied Research project, led by ÖIR – Austrian Institute for Regional Studies and Spatial Planning with Politecnico di Milano, Delft University of Technology and the Netherlands Environmental Assessment Agency as project partners¹. This is a standard version of the 'quick check' tool. An advanced version of the tool is available on the ARTS project page at www.espon.eu.

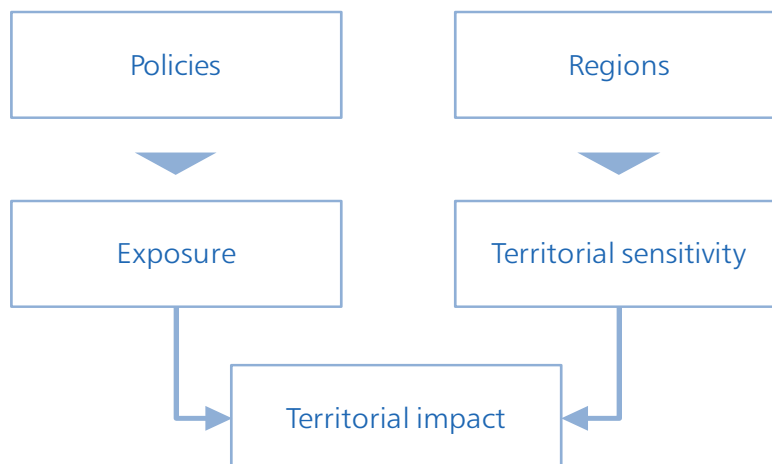
1. Introduction

1.1 The methodology: based on the vulnerability concept

The TIA quick check is based on the vulnerability concept developed by the Intergovernmental Panel on Climate Change (IPCC). In this case, the effects deriving from a particular policy measure (exposure) are combined with the characteristics of a region (territorial sensitivity) to produce potential territorial impacts. In the TIA quick check the following definitions are used:

- The exposure describes the intensity by which EU directives and policies potentially affect European territory through a double logical chain. On the one hand single directives and policies may affect specific classes of regions (regional exposure), without reference to the specificity of each region; on the other hand they may affect particular "fields" of the territorial realm, e.g. surface water quality, emissions, sectoral production (field exposure);
- The (territorial) sensitivity describes how single territories/regions are subject and evaluate impacts in specific exposure fields, due to their socio-economic and geographical characteristics and to the social values and priorities they are likely to show;
- The territorial impact is the final, likely effect of a given EU policy or directive as a product of exposure and regional sensitivity. The impact can be direct or indirect along specific cause-and-effect logical chains.

Territorial impact combining exposure with sensitivity



¹ ESPON ARTS aims to develop a tool by which to analyse the impact of EU legislation that takes the sensitivity of regions into account. The analysis of regional sensitivity to EU directives and policies is intended as a simplified, evidence-based procedure of Territorial Impact Assessment (TIA). This 'quick check' should be as simple, comprehensible and user-friendly as possible.

1.2 The result: an excel tool and a procedure for a TIA quick check

The objective of ESPON-ARTS was to devise a user-friendly methodology that allows one to make a 'quick and dirty' ex-ante analysis of the potential impact of EU legislation, policies and directives on the development of regions. To this end, the methodology combines a standardised indicator-based tool developed in Excel with a means to systematically collect expert knowledge in a workshop setting. The expert contribution serves as input for the analysis and for providing the interpretation of the output of the impact indicators.

The TIA quick check uses the indicators and typologies as developed in the ESPON ARTS project. It covers the full range of potential impacts at a general level with common indicators for European NUTS 2 regions.

2. How to do the advanced TIA quick check

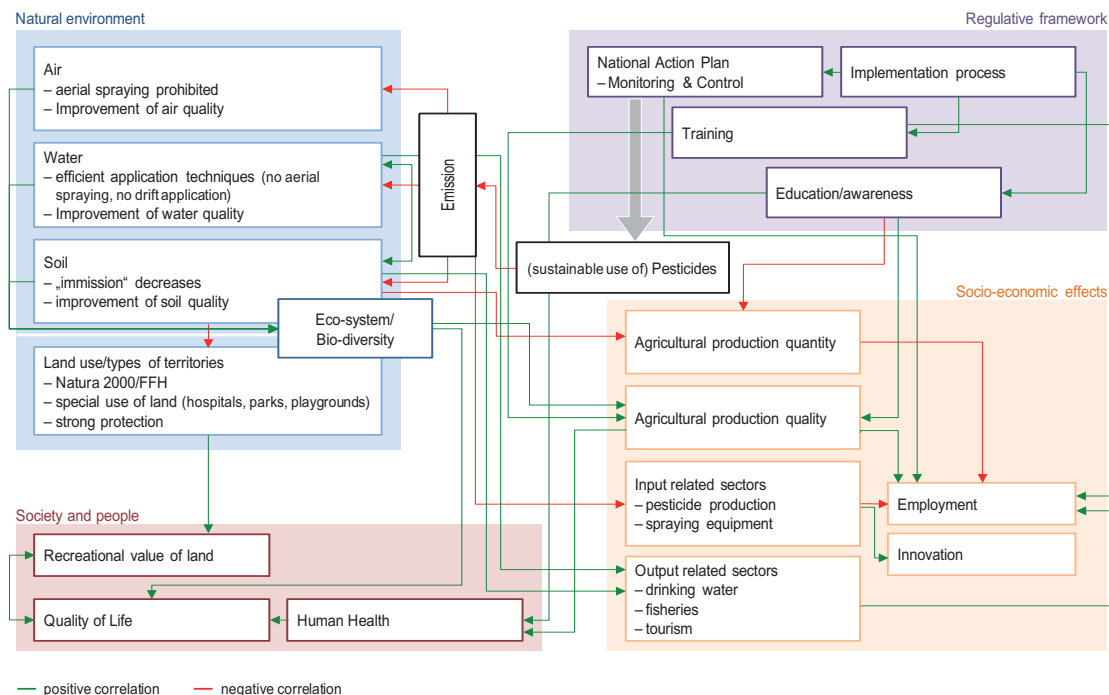
The standard TIA quick check is done in nine steps using expert knowledge and a set of standardised indicators and types of regions. It can be performed in a workshop atmosphere; preferably with a group of experts in the field of the policy proposal and experts on regional development.

a) The conceptual model: How does a policy influence the development of regions?

In a first step, it is necessary to detect the potential effects of a policy (in the case of ARTS, EU-directives were chosen) on territorial development. Based on a careful study of the actual text of the proposal, the experts then draw a conceptual model that translates the text into cause/effect relations (the intervention logic). Not only intended effects, but also unintended and indirect effects are considered, and on as many different fields as possible. This exercise is best done in an informal workshop setting so as to maximize the amount of input.

The cause/effect relationships can then be drawn out. Here, links between all the effects deriving from the policy proposal (exposure in the vulnerability concept) and the receptive capacity of a region (sensitivity in the vulnerability concept) are made explicit. The result is a systemic picture or flowchart showing the conceptual model of the proposal according to its intervention logic and potential effects (see following example).

Conceptual model of the directive 2009/128/EC / Directive on the sustainable use of pesticides



b) Dealing with discrete cause/effect chains (branching)

In some cases, a policy will have only one chain of effects. In most cases, there are different, often mutually exclusive alternatives. For example, some policies only set targets, allowing member states to implement their own measures to meet these targets. Depending on the measure, the policy can have quite different territorial impacts. In other cases, the effects of a policy will vary according to type of region. In order to deal with this variability the policy is “branched” into different cause/effect chains, and each one is analysed separately.

c) Which types of regions are affected? (regional exposure)

A policy proposal may affect only particular regions (e.g. coastal regions, regions with presence of particular productions or facilities like nuclear power plants etc.) or different types of regions could be affected in different ways. Therefore, it is essential to only include those regions being affected in the analysis. Exposed regions are selected using typologies (e.g. rural/urban, central/peripheral, advanced/lagging, high/low presence of certain sectors). ESPON ARTS provides a set of pre-selected types of NUTS2 regions to choose from, but in theory any typology or selection is possible.¹

¹ The following types of NUTS2 regions are available at the moment: Agglomerated regions, areas at highest technological/environmental risk, regions with relevant chemical industries, densely populated regions, forest regions, harbour regions, regions with a high density of rail, regions with a high density of road, regions with highest density of rail and road network, regions with highest share of employment in automotive, industrial regions, major airport location, regions with a high share of natural areas, rural regions, shrinking regions, regions with unprofitable farming, urban regions, wealthy regions, regions exposed to PM.

d) What is the intensity of exposure on different fields? (exposure matrix)

In the next step, the conceptual model is translated into a set of indicators that describe the intensity of policy exposure. This is done using a predefined set of thematic fields such as natural environment, regional economy as well as society and people. To do this, the project produced a Directive-Exposure Matrix (DEM) Excel tool which allows data to be entered according to each field.

Example for filling in the Directive Exposure Matrix (DEM)

Directive on good weather		Effects on...	Natural environment					
		Details	Soil			Landscape and cultural heritage		Air
		Detailed effects on ...	erosion	pollutants in soil	share of artificial areas/ soil sealing	conservation of natural heritage (landscape)	conservation of cultural heritage	pollutants in air
Potential effects on:		Indicator value						
1	Tourist		no effect	no effect	decrease	increase	no effect	no effect
1	Urban		no effect	decrease	no effect	no effect	increase	strong decrease
Comments							reduction of acid rain	
Transformation: from indicator value to territorial welfare								
Exposure type: Cost or benefit for region?			cost	cost	cost	benefit	benefit	cost
Potential effect on terr. welfare								
1	Tourist		0	0	1	1	0	0
1	Urban		0	1	0	0	1	2

List of exposure fields

Natural environment				
Soil	Water	Air	Climatic factors	Fauna/Flora/ Habitat
erosion	water consumption	pollutants in air	emissions of CO2	biodiversity
pollutants in soil	pollutants in ground/surface water		heavy rain/ flood hazard/ occurrence of landslides	conservation of natural heritage (landscape diversity)
share of artificial areas/soil sealing				conservation of cultural heritage
Regional economy				
Economic development	Agriculture	Industry	Services	Tourism
economic growth	employment in primary sector	employment in secondary sector	employment in tertiary sector	overnight stays
innovation	% of arable area, permanent grass/- crop area			
entrepreneurship market barriers				
Society and people				
Social disparities	Demography	Accessibility	Built environment	Governance
disposable income in PPS per capita	out-migration/ brain drain/"shrinking" regions	daily accessibility by air	increase of urbanization relative to population growth	efficiency of government/ governance mechanisms
equal income distribution	number of people exposed to noise	daily accessibility by waterways	mixed land use	duration or complexity of planning procedures
employment rate	accident rate in transport	daily accessibility by road		participation rate
	accident risk: industry/energy supply	daily accessibility by rail		societal transfers (e.g. tax added)
	healthy life expectancy at birth	renewable energy		transnational cooperation between member states
		fossil fuel consumption		

(For each field, the level of exposure is defined by expert judgement according to the following classes:

- ++ strong advantageous effect on territorial welfare (strong increase)
- + weak advantageous effect on territorial welfare (increase)
- O no effect
- weak disadvantageous effect on territorial welfare (decrease)
- strong disadvantageous effect on territorial welfare (strong decrease)
- ? Unknown effect / effect cannot be specified
- +/- direction cannot be specified (diverse effects)

These classes are then converted into numerical terms so as to allow further computation.

e) What is the territorial impact in European regions? (Territorial Impact Matrix, TIM)

Once the Directive Exposure Matrix in the previous step has been filled in, the impact values are calculated using predefined sensitivity adjustments. These are determined for each field and called the Regional Sensitivity Matrix. The Territorial Impact Matrix (TIM) calculates the impact for each thematic exposure field and for each NUTS 2 region (= 42 fields x 287 NUTS 2 regions) and sorts the results into 9 classes:









Example for the Territorial Impact Matrix (TIM)

		E1	E2	E3	E10	E11	E12	E13	E14
AT11	Burgenland	0,00	0,00	0,00	0,00	0,00	0,00	na	0,00
AT12	Niederösterreich	0,00	0,00	0,00	0,00	0,00	0,00	na	0,00
AT13	Wien	0,00	0,00	-1,06	-0,77	0,00	0,78	na	1,79
AT21	Kärnten	0,00	0,00	0,00	0,00	0,00	0,00	na	0,00
AT22	Steiermark	0,00	0,00	0,00	0,00	0,00	0,00	na	0,00
AT31	Oberösterreich	0,00	0,00	-0,77	-0,78	0,00	0,81	na	1,78
AT32	Salzburg	0,00	0,00	-0,76	-0,99	0,00	0,80	na	1,74
AT33	Tirol	0,00	0,00	0,00	0,00	0,00	0,00	na	0,00
AT34	Vorarlberg	0,00	0,00	-0,78	-1,04	0,00	0,80	na	1,78
BE10	Région de Bruxelles-Capitale	na	0,00	-1,19	-0,75	0,00	0,76	na	1,69
BE21	Prov. Antwerpen	0,00	0,00	-0,91	-0,76	0,00	0,80	na	1,74
BE22	Prov. Limburg (B)	0,00	0,00	-0,88	-0,78	0,00	0,84	na	1,76
BE23	Prov. Oost-Vlaanderen	0,00	0,00	-0,88	-0,75	0,00	0,83	na	1,73
BE24	Prov. Vlaams Brabant	0,00	0,00	-0,91	-0,75	0,00	0,81	na	1,74

- F1 erosion
- F2 pollutions in soil
- F3 soil sealing
- F10 landscape diversity

- F11 conservation of culture heritage
- F12 economic growth
- F13 innovation
- F14 entrepreneurship

Scale of potential territorial impact

	very high positive impact		minor negative impact
	high positive impact		moderate negative impact
	moderate positive impact		high negative impact
	minor positive impact		very high negative impact
	no exposure		

f) Do the results make sense? (plausibility and quality check)

The results calculated in the territorial impact matrix allows for a first plausibility check. Usually the results show that a proposal only impacts a few thematic fields. The results should be discussed with the experts along two lines:

- Does the selection of regions provide a plausible picture? If not, the selection of the types of regions may need to be modified.
- Is the relationship between the different fields of exposure plausible? If not, the expert judgment about the intensity of exposure may need to be modified.

Once adjustments are made, the Territorial Impact Matrix (TIM) can be recalculated with the new values

g) Which regions will be hit in which fields? (mapping)

When the results are reliable, maps showing the impact of different indicators can be drawn up. This can be followed by another plausibility check. In the trial run using 12 directives, several TIMs were recalculated after scrutinising the final maps.

h) What are the policy implications? (discussion)

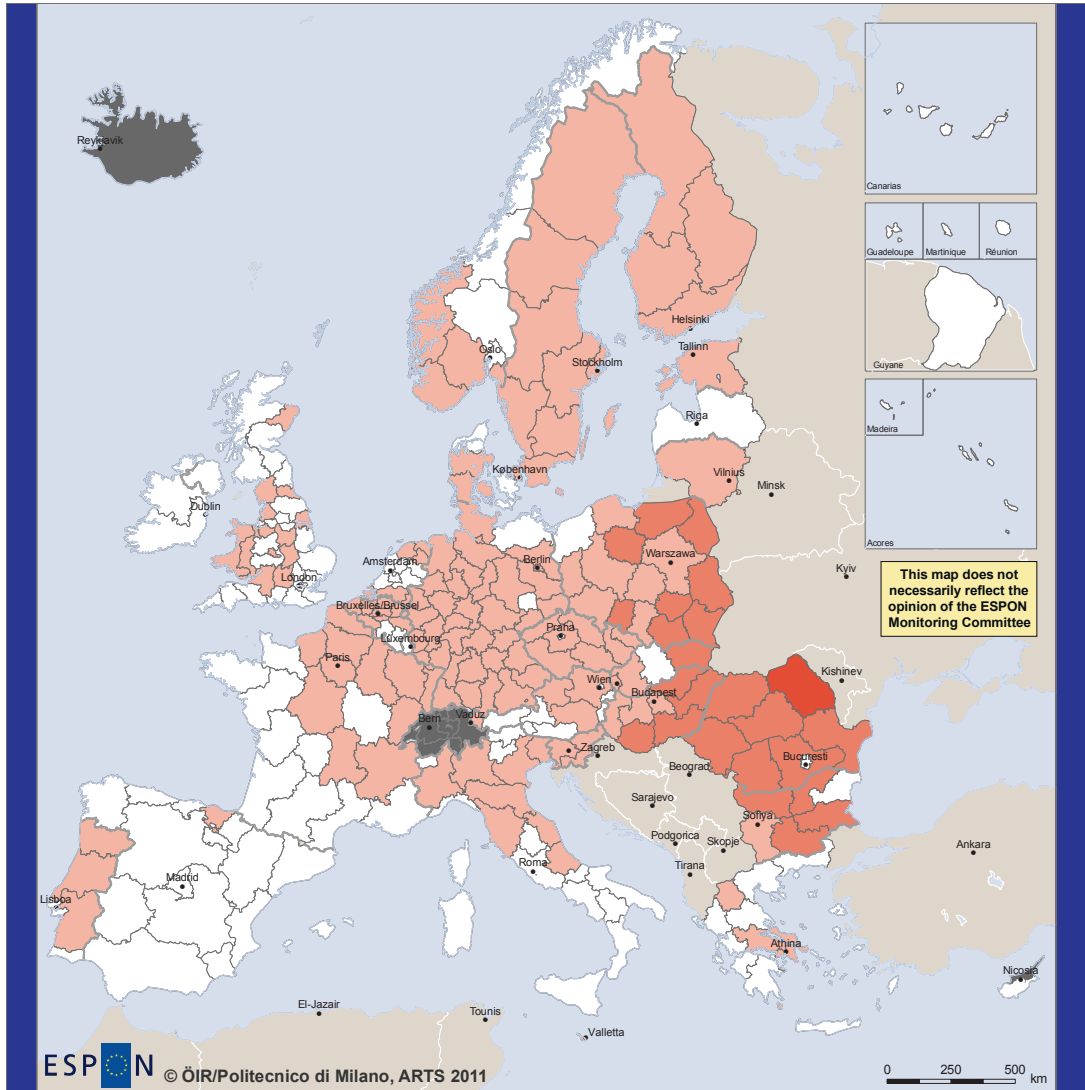
The maps provide the framework for the subsequent discussion on policy implications. The territorial patterns of both the positive impacts and negative effects are examined and discussed. Furthermore, the issue of potential adaptive capacity should be raised, as well as governance strategies to facilitate a successful implementation

i) How to communicate the results (reporting)

Based on the results of the territorial impact assessment and the expert discussion, a short report should be drawn up including maps on relevant indicators. This communicates the results of the ex-ante analysis to the relevant audience.

Example for a Map depicting the territorial impact on one field

Regions affected by Directive on air quality branch b
Economic growth (GDP/capita)



EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

Regional level: NUTS 2
Transformation and Compilation of Data based on:
ESPON Projects, EUROSTAT, EEA Corine Land Cover,
5th Cohesion Report, BOKU University, DG AGRI
© EuroGeographics Association for administrative boundaries

Negative Impact

- | | |
|--|---|
| Very high impact | No Data |
| High impact | Neighbourhood Countries |
| Moderate impact | |
| Minor impact | |
| Not affected | |

Types of regions affected are industrial regions.
Branch b refers to at-source emissions measures for industry.

Proposed agenda of a TIA workshop

9:00: Step 1:

The conceptual model: how does a policy influences the development of regions?

Result: a systemic picture showing the conceptual model of the policy proposal investigated according to its intervention logic and potential effects

11:00 Coffee break

11:30 Step 2:

Dealing with discrete cause/effect chains (branching)

Step 3:

Which types of regions are affected? (regional exposure)

Result: decision about different logical chains (branches) deriving from one policy proposal and about the types of regions affected (regionally exposed)

12:00 Step 4:

What is the intensity of exposure on different fields? (exposure matrix)

Result: the translation of the conceptual model into a set of indicators that describe the intensity of policy exposure (directive exposure matrix) for each branch

13:00 Lunch break

14:00 Step 5:

What is the territorial impact on regions? (Territorial Impact Matrix, TIM)

Step 6:

Do the results make sense? (plausibility and quality check)

The impact values are calculated using predefined sensitivity adjustments automatically. The TIM provides information about the relevant fields touched by the policy proposal.

Result: a stable result of the territorial impact of a policy proposal

15:00 Step 7:

Which regions are hit in which fields? (mapping the results)

Result: maps of the territorial impact for the relevant indicators

15:30 Step 8:

What are the policy implications? (adaptive capacity discussion)

Result: information about policy implications, and the potential adaptive capacity and governance strategies to facilitate a successful implementation.

17:00 End of the meeting

After the meeting:

Step 9:

How to communicate the results (write-up)

Result: minutes

Annex to Chapter II - A national and sub-national framework for assessing the territorial impacts of European directives	page 38
Annex to Chapter III - Assessing territorial impacts: European Commission operational guidance	page 45
1. Definitions of regional typologies	page 45
2. Definition of local typologies	page 53
3. Sub-national data source	page 60
4. Tools to support the assessment of territorial impacts	page 69
5. Descriptions of JRC models with a sub-national dimension	page 71

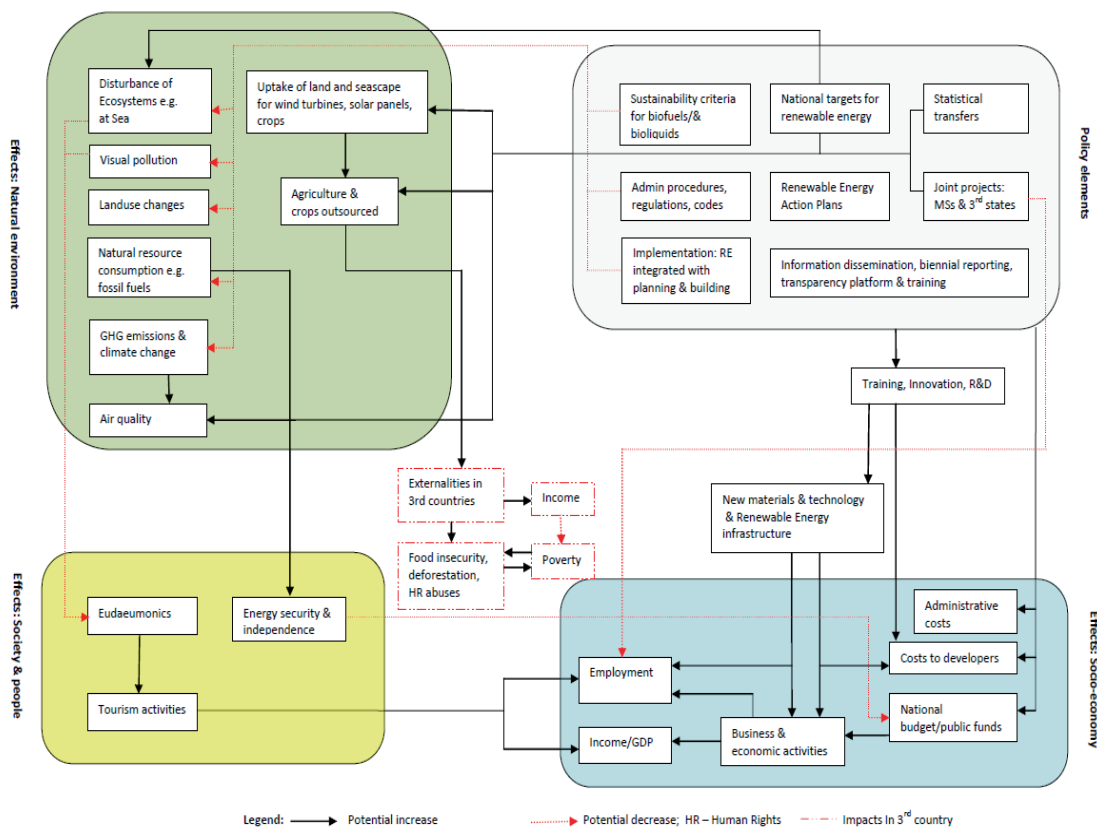
Annex to Chapter II - A national and sub-national framework for assessing territorial impacts of European directives

Logical chains' examples



Hand-written 'back of envelope' example and workshop example

Logical chain of potential impacts: Directive 2009/28/EC on the promotion of the use of renewable energy (RE)



More elaborate 'designed' example

Europe 2020 headline issues and corresponding possible TIA criteria

Headline issue	Target	Corresponding TIA criteria
Employment rate	75 % of the population aged 20-64 should be employed	Employment
Investment in research and development	3% of the EU's GDP should be invested in R&D. The total gross domestic expenditure on research and development comprises: business enterprise expenditure on R&D, higher education expenditure on R&D, government expenditure on R&D and private non-profit sector expenditure on R&D.	Investment in research and development
Greenhouse gas emissions	Reduction of the greenhouse gas emissions by 20% compared to 1990	Greenhouse gas emissions
Renewable energy	Increase in the share of renewable energy sources in final energy consumption to 20%	Renewable Energy
Energy efficiency	20% increase in energy efficiency	Energy Efficiency
School dropout rate	The share of early school leavers should be under 10%	Educational attainment
Higher education rate	at least 40% of 30-34 years old should have completed a tertiary or equivalent education	
Poverty rate	Reduction of poverty by aiming to lift at least 20 million people out of the risk of poverty or exclusion	Poverty and social exclusion

Checklist for screening (unshaded) & scoping (unshaded & shaded) at national level

TERRITORIAL IMPACT ASSESSMENT SCREENING / SCOPING CHECKLIST		Policy: _____			Date: _____
		If applicable, policy element: _____			
Assessment criteria (criteria below are indicative)		Likely major impact at the national or local level? Yes (✓) no (x), uncertain (?)	Comments: nature of the impact and justification	Location/ features of areas likely to be affected?	If several policy elements are considered: Cumulative impacts
EU2020	Energy efficiency + renewables				
	Investment in research and development				
	Employment				
	Educational attainment				
	Green house gas emissions				
	Poverty and social exclusion				
UK specific	Health and safety				
	Waste production				
	Administrative costs / burden				
	Cultural heritage				
	Biodiversity (flora / fauna)				
	Air pollution				
	Water Pollution				
Soil pollution					

If several policy elements are considered, then a checklist for each element has to be prepared; the final 'cumulative impact' column is only prepared once, based on the assessments of each element.

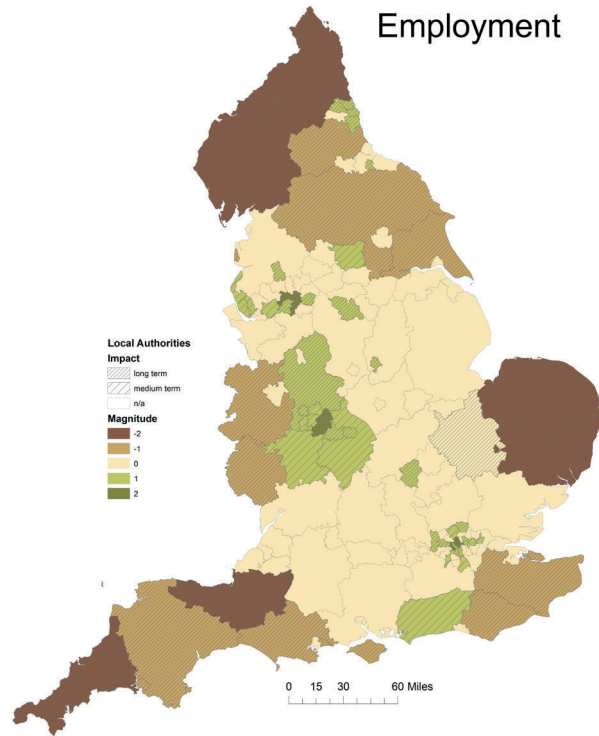
Territorial Impact Assessment Matrix for Regional / Local Level Assessment

TERRITORIAL IMPACT ASSESSMENT MATRIX					Locality: _____	Date: _____
Assessment criteria	Nature of impact	Directive/Policy element A	Policy element B	Policy element C	Policy elements Cumulative	
	Magnitude (0, 1, 2)					
	Orientation against baseline (increase or decrease?)					
	Temporal distribution (Short term, medium term, long term?)					
	Justification					
	.					
	.					
	.					
Overall Comments:						
Any changes to Directive proposal suggested?						

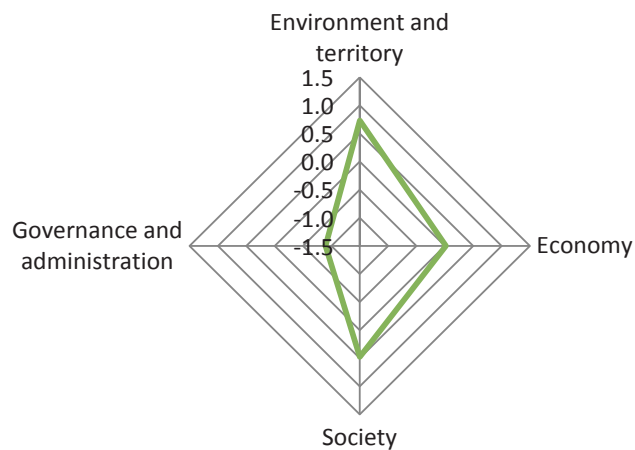
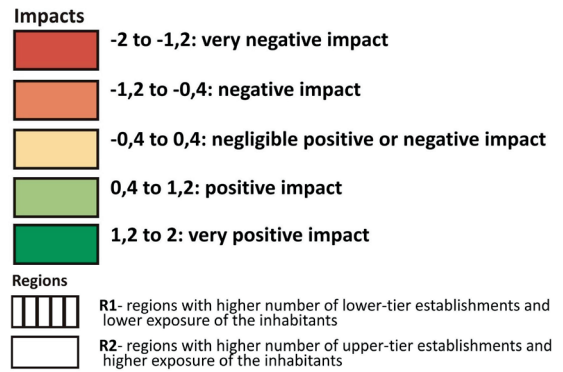
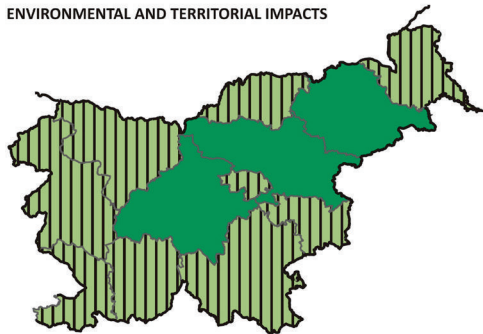
Impact evaluation table for national level, and, if deemed necessary, regional / local level

TERRITORIAL IMPACT ASSESSMENT IMPACT EVALUATION TABLE	Policy:	Locality:	Date:
Policy objectives	Impact significance? (-2, -1, 0, +1, +2)	Justification and comments (e.g. possible means of mitigation)	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Examples for collection of regional/local assessment data at national level in England and Slovenia and a radar chart, showing aggregate results



IMPACTS OF DIRECTIVE SEVESO III
ENVIRONMENTAL AND TERRITORIAL IMPACTS



Example for web-based template for feeding assessment result back to the national level (if many regions / localities are involved)

Page 1 of 2

Part 1: TIA Impact Assessment Matrix

For each criterion, please indicate the magnitude and orientation of potential impact; and also provide comments justifying your opinion.

1. Please indicate the date and your locality.*

2. Please indicate the magnitude and orientation of potential impact (between -2 and 2). Negative sign for decrease in baseline value and positive sign for increase in baseline value. (2 = very large significant increase/decrease; 1 = modest increase/decrease; 0 = no change)*

	2	1	0	-1	-2
Administrative costs / burdens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3.

	Long term	Mid term	Short term	N/A
Please indicate the temporal distribution of expected impact	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Comments and justification

Annex to Chapter III - Assessing territorial impacts: European Commission operational guidance

This annex provides an overview of regional and local typologies. These typologies have been developed for analytical and statistical purposes. The regional and local typologies are also linked, which ensures greater consistency and data availability. (See section 2 and chapter 14 of the Eurostat 2012 regional yearbook¹ for more detail.)

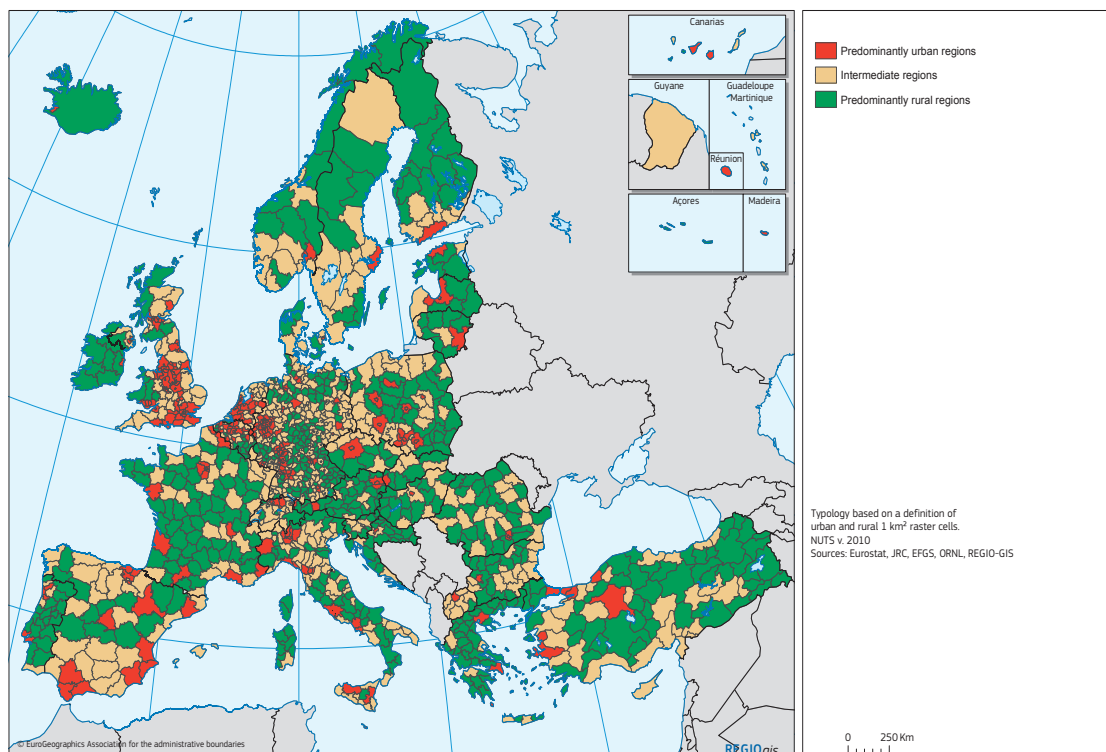
In addition, the annex provides an overview of sources of sub-national data, tools developed to support impact assessments and models with a sub-national component held by the Joint Research Centre.

1. Definitions of regional typologies

All these typologies have been published in a Regional Focus (2011/01)² and on the Eurostat website 'Statistics explained'³. These typologies will be updated after each change in the NUTS classifications. Changes in the methodology or in its application will be discussed with the relevant services prior to their application. Updates will be published on both websites.

1.1. Urban-rural typology

Urban-rural typology of NUTS3 regions



The urban-rural including remoteness typology classifies all NUTS 3 regions according to criteria based on population density and population distribution (urban-rural).

¹ http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Territorial_typologies

² http://ec.europa.eu/regional_policy/sources/docgener/focus/2011_01_typologies.pdf

³ http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Regional_typologies_overview

This classification is combined with a distinction between areas located close to city centres and areas that are remote. It creates five categories of NUTS 3 regions:

1. predominantly urban regions;
2. intermediate regions, close to a city;
3. intermediate, remote regions;
4. predominantly rural regions, close to a city;
5. predominantly rural, remote regions.

The classification is completed in four steps: identify rural area population, classify NUTS 3 regions and adjust classification based on the presence of cities. The last step assesses which regions are remote.

Population in rural areas

This typology uses a simple two-step approach to identify population in rural areas:

1. rural areas are all areas outside urban clusters;
2. urban clusters are clusters of contiguous¹ grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5 000

Regional classification

NUTS 3 regions are classified on the basis of the share of population in rural areas:

- predominantly rural if the share of population living in rural areas is higher than 50 %;
- intermediate, if the share of population living in rural areas is between 20 % and 50 %;
- predominantly urban, if the share of population living in rural areas is below 20 %.

To resolve the distortion created by extremely small NUTS 3 regions, regions smaller than 500 km² are combined for classification purposes with one or more of their neighbours.

Presence of cities

In a third step, the size of the urban centres in the region is considered:

- a predominantly rural region which contains an urban centre of more than 200 000 inhabitants representing at least 25 % of the regional population it becomes intermediate;
- an intermediate region which contains an urban centre of more than 500 000 inhabitants representing at least 25 % of the regional population becomes predominantly urban.

(See also the Eurostat regional yearbook 2010, pp.240-253 or Urban-rural typology).

1.2. Urban-rural typology including remoteness

This typology follows the same approach as above and adds a remoteness dimension to it.

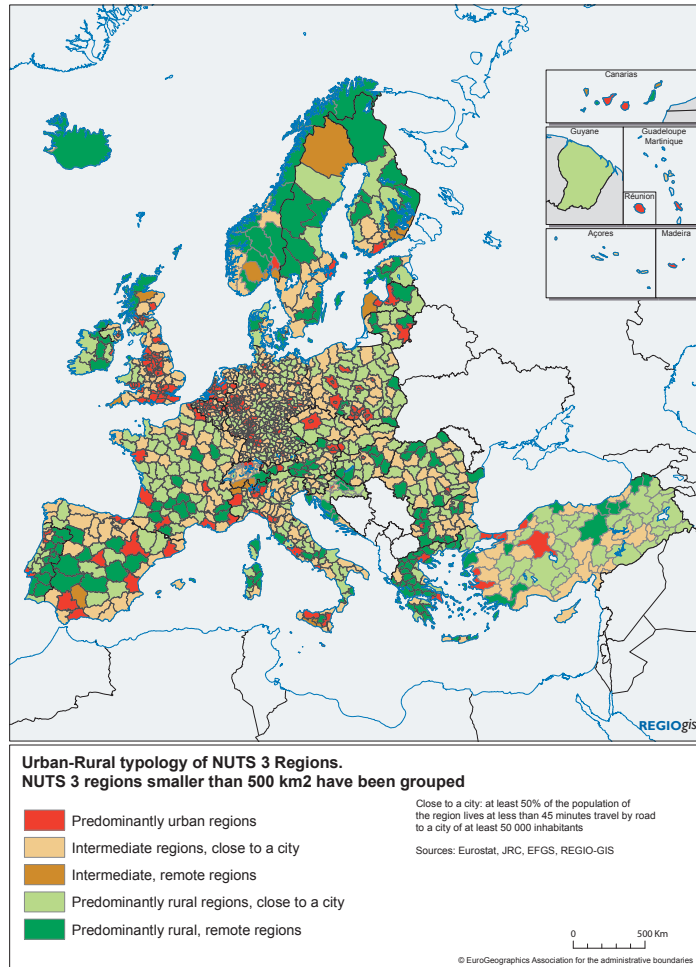
Remoteness dimension

All predominantly urban regions are considered close to a city. A predominantly rural or intermediate regions is considered remote if less than half of its residents can drive to the centre of a city of at least 50 000 inhabitants within 45 minutes. If more than half of the regions' population can reach a city of at least 50 000, it is considered close to a city. For more details on the methodology please consult Regional Focus 01/2008².

¹ Contiguity for urban clusters includes the diagonals (i.e. cells with only the corners touching). Gaps in the urban cluster are not filled (i.e. cells surrounded by urban cells).

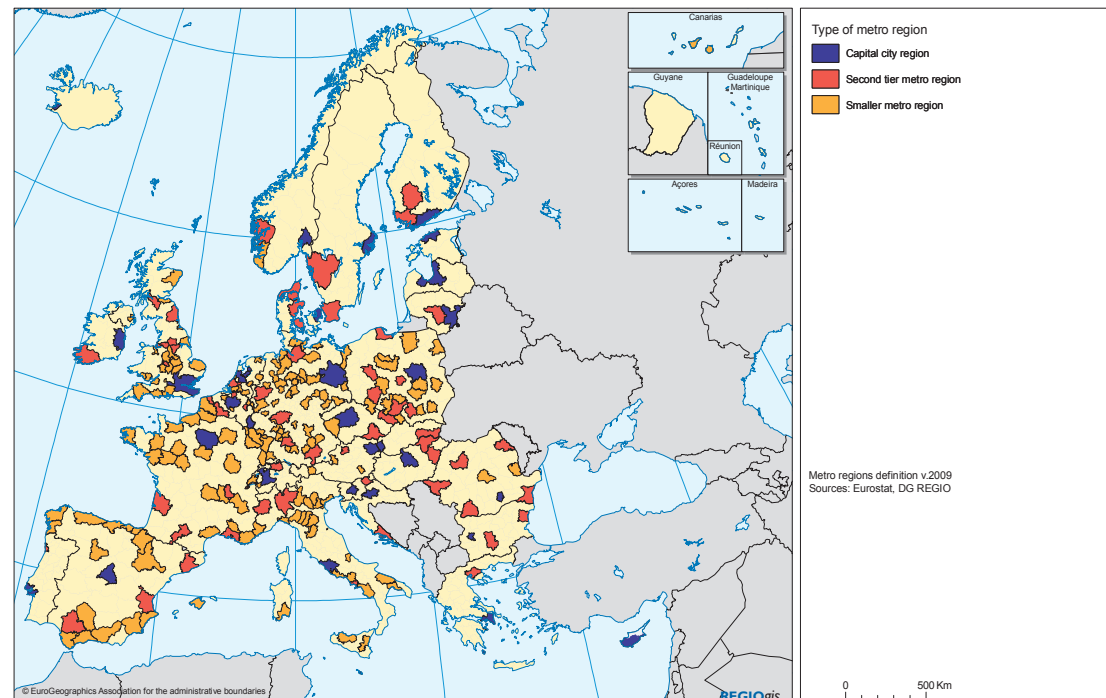
² http://ec.europa.eu/regional_policy/information/focus/index_en.cfm

Urban-rural typology of NUTS3 regions including remoteness



1.3. Metro regions

Typology of metro regions



The NUTS 3-based typology of metro regions contains groupings of NUTS 3 regions used as approximations of the main metropolitan areas.

The initial methodology for the selection of the NUTS 3 components of the metro regions is based on the Urban Audit definition of Larger Urban Zones (LUZ). These LUZs contain the major cities and their surrounding travel-to-work areas. LUZs are defined as groupings of existing administrative areas (often LAU2 units). Their boundaries do not necessarily coincide with those of NUTS 3 regions. Consequently, NUTS 3 regions in which at least 50% of the regional population lives inside a given LUZ were considered to be the components of the metro region related to that LUZ.

Hence, the quality of the territorial approximation depends on the average size of the NUTS 3 regions concerned.

In cooperation with the OECD, refined versions of the methodology are being tested, using population distribution at a fine level of disaggregation (1 km²) to identify the cores of the metro regions. Census-based local commuting data are then used to define contiguous areas around the cores, where substantial levels of commuting to these cores occur. This approach has resulted in revised definitions of the extent of several metro regions. The typology distinguishes three types of metro regions:

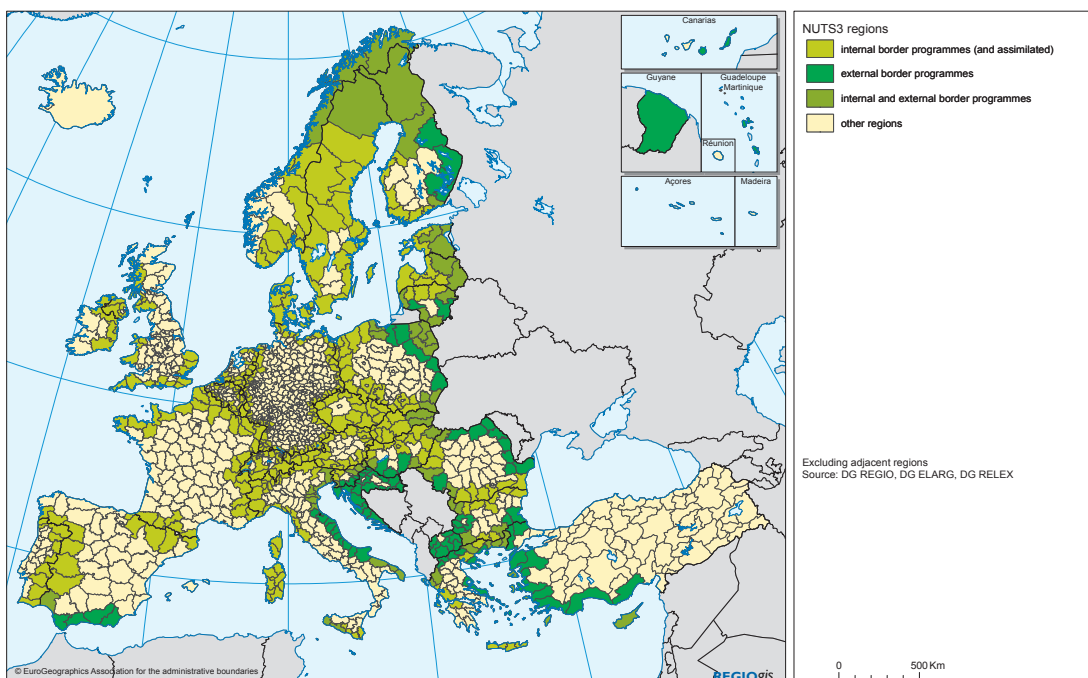
1. capital city regions;
2. second-tier metro regions;
3. smaller metro regions.

The capital city region is the metro region which includes the national capital.

Second-tier metro regions are the group of largest cities in the country excluding the capital. For this purpose, a fixed population threshold could not be used. As a result, a natural break served the purpose of distinguishing the second tier from the smaller metro regions. The distinction between second tier and smaller metro regions may be adapted in future to provide a closer match with the distinctions used in, especially national, policy debates.

1.4. Border regions

Cross-border cooperation programme areas (ERDF, IPA and ENPI), 2007-2013



The NUTS 3-based selection of border regions refers to the regions participating in the core areas of cross-border cooperation programmes in the programming period 2007-2013.

This includes:

- programme areas of cross-border programmes co-financed by ERDF under the European territorial cooperation objective;
- areas of the cross-border cooperation component of IPA (Instrument for Pre-Accession Assistance);
- areas of the cross-border cooperation programmes within ENPI (European Neighbourhood and Partnership Instrument).

The typology lists regions according to the current NUTS classification (valid from 1/1/2008 to 31/11/2011). Some programme areas have been determined on the basis of a former NUTS classification. Due to NUTS boundary changes, some current NUTS 3 regions are only partly eligible as programme areas.

The typology does not consider areas adjacent to the core programme areas, i.e. the 'flexibility areas' referred to in Art. 21(1) of Regulation 1080/2006 of 05/07/2006.

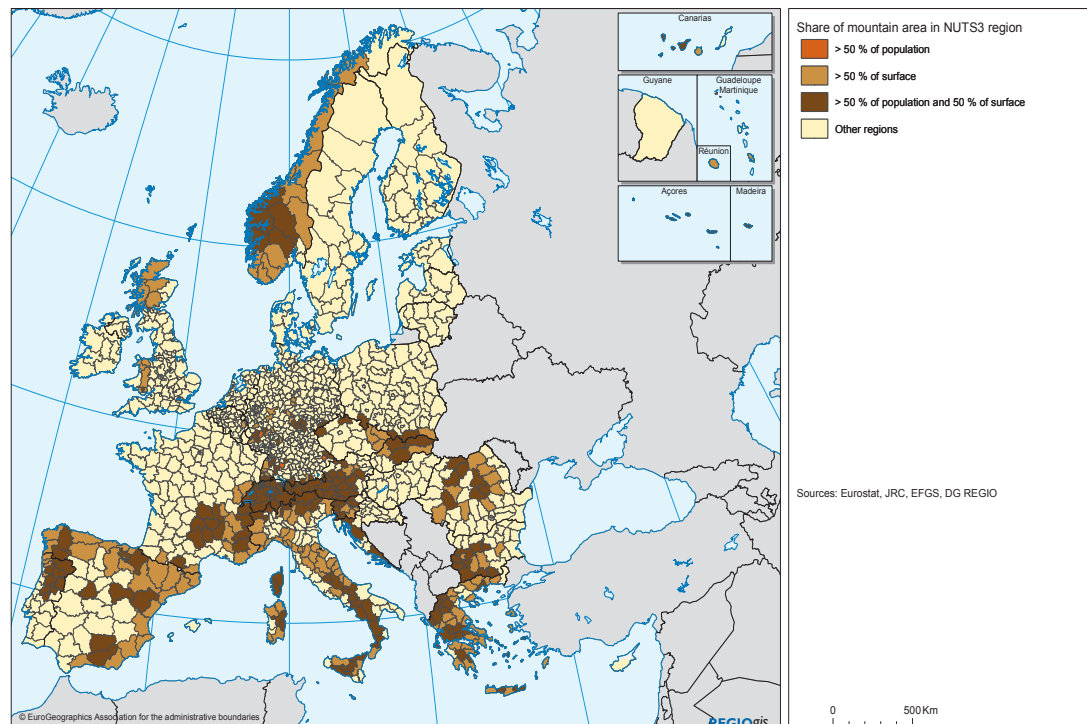
Two main types of border regions can be distinguished:

1. internal border regions – these regions are located on borders between EU Member States and/or European Free Trade Area (EFTA) countries;
2. external borders – these regions participate in programmes involving countries outside both the EU and EFTA.

This typology will be updated to cover the new NUTS classification and the new Cohesion Policy programming period.

1.5. Mountain regions

Typology of mountain regions at NUTS3 level



Mountain regions at NUTS 3 level are defined as regions in which more than 50% of the surface is covered by topographic mountain areas or in which more than 50% of the regional population lives in these topographic mountain areas.

The study on mountain areas in Europe¹ defines topographic mountain areas using the following criteria:

- above 2500m, all areas are included within the mountain delimitation;
- between 1500m and 2500m, only areas with a slope of over two degrees within a 3 km radius are considered mountainous.

Between 1000m and 1500m, areas had to justify one of two sets of criteria in order to be considered mountainous. The first of these is that the slope within a 3 km radius should exceed five degrees. If the slope is less steep than this, the area can still be considered mountainous if elevations encountered within a radius of 7 km vary by at least 300 meters. If neither of these two sets of criteria is met, the area is considered non-mountainous.

Between 300m and 1000m, only the latter of the two previous sets of criteria is applied. This means that only areas in which elevations encountered within a radius of 7 km vary by at least 300 meters are considered mountainous.

Below 300m, the objective was to identify areas with strong local contrasts in topography, such as Scottish and Norwegian fjords and Mediterranean coastal mountain areas. Selecting areas according to the standard deviation of elevations in the immediate vicinity of each appeared to be the best approach for the inclusion of these types of landscape. For each point of the digital elevation model, the standard deviation from the eight cardinal points surrounding it (North – North-East – East – South-East – South – South-West – West – North-West) was calculated. If this standard deviation is greater than 50 meters, the landscape is sufficiently undulating to be considered mountainous despite its low elevation.

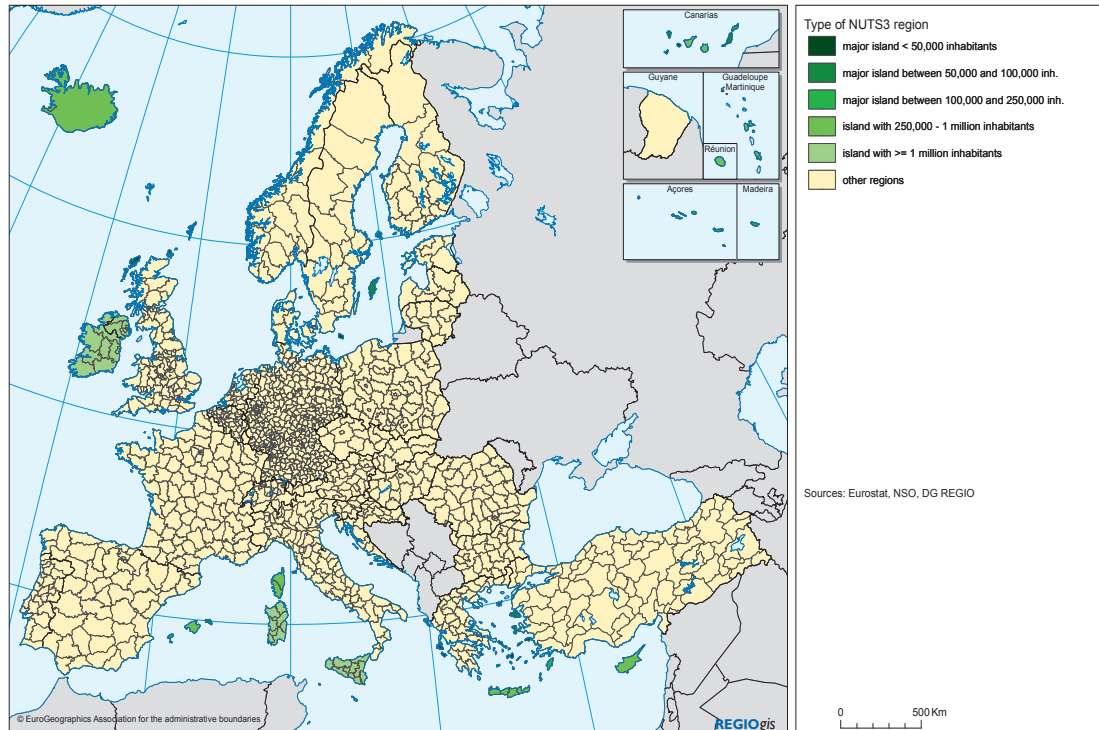
The typology of NUTS 3 mountain regions distinguishes three categories:

1. regions with more than 50% of their population living in mountain areas;
2. regions with more than 50% of their surface covered by mountain areas;
3. regions with more than 50% of their surface covered by mountain areas, and with more than 50% of their population living in mountain areas.

¹ http://ec.europa.eu/regional_policy/information/studies/archives_en.cfm#4

1.6. Island regions

Typology of island regions



Island regions are NUTS 3 regions entirely covered by islands.

In this context, islands are defined as territories having:

- a minimum surface of 1 km²;
- a minimum distance between the island and the mainland of 1 km;
- a resident population of more than 50 inhabitants;
- no fixed link (bridge, tunnel, dyke) between the island and the mainland.

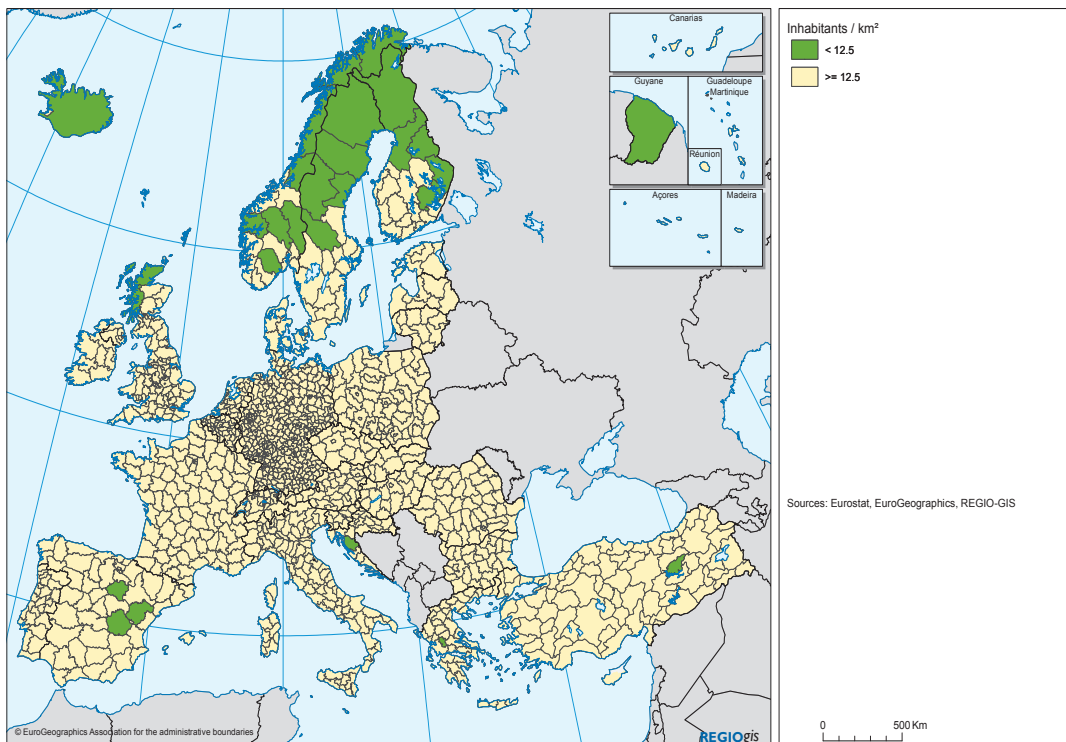
NUTS 3 island regions can correspond to a single island, or can be composed of several islands, or can be part of a bigger island containing several NUTS 3 regions.

The typology of NUTS 3 island regions distinguishes five categories, depending on the size of the major island related to the NUTS 3 region:

1. regions where the major island has less than 50 000 inhabitants;
2. regions where the major island has between 50 000 and 100 000 inhabitants;
3. regions where the major island has between 100 000 and 250 000 inhabitants;
4. regions corresponding to an island with 250 000 to 1 million inhabitants, or being part of such an island;
5. regions being part of an island with at least 1 million inhabitants.

1.7. Sparsely-populated regions

Sparsely populated NUTS3 regions, 2007

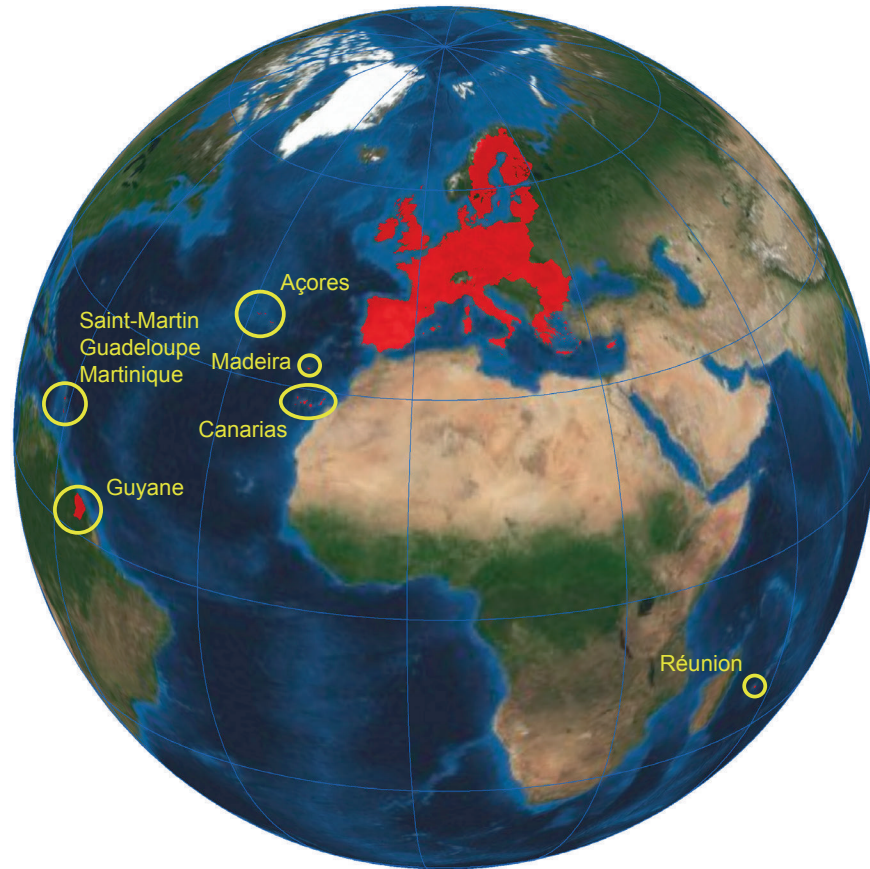


Sparsely-populated regions are regions with a population density below a certain threshold. Paragraph 30(b) of the Guidelines on national regional aid for 2007-2013 defines low population density regions as 'areas made up essentially of NUTS 2 geographic regions with a population density of less than 8 inhabitants per km², or NUTS 3 geographic regions with a population density of less than 12.5 inhabitants per km²'. In the Cohesion Report, the analysis was based on the NUTS 3 regions.

As a result, sparsely-populated areas are defined as NUTS 3 regions with a population density of fewer than 12.5 inhabitants per km².

1.8. Outermost regions

Outermost regions are identified by Article 349 of the Consolidated Treaty on the Functioning of the European Union as Guadeloupe, French Guiana, Martinique, Réunion, Saint-Martin (i.e. the French overseas departments), the Azores, Madeira and the Canary Islands.



2. Definition of local typologies

This section presents two linked local typologies. They are linked because in both typologies, the cities are defined in an identical manner.

Both local typologies are also linked to regional typologies:

- The rural grid cells used in the degree of urbanisation are also used in the urban-rural regional typology.
- The cities are used to identify regions close to a city.
- The cities and commuting zones are used to identify the metro regions.

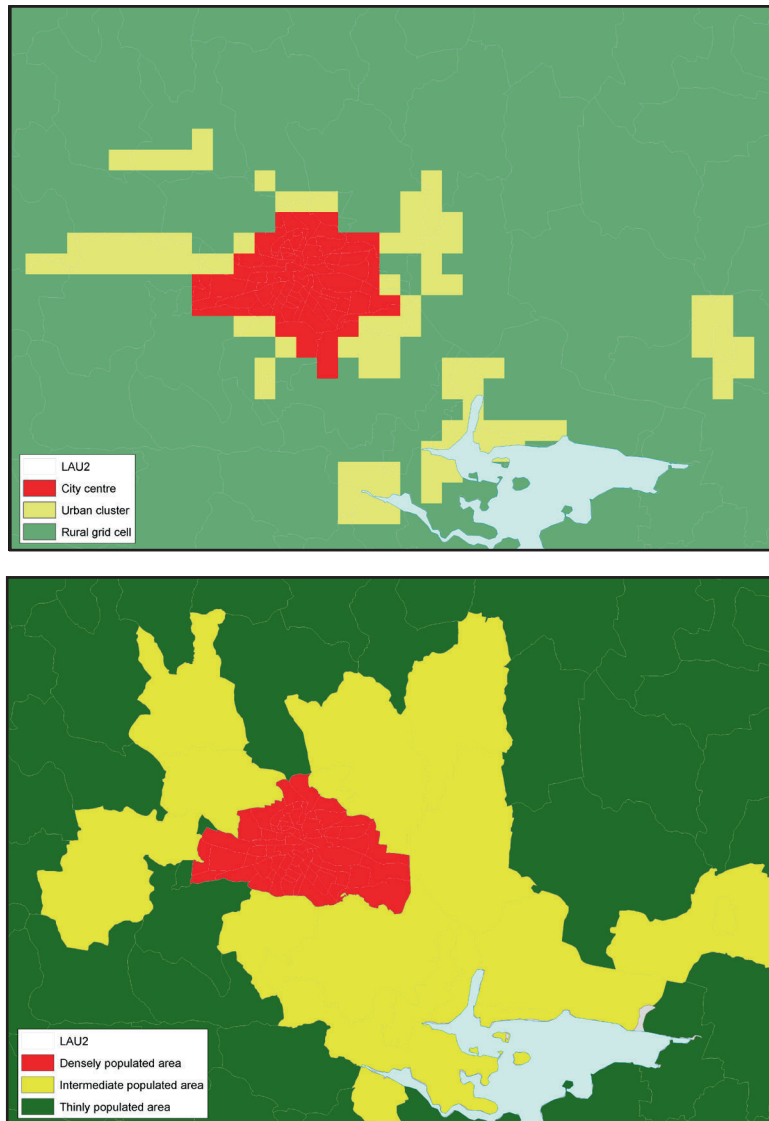
2.1. The degree of urbanisation

The new degree of urbanisation creates a three-way classification of LAU2s as follows:

- (a) Densely populated area: (alternate name: cities or large urban area)
 - At least 50% lives in a city centre
- (b) Intermediate density area (alternate name: towns and suburbs or small urban area)
 - Less than 50% of the population lives in rural grid cells and
 - Less than 50% lives in a city centre
- (c) Thinly populated area (alternate name: rural area)
 - More than 50% of the population lives in rural grid cells.

The set of two images below gives an example of Cork in Ireland.

Cork, Ireland: Type of cluster and degree of urbanisation



Definitions:

City centre (or high-density cluster):

- Contiguous¹ grid cells of 1km² with a density of at least 1 500 inhabitants per km² and a minimum population of 50 000.

Urban clusters:

- Clusters of contiguous² grid cells of 1km² with a density of at least 300 inhabitants per km² and a minimum population of 5 000.

Rural grid cells:

- Grid cells outside urban clusters

¹ Contiguity does not include the diagonal (i.e. cells with only the corners touching) and gaps in the cluster are filled (i.e. cells surrounded by a majority of high-density cells applied iteratively). For more detail see section 4.5.

² Contiguity includes the diagonal. For more detail see section 4.5.

Adjustments and validation by national statistical institutes

The application of this methodology was sent to the national statistical institutes (NSI) for adjustments and validation. The NSIs could make two types of adjustments: adjusting city boundaries and adjusting LAU2 classifications.

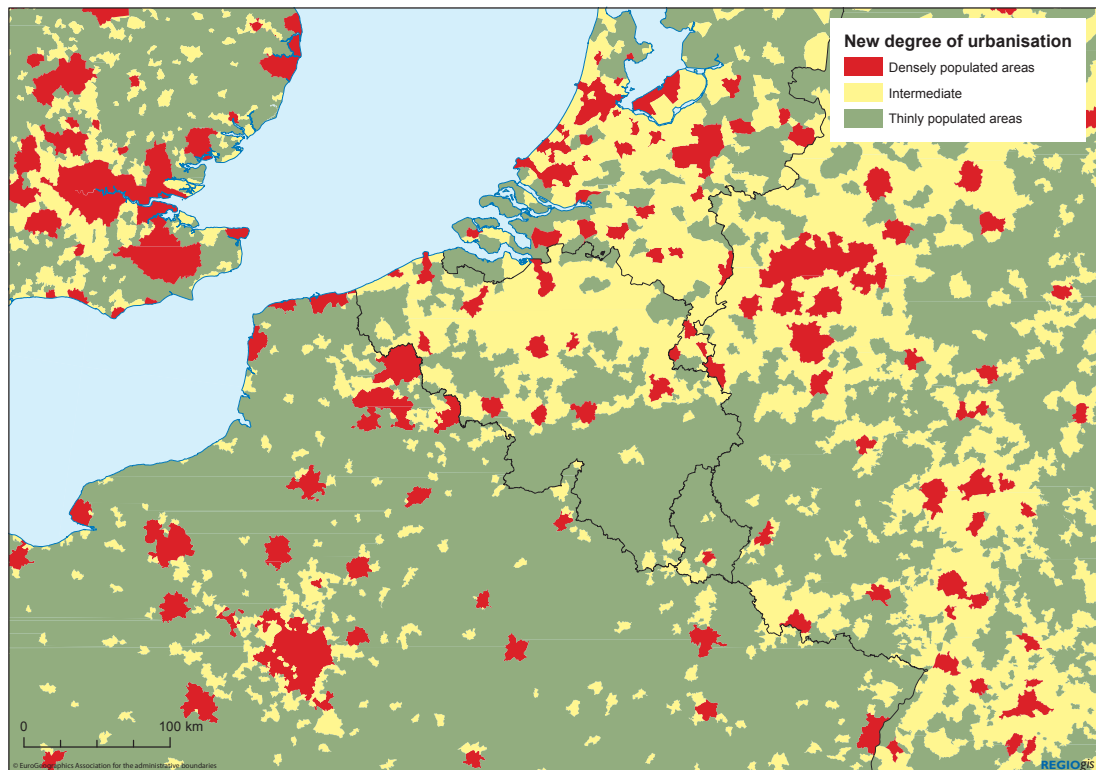
Adjusting city boundaries

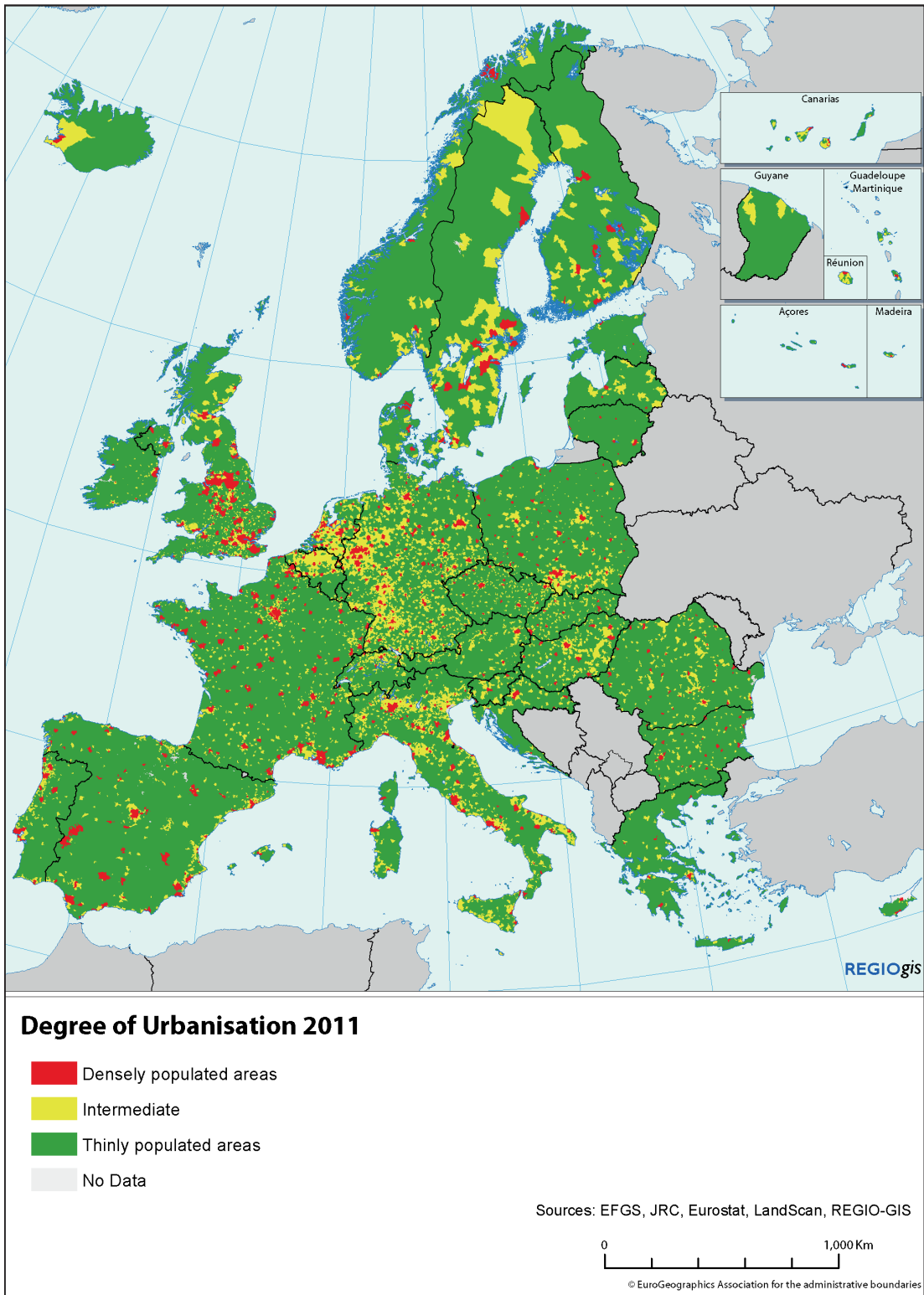
The guidance note highlights that due to the variation of the area size of LAU2s, the match between the high-density cluster and the densely populated LAU2s could be adjusted within certain constraints. In this context, several NSI have requested changes to the densely populated areas to ensure a better match between the appropriate political level and/or a level for which annual data is collected.

Other adjustments

Due to the sources of the population grid and the fairly coarse resolution of the population grid, the classification of a limited number of LAU2s may not correspond to this approach. As a result, National Statistical Institutes (NSI) were invited to critically review this classification and to make, where necessary, adjustments to the classification.

This new definition identified 885 cities with an urban centre of at least 50 000 inhabitants in the EU, Switzerland, Croatia, Iceland and Norway. These cities host about 40% of the EU population. Each city is part of its own commuting zone or a polycentric commuting zone which covers multiple cities.





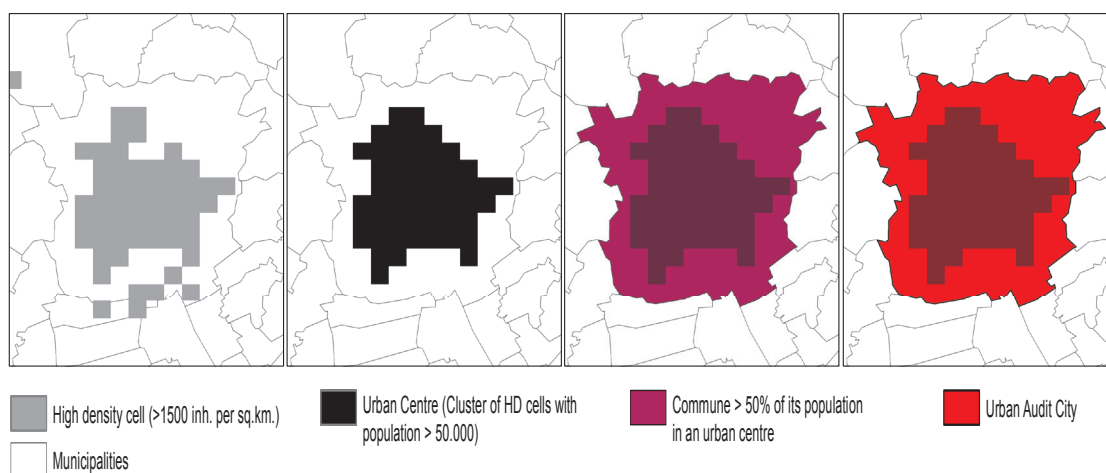
2.2. Harmonised definition of a city and its commuting zone

How does this definition work?

This new definition works in four basic steps and is based on the presence of an 'urban centre' a new spatial concept based on high-density population grid cells.

How to define a city

High density cells, urban centre and city (Graz)



Step 1: All grid cells with a density of more than 1 500 inhabitants per sq. km are selected (map 1.1.).

Step 2: The contiguous¹ high-density cells are then clustered, gaps² are filled and only the clusters with a minimum population of 50 000 inhabitants (map 1.2) are kept as an 'urban centre'.

Step 3: All the municipalities (local administrative units level 2 or LAU2) with at least half their population inside the urban centre are selected as candidates to become part of the city (map 1.3).

Step 4: The city is defined ensuring that 1) there is a link to the political level, 2) that at least 50% of city the population lives in an urban centre and 3) that at least 75% of the population of the urban centre lives in a city (map 1.4).

In most cases, as for example in Graz, the last step is not necessary as the city consists of a single municipality that covers the entire urban centre and the vast majority of the city residents live in that urban centre.

For 32 cities with an urban centre that stretched far beyond the city, a 'greater city' level was created to improve international comparability.

To ensure that this definition identified all relevant centres, the national statistical institute were consulted and minor adjustments were made where needed and consistent with this approach.

¹ Contiguity for high-density clusters does not include the diagonal (i.e. cells with only the corners touching).

² Gaps in the high-density cluster are filled using the majority rule iteratively. The majority rule means that if at least five out of the eight cells surrounding a cell belong to the same high-density cluster it will be added. This is repeated until no more cells are added.

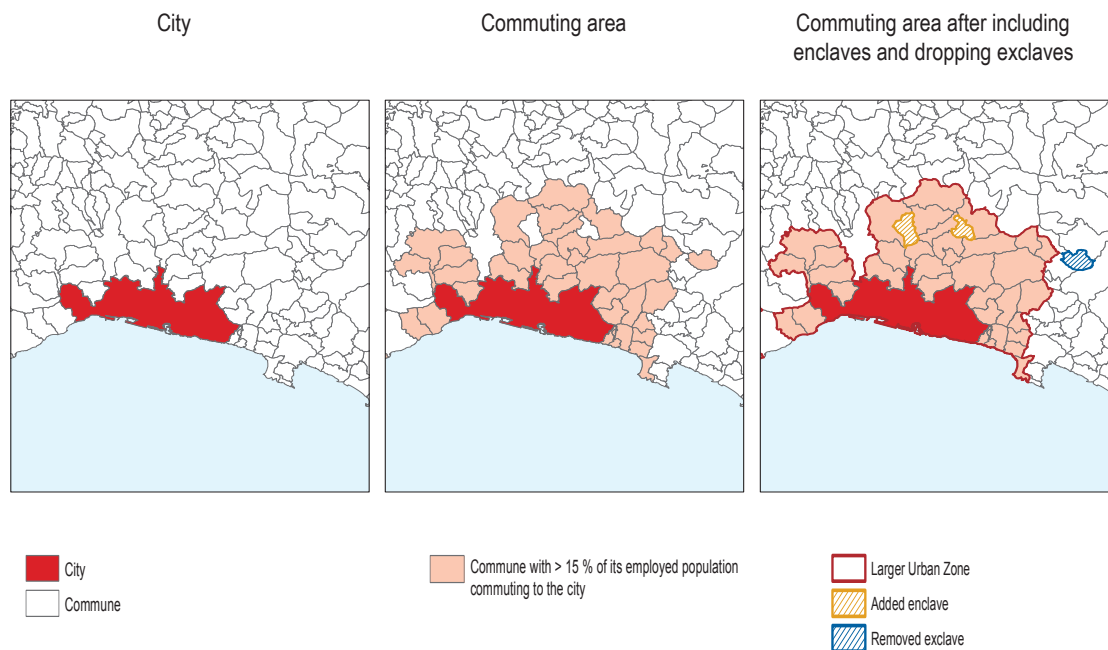
A Harmonised Definition of a Commuting Zone.

Once all cities have been defined, a commuting zone can be identified based on commuting patterns using the following steps:

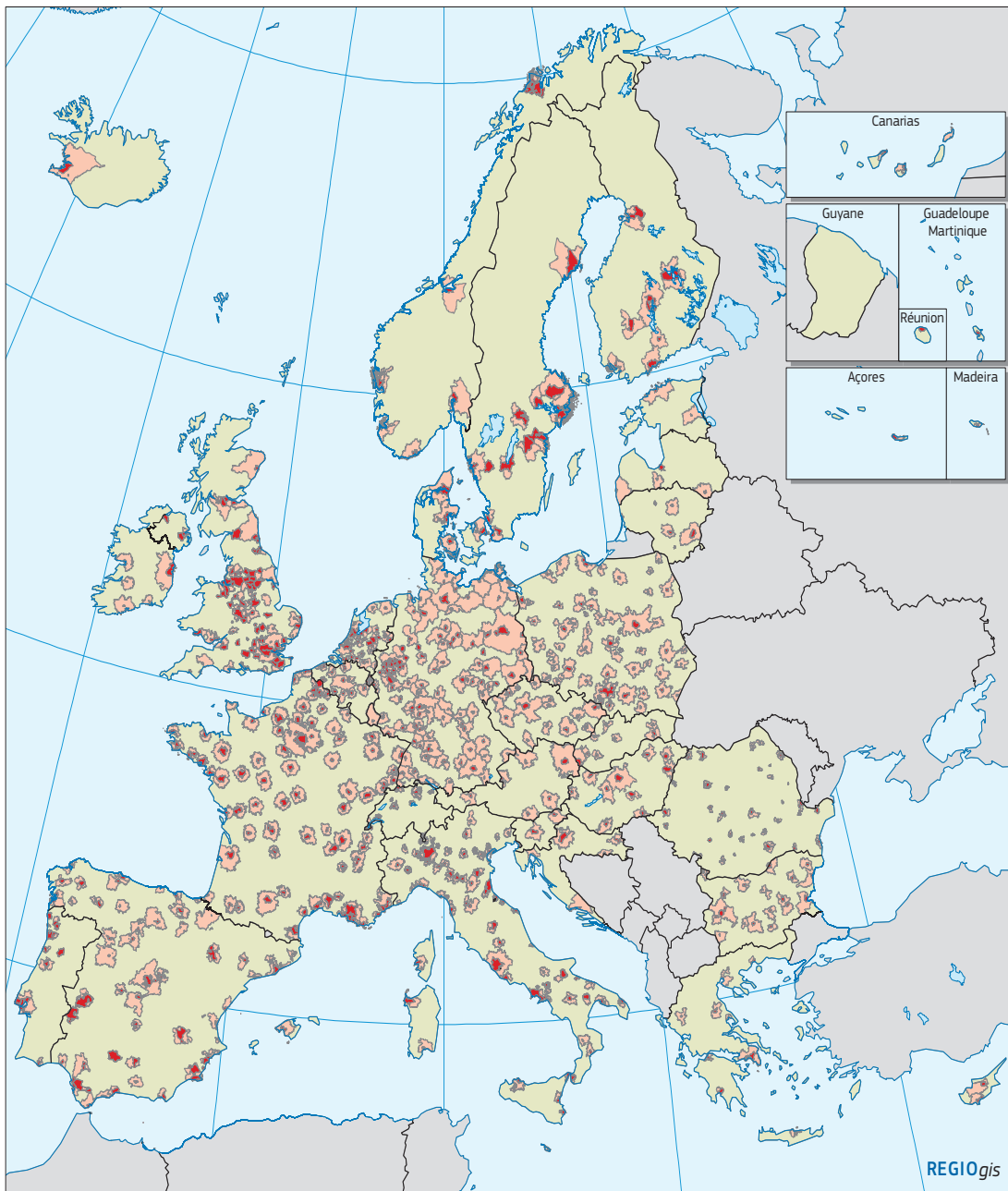
1. If 15% of employed persons living in one city work in another city, these cities are combined into a single destination.
2. All municipalities with at least 15% of their employed residents working in a city are identified (image 2)
3. Municipalities surrounded¹ by a single functional area are included and non-contiguous municipalities are dropped (image 2.3).

How to define a commuting zone

City and its commuting zone (Genova)



¹ Surrounded is defined as sharing at least 100% of its land border with the functional area.



2012: Urban Audit Cities and Larger Urban Zones

- City / Greater city
- Larger Urban Zone
- Country covered by Urban Audit

Sources: DG Regio

0 500 Km

© EuroGeographics Association for the administrative boundaries

3. Sub-national data source

This section provides an overview of the main sources of sub-national data for the European Union.

3.1. Eurostat

Eurostat has been expanding its sub national data offer in the recent years in two dimensions, more domains covered and more detailed geographical levels:

- Most indicators are published for the so called NUTS regions (see Table 2 for details).
- Some of these indicators are also calculated for a predefined group of NUTS 3 regions, like rural regions, metropolitan regions, coastal regions, etc.
- The urban-rural characteristics could be also analysed at a lower geographical scale, at the 'local area' (communes, municipalities) level using the degree of urbanization classification. Data is published for the sum of all urban/intermediate/rural local areas of a given country (see Table 3).
- Data is also available for cities. The list of indicators covers most aspects of urban life, e.g. demography, housing, health, the labour market, education, climate, transport and cultural infrastructure.
- The European population 1km² grid dataset provides data for the reference year 2006 combining data from registers, hybrid data from various national data sources and disaggregated data.
- The statistical information listed above can be overlaid with several geographical layers, allowing calculating new indicators, like accessibility of services, share of population living within a certain distance from the coast, etc. (see List 1 below).

For more information please visit the website dedicated to sub-national statistics.¹

¹ http://epp.eurostat.ec.europa.eu/portal/page/portal/region_cities/introduction

Statistics by NUTS regions

Domain	Content	NUTS level
Demography	Population by age and by gender; Population change (births, deaths); Life tables (life expectancy, etc.); Infant mortality; Census data (2001)	NUTS 2 or NUTS 3
Migration	Internal migration (arrivals, departures by sex, origin and destination)	NUTS 2
Economic accounts	Gross Domestic Product (GDP) indicators; Branch accounts; Household accounts	NUTS 2 or NUTS 3
Labour Market	Economically active population; Employment and unemployment; Socio-demographic labour force statistics; Labour market disparities; Job vacancy	NUTS 2 or NUTS 3
Labour Cost	Labour cost, wages and salaries, direct remuneration, hours worked (1996, 2000, 2004, 2008)	NUTS 1
Science and Technology	R&D expenditure and staff; Human resources in science and technology; Employment in technology-intensive sectors; European patent applications	NUTS 1 or NUTS 2
Structural Business	Structural business statistics (Number of local units, persons employed and Wages and salaries by economic activity); Distributive trade statistics (2009)	NUTS 1 or NUTS 2
Agriculture	Land use/cover; Farm Structure Survey indicators (Area, livestock, labour force and standard output of farms); Animal, milk and crop production; Economic accounts for agriculture; Agri-environmental indicators (for e.g. farmers training level)	NUTS 1, NUTS 2 or NUTS 3
Health	Causes of death; Health care infrastructure; Health status; Hospital patients	NUTS1 or NUTS 2
Tourism	Tourist accommodation, arrivals, nights spent	NUTS 2 or NUTS 3
Transport	Road, rail, maritime, inland waterways and air transport; Transport infrastructure, stock of vehicles and road accidents	NUTS 2 or NUTS 3
Education	Number of students by sex, age, education level, orientation; Educational attainment and lifelong learning	NUTS 1 or NUTS 2
Information Society	Internet access; Computer usage	NUTS 1 or NUTS 2
Environment	Water resources; Wastewater treatment; Solid waste	NUTS 1 or NUTS 2
Social policy/ income and living conditions	At-risk-of-poverty-or-social-exclusion and its three dimensions	NUTS 0, NUTS 1 or NUTS 2

Statistics by degree of urbanisation

Domain	Content
Labour Market	Economically active population; Employment and unemployment;
Education	Participation rate in education; Educational attainment and lifelong learning
Information Society	Internet access; Computer usage
Social, income and living conditions	At-risk-of-poverty; Severe material deprivation rate; Household budget characteristics; Housing costs; Distribution of population by dwelling type and income group

List 1 - Geographical Information (Reference topographic layers and Specific thematic layers)

- Administrative and statistical regions (NUTS 0-3, LAU1-2) (source : EuroGeographics)
- Topographic layers (administrative areas and boundaries, hydrography, transport infrastructure, settlements and city areas, points of interest) (source : EuroGeographics)
- Country boundaries (source: UN), Exclusive Economic Zones (EEZ, source: VLIZ), coastline
- Ports, Airports, Maritime routes (under validation), coverage: Europe
- Degree of Urbanisation, coverage: EU27, EFTA
- Urban Audit (SubCity districts, cities, Large Urban Zones)
- Digital Elevation Model, coverage: Europe up to 60° N
- High resolution road network, including detailed network at street level, some points of interest, speed profiles for itinerary and journey time calculation, coverage: EU27 (excl. CY), EFTA, candidate and potential candidate countries
- Data from the LUCAS land use, land cover survey.

3.2. JRC

DG JRC develops georeferenced datasets at European and global scale, many of which are relevant for regional or territorial analysis. These datasets cover themes as natural hazards and risk prevention, distribution of species, climate change, agriculture, land cover, soil data, etc.

An updated inventory of available datasets can be retrieved from the JRC Reference Data and Service Infrastructure (RDSI): <http://rdsi-portal.jrc.it:8081/web/guest/home>

For Commission services, this inventory can also be searched using the INSPIRE@EC Geoportal: <https://webgate.acceptance.ec.europa.eu/inspire/geoportal/catalog/identity/login.page>

Additionally, the JRC operates and maintains the INSPIRE geoportal giving access to data and services from Member States: <http://inspire-geoportal.ec.europa.eu/discovery/>

3.3. EEA

Data sets in this table are organised per EEA Environmental Data Centres that could be consulted for additional information.

Data available from the EEA

Key data sets	Brief description of the content	Spatial coverage e.g. countries	Spatial resolution e.g. MMU, meters	Update frequency, latest year available
Air pollution (Data centre http://www.eea.europa.eu/themes/air/dc)				
E-PRTR (also used for water)	Pollutant releases from individual industrial facilities to air, water and soil, and waste transfers	EU-27, IS, LI, NO, CH, RS	Point source data. Geographic coordinates available.	Annual. Data for 2010 available.
E-PRTR (also used for water)	Spatial emission maps of selected pollutants to air and water from 'diffuse' sources e.g. transport, households etc.	Air: EU-27, CH, LI, NO, IS Water: EU-27, NO, CH, LI	Air: 5 km grid Water: River basin district	Air: Periodic updates. 2009 available. Water: Periodic updates. Dataset compiles data from different years
Large combustion plant emissions	Emissions of NO _x , SO _x , and dust from individual large combustion plants. Fuel data for the plants where this is not confidential.	EU-27	Point source data. Plant name and address available.	Three yearly updates. Datasets 2004-2006, and 2007-2009 available.
AirBase	Measurement data and associated meta information delivered under the EoI decision and the set of derived statistics are made publicly available in the European air quality database (AirBase). All products are downloadable (e.g. raw data, calculated statistics, meta data). AirBase covers all EoI pollutants, which amount to 187 different components of which 15 are mandatory.	EEA-32, AL, BA, HR, ME, MK, RS	Geographic coordinates available.	Annual. Data for 2010 available.

Air Quality Questionnaire	The EU air quality legislation requires EU Member States (MS) to divide their territory into a number of air quality management zones and agglomerations. In these zones and agglomerations, the Member States should annually assess ambient air quality levels against the attainment of air quality standards and objectives (for different pollutants). EEA publishes the related spatial information: http://www.eea.europa.eu/data-and-maps/data/zones-in-relation-to-eu-air-quality-thresholds-2	EU-27, CH, IS, NO	Polygons (zones and aggllo.)	Annual. Data for 2009 available.
Biodiversity (Data centre http://www.eea.europa.eu/themes/biodiversity/dc)				
NATURA 2000	The European network of protected sites(Special Protected Areas, Sites of Community Importance and Special Areas of Conservation)	EU27	1:100 000	2011
CDDA	The European inventory of nationally designated areas holds information about protected sites and about the national legislative instruments, which directly or indirectly create protected areas	EEA39	n/a	2011
Conservation status of habitat types and species	All Member States are requested by the Habitats Directive (1992 Article 17) to monitor habitat types and species considered to be of Community interest.	EU27	10 km grid (1:10 000 000)	2006 (temporal coverage 2000-2006)
Bio geographical regions, Europe	The bio-geographic regions dataset contains the official delineations used in the Habitats Directive (92/43/EEC) and for the EMERALD Network set up under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)	EEA39 + ENPI East countries and European part of Russian Federation	varying/a (1:1M to 1:10M)	2011

Climate change (Data centre http://www.eea.europa.eu/themes/climate/dc)				
Urban Audit data	329 variables covering socio-economic and environmental data per city and per LUZ: These are needed to assess urban vulnerability to climate change in Europe (sensitivities and adaptive capacity)	EU27 plus Turkey, Croatia, Switzerland and Norway	Per core city, sub-city districts and per Larger urban Zone	Every 3 years Last: 2004, 2007, 2009
DEGURBA Degree of Urbanisation	degree of urbanisation based on population densities (1km ² population grid) (1)Densely populated area: (2)Intermediate density area (3) Thinly populated area	EU27 plus Turkey, Croatia, Switzerland, Norway , Iceland	LAU 2	2006 Next population updates for 2011, 2014
European Climate Assessment and Dataset (ECA&D)	Daily gridded data of surface temperature, precipitation and surface atmospheric pressure. Daily gridded data are available since 01-01-1950. http://eca.knmi.nl/download/ensembles/download.php	EEA39 ++	Gridded 25 km resolution	Update 2 times per year, last update April 2012. Next update Sept. 2012
Climate change adaptation (Climate-Adapt platform: http://climate-adapt.eea.europa.eu)				
Climate observation and scenarios (data from other organisations made accessible by EEA)	Interactive maps of various layers from ClimWatAdapt, ESPON Climate, JRC-IES and ENSEMBLES are available through climate-adapt mapviewer *	EU27	Gridded in 25 km spatial resolution or NUTS2 and NUTS 3 level	No regular update is foreseen

Land use (Data centre http://www.eea.europa.eu/themes/landuse/dc)				
Corine Land Cover	Vector land cover map with 44 classes derived from satellite image at scale 1:100 000	EEA39 (38)	25ha (5ha changes)	1990, 2000, 2006
Impervious-ness	Raster map on degree of soil sealing 0-100% derived from satellite image	EEA39	100m raster	2006, 2009
Landscape fragmentation	Fragmentation of landscape by urban areas and transport infrastructure calculated as mesh size on unfragmented land	EEA29	1km grid (EEA)	2009
Urban Atlas (also used for climate change)	Vector land cover map of cities with their surroundings at scale 1:10 000	EU27, ca. 300 large urban zones	0.25ha	2006

Water (Data centre http://www.eea.europa.eu/themes/water/dc)				
Waterbase (use WISE viewer to explore)	<ul style="list-style-type: none"> a) Water quantity time series b) chemical quality of groundwater, characteristics of groundwater bodies and sampling sites c) physical characteristics of the transitional, coastal and marine water monitoring and flux stations, proxy pressures on the upstream catchment, basin and River Basin District associated with transitional and coastal waters, chemical quality data on nutrients in seawater and hazardous substances in biota, sediment and seawater, as well as data on direct discharges and riverine input loads. d) River Basin Districts (RBDs) and/or their subunits (RBDSUs) e) Lakes: nutrients, organic matter, hazardous substances and other chemical determinands in water, proxy pressure data on the upstream catchments and physical characteristics f) Rivers: data on nutrients, organic matter, hazardous substances and other chemical determinands in water, proxy pressure data on the upstream catchments and physical characteristics g) emissions of nutrients and hazardous substances to water, aggregated within River Basin Districts (RBDs) h) data selected from the reporting of Member States as part of the UWWTD implementation 	<p>Varying, but exact country coverage is available for each data category. Example of typical country coverage for a) 'Water quantity time series' (in the column to the left):</p> <ul style="list-style-type: none"> a) Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Ireland, Latvia, Liechtenstein, Lithuania, Macedonia, the former Yugoslavian Republic of, Netherlands, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom 	<ul style="list-style-type: none"> a) b) c) e) f) h) point data, geographical coordinates available d) vector data 	<ul style="list-style-type: none"> a) 1961-2010 (latest update 2012) b) 1960-2010 (latest update 2012) c) 1978-2009 (latest update 2011) d) 2011 e) 1931-1939 and 1949-2009 (latest update 2011) f) 1965-2009 (latest update 2011) g) 1977-1998 and 2000-2009 (latest update 2011) h) 2007-2008 (latest update 2011)

Bathing Water Directive - Status of bathing water	The EU Bathing Waters Directive requires Member States to identify bathing places in fresh and coastal waters and monitor them for indicators of microbiological pollution (and other substances) throughout the bathing season which runs from May to September.	EU27, Croatia, Montenegro, Switzerland.	Point data. Geographic coordinates available.	1990-2011
E-PRTR data for water	(see section on air pollution)			

3.4. ESPON

The mission of the ESPON 2013 Programme is to support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory. Support is being provided, amongst other, by providing comparable information, evidence, analyses and scenarios on territorial dynamics. The ESPON 2013 Database is a core element in making fundamental regional information provided by ESPON projects and EUROSTAT accessible for policy makers and practitioners related to regions, cities and larger territories.

Currently the ESPON 2013 Database contains approximately 1250 socio-economic indicators, covering 60 countries in Europe and in the world, with a main focus to cover the entire European Union plus Switzerland, Norway, Iceland and Liechtenstein (ESPON space). The Database provides access to the following data categories: regional, local, urban, neighbourhood (candidate countries), world, grid and historical data.

The regional and local data and indicators use the Nomenclature of Territorial Units for Statistics (NUTS) references. The other types of data use similar statistical units or grid. The temporal coverage of the data ranges from 1950 to 2050. Most of the datasets and information produced are public available and free accessible.

Some of the data included in the ESPON 2013 Database are further elaborations upon data published by the EEA. For example, in field of climate change and land use, ESPON has completed a number of studies which further analyses and refine data published by the EEA.

Themes covered by the ESPON 2013 Database are related to territorial cohesion and as such very diverse.

They cover:

- demography
- agriculture
- transport
- accessibility
- energy and resources
- climate change
- land use and land cover
- natural hazards and risk prevention
- education
- labour market
- living conditions
- culture
- economy

- employment
- research and innovation
- typologies
- scenarios
- geographical objects.

Link to the ESPON 2013 Programme website: <http://www.espon.eu/>

Direct link to the ESPON 2013 Database: <http://database.espon.eu/data>

4. Tools to support the assessment of territorial impacts

4.1. ESPON ARTS¹

ESPON ARTS assesses the impact of policy options using a vulnerability approach. It relies on seven steps and is often used in a workshop.

(1) Setting the frame

The first step is to detect the potential effects of a policy option on a territory. In a workshop, the experts draw a picture of the cause-effect relationships.

(2) Considering different types of regions – regional Exposure

A policy may affect only particular regions (e.g. coastal regions, regions with presence of particular productions or facilities like nuclear power plants etc.) or different types of regions could be touched in different ways by a directive. This instrument provides a set of pre-selected types of regions to facilitate the decision if a certain type of region is involved. Moreover it enables to define the exposure differently for different types of regions.

This step should determine:

- (a) If a directive affects a certain type of region (according to the preselected types of region) or
- (b) Is it necessary to distinguish the exposure resulting from a directive along different types of regions?

(3) Estimating in exposure

The previous step decided if a region was exposed to a policy. In this step, the intensity of the exposure should be defined according to the following classes:

- high positive exposure intensity
- low positive exposure intensity
- no exposure
- low negative exposure intensity
- high negative exposure intensity

(4) Calculating the impact and plausibility checks

Based on the exposure and the regional sensitivity, which can be integrated in preformatted excel file, the territorial impact is calculated automatically. It provides for each thematic field/indicator and for each region the impact of the policy option in a region in 9 classes ranging from very high positive impact to very high negative impact. These should be checked for plausibility.

¹ http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/arts.html

(5) Mapping the Territorial impact

If the plausibility checks are positive the maps showing the impact along the different indicators can be drawn. Additionally 'summative' impacts of a policy option on each region, considering together all impacts on the different fields can be drawn.

(6) Discussion on policy implications

Based on the maps the discussion on policy implication can be done, focusing on the positive impacts of a directive as well as on negative effects. The host moderates the discussion and writes the minutes.

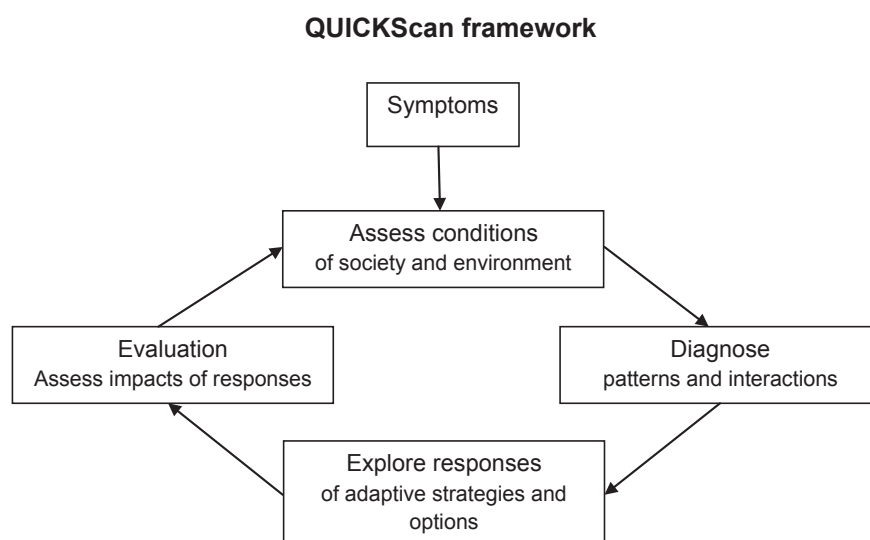
(7) Writing the minutes

Based on the results of the meeting and the discussion minutes are elaborated according to a common structure.

4.2. QUICKScan

QUICKScan¹ is both a framework (Figure 7) and a software tool to be applied in group-processes with policy makers and experts to develop and explore potential policy options and assess likely impacts of those options. The framework addresses five questions:

- What aspects, in a policy context are relevant with respect to human and ecosystems well-being?
- What typical 'pictures' of the past and actual condition and trends exist?
- What elements and interactions are relevant for the persistence of these patterns, trends and impacts?
- Which strategies and options can be devised to preserve, restore, use, improve, mitigate, or adapt?
- Which hotspot areas, services or land covers could be identified as targets for policy actions?



¹ For more information see: Verweij, P., Winograd, M., Perez-Soba, M., Knapen, M., van Randen, Y. (2012), QUICKScan: a pragmatic approach to decision support. In: Seppelt, R. Voinov, A.A. and D. Bankamp (Eds.): 2012 International Congress on Environmental Modelling and Software. Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig, Germany. <http://www.iemss.org/society/index.php/iemss-2012-proceedings>. Perez-Soba, M., Verweij, P., Winograd, M., QUICKScan: a decision-making support toolbox to improve assessments of ecosystems and ecosystem services (2012), The Economics of Ecosystems and Biodiversity - TEEB Conference 2012 Mainstreaming the Economics of Nature: Challenges for Science and Implementation, Leipzig, Germany.

The QUICKScan software encompasses a modelling environment with functionalities to do the assessment of societal and environmental conditions, diagnose patterns and interactions, implement alternative responses and evaluate the impacts of those responses.

A typical EEA QUICKScan exercise starts by populating the system with data that the participants find relevant to the policy question. In the next step, participants try to assess the impact of different policy options by defining rules of 'if..then..else' type. The rules can be quantitative or use qualitative typologies. They may also be linked together to form a chain of rules. The system will apply these rules to the data and create derived data. Finally, the derived data can be aggregated (e.g. by administrative unit, biophysical units) and displayed in tables, charts and maps in order to help the policy makers to compare the impact of different policy scenarios.

The EEA QUICKScan toolbox allows combining tacit expert knowledge with available spatial and statistical data. Inevitably, it requires a certain level of knowledge of data availability and Geographic Information Systems. However, with this condition in place, the EEA QUICKScan can help the assessment of policy questions in a relatively short period.

5. Descriptions of JRC models with a sub-national dimension

The models listed below were developed by the JRC to support the policy needs of different services of the European Commission, such as exploration of future policies and impact assessments of specific policy options.

5.1. LUMP: Land Use Modelling Platform

Non-technical description

The changes in the cover and use of the surface of the earth depend on natural processes and are, at the same time, shaped by demographic, economic, cultural, political, and technological drivers. The Land Use Modelling Platform (LUMP) can help to understand and interpret the complex interactions between the bio-physical and human factors that influence land use/cover dynamics. In addition, it can be used as a tool to assess environmental consequences of policies with direct or indirect spatial impacts.

The model is based upon the combination of a spatially explicit land use model and its linkages with other modelling activities in thematic fields such as hydrology, agriculture, economy, forestry and so on.

LUMP consists of three modules. The first module formulates the demand for different land uses. The second module allocates the land and it is the core of the model called also EU Clue Scanner. Finally, the third module computes the indicators necessary for the interpretation of the results. These can be related to the use of the land itself (e.g. change in agricultural land abandonment, urban expansion) or thematic such as land cover connectivity potential, soil sealing, river flood risk, urban sprawl and content of organic carbon in soils.

Areas where the model can be applied

The LUMP is most suited for ex-ante impact assessment of European policies that influence, directly or indirectly land use/cover change. The forecasted land use/cover changes are not only analysed per se. Land use/cover is an important factor for many ecosystem services such as provision of food; fibre and timber; biodiversity; water flows and climate regulation; carbon sequestration; provision of recreational opportunities; etc. Therefore, LUMP aims at providing relevant input to analyse a growing number of environmental domains that are influenced by land use/cover change.

The modelling framework in LUMP allows the translation of policy questions into alternative scenarios that could be compared through a set of indicators that capture economic, environmental and social issues.

To date, LUMP has been applied in the following ex-ante impact assessments:

- Integrated Coastal Zone Management
- Green measures of the Common Agricultural Policy post-2013
- 2012 Blueprint to Safeguard Europe's Waters

Further applications are being prepared in the fields of energy, resource efficiency, bio-economy and the adaptation strategy to climate change.

Spatial resolution

The latest version of the model can operate at a resolution of 100 x 100 m which is also the resolution of the most important input map, the CORINE Land Cover 2006, which defines the original state of the land use/cover in Europe. The outputs and indicators of the model can be aggregated to a coarser resolution, e.g. at any NUTS aggregation level.

It can be run also for individual NUTS1 or countries only. It also allows working with irregular regions of interest, composed by any configuration of NUTS1 regions.

Input and output variables

LUMP links specialized models and data within a coherent workflow. The model uses input from demographic (EUROPOP 2008, 2010) and economic models (CAPRI, GEM-E3, RHOMOLO) and also from TRANS-TOOLS. The model also requires a number of spatially explicit parameters at different resolutions (1 x 1 km, 100 x 100 m).

The main output of LUMP is a simulated map of the land use/cover for a given year in the future. The allocation module is currently able to simulate land use/cover classes such as urban, industry and commerce, agriculture, forest and semi-natural areas, thus allowing the competition between land uses to be accounted for dynamically in time and space. However, due to its components, functionalities and linkages with other models, the platform goes beyond the simple allocation of land uses and can be considered an integrative platform capable of translating scenarios into physical impacts in a range of environmental domains. LUMP is currently prepared to provide relevant output to the LISFLOOD model, which models river discharge at European level.

Timeframe

As currently configured, the model runs from 2006, producing yearly results up to 2030. Under some conditions, the timeframe can be extended by 10 or 20 years.

Country coverage

LUMP covers the whole of the EU. The model can be extended to cover new Member States of the European Union or to other neighbour countries of interest for which CORINE Land Cover 2006 (or comparable map) is available.

5.2. TRANS-TOOLS: a transport network model

Non-technical description

TRANS-TOOLS was tailored specifically to the main priorities of the EU transport policy. It combines, in an integrated manner, advanced modelling techniques in transport generation and assignment, economic activity, trade, logistics, regional development and environmental impacts. It covers the networks of all main modes in both passenger and freight transport.

It can be used in combination with other models and tools (TREMOVE, TRANSVISIONS meta-models, PRIMES, etc.) when required.

Areas where the model can be applied

The features of the model have been selected in order to best simulate and analyse the impacts of three types of measures:

- Changes in transport networks, especially TEN-T
- Pricing measures
- Changes in logistics and distribution systems

TRANS-TOOLS is not suited to assess the impact of the selected specific projects, mainly due to its traffic generating equations that were calibrated to minimize aggregate errors across all of Europe, and therefore could produce very erroneous results locally. Whereas this type of error might be acceptable in the evaluation of global policies, in which case such errors could be mutually compensating, it would be unacceptable when looking at individual projects defined over relatively limited areas.

Spatial resolution

NUTS3

Input and output variables

The main input variables are:

- Transport statistics, GDP and demographics, trade statistics (Eurostat)
- Logistics patterns (research projects)
- Price elasticities of transport demand (economic literature and research projects)
- Emission factors and external costs (research projects)

In order to keep consistency with past or parallel policy relevant analyses and projections, the TRANS-TOOLS Reference scenario matches historical data as published by EUROSTAT and DG MOVE, it is consistent with the energy outlook (PRIMES Reference scenario) and it uses the same assumptions concerning population and economic development than the other related policy departments do (e.g. DG ECFIN, DG CLIM, DG ENV).

The model can simulate the impact of changes in accessibility in terms of:

- Demand per mode
- Traffic on the network links
- Transport costs (per Origin-Destination pair, commodity type, specific corridor, etc.)
- Regional GDP
- Travel times
- Emission and accidents

Timeframe

Currently runs up to year 2030. Version 2.6 (due late 2012) will run until 2050.

Country coverage

EU28 plus neighbouring European countries.

5.3. RHOMOLO: Regional Holistic Model

Non-technical description

The model integrates economic, spatial and social dimensions in a micro-economically founded framework.

RHOMOLO incorporates the following important features:

- Each regional economy is divided into six sectors which are linked through input-output linkages
- Producers (firms) produce goods and services by combining labour, capital, and intermediate inputs
- Consumers (households, governments and firms) purchase goods and services and save the rest of their budget
- Regional governments collect taxes, pay subsidies, consume goods and services and accumulate savings (or make debts)
- Dynamic optimisation of investments
- Regions are linked within the framework of New Economic Geography: inter-regional trade of goods and services are subject to trade costs; the model allows for knowledge spillovers, factor mobility and agglomeration economies.

The pattern of inter-regional trade flows depends upon the preferences of consumers for buying goods from particular regions and upon the prices RHOMOLO differ by the type of good transported, the distance between the regions of origin and destination, and the quality/density of the transport infrastructure.

Each NUTS2 region in RHOMOLO consists of three types of economic agents: households, production sectors, and a government. The six activities are differentiated according to the NACE classification. Each activity produces only one type of good or service. Service sectors in RHOMOLO include both market and public sectors.

Labour is not differentiated according to skill/education level, although wages are region-specific and vary according to the differing educational and productivity levels of the regions. Wages take the appropriate level that equalises demand and supply. In addition, RHOMOLO allows also for inter-regional labour migration and positive unemployment in each region and sector.

Areas where the model can be applied

RHOMOLO can be used for ex-ante impact assessment of European Cohesion Policy and also for other policy simulations and comparison between policy scenarios. For example, RHOMOLO can be used to analyse the impact of innovation policy through the links between R&D expenditure, TFP growth and spillover effects.

Spatial resolution

NUTS2

Input and output variables

The input data come mainly from EUROSTAT, WIOD and the National Statistical Offices. The model simulates the impact of changes in exogenous shocks (economic integration, changes in policy regime, etc).

- Gross domestic product (GDP)
- Employment and unemployment
- Public and private savings and investment
- Inter-regional trade
- Inter-regional labour migration, unemployment and wages
- Regional disparities in wealth, poverty, etc.

Timeframe

Currently, the time horizon of RHOMOLO is 2030 but it can be extended to a longer time period if combined with DSGE models such as QUEST.

Country coverage

EU27 and the rest of the world as one aggregated region.

5.4. CAPRI: Common Agricultural Policy Regional Impact Analysis

Non-technical description

CAPRI is a modelling system which consists of specific data bases, a methodology, its software implementation and the researchers involved in their development, maintenance and applications. It is the key model for the Commission reporting on agricultural and agri-environmental policies at the regional level. The model consists of a supply module and a market module, e.g. a spatial, global multi-commodity model for agricultural products including 47 products in 77 countries organized in 40 trade blocks.

Areas where the model can be applied

The objective of CAPRI is to evaluate ex-ante impacts of the Common Agricultural Policy (CAP) and trade policies on production, income, markets, trade and the environment, from global to regional level.

For example, it is able to perform a regional level analysis of specific Common Market Organisations (e.g. sugar, dairies), trade of agricultural goods with the rest of the world (e.g. WTO proposals) and different subsidisation schemes in Europe (e.g. partial decoupling of agricultural subsidies).

Recent examples include the 'greening measures' in the framework of the CAP 2014-2020 and the Mercosur free trade agreement.

Spatial resolution

NUTS0, NUTS1, NUTS2, farm types (within NUTS2) and cluster of 1x1 km grid cells (for environmental impact assessment)

Input and output variables

The model is based on data from EUROSTAT, FAOSTAT, OECD and extractions from the Farm Accounting Data Network (FADN). They cover about 50 agricultural primary and processed products in the EU, from regional to global level including input and output coefficients. Specific modules ensure that the data used in CAPRI are mutually compatible and complete in time and space.

Some exogenous variables like population growth, GDP, exchange rates, oil prices are coming from UN, DG ECFIN or Global Insight.

Output variables:

- Supply, demand, trade flows of agricultural commodities
- Hectares, herd size, yields, input use
- Producer and consumer prices, income indicators
- Environmental indicators, e.g. nutrient balances, GHG
- Welfare effects including the EU budget for the CAP

Timeframe

CAPRI is a static model and therefore compares a scenario (policy change) to a baseline (business as usual) for a specific year in time.

- Medium term : at this moment, one point in time = 2020
- Long term : under development = 2050

Country coverage

CAPRI is a global model, covering 77 countries in 40 trade blocks in the EU27, Norway, Turkey and Western Balkans.

5.5. RIAT-CHIMERE: Assessment of regional Air quality scenarios

Non-technical description

The RIAT-CHIMERE is composed of two main elements: (1) RIAT is a Regional Integrated Assessment Tool that brings together data on pollutant sources (emission inventories), their contribution to atmospheric concentrations and human exposure, with information on potential emission reduction measures and their respective implementation costs. (2) CHIMERE is a multi-scale air quality model (developed by the Laboratoire de Meteorologie Dynamique and by INERIS (France)) which is designed to produce daily forecasts of ozone, aerosols and other pollutants and make long-term simulations (entire seasons or years) for emission control scenarios. CHIMERE provides the link between emissions and concentrations within RIAT.

Areas where the model can be applied

RIAT-CHIMERE is well suited to assess the impact of emission reduction strategies on air quality and health at both the urban and regional scales.

RIAT-CHIMERE has not been directly used in impact assessments for the Commission but its CHIMERE component is currently used in projects which aim at providing support to the Commission, e.g. EC4MACS or in the frame of contract services in support to Commission departments (e.g. DG. ENV). RIAT is currently used by several regions (e.g. Lombardy, Emilia-Romagna and Alsace) in the EU to assess the impacts of regional air quality plans.

Spatial resolution

RIAT-CHIMERE runs over a range of spatial scales from the regional (several hundreds kilometres) to the urban (few tens of km) with resolutions from 1-2 Km to 20 Km.

The CHIMERE model has been widely used over Europe, with a spatial resolution as low as 10 km and time period up to full years to assess the impact of urban and regional areas. It can as well be used at higher resolution, with smaller domains or for shorter periods. RIAT is mostly used with resolutions ranging from 2 to 20 km.

Input and output variables

CHIMERE requires meteorological data (from prognostic meteorological model), boundary conditions for pollutant concentration (e.g. from coarser scale models) and land-use information and temporally and spatially defined emissions (both anthropogenic and biogenic). Outputs are gridded three dimensional fields of the selected pollutants (O₃, aerosol, NO_x, CO etc.) with an hourly time resolution.

In addition to CHIMERE the RIAT component requires information on technological costs (set to GAINS value by default) and emission-concentrations relationships (from CHIMERE). RIAT provides cost-effective sets of abatement measures together with a spatial distribution of air quality indicators and associated costs.

Timeframe

CHIMERE can be used for both short episodes or for full year simulations. RIAT is mostly used for seasonal or yearly assessments (although based on a hourly resolution) Entire year air quality scenarios can be produced as well to assess pollution trends in future years (e.g. 2020, 2030) based on adequate emission projections.

Country coverage

In theory, the model can be applied to any specific area having adequate input data. At present CHIMERE is a well-established and widely used (about 35 modeling groups) air quality model in Europe to assess and/or design future compliance with air quality standards. The RIAT component recently developed requires a more intensive data preparation and is currently applied within a few regional areas in the EU.

5.6. RURAL EC MOD: Ex ante Spatial Policy Impact Analysis of the rural development policy

Non-technical description

The RURAL EC MOD model allows for a split between urban and rural areas while capturing the economic interactions between the different actors - firms, government and households - in the short and medium run. When implementing policy scenarios, the model captures the responses of all actors to policy changes and indicates the impact on the regional economy but also on rural and urban areas.

Areas where the model can be applied

The model can be used for assessing the impact of expenditure-based interventions. The model has been used in the Impact Assessment of the reformed CAP.

Spatial resolution

NUTS3

Input and output variables

The inputs required:

- Social accounting matrix of a NUTS 3 region
- Assumptions on types of factor markets and macroeconomic balances best define the economy (closure rules)
- Elasticities for structural forms: trade, production, substitution, LES-demand
- Exogenous parameters, e.g. depreciation rate, TFP by sector
- Spending on rural development policy measures at NUTS 3 level
- Pillar 1 by type (e.g. coupled, SFP) and Pillar 2 by measure (e.g.311)

The output of the model typically includes:

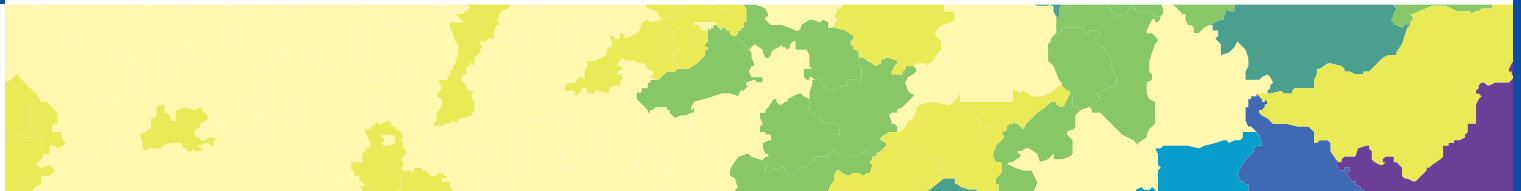
- GDP: total region, urban and rural areas
- Employment levels: activity, skilled/unskilled, urban/rural
- Income: rural/urban, farm households
- Exports: total region, and by sector
- Producer Prices: by sector
- Production: total, by activity: cereals, mining, manufacturing
- Wages: by type of labour, by area: urban/rural

Timeframe

Theoretically, the model can be run for a very long period, although in practice, it is better to limit the horizon to a maximum of 25 years (because of uncertainty surrounding the additional data requirement). As an example, previous impact assessments have modelled the impact of rural development policies from 2006 up to 2020.

Country coverage

EU



<http://www.espon.eu/>

The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.

ESPON shall support Cohesion Policy development with European-wide comparable information, evidence, analyses and scenarios on framework conditions for the development of regions, cities and larger territories. In doing so, it shall facilitate the mobilisation of territorial capital and development opportunities, contributing to improving European competitiveness, to the widening and deepening of European territorial cooperation and to a sustainable and balanced development. The Managing Authority responsible for the ESPON 2013 Programme is the Ministry of Sustainable Development and Infrastructures of Luxembourg.

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