ESPON TIA Quick Check

Moderator's Guide and Methodological Background

The ESPON TIA Quick Check is a simplified, evidence-based procedure of Territorial Impact Assessment (TIA). It helps to steer an expert discussion about the territorial effects of an EU policy proposal by checking all relevant indicators in a workshop setting. It translates the results of the expert discussion about the territorial impact of EU policy in maps on NUTS3 level. Thus, it serves as a starting point for discussing different impacts of a concrete EU policy on different regions.

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

This report presents an overview of the results and the analytical approach applied by the project. This Project was conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

The ESPON website provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This basic report exists only in an electronic version.

List of authors

ÖIR – Austrian Institute for Regional Studies and Spatial Planning

- Erich Dallhammer
- Stephanie Essig
- Jiannis Kaucic
- Bernd Schuh

Table of contents

Tables and figures

Introduction

The territorial impact assessment (TIA) enriches the Impact Assessment procedure by showing a regional differentiation of the impact of EU policies. The ESPON TIA Quick Check at hand helps to assess territorial impact of EU policies. It helps to steer an expert discussion about the territorial effects of an EU policy proposal by checking all relevant indicators in a workshop setting.

The results of the guided expert discussion are judgments about the potential impact of an EU policy in different thematic fields (economy, society, environment, governance) for a range of indicators. These results are fed into the TIA web tool. Based on the different sensitivity of regions the expert judgments are translated into maps showing the territorial impact of EU policy on NUTS3 level. These maps can serve as starting point for further discussion of different impacts of a concrete EU policy on different regions.

The paper at hand combines two relevant types of information for using the TIA quick check:

- “The Moderator’s Guide” provides a description of the webtool and the procedure. It gives clear hints on how the TIA quick check is working and how a moderator can prepare himself/herself best.
- “The Methodological Background” describes the theory behind the tool and how the tool is functioning in detail.

Moderators guide

As host of the TIA Workshop session the moderator is responsible for the preparation of the workshop, for its moderation and its documentation. The ESPON TIA Quick Check provides several supporting hints and documents. This is described according to the nine steps of the ESPON TIA quick check.

1 Preparing the workshop session

The ESPON TIA Quick Check is set up in an interactive way and needs to be moderated by a host, who guides a group of experts through the various steps. In order to prepare the workshop session it is relevant to

- organise the workshop – setting
- pre-check of EU policy
- prepare the TIA web-tool

1.1 Organising the workshop – setting

The success of the workshop depends amongst others on the design of the workshop setting and the group of experts that are discussing the territorial impact of the concrete EU policy.

Who shall participate?

The group shall include persons with different backgrounds representing various points of view vis-à-vis. The list of discussants shall include the following experts and stakeholders:

- A person who knows the policy proposal and its background very well (e.g. one of the “writers” of the policy proposal) as e.g. a representative of the relevant policy-issuing Directorate General
- relevant stakeholders as e.g. DG Regio, CoR, representatives of Member States, regions and interest groups
- experts representing different fields that could be touched by the EU policy proposal

How many people shall participate?

A group of 7-15 experts is a good size for discussing the territorial effects of a policy proposal. In a smaller group it is probably difficult to cover all relevant field of expertise that can contribute to the discussion. With more than 15 people an open discussion and agreements about the weighting of the policy’s effects will become more difficult.

What information shall the participants get in advance?

It is important that the participants know what the TIA Quick Check is about. In order to prepare themselves for the workshop they shall get the relevant **policy paper** that will be discussed and the **agenda of the workshop including** a short description of the TIA Quick Check in advance.

Additionally it is good to know some important 'rules of the game' in advance:

- The whole group shall be present throughout the process. – As the process is built up as a cascade of group decisions late comers will miss important information.
- The group will take out the most of this process if they approach the session with the willingness to actively contribute, accept other opinions and let themselves into holistic thinking. – With this respect it shall not be acceptable to ignore and neglect other opinions and contributions.
- The process will be designed in several loops so – there will be no ultimate "truth" in the results, but rather a "best compromise solution.

Which equipment is needed in the room?

The setting of the room shall include the following equipment:

- There should be a **large table** where the participants can sit around and discuss. (No person should be seated in a second row.) – If you would like to intensify the discussion take the chairs away for discussing Step 2 – the conceptual model.
- On the table a large **table cloth** is needed on which the participants could write and draw a systemic picture of the effects of the policy to be discussed. You need also enough whiteboard markers to write on the table cloth.
- A **computer** with access to **internet** linked to a **projector** is needed in order to make the nine steps of the ESPON TIA Quick Check and the expert input visible for all participants.

How long shall a workshop session be?

There shall be enough time for the expert discussion during the workshop. Special time will be needed especially for the following steps:

- Discussion of the systemic picture
- Discussion of the results displayed in the maps
- Discussion of the policy consequences after the assessment of the territorial impact

Usually it is necessary to have almost one full day (including a break). – A draft agenda is provided in the annex.

1.2 Pre-analysis of the EU policy proposal

It is important that the moderator knows about the content of the EU policy to be assessed. The ESPON TIA Quick Check focuses on two core questions:

- Are some types of regions affected more than others/ in different ways than others?
- In which thematic fields are the main positive or negative (net-) effects of the policy?

When reading the policy proposal these two core questions need to be kept in mind. The ESPON TIA Quick Check offers a list of types of regions and a list of potential affected thematic fields. Additionally it allows uploading external data

- to enlarge the list of thematic fields to be analysed
- to add additional types of regions that are affected specifically

It is helpful, if an expert prepares a short presentation providing an introduction describing the main cornerstones of the policy proposal and the results of the impact assessment of DG Regio (when available).

1.3 Preparing the TIA web-tool

It is strongly recommended to prepare the TIA Webtool in advance and to make an internal test-run. Especially the following steps shall be prepared in advance:

- Step 1 – How to get started: Pre-fill in the information that is already available, as e.g. name of the workshop session, date and location, names of participants.
- Step 3[1] – Which types of regions are affected?: Check the list of types of regions as provided. According to your pre-check of the EU policy the following questions might help you to identify relevant types of regions:
  - Are the relevant types of regions that could be affected by the EU policy covered by the existing list?
    - If yes: keep them in mind
    - If no: Try to find an adequate typology of regions (on NUTS3 level) and upload it before the workshop starts.
- Step 4 – What is the intensity of exposure on different fields?: According to your pre-check of the EU policy:
  - Can the provided list of indicators cover all relevant fields of potential impacts that you would expect to be raised by the experts during the workshop?
    - If yes, make notes and try to focus the discussion on the most relevant indicators.

[1] Note that the figures of the steps refer to their order within the web-tool

- If no: Try to find adequate additional indicators describing the characteristics of the regions in the relevant fields detected (on NUTS3 level) and upload them before the workshop starts. Are there indicators that are potentially less relevant?

You can upload your own data and save your pre-settings of your workshop session. It can be started again, when the expert workshop starts.

2 Step 1 – How to get started

Main tasks	In Step 1 the functioning of the TIA Quick Check, the rules of the game and the agenda shall be explained.
The web-tool	The tool allows to include the workshop's name, its date and location. The workshop starts with session 1. In order to picture different scenarios of effects it is possible to start a second or third session and go through the steps 3 – 6. In step 7 the results of different sessions can be compared. A short presentation of the TIA Quick-Check can be downloaded

The discussion	For steering the discussion a short presentation shall include the following points:
	• The agenda
	• A short introduction of all participants
	• The rules of the day:
	  • The whole group shall be present throughout the process. – As the process is built up as a cascade of group decisions late comers will miss important information.
	  • The group will take out the most of this process if they approach the session with the willingness to actively contribute, accept other opinions and let themselves into holistic thinking.
	  • The process will be designed in several loops so – there will be no ultimate "truth" in the results, but rather a "best compromise solution.
	• The TIA quick-check methodology
	• The aim of the workshop: it should be clearly explained that the results of the workshop are representing the views of the experts present at the workshop
	• The presentation of the policy proposal to be discussed

Result	The workshop setting is clear and Every participant is informed about the next steps.

3 Step 2 – The conceptual model

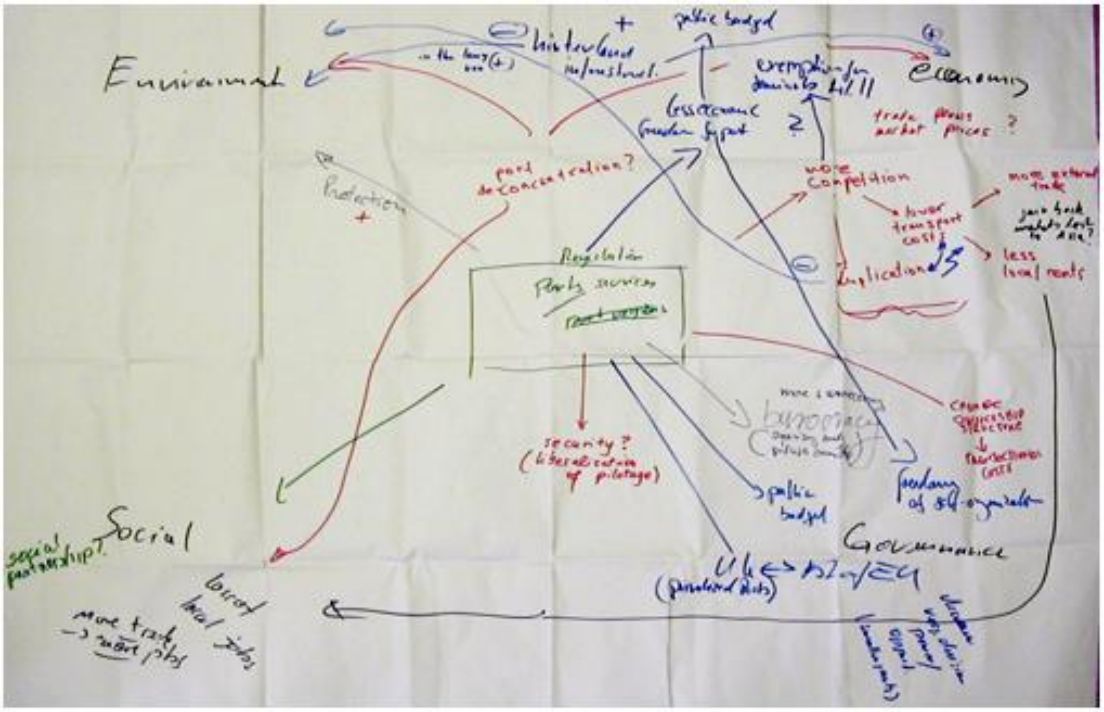
Main tasks	In Step 2 the participants of the workshop together create a conceptual model ("systemic picture") depicting the potential effects of the policy at hand on territorial development in the fields of economy, society, environment and governance
The methodological background	As a first step for identifying potential territorial impacts, it is necessary to translate the text of the policy proposal into cause/effect relations describing the "intervention logic" of a directive. These relationships are depicted as flowcharts showing the links between the regulatory elements laid down in the policy, its specific targets and the different fields in which it will potentially show direct or indirect effects ("fields of exposure" in this project's definition). The conceptual model translates the text of the policy proposal into cause-effect relations into a systemic picture. It allows for a comprehensive systemic view in case of complex cause-effect chains. In our case the causes and effects of EU policy proposals on territorial impacts are pictured. Thus, it helps to detect systemic effects and to reveal interdependencies. In the TIA Quick Check the starting point of the discussion are the potential effects of the analysed EU Policy on different fields of impact: "economy", "society", "environment" and "governance" broken down into more detailed thematic fields, measured by indicators. The systemic picture allows for traceability for the user of the model.
The web-tool	The web tool provides a set of examples, how a systemic picture can look like and a set of questions steering the discussion. The result, the systemic picture can be uploaded to the webtool.
The discussion	A brainstorming exercise will be used to support the drawing of the conceptual model. The brainstorming uses the expert knowledge of all participants to identify the potential consequences of policies, etc. It serves as a relatively quick way of identifying potential impacts. The participants shall think about potential effects of the policy proposal on the regions' development in comparison to the development without the new legislation ("baseline scenario"). The table cloth shall be prepared in the following form: • The table cloth is lying on a large table where the participants can sit around and discuss. No person should be seated in a second row. (If you would like to intensify the discussion take the chairs away) • The name of the policy proposal shall be written in its centre. • On each corner the main thematic fields should be written down: economy", "society", "environment", "governance" • Each indicator of the TIA quick check should be written down of a separate postcard ("indicator-postcard") in order to be able to add the relevant indicators on to the systemic picture.

	• There are enough whiteboard markers that every participant could write down his/her ideas. The following questions can steer the discussion: • What are direct and indirect economic, social, environmental and governmental effects and how they occur (causality) of the policy proposal compared to the "0-option")? • Are different types of regions affected differently? Which types of regions are affected in what way? • What are intended effects in terms of territory? What are unintended and indirect effects? • Can you consider as many different fields as possible? The participants draw causal 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), indicating **indirect or direct negative and positive** relations. They shall explain their ideas to the group in a few words and write them on the table cloth. Others can write amendments and comments, but crossing out is forbidden. All findings should be listed on the tablecloth. The moderator can ask guiding questions to make sure that all information is captured in the picture. He/She brings in the "indicator-postcards" in order to guide the discussion thus making sure that all relevant indicators, which are represented in the tool, are included in the case-effect chains of the systemic picture. It is also important to clarify if specific indicator postcards are deemed inappropriate and/ or if they may be regarded/ used as proxies/ second best approaches for identifying effects. The relevant indicators can be added to the systemic picture by gluing them to the table cloth and drawing the relevant links.
Result	A systemic picture showing the conceptual model of the policy proposal according to its intervention logic and potential effects. This picture can be up-loaded in the workshop session.

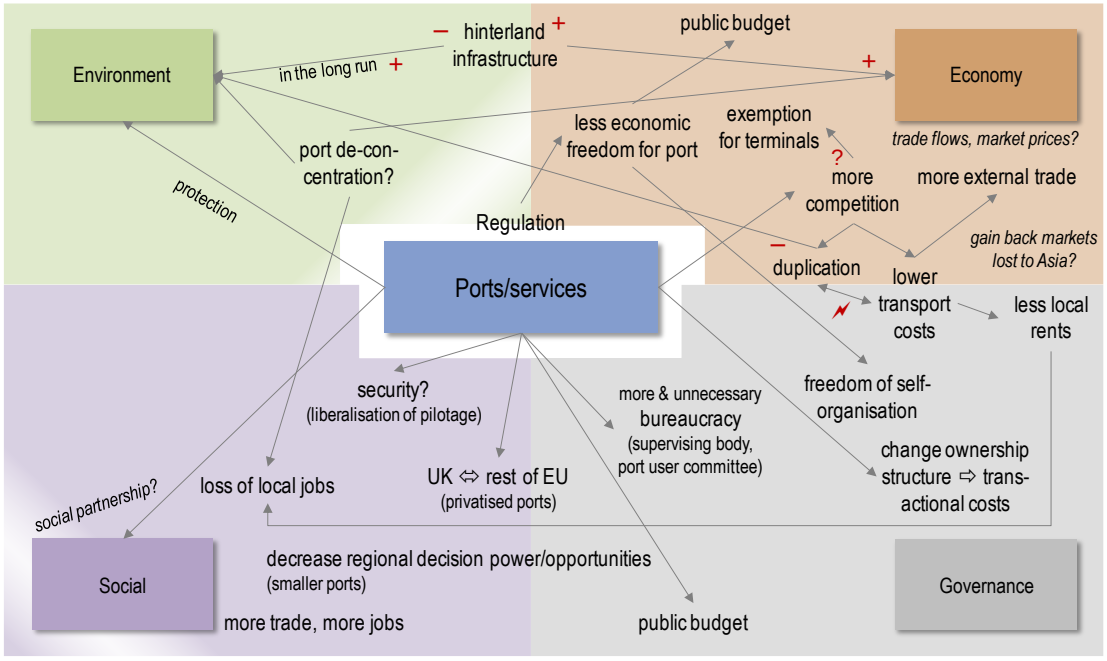
Additional examples of a conceptual model/systemic picture

Example 1 – market access to port services

Handwritten conceptual model of the regulation COM(2013) 296 final/establishing a framework on market access to port services and financial transparency of ports. Source: ÖIR, 2013 based on the documentation of a CoR-Workshop in Brussels, September 25th, 2013.

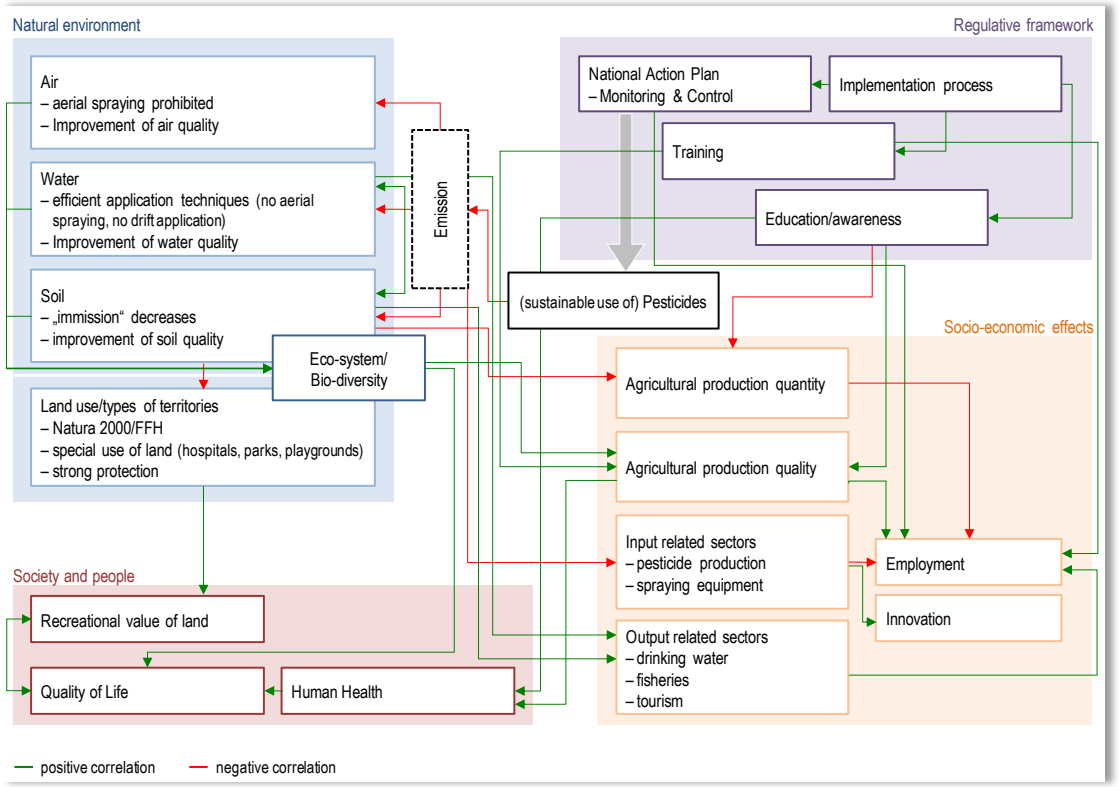


Scheme: Conceptual model of the regulation COM(2013) 296 final/establishing a framework on market access to port services and financial transparency of ports. Source: ÖIR, 2013 based on: CoR-Workshop, Brussels, September 25th, 2014.



Example 2 – sustainable use of pesticides

Conceptual model of the directive 2009/128/EC/Directive on the sustainable use of pesticides. Source: ÖIR, 2011



4 Step 3 – Which types of regions are affected?

Main tasks	On the basis of the systemic picture in Step 3 will be analysed if different regions might show diverse potential effects due to the implementation of the LPD. These different types of regions are selected.
The methodological background	The effects of a policy proposal could vary according to the type of region: 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 pre-select in this step only those regions being affected for-further analysis. Additionally a policy proposal offers different 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 order to deal with this variability the policy is now "branched" into different cause/effect chains, and each one is analysed separately. This is done by selecting different types of regions.
The web-tool	The web-tool provides a set of pre-selected types of NUTS3 regions to choose from (e.g. rural/urban, central/peripheral, advanced/lagging). It allows to select up to five different regions within one session. (If more branches of effects are identified another session can be started in Step 1.) Additionally the web-tool offers the possibility to add a new type of region. In this case, please use the given template to integrate the data. (Please consider the quality check issues outlined in the template.) (It is recommended to prepare the "additional" type of region in advance and to upload it during the test run.)
The discussion	The following questions may support the identification of (a) relevant branche(s) and types of regions: • Does the policy proposal affect different issues and topics? • Do different effects of the policy proposal on different regions exist? • Will the policy proposal have a specific impact on certain regions? • Which types of region might be strongly affected by the policy proposal? • Which regions are more likely to be impacted than others? If no differentiation between different types of regions is identified, the type "all regions" is to be selected in order to provide a full picture of the territorial effects of the policy proposal in the European Union.
Result	Final selection of regions, which will be affected

5 Step 4 – What is the intensity of exposure on different fields?

Main tasks	In Step 4 the experts estimate the effect of the policy proposal for the selected types of regions in different "exposure fields", each described by an indicator.
The methodological background	The conceptual model is translated into a set of indicators that describe the intensity of policy exposure. They estimate if the effect goes in a positive or negative direction (advantageous/disadvantageous effect) and the intensity (high/weak/minor).
The web-tool	The web-tool offers a set of thematic fields described by territorial indicators in the fields of economy, society, environment and governance that could be affected by the policy proposal. (The exact definition of each of the indicators is shown, when you scroll over each of the indicator fields.) It offers the opportunity for each indicator and for each of the selected types of region to judge the effect of the policy proposal in the following way ++ strong advantageous effect on territorial welfare + weak advantageous effect on territorial welfare O minor effect/diverse effects - weak disadvantageous effect on territorial welfare - - strong disadvantageous effect on territorial welfare When the effect is unknown, no judgement is needed. Additionally it is possible to upload additional indicators to the web tool. Therefore, a template to integrate the data is provided (Please consider the quality check issues outlined in the template.)
The discussion	The experts estimate for each of the types of regions (identified in the preceding step) and each thematic field measured by an indicator the intensity of exposure caused by implementing the policy proposal.. Thereby, it is recommended to establish a clear link between the conceptual model drawn in step 2 and the effects pictured by the indicators. When there is no common understanding on the expert judgement in the group the model offers the opportunity to work with scenarios. For starting a second scenario, go to step 1. In Step 7 the results of different scenarios can be compared. Note: • Go over each relevant indicator asking if anyone has any comments, but focus your discussion on the most important indicators; indicators of less relevance could be skipped. • You can either discuss each indicator per region or each region per

	indicator. Chose the procedure the participants deem the easiest one. • If the effect is unknown, cannot be specified or if the direction cannot be specified because of diverse effects, please indicate the respective class for the indicator ("unknown", "direction cannot be specified")." Guiding questions for discussing each indicator: • Are the potential effects advantageous or disadvantageous? • Are the effects strong, weak or minor?
Result	Expert judgment depicting the effect of the LPD on the different fields of indicators in the selected types of regions

6 Step 5 – What is the territorial impact in European regions?

Main tasks	In Step 5 the web-tool calculates for each region and for each indicator the potential territorial impact by combining the expert judgement of the exposure caused by the policy proposal and the sensitivity of the regions described by a sensitivity indicator.
The methodological background	The territorial impact is the product of the intensity of the exposure as estimated by the participants of the workshop and the pre-defined regional sensitivity for each region. The intensity of exposure is assessed by experts judgement, through the identification of the systemic picture along the fields of exposure. The classes of the expert judgement are converted into numerical terms (-1.5, -1, 0, 1, 1.5). The regional sensitivity is given by the sensitivity indicator that is related to the field of exposure and normalised ranging from 0.75 to 1.25. The calculation of the territorial impact is the product of the intensity of the exposure estimated by the experts and the pre-defined regional sensitivity. As a consequence the final scores describing the impact are continuous scores ranging from -1.875 to +1.875. The impacts are aggregated in three positive and three negative classes (plus the 0 class, indicating no exposure): “high, moderate and minor impact”, the medium class merging cases with a high and low initial exposure.
The web-tool	The web-tool calculates the territorial impact for all regions. It shows for each indicator and each type of regions a diagram with the allocation of the impact: How many percent of the regions will facing a high/a moderate/a minor impact?
The discussion	The indicators which show the most diverse territorial impact are delivering the most interesting results for the selection of maps in Step 6.
Result	The identification of indicators, showing diverse impact in the different regions.

.

7 Step 6 – Which regions will be hit in which fields? Mapping exercise

Main tasks	In Step 6 for each type of region and for each indicator the TIA quick check model produces a map showing the impact of regions according to the expert judgement.
The methodological background	For each indicator maps can be drawn showing the territorial impact. According to the selected type of regions only for those regions that are covered by the respective type of regions values are shown. – It is assumed that regions that do not belong to the selected type are either covered by another type of regions with a separate expert judgement or that they are only affected in a minor way.
The web-tool	The web-tool offers the opportunity to show two maps side by side on the screen allowing comparisons according to different types of regions and/or different indicators. The maps give a "quick and dirty" first impression about the result of the modelling. They show how according to the group assessment the policy proposal would affect different territories.
The discussion	Show the maps and go slowly through each of them and discuss the results. Guiding questions could be: • Does the selection of regions provide a plausible picture? • Is the relationship between the different regions and the different results reasonable? • Which patterns and results are astonishing for you? For which regions have you expected other results? • Which might be the reason for different results than expected? • Is the relationship between the different fields of exposure plausible? If it is not, the expert judgment about the intensity of exposure may need modification and further elaboration. • Do the basic settings concerning the typology of regions need adaptation? **Note:** When discussing the maps, please have in mind that the maps are not showing the ultimate "truth", but the result of the sum of the judgments of the experts participating at the workshop. The results should therefore be handled with care – i.e. to use them outside the setting of the workshop (e.g. publish them) needs especially carefulness. The results should therefore be critically reviewed and at best used to make up the minds of the decision makers and/or to go back for another round of impact assessments.
Result	Maps depicting the expert judgement

8 Step 7 – Do the results make sense? Comparing different scenarios

Main tasks	Step 7 offers the possibility to compare different scenarios of the expert judgement by adding the information of another session. It helps to check the plausibility of the TIA results and to detect potential errors in the expert judgment
The methodological background	The result of the TIA impact is based amongst others on the judgement of the experts that are participating at the workshop. As this expert judgement is not an objective fact, but an inter-subjective judgement it makes sense to think in scenarios and to modify the expert judgement and reflecting the different results. Additionally, working with scenarios can also be used, when there is no common opinion about the exposure caused by the policy proposal in several indicators in the groups of experts.
The web-tool	The web-tool offers the option to start several sessions within one workshop and to test different expert judgements concerning the intensity of the exposure. In Step 7 the results of the different sessions/scenarios can be compared.
The discussion	The discussion about the plausibility check can be guided by the following questions: • Is there a plausible difference between the different expert judgements? • If it is not, should we try another expert judgment about the intensity of exposure? **Note:** If necessary start a new workshop session and adapt your judgment, then compare the mapping results
Result	A plausibility check of the maps by comparing the results of different scenarios/sessions

9 Step 8 – Summing up: What are the policy implications?

Main tasks	In Sep 8 the policy implications of the results of the TIA quick check are discussed.
The methodological background	The main aim of the TIA quick-check is to develop policy implication based on the results of the workshop.
The web-tool	The web-tool offers a set of guiding questions and the possibility to write down main conclusions.
The discussion	The discussion should focus on conclusions, based on the results of the TIA quick check. All relevant steps (conceptual model/systemic picture, expert judgement and the estimates territorial impact as shown in the maps) should be taken into account. The discussion can be steered by the following guiding questions: • Which implications can be deducted from the results of the workshop? • Could this policy proposal have a disproportionately large impact on certain areas, regions or Member States? If yes, please indicate which ones and why. • Is this problem concentrated in certain areas, regions or Member States? • Should the policy be adjusted for the entire Union or some of its parts? • Should the EU exempt some parts of the Union from the policy?
Result	Conclusions and main findings of the workshop session.

10 Step 9 – How to communicate the results? Reporting

Main tasks	Step 9 includes the documentation of the workshop results describing all outcomes of the workshop.
The methodological background	In order to save the outcomes of the workshop it is essential to make a (short) report which includes all relevant results. This helps to communicate the results of the ex-ante analysis to the relevant audience. It could serve as an input for further discussions. However, please be aware that the maps are a result of a one day workshop: The exposure is based on the expert judgement of the participants. The sensitivity of regions is described by proxy indicators. This very general model helps to steer the discussion but it cannot replace a thorough assessment of relevant and concrete territorial effects of a policy proposal.
The web-tool	The web-tool provides a template of the report in MS Word that can be downloaded. Also the impact-maps can be downloaded.
The discussion	The reporting is done after the workshop. The template helps to structure the report. Therein main parts of the workshop, focussing on the most relevant issues shall be documented. While preparing the report, please have your purpose of spreading the results of your workshop to policy makers, etc. in mind. Guiding questions for preparing the report: • What are the main outcomes of each of the nine steps of the ESPON TIA Quick Check? • What are the main recommendations, which were agreed upon during discussion? A draft version of the report can be circulated around the participants asking them for their input. So you get an agreed documentation of the workshop.
Result	Short report documenting the results of the workshop

Annex: Draft agenda

11:00 Welcome and Introduction

ESPON TIA Web Application project

11:30 Test run 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

12:30 Lunch break

13:15 Test run Steps 2 – 8

Step 2: Dealing with discrete cause/effect chains (branching)

Step 3: Which types of regions are affected? (regional exposure)

Step 4: What is the intensity of exposure on different fields?

Step 5: What is the territorial impact on regions?

Step 6: Which regions are hit in which fields? (mapping the results)

Step 7: Do the results make sense? (plausibility and quality check)

Step 8: What are the policy implications? (adaptive capacity discussion)

16:15 Feedback and recommendations

First impression of the usability of the ESPON TIA Web Application & recommendations for improvement

17:30 End of the meeting

Methodological background

The methodological background outlines the underlying methods of the ESPON TIA Quick Check. The following issues are discussed:

(1) Introduction to the tool

(2) Theoretical concept of Territorial Impact Assessment (TIA)

(3) Calculation method

(4) Normalisation method

(5) List of indicators

The ESPON TIA Quick Check is an interactive tool assessing ex ante the territorial impact of policy proposals as e.g. legislations, policies and directives. It allows the user to make a 'quick and dirty' ex-ante analysis of the potential impact of EU legislation, policies and directives on the development of regions, which might be unanticipated and undesirable.

The tool combines expert knowledge gathered in a workshop with a set of statistical data describing the characteristics of regions. The users are guided through the different steps of the impact analysis and receive assistance and guidance for preparing a territorial impact analysis.[2]

1 The concept of Territorial impact Assessment (TIA)

Legislations, Policies and Directives (hereinafter referred to as: LPD) may often have unintended impacts on the territory, its development and its organisation on the different spatial levels, including the European, the national and the regional one. It is the aim of territorial impact assessment to identify the fact, whether a policy, regulation or legislation has *"a large asymmetric territorial impact, also known as an "outlier" impact"* (EU COM, 2013: 2). Assessing the impact on the territorial level includes an analysis of different spatial angles, including different administrative and political levels, types of regions (rural areas, mountain areas, etc.) as well as functional areas (labour markets, etc.) (cf. EU COM, 2013: 2). It is the intention of the analysis to detect, if costs or benefits of particular policies are distributed in an asymmetric manner – than the policy should be adjusted – or if these costs and benefits are distributed quite symmetric. Conducting a territorial impact assessment should limit the risk of "*causing an unbalanced territorial or spatial distribution of costs and benefits for different types of territories"* (ESPON, 2012: 7).

Impact assessment (IA) is a standard procedure to prepare *"evidence for political decision-makers on the advantages and disadvantages of possible policy options by*

[2] Main parts of the texts are deriving from the final report of the ESPON ARTS Project: ESPON (2012): ESPON ARTS. Assessment of Regional and Territorial Sensitivity. Available from: http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/arts.html

assessing their potential impact" (EU COM, 2013a: online). The basic idea behind the IA procedure is that ex-ante impact evaluations of new policy proposals, when carried out in parallel to the policymaking process, will improve the original ideas and result in robust, effective, efficient and widely supported policies (cf. ESPON, 2012b: 19). The territorial impact assessment (TIA) enriches the IA procedure by showing a regional differentiation of the impact of EU policies.

Since the 1990s policymakers are analysing the territorial impact of LPDs, specific seminars (e.g. Amsterdam 2009) were held and documents (e.g. TA2020, agreed in 2011) were published. As Fischer et al. point out: TIA was *"first discussed in the mid and late 1990s with the European Spatial Development Perspective (ESDP) (...), calling for TIA to be undertaken in relation to large infrastructure projects (notably in the field of transport), large-scale water management projects and in relation to cross-border spatial development"* (Fischer et al., 2014: 3; cf. ESPON, 2012: 7). Research projects in the field of TIA include among others the ESPON ARTS and the ESPON EATIA project. ESPON EATIA defined territorial impact as being *"essentially 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"* (Fischer et al., 2013: 3). Territorial impact assessment as such can be *"interpreted as an ex-ante mechanism that can be used to identify such impacts at national, regional and local levels in Member States to help identify potential policy conflicts or inconsistencies. It can also identify the differential nature of potential impacts between different places and in this sense it can provide a means of considering the spatial dimension of EU policy impacts"* (Fischer et al., 2013: 3); here it needs to be pointed out that territorial impact assessment also identifies – besides negative effects – synergies as well as positive side effects. EU COM identifies impact assessment as *"a set of logical steps to be followed when you prepare policy proposals. It is a process that prepares evidence for political decision-makers on the advantages and disadvantages of possible policy options by assessing their potential impacts"* (EU COM, 2009: 4).

The guidelines on impact assessment, published in 2009 by the European Commission (cf. EU COM, 2009: 5), explain impact assessment, identify main stakeholders and target groups and outline the procedure of assessing impact. Based on these guidelines – as well as the structure of the territorial impact assessment quick-check, developed in the ESPON ARTS project – the following steps of impact assessment can be identified:

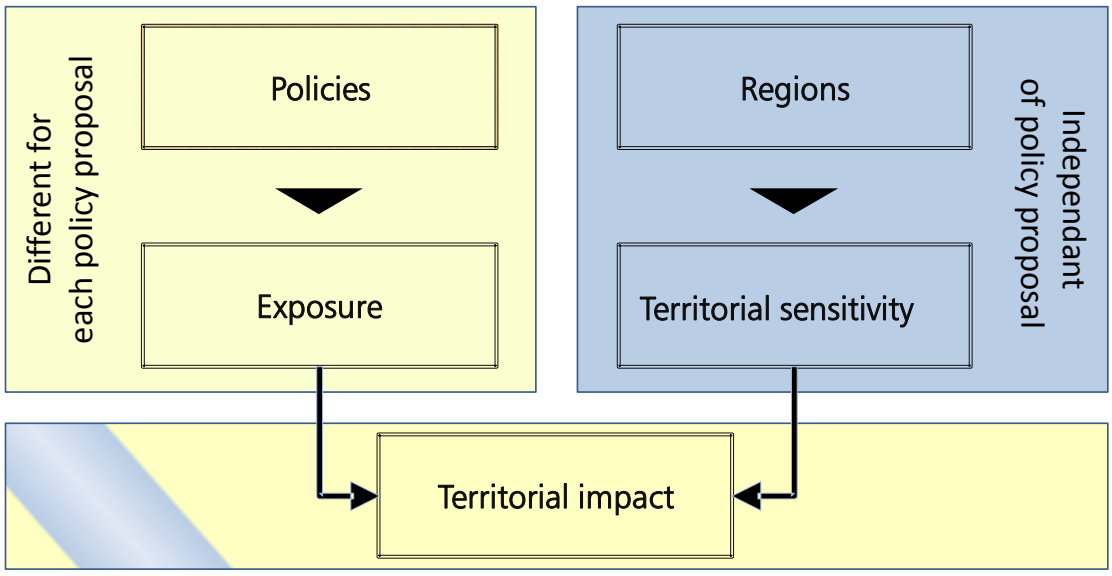
(1) Identification of the problem
(2) Definition of the objectives
(3) Development of the main policy options
(4) Analysis of the impacts of these options
(5) Comparison of these options
(6) Outlining of policy monitoring and evaluation

2 The underlying 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.

Figure 1: The principle of the vulnerability concept



It is the aim of the tool to analyse the potential impact of EU policy proposals 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).

The results of the ESPON TIA Quick Check are maps showing the potential territorial impact combining expert judgement on the exposure caused by a policy proposal

with the sensitivity of regions. These maps are the starting point for describing and discussing the territorial impact of the assessed EU policy.

It needs to be highlighted that the tool's approach is not only an one-off workshop, but depicts a process which needs good preparation from both moderator and participants to guarantee a successful workshop. Additionally, follow-up discussions as well as verifications of the content of discussions need to be continued after the actual workshop session. The tool cannot provide any recipe if additional in-depth territorial impact assessment might be necessary, since every case varies and different workshop results might ask for different follow-up procedures.

3 Calculating the territorial impact

One of the goals of the ESPON TIA quick check is to provide an operational methodology (as simple, comprehensible and user-friendly as possible) in order to define in quali/quantitative and comparative terms the sensitivity of European regions to EU directives. As all European regions have to be inspected and many directives considered, it is necessary to use a statistical and quantitative methodology.

Three definitions represent the conceptual pillars on which the quantitative methodology is built: exposure, sensitivity and territorial impact.

The starting point is given by the following sets of elements.

(a) a common set of n exposure fields f, the same for all directives,
where f = 1…… f ….n
(b) a common set of m regions r (at NUTS 3 level in this tool)
where r = 1 …..r..... m

Given the fact that three dimensions are involved – exposure fields, regions and directives – the problem at hand looks statistically complex and has to be simplified without missing relevant information or trivializing the entire procedure.

The methodology resides in the construction and combination (multiplication) of three indicators, organised respectively in three matrices, which represent the three logical steps of the methodology itself:

A – the Directive/Exposure Matrix, indicating the intensity of exposure of each field to each single directive,
B – the Regional Exposure Matrix, indicating the intensity of exposure of each region to each single directive,
C – the Regional Sensitivity Matrix, indicating the intensity by which each region is sensitive to impacts in each specific exposure field.

3.1 The Directive/Exposure Matrix

The Directive/Exposure Matrix presents the experts' evaluation done in the workshop of the intensity by which each policy proposal acts on the different exposure fields. Exposure fields relate to different dimensions of environment, economy, society and governance.

The list of exposure fields is the result of comprehensive literature research covering impact assessment methodologies and the expert knowledge.

Intensity of exposure of these fields to directives is assessed by experts judgement, thorough the careful identification of the logical chains from EU decisions to territorial impact. The regional dimension is absent here.

The generic value of the indicator of intensity of exposure in each cell of the matrix is:

dEXPf (intensity of exposure of field f to directive d)

The experts choose between strong or weak advantageous resp. disadvantageous effect on territorial welfare, no effect as well as unknown effect. These classes are then converted into numerical terms. In this project, the exposure values are indicated by positive and negative scores, as follows:

1.5 = high positive exposure intensity
1 = low positive exposure intensity
0 = no exposure
- 1 = low negative exposure intensity
- 1.5 = high negative exposure intensity
? = unknown exposure

The sign of impact scores is assigned looking at the likely direction of field indicators when exposed to a policy proposal. In the Directive/Exposure Matrix, on each row indicating the different exposure fields, it is clearly indicated whether an increase in the indicator has to be considered a benefit or a cost [3].

A case that often presents itself – given the complexity of the single policy proposal, the multiplicity of policy indications eventually encompassed, the multiplicity of the logical chains that each policy proposal generates, from decision to impact – is the impossibility of treating in a single vector of the Directive/Exposure Matrix the potential effects of a Directive on the different exposure fields. In this case is necessary to devise a "branching" of the effects of the policy proposal into two or more logical chains, and consequently impacts. In fact, the effects of a policy proposal on a single exposure field (e.g. air quality) could be different in the different branches of the logical chain, and impact differently on different classes of regions: for example, a policy proposal supporting the production of electric engines for cars

[3] This is particularly relevant as far as a "cumulative" territorial impact should be calculated, comparing the impacts on different fields.

will improve the air quality in regions where the new cars will be adopted, but could worsen air quality in regions where the new cars will be produced, due to increases in emissions from plants and transport involved.

In this case, the policy proposal splitting into branches needs to be treated as two separate policy proposals in both the Directive/Exposure Matrix and the following one, the Regional Exposure Matrix.

3.2 The Regional Exposure Matrix

The Regional Exposure Matrix – with two dimensions: m regions on rows and n policy options on column – encompasses the exposure of single regions to each policy proposal, i.e. the fact that EU policy proposals may or not affect the single regions. In fact, a policy proposal could touch only particular regions – e.g. coastal regions, peripheral regions or else – and not being relevant for other regions. As a consequence, only regions directly hit by the directives are considered; indirect and side effects, both expected and generally unexpected, are supposed to take place only inside the regions directly affected and not to spill-over the regional borders. ESPON and DG REGIO typologies can be used as a basis for the possible types of regions affected by the policy proposal. (A set of typologies is already implemented in the tool). However, in some cases it might be useful to add more specific types like regions with a high share of employment in a particular sector (Therefore the tool offers the possibility to add new types of regions).

In the ESPON TIA Quick Check, this matrix is a dychotomic, NO/YES matrix (0/1). The generic value of the regional exposure matrix in each cell is:

dREXPr (intensity of regional exposure of region r to directive d).

In this case, the exposure field dimension is absent. The matrix is filled (with 0/1 scores) according to the results of the logical chain inspection on the single directives: regions are classified in different categories, relevant for the single exposure potentials indicated in the logical chain description, as e.g. urban/rural/intermediate, coastal, mountainous, etc. The indicators and thresholds for considering a region exposed/non-exposed is given in the following section.

3.3 The Regional Sensitivity Matrix

The Regional Sensitivity Matrix – with two dimensions: m regions on rows and n exposure fields on columns – encompasses the general sensitivity of each region to single exposure fields, with no reference to any specific directive. This sensitivity depends on socio-economic and geographical characteristics of the single regions, their social values and the political priorities attached to the different policy fields. A region might be particularly sensitive to economic impacts (on GDP or employment levels), given its relative backwardness; another could be particularly sensitive to

environmental impacts given the presence of very sensitive natural or mountain areas; a further region could be very sensitive to impacts on congestion given its present high level of traffic density and traffic jams. In this case, the directive dimension is not present.

The Regional Sensitivity matrix is built, for each exposure field, using relevant statistical indicators from a regional data base. In general, on the basis of experts judgement and data availability, a region is hypothesized to be more sensitive to "pressure" indicators in direct proportionality to the present pressure condition (e.g., in the field of emissions, air or water quality), and more sensitive to status conditions in inverse proportionality (e.g. in the field of GDP and employment).

The generic value of the regional sensitivity in each cell of the matrix is:

Sr,f (intensity of sensitivity of region r concerning exposure field f).

Each term of the S matrix has the form of a correction coefficient, amplifying or reducing the potential impact of directives on each exposure field in each region (given by the multiplication of the previous two matrices, as it will be explained below). It was decided to allow a correction of ± 25% to potential impact: therefore the coefficients range from 0.75 to 1.25 in the entire array of regions and are proportional to the specific sensitivity indicators chosen for each exposure field.

In further research works, the sensitivity matrix could encompass the effect of the analysis on regional reaction or adjustment capability with respect to the potential effects of EU directives, taking into consideration the internal governance structure and performance in each region. In the present research project this last issue is only tackled in theoretical terms.

3.4 The Territorial Impact Matrices

The Territorial Impact Matrices are built through empirical investigation and statistical elaborations of the ESPON ARTS project. The elements of the three matrices presented in the previous section are multiplied by each other, term by term (not in the linear algebra way), and the general term obtained will be:

$$dTIM_{r,f} = dEXP_f \cdot dREXP_r \cdot S_{r,f} \qquad (1)$$

indicating the likely impact of the policy proposal d on the exposure field f in region r. Given the three dimensions encompassed (d,f,r: policy proposals, impact fields and regions), the results are organised in a series of 12 matrices (one for each policy proposal), each of them indicating likely impact on exposure fields (on columns) in all regions (on rows) for each directive. In a more compact geometrical presentation, the results are encompassed in a cube with regions, fields and policy proposal on the three axes: the Directives/Impact Cube (Figure 3).

The logics of the general model may be split in two parts, concerning the first multiplication and then the second one. The first multiplication refers to the

application of the Directives/Exposure matrix to the case of each region, according to the fact that the region is exposed or not to the single policy proposal. The result that could be considered as a sort of “potential impact” (POTIM), is presented in a series of matrices, one for each directive:

$$dPOTIM_{r,f} = dEXP_f \cdot dREXP_r \qquad (1a)$$

For each single policy option, the POTIM matrix has a dimension mxn, with the m regions on rows and the n exposure fields on columns.

In a second step, the potential impact matrices POTIM (one for each policy option) are multiplied by the same regional sensitivity matrix, adding the further information concerning the relevance for the single regions of the single potential impact forecasted. The result is given by:

$$dTIM_{r,f} = dPOTIM_{r,f} \cdot S_{r,f} \qquad (1b)$$

The final territorial impact TIM is encompassed in a matrix mxn (with regions on rows and impact fields on columns) indicating likely impact of one single directive on the different exposure fields in each region.

As a consequence of the scores attributed in the first matrix (-1.5, -1, 0, 1, 1.5) and in the third one (0.75 to 1.25), the final scores emerging in the TIM matrices are continuous scores ranging from -1.875 to +1.875. In maps, impacts are aggregated in three classes (plus the 0 class, indicating minor exposure): “high, moderate and minor impact”, the medium class merging cases with a high and low initial Directive/Exposure impact (1 and 1.5).

It is clear from what precedes that the three matrices presented above are simple two-dimensional matrices (with two subscripts of their terms each), while the final result is represented by a series of matrices, one per policy option (three subscripts); the mapping of results (TIM of policy option X on exposure field Y) implies a map for each column Y of the matrix referring to directive X.

Figure 2: Assessment process of territorial impact of a EU Directive

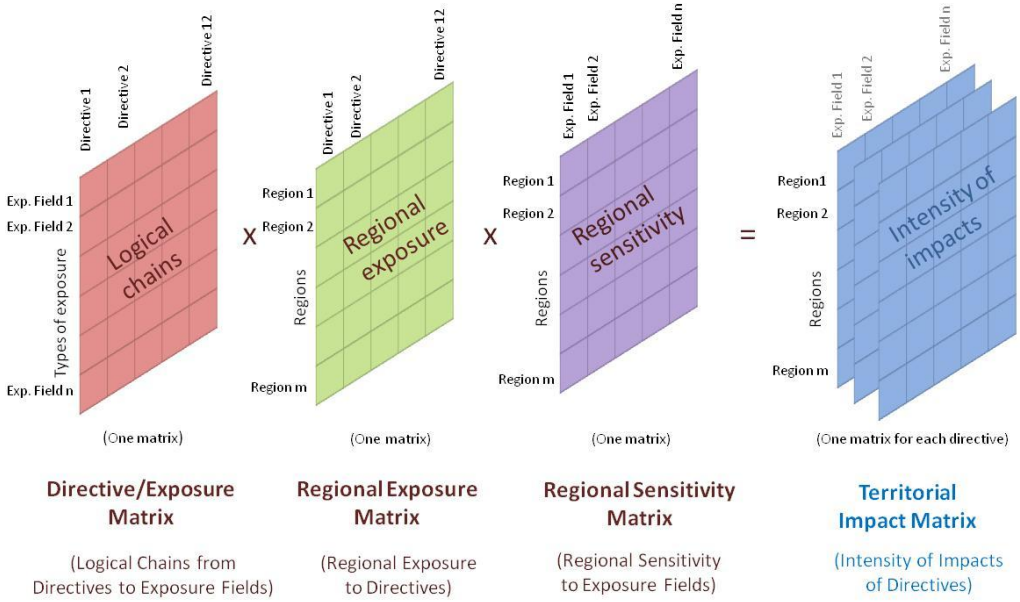
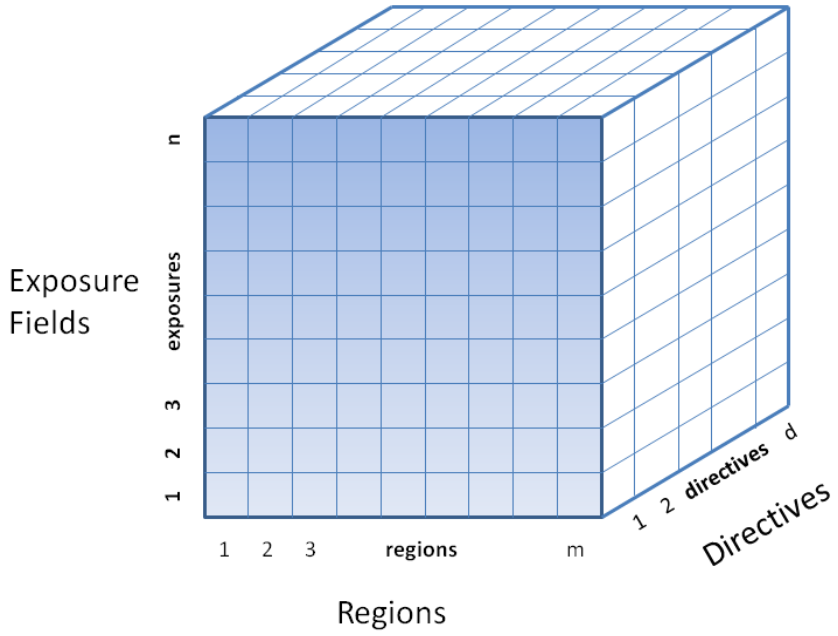


Figure 3: The policy options/Impact Cube



3.5 No aggregation of impacts

The problem to be faced when trying to aggregate this heterogeneous information on the regional scale is in brief the problem of oversimplified assumptions in this context. In order to deal with real-world complexity, aggregation – i.e. the simplification of real-world observations – is necessary. Thus for the tool suggested in this report we have decided to rely on cumulative aggregations and leave the exposure fields separated.

4 Using own data

4.1 Adding types of regions

For developing a new type of regions all NUTS 3 regions have to be divided into classes and given a value of 0 or 1 according to whether they belong to a particular type of region or not. Such datasets can be added to the ESPON TIA Quick Check web tool. It provides a template, where for each NUTS 3 regions the values of the indicator could be to be filled in.

4.2 Adding indicators describing the sensitivity of regions – Normalisation method

During the TIA quick check additional fields of exposure which are affected by the policy proposal and which are not provided by the tool as standard could be identified. Whereas the exposure caused by the policy proposal could be judged by the experts during the workshop, a valid indicator for describing the sensitivity of regions needs to be defined in advance. The TIA quick check offers the possibility to upload new indicators. It provides a template, where for each NUTS 3 regions the values of the indicator could be to be filled in.

For the new indicator it has to be defined, whether the exposure field needs to be evaluated as being either harmful ('cost') or favourable ('benefit') for the regions welfare. Then the tool will automatically transform the experts rating into numbers for further calculation (= normalisation).

The normalisation follows a linear procedure. Normalised values range from 0.75 up to 1.25. Basically, normalized sensitivity indicators represent coefficients that can increase (if greater than 1) or decrease (if lower than 1) each policy proposal's impact on a specific field.

For this step the following definitions are needed:

$Xnorm_i$ the normalized value of the sensitivity indicator for impact field i

X_i the original value of the sensitivity indicator for impact field i

$Xmin_i$ the minimum original value of the sensitivity indicator for impact field i

$Xmax_i$ the maximum original value of the sensitivity indicator for impact field i

Then, normalization follows this formula:

$$Xnorm_i = 0{,}75+((1.25-0.75)*((X_i – Xmin_i)/(Xmax_i – Xmin_i)))$$

5 List of indicators

Table 1: List of indicators implemented in the ESPON TIA Quick Check

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
Regional Economy							
Economic development	Economic growth (GDP/capita)	Regions with lower GDP per capita are expected to benefit more from directives aimed at GDP growth increase and which inadvertently harm economic growth. Sensitivity is thus inversely proportional to the level of GDP per capita	Gross domestic product (GDP) at current market prices; Purchasing Power Standard per inhabitant	EUROSTAT	2011	NUTS3 2010	no data for Liechtenstein, CH only NUTS0
Economic development	Entrepreneurship (share of private enterprises)	Regions showing lower levels of self-employment are expected to benefit more from actions aiming at its promotion, or which inhibit it unintentionally. Sensitivity is thus inversely proportional to the share of self employment	Share of Self employed persons on employed persons is used as a proxy for entrepreneurship	EUROSTAT	2012	NUTS2 2010	no data for Liechtenstein
Innovation	R&D Expenditure	Regions with lower R&D expenditure are expected to benefit more from directives aimed at increase in R&D and which inadvertently harm growth in R&D. Sensitivity is thus inversely proportional to the level of R&D expenditure as percentage of GDP	Total intramural R&D expenditure (GERD), all sectors as a percentage of the GDP	EUROSTAT	2011	NUTS2 2010	No data: DE22, DE23, FR91-94, CH, LI
Innovation	Employment in technology and knowledge-intensive sectors	Regions with a greater share of employment in technology and knowledge intensive sectores are considered to be more sensitive to directives influencing innovation. Sensitivity is therefore directly proportional	Share of employment in high-tech manufacturing and knowledge-intensive high-tech services on total employment	EUROSTAT LFS	2012	NUTS2 2010	no data for French overseas dpt., Liechtenstein, DEB2, EL13, EL21, EL22, EL41, ES63, ES64, FR21, FR22, FR25, FR26, FR41, FR43, FR53, FR63, FR72, ITC2, PT15, PT20, PT30, FI20, UKD1, UKF3, UKK3, UKM5, UKM6 BG31: 2009

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
							EL25, ITF2: 2010 BG32, BG34, FR23, EL11, EL42, NL34, PT18, UKC1: 2011
Production of raw materials	Employment in the primary sector	Regions with a higher share of employment in the primary sector are expected to be influenced more by changes concerning this sector resulting from a directive. Sensitivity is thus directly proportional to the share of employment in this sector.	Share of persons employed in Agriculture, hunting and forestry as well as Mining and quarrying on total employment	EUROSTAT LFS and SBS, ÖIR calculation	2011	NUTS2 2010	no data for Liechtenstein; BE10, DE30; DE50; DE60, DEC0; ES63; ES64; FR83; FR93; FI20; UKC1; UKD3; UKD7; UKE3; UKE4; UKG3; UKI1; UKI2; UKJ1
Agriculture	Share of agricultural areas	Regions with a larger share of agricultural areas are likely to be more sensitive to directives touching these areas. Sensitivity is thus directly proportional to the share of agricultural areas	Share of arable area, permanent crops area, Pastures and Heterogeneous agricultural areas on total	ESPON on CLC	2006	NUTS3 2006	EL11-14, UK only NUTS2; No data: EL21-43, FR91-94, ITC4C, ITC4D, ITF46-48, ITH59, ITI31, ITI34, ITI35, NL337-339, NL33A, PT20, PT30, CH
Industry	Employment in the secondary sector	Regions with a higher share of employment in the secondary sector are expected to be influenced more by changes concerning this sector resulting from a directive. Sensitivity is thus directly proportional to the share of employment in this sector.	Share of persons employed in Manufacturing on total employment	EUROSTAT SBS, ÖIR calculation	2011	NUTS2 2010	BE33, BE34, DEB3, DEC0, DK; FR, IT: 2010; no data for HR; SI02; CH, LIE; BE10; DE30; DE40; DEA3; DEB1; DEB2; DED4; DED5; EL; ITH; ITI; MT
Services	Employment in tertiary sector	Regions with a higher share of employment in the tertiary sector are expected to be influenced more by changes concerning this sector resulting from a directive. Sensitivity is thus directly proportional to the share of employment in this sector.	Share of persons employed in Services on total employment	EUROSTAT LFS, ÖIR calculation	2012	NUTS2 2010	AT22, BG41, DE25, DEB3, EL, ITI2, PL32, UKE3, UKN0: 2011 AT32, BE32, DE92, FR21, FR25, FR26, FR43, FR53, EL11, HU32, NL11, NL13, PL62, RO32: 2010; no data for BE22; BE34; BE35; BG31; BG32;BG33; BG34; BG42; DE13; DE14; DE22-DE24; DE26-DE27; DE50; DE72; DE73; DE91; DE93; DEA4; DEB1-DEB4; DEC0; ES23; ES43; ES63; ES64; FR63; FR83; FR91; FR92; FR93; FR94;

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
							ITC2; ITF2; ITF5; ITF6; ITH1; ITH2; HU21; HU22; HU23; HU31; HU33; NL23; NL34; AT11; AT21; AT34; PL33; PL34; PL43; PL53; PT15; PT16; PT18; PT30; RO11-RO31; RO41; RO42; FI20; UKD1; UKF3; UKK3; UKM5; UKM6 and LI
Tourism	Total overnight stays/Tot POP/1000	Regions with higher levels of tourism are likely to be influenced more strongly by directives concerning tourism as compared to regions with no established tourism sector. Sensitivity is thus directly proportional to the total number of nights on population	Total nights spent at tourist accommodation establishments per thousand inhabitants	EUROSTAT	2012	NUTS2 2010	No data for IE, UK and AT22: 2011; UKI2: 2010; CH: 2002
Society and people							
Social disparities	Unemployment rate	Regions experiencing higher levels of unemployment are likely to benefit more from a reduction of unemployment and are more harmed by increases thereof. Sensitivity is thus directly proportional to the unemployment rate	unemployed people/economically active population	ESPON on EUROSTAT	2009	NUTS3 2006	No data available for Liechtenstein, French overseas dpt.; ITC4C; ITC4D; ITF46-48; ITH59; ITI31; ITI34; ITI35; NL337-339; NL33A; UKD6; UKE44; UKE45; UKF24; UKF25; UKG36-39; UKH24; UKH25
Social disparities	Female employment	Regions with lower levels of female employment are expected to benefit more from measures aimed at reducing gender disparities at the labour market. Sensitivity is thus indirectly proportional to the ratio of female to male employment	Ratio of female employment from 15 to 64 years on male employment from 15 to 64 years	EUROSTAT	2013	NUTS2 2010	No data available for Liechtenstein
Social disparities	Early leavers from education and training	Regions with higher shares of early leavers from education and training are expected to benefit more from measures aimed at reducing social disparities at the labour market.	Share of early leavers from education and training on population aged 18-24 years	EUROSTAT	2013	NUTS2 2010	DEB2, DED4, FR63, AT34, PL33, UKK3, UKM5: 2012; EL41, PL34, PL52, UKD1, UKM6: 2011; AT21, AT32: 2010; No data: FR83, FR91-94, AT11, FI20, LI

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
		Sensitivity is thus directly proportional to the share of early leavers from education and training					
Social disparities	Disposable Income	Regions with lower disposable income per capita are expected to benefit more from directives raising disposable income and more harmed by potential decreases. Sensitivity is thus inversely proportional to the level of disposable income per capita in PPS	Disposable income per capita in purchasing power standard based on final consumption per inhabitant	EUROSTAT	2010	NUTS2 2010	FR91, FR92, FR93, FR94: 2008 CY, LU: 2009; no data for DED4, DED5; HR; ITH5; ITI3; Malta; Switzerland; Iceland; Liechtenstein
Social disparities	People at risk of poverty or social exclusion	Regions which display a higher at-risk-of-poverty rate are likely to experience more acute poverty. Sensitivity towards directives influencing poverty is directly proportional to the at-risk-of-poverty rate	At-risk-of-poverty rate in percent of total population	EUROSTAT	2012	NUTS2/NUTS1 2010	Only NUTS1: BE (2011), EL (2010), HR (2012), HU (2012), PL (2012), UK (2009), CY, LV, LT, LU, MT (2012); Only NUTS0:HR, IS; NUTS2: IE, SE11: 2011 DE, NL: 2010; FR: 2009; PT: 2005; no data: DED4, DED5; French Overseas Departments; Liechtenstein
Governance	Government Effectiveness	Regions showing lower quality and fairness of local public school and healthcare systems may benefit more from directives aiming at improving public school and healthcare systems. Sensitivity is thus inversely proportional to this indicator	EU Regional Competitiveness Index 2013	DG Regio project on QoG	2009	NUTS2 2006	No data: CH, FI1B, FI1C, HR, IS, LI, NO
Governance	Interregional cooperation	Whereas all regions may equally benefit by increases in transnational cooperation, cross-border regions are more likely to be actually involved and interested in such agreements. Sensitivity is thus considered as directly proportional to the number of organisations participating in Interreg IVC projects.	Number of organisations participating in Interreg IVC projects	ESPON TERCO Project	2012	NUTS2 2006	No data: French Overseas Departments; HR

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
Health	Healthy life expectancy at birth	Regions in which life expectancy is lower are assumed to benefit more from policy measures aimed at its increase and more negatively influenced by those which decrease it. Sensitivity is thus inversely proportional to life expectancy at birth.	Life expectancy at given exact age (less than one year)	EUROSTAT	2012	NUTS2 2010	DEE; IE; RO: 2011; FR91; UK: 2010; No data: UKD6, UKD7
Health	Number of people exposed to noise	Exposure to noise is largely dependant on the proximity to industrial, commercial or transport units. Regions with a higher share of these areas are likely to be more hit by impacts changing the levels of noise. Sensitivity is thus directly proportional to the share of population living in urban areas.	Area of Corine Landcover level 2 classes 12 and 13 (m^2) per inhabitant of NUTS3 region (2006)	ESPON on CLC; OIR calculation	2006	NUTS3 2006; NUTS2 2006 (UK)	No data: CH, EL21-43; French overseas Departments, ITC4C, ITC4D, ITF46-48, ITH59, ITI31, ITI34, ITI35, NL337-339, NL33A, PT20, PT30, Data on NUTS2: EL, UK
Demography	Out-migration/brain drain/"shrinking" of regions	Regions experiencing out-migration or brain drain will benefit more from actions aimed at their reduction or suffer most from their exacerbation. Sensitivity is thus inversely proportional to the crude rate of net migration	The crude rate of net migration is equal to the difference between the crude rate of population change and the crude rate of natural change (that is, net migration is considered as the part of population change not attributable to births and deaths).	EUROSTAT	2012	NUTS3 2010	DE80; UK: 2010; IE, RO; IS: 2011; No data: UKD6, UKD71, UKE44, UKE45, UKF24, UKF25, UKG36-39, UKH34, UKH35
Accessibility	Potential accessibility by road	Regions with lower potential accessibility will benefit more from its increase and be most disadvantaged by measures that lower it. Sensitivity is thus inversely proportional to potential accessibility by road.	population in all destination regions+accessibility potential of the origin region weighted by travel time (index related to ESPON average)	© S&W Spiekermann & Wegener, Urban and Regional Research, ESPON TRACC Final Report	2011	NUTS3 2006	no data for French overseas dpt; HR; ITC4C, ITC4D; ITF46-48; ITH59; ITI31; ITI34; ITI35; NL337-NL339; NL33A; UKD61-71; UKE44; UKE45; UKF24; UKF25; UKG36-UKG39; UKH24; UKH25
Accessibility	Potential accessibility by rail	Regions with lower potential accessibility will benefit more from its increase and be most disadvantaged by measures that lower it. Sensitivity is	population in all destination regions+accessibility potential of the origin region weighted by travel time (index related to ESPON average)	© S&W Spiekermann & Wegener, Urban and	2011	NUTS3 2006	no data for French overseas dpt; HR; ITC4C, ITC4D; ITF46-48; ITH59; ITI31; ITI34; ITI35; NL337-NL339; NL33A; UKD61-71;

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
		thus inversely proportional to potential accessibility by rail.		Regional Research, ESPON TRACC Final Report			UKE44; UKE45; UKF24; UKF25; UKG36-UKG39; UKH24; UKH25
Accessibility	Potential accessibility by air	Regions with lower potential accessibility will benefit more from its increase and be most disadvantaged by measures that lower it. Sensitivity is thus inversely proportional to potential accessibility by air.	population in all destination regions+accessibility potential of the origin region weighted by travel time (index related to ESPON average)	© S&W Spiekermann & Wegener, Urban and Regional Research, ESPON TRACC Final Report	2011	NUTS3 2006	no data for French overseas dpt; HR; ITC4C, ITC4D; ITF46-48; ITH59; ITI31; ITI34; ITI35; NL337-NL339; NL33A; UKD61-71; UKE44; UKE45; UKF24; UKF25; UKG36-UKG39; UKH24; UKH25
Accessibility	Access to high-level passenger transport infrastructure.	Regions with less access to high level passenger transport infrastructure will benefit more from its increase and be most disadvantaged by measures that lower it. Sensitivity is thus inversely proportional to the average accessb time to transport networks	average access time to transport networks, all modes within reach included.	MCRIT, TRANSTOOLS Transport Network	2012	NUTS3 2006	no data for French overseas dpt; HR; MT; DEA16; DEA55; EL221; EL442; ES630; ES640; ITC4C, ITC4D; ITC20; ITF46-48; ITG25-27; ITG2A, ITG2B; ITH59; ITI31; ITI34; ITI35; NL337-NL339; NL33A; PT200; PT300; UKD61-71; UKE44; UKE45; UKF24; UKF25; UKG36-UKG39; UKH24; UKH25; UKJ34
Culture	Conservation of cultural heritage	Regions possessing a large number of artistically and historically valuable monuments (as documented by 3 stars in the Italian Touring Club (TCI) guidebooks) are expected to be more sensitive to directives aimed at cultural heritage conservation, or which may have an indirect bearing on it. Sensitivity is thus directly proportional to the number of sites with 3 TCI stars.	Monuments and other tourist sights indexed; Weighted average of "stars" in TCI guidebook series in each NUTS 2 area (assigning weigh 3 to "conjunts" and 1 to individual momuments and objects), years 2001-2008	ESPON ATTREG Project	2001-08	NUTS2 2006	Data complete
Natural environment							

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
Air	Pollutants in air (PM10)	Regions showing greater concentration of air pollution are expected to benefit more from directives aimed at its reduction. For this, particular matter (PM10) was used as an indicator of pollution in general; sensitivity is thus directly proportional to PM 10 concentration	Concentration of particulate matter (PM10) at surface level, 2009, Yearly average (µg/m³) – population weighted average	5th Cohesion Report	2009	NUTS3 2006	No data: CH, NO, IS, LI, DEA2D, DED2, DED4, DED5, ES70, FR91-94, HR, ITC4C, ITC4D, ITF46-48, ITH59, ITI31, ITI34, ITI35, NL337-339, NL33A, UKD6, UKD7, UKE44, UKE45, UKF24, UKF25, UKG36-39, UKH24, UKH25
Emissions	Emissions of CO2	Regions showing greater density of vehicle fleet and employment in industry per capita are expected to be more sensitive to directives aimed at reducing CO2 emissions	Emissions of CO2 are largely dependent on vehicle emissions and emissions in industry. Therefore, the combination of vehicle concentration and employment in industry is used as a proxy for emissions of CO2	EUROSTAT; ÖIR calculation	2011	NUTS2 2010	No data: IS, DED4, DED5, FR91-94, ITH5, ITI3, FI1B, FI1C, UKD6-7,
Fauna/Flora/Habitat	Protected areas (NATURA 2000)	Regions showing a greater area of protected nature areas are expected to be more sensitive to directives directed at biodiversity or directives which may endanger habitats, Sensitivity is thus directly proportional to the share of areas protected under the Natura 2000 programme	NATURA 2000 areas in % of total NUTS 3 area 2009 is used as a proxy for biodiversity	EEA, REGIO-GIS; DG ENV (5th Cohesion Report)	2009	NUTS3 2006	No data: CH, HR, NO, IS, LI
Landscape	Conservation of forests and semi natural areas	Regions with a higher proportion of natural areas are expected to be more sensitive to directives having an effect on this. Sensitivity is thus directly proportional to the share of natural areas	Share of Forest and semi natural areas on total NUTS area (Corine Land Cover levels 1, 2 and 3 from the European Environmental Agency aggregated in the NUTS 2006 delineation)	ESPON on CLC	2006	NUTS3 2006	EL11-14, UK only NUTS2; No data: EL21-43, FR91-94, ITC4C, ITC4D, ITF46-48, ITH59, ITI31, ITI34, ITI35, NL337-339, NL33A, PT20, PT30, CH
Water	Water resources	Regions having a greater share of inland water may experience lower constraints of water consumption and quality. Sensitivity is thus inversely proportional to the share of inland water areas	Share of Inland water areas on total NUTS area (Corine Land Cover levels 1, 2 and 3 from the European Environmental Agency aggregated in the NUTS 2006 delineation)	ESPON on CLC	2006	NUTS3 2006	EL11-14, UK only NUTS2; No data: EL21-43, FR91-94, ITC4C, ITC4D, ITF46-48, ITH59, ITI31, ITI34, ITI35, NL337-339, NL33A, PT20, PT30, CH

Thematic field	Exposure field	Direction of sensitivity	Description	Source	Reference Year	Original Indicator Spatial Reference	Data availability
Soil & Water	Pollutants in soil and ground/surface water	Regions showing a higher density of land-use are expected to be more sensitive to directives aimed at a reduction of soil and water pollution. Sensitivity is thus directly proportional to the density of land use	Population plus employment divided by area of NUTS2 Region is used as a proxy for high density land use	EUROSTAT, ÖIR calculation	2011	NUTS2 2006	No data: UKD6, UKD7
Soil	Share of artificial areas/soil sealing	Regions displaying a greater share of artificial areas are expected to be more sensitive to directives aimed at a reduction of soil sealing or those causing more urbanization. Sensitivity is thus directly proportional to the share of artificial areas	Share of Artificial surfaces on total NUTS area (Corine Land Cover levels 1, 2 and 3 from the European Environmental Agency aggregated in the NUTS 2006 delineation)	ESPON on CLC	2006	NUTS3 2006	EL11-14, UK only NUTS2; No data: EL21-43, FR91-94, ITC4C, ITC4D, ITF46-48, ITH59, ITI31, ITI34, ITI35, NL337-339, NL33A, PT20, PT30, CH
Natural Hazards	Exposure to landslides	Regions showing a greater likelihood of landslide occurence are expected to be more sensitive to directives whose implementation have some impact on this phenomenon. Sensitivity is thus directly proportional to the likelihood of landslide occurrence	Spatial likelihood of landslide occurrence in 5 classes	ESPON on JRC European Soil Portal	2012	NUTS3 2010	no data for HR, French overseas dpt.
Natural Hazards	Exposure to floods	Regions showing a greater likelihood of floods occurrence are expected to be more sensitive and benefit more from directives aimed at a reduction of this risk. Sensitivity is thus directly proportional to the likelihood of floods occurrence	Spatial likelihood of floods occurrence in 5 classes	ESPON on Dartmouth Flood Observatory	2012	NUTS3 2010	no data for HR, Canarias, La Reunion, Guyane
Natural Hazards	Exposure to winter avalanches	Regions showing a greater likelihood of avalanches occurrence are expected to be more sensitive and benefit more from directives aimed at a reduction of this risk. Sensitivity is thus directly proportional to the likelihood of avalanches occurrence	Spatial likelihood of avalanches occurrence in 5 classes	ESPON on USGS and DLR	2012	NUTS3 2010	no data for HR

Source: OIR, 2014.

6 Links and Literature

ESPON has conducted a lot of research in the field of territorial impact assessment. Examples of projects are ESPON ARTS – on which the ESPON TIA Quick Check is based upon – as well as the project ESPON EATIA. Further information can be obtained from the following links:

- ESPON (2011): The TIA quick check. Standard Version. Available from: http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ARTS/TIA_quick_check_standard_version.pdf
- ESPON (2011): The TIA quick check. Advanced Version. Available from: http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/ARTS/TIA_quick_check_advanced_version.pdf
- ESPON (2012): ESPON ARTS. Assessment of Regional and Territorial Sensitivity. Available from: http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/arts.html
- ESPON (2013): EATIA – ESPON and Territorial Impact Assessment. Available from: http://www.espon.eu/main/Menu_Projects/Menu_TargetedAnalyses/EATIA.html?currentPage=2

A practical ESPON guide summarises the main issues of territorial impact assessment:

- ESPON (2012): 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. Luxembourg. Available from: http://www.espon.eu/export/sites/default/Documents/Publications/TerritorialImpactAssessment/TIA_Printed_version.pdf
- The webpage http://ec.europa.eu/smart-regulation/impact/index_en.htm provides key documents of impact assessment in the European Union, including:
  - EU COM (2009): Impact Assessment Guidelines. SEC(2009) 92. Available from: http://ec.europa.eu/smart-regulation/impact/commission_guidelines/docs/iag_2009_en.pdf
  - EU COM (2013): Commission Staff Working Document. Assessing territorial impacts: Operational guidance on how to assess regional and local impacts within the Commission Impact Assessment System. Available from: http://ec.europa.eu/smart-regulation/impact/key_docs/docs/cswd_ati_en.pdf

Additional publications are e.g.:

- Fischer, Thomas B.; Gore, Tom; Golobic, Mojca; Marot, Naja (2013): Territorial Impact Assessment – a new policy assessment tool to support territorial cohesion. Available from: http://www.iaia.org/conferences/iaia13/proceedings/Final%20papers%20review%20process%2013/Territorial%20Impact%20Assessment%20%E2%80%93%20a%20new%20policy%20assessment%20tool%20to%20support%20territorial%20cohesion%20.pdf?AspxAutoDetectCookieSupport=1
- Fischer, Thomas B.; Sykes, Olivier; Gore, Thomas; Marot, Naja; Golobic, Mojca; Pinho, Paulo; Waterhout, Bas; Perdicoulis, Anastassios (2014): Territorial Impact Assessment of European Draft Directives – The Emergence of a New Policy Assessment Instrument. Available from: http://www.google.at/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCwQFjAA&url=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F259714598_Territorial_Impact_Assessment_of_European_Draft_DirectivesThe_Emergence_of_a_New_Policy_Assessment_Instrument%2Ffile%2F5046352dd0523ea61b.pdf&ei=Wh8GU73yE-Sg7AaYkYHIDg&usg=AFQjCNHAKSQyIO1Y5A3Mg_a5ZMq3wobriQ&bvm=bv.61725948,d.ZGU&cad=rja

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.

ISBN