A Executive summary

The need for an in-depth assessment of the territorial and regional effects of EU sectoral policies and directives had already entered the European policy debate during the preparation of the European Spatial Development Perspective (1995-1999). The *Territorial Agenda* of the European Union (May 2007) and the First Action Programme (November 2007) as well as the *Green Paper on Territorial Cohesion* (October 2008) focussed explicitly on the issue of regional diversity.

The impact assessment (IA) procedure at the level of the European Commission was introduced in 2002 and further developed by means of a gradual process that allowed Commission officials and organizations to develop and improve the method. The basic idea behind the IA procedure is that ex-ante impact evaluations of new policy proposals, when carried out parallel to the policymaking process, will improve the original ideas and result in robust, effective, efficient and widely supported policies.

In line with the goals articulated in the EU *Impact Assessment Guidelines,* 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). TIA is defined as "a tool for assessing the impact of spatial development against spatial policy objectives or prospects for an area", working at "any spatial scale" and therefore applicable to large projects, plans and programmes (Williams et al., 2000, ECTP/CSD 2001, Böhme & Eser, 2008).

The task: a methodology for a TIA ex-ante quick check

Based on the experiences within ESPON ARTS, a quantitative tool was developed to quickly gauge the potential impact of EU legislation, policies and directives on regions (hereafter referred to as simply "policy proposals"). The main task was to elaborate a general common framework and a methodology in which assessments concerning particular policy proposals could fit. This 'quick check' should be as simple, comprehensible and user-friendly as possible.

Based on the methodological approach an operational procedure was developed showing how to apply the procedure when conducting the **TIA quick check**. The quick check for was tested on 12 EU directives[1] and a more in-depth assessment using this methodology was performed on 3 directives. One of these was carried out

[1] Directive on air quality (NOx), Water Framework Directive, Seveso Directive, Directive on managing environmental noise, Directive on promotion of use of biofuels, Directive on the environmental liability, Directive on the interoperability of electronic road toll systems, Directive on recognition of qualifications, Directive on critical infrastructure, Directive on sustainable use of pesticides, Directive on clean and energy-efficient road transport vehicles, Directive on the energy performance of buildings,

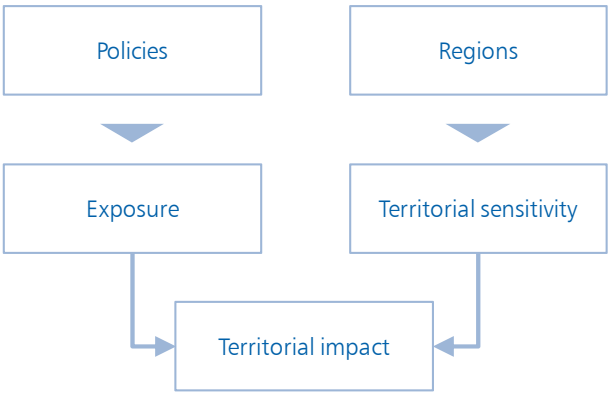
a second time in a workshop setting with experts from the European Commission. The result is a method and procedure that can be applied by policymakers.

The methodological approach: 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.

Figure A 1: Territorial impact combining exposure with sensitivity



The vulnerability concept of the IPCC also includes the notion of *adaptive capacity,* which describes the ability of a system to adjust to the potential impact, moderate potential damages and cope with the consequences. This concept is not part of the TIA quick check (which is mainly interested in potential impacts), but the results of the TIA quick check would be a good starting point a discussion of the possibilities of regions to adjust to any potential impacts, especially in the context of good governance.

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

As stated, 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 can be used in two ways:

- The **standard 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.
- The **advanced TIA quick check** enables one to use the methodological framework described above and also allows users to define special indicators describing the exposure to policy proposals combine these with new indicators describing regional sensitivity. In this case, the tool provides the technical framework, but the indicators are defined individually.

Standard TIA quick check

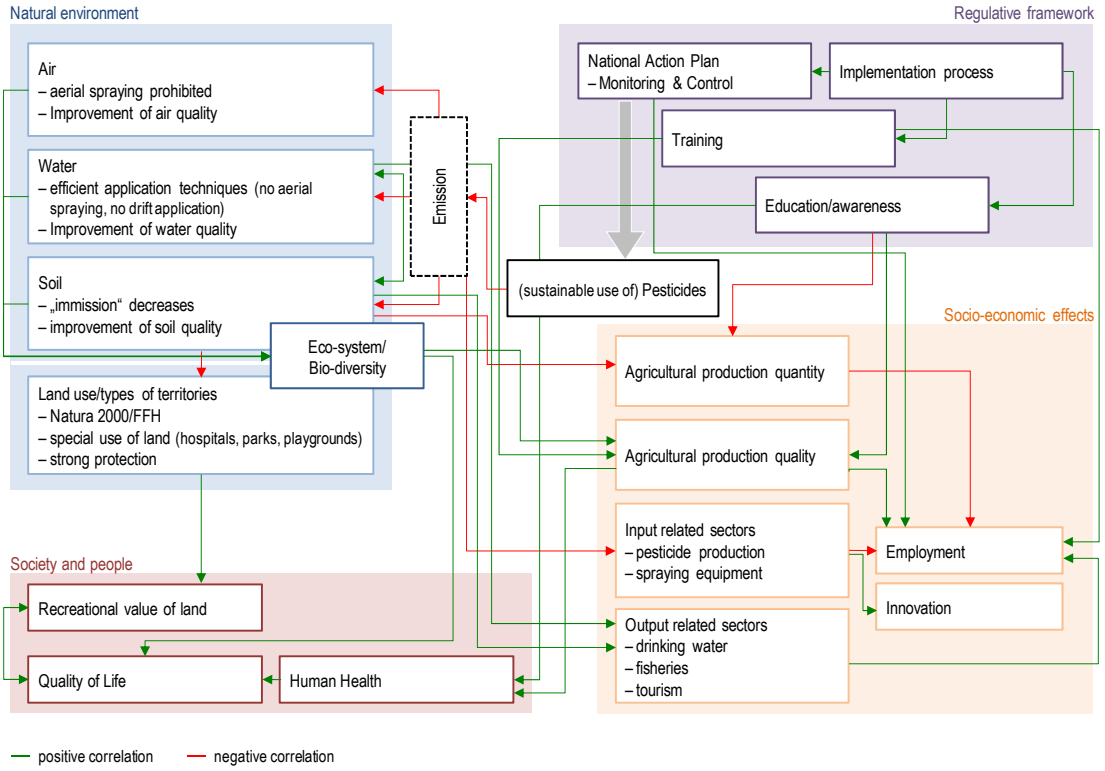
The standardised TIA quick check is done in nine steps using expert knowledge and a set of standardised indicators and types of regions. It can be performed in a workshop atmosphere; preferably with a group of experts in the field of the policy proposal and experts on regional development.

(1) The conceptual model: how does a policy affect 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).

Figure A 2: Conceptual model of the directive 2009/128/EC Directive on the sustainable use of pesticides



(2) 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.

(3) 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.[2]

[2] 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

(4) 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.

Table A 1: 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		

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_{10}.

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.

(5) What is the territorial impact on 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:

Table A 2: 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	

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

The results calculated in the territorial impact matrix should then be checked for plausibility. Usually the results show that a proposal only affects 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.

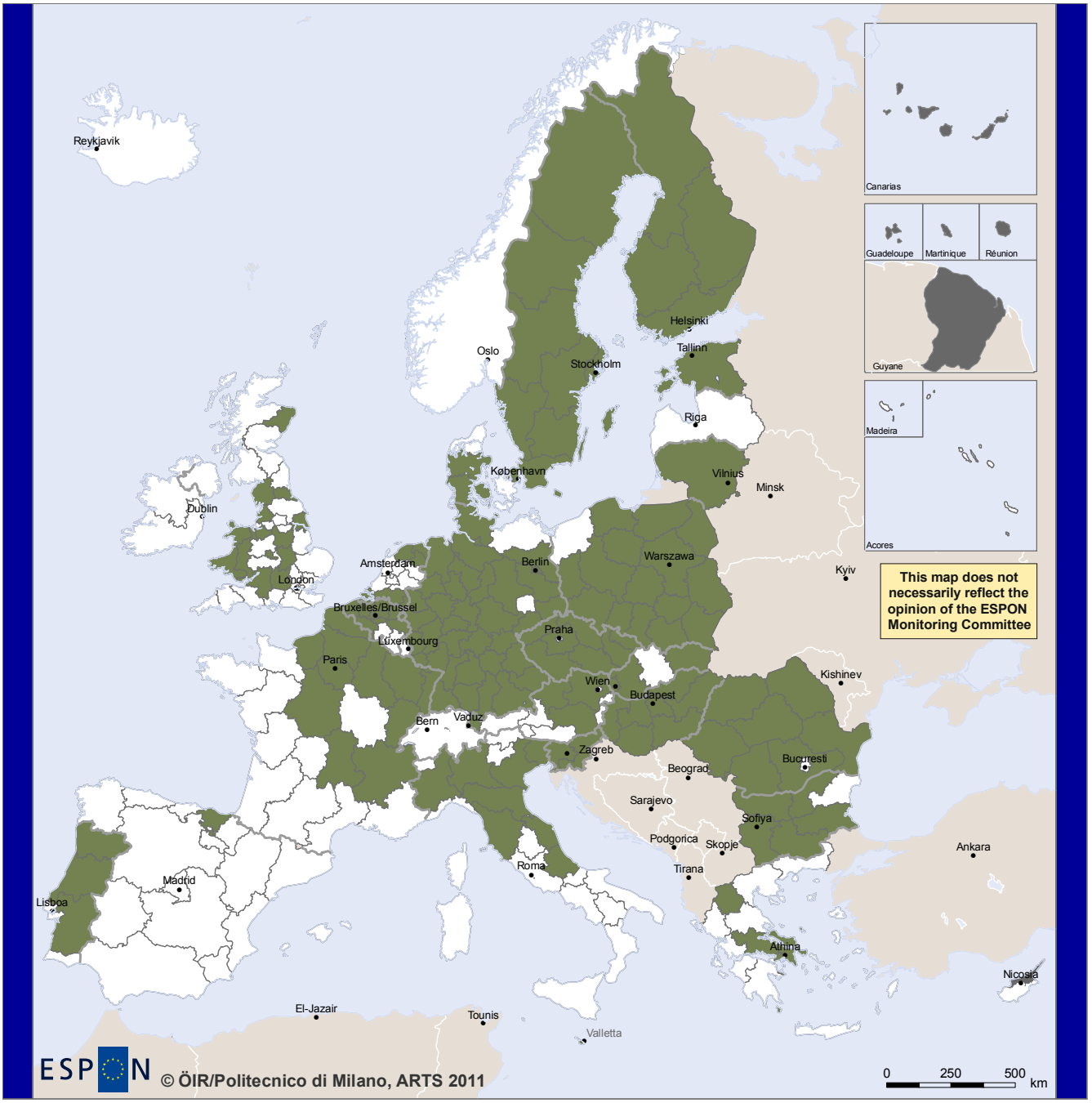
(7) Which regions are affected in which fields? (mapping the results)

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.

Map A 1: Example for mapping the expected territorial impact for one indicator

[following page]

Regions affected by Directive on air quality branch b Pollutants in air (F6)



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

Positive Impact

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

Types of regions affected: industrial regions

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

The maps showing the regionally differentiated territorial impact serve as the starting point for a subsequent discussion on policy implications, which focuses on both the positive and negative impacts. Furthermore, the issue of potential adaptive capacity should be raised, as well as governance strategies to facilitate a successful implementation.

(9) How to communicate the results (write-up)

Based on the results of the territorial impact assessment and the expert discussion, a short report can be drawn up (including maps on relevant indicators) to serve as the first "quick check" of territorial impact. This report aims at communicating the results of the ex-ante analysis to the relevant audience.

The advanced TIA quick check

The advanced TIA quick check enables one to assess the impact of a policy proposal along self-defined thematic fields using new indicators for exposure and sensitivity of regions. The TIA-tool provides the technical setting for linking the exposure and sensitivity indicators, but the indicators themselves need to be defined individually. As with the TIA quick check, the tool allows one to calculate the impact in these fields using the same nine steps.

(1) The conceptual model: How does a policy affect the development of regions?

As with the standard TIA quick check, it is necessary to detect the potential effects of a policy on territorial development by translating the text into a conceptual model and drawing out the cause/effect relationships (the *intervention logic*).

(2) Are there discrete cause/effect chains? (branching)

Like the standard TIA quick check, different cause/effect chains can be analysed separately.

(3) Which types of regions are affected?

The advanced TIA quick check allows one to define specific types of regions that could be affected. The user has to fill the Regional Exposure Matrix (REM) by assigning each NUTS 2 region either an '0', indicating that a region is not that type of region, or '1', classifying a region as being part of that specific type of region.

(4) What are the fields of exposure and how can the sensitivity of regions towards this exposure be described?

Based on the conceptual model, the fields of exposure can be defined freely. However, it is important to define for each field of exposure the following indicators:

- One indicator should describe the potential exposure deriving from a policy proposal. This indicator will be filled into the Directive Exposure Matrix.
- One Indicator describing the sensitivity of a region. This indicator will be normalized in the range 0.75 to 1.25. This indicator will be filled in into the Regional Sensitivity Matrix.

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

Based on the Directive Exposure Matrix and the pre-defined sensitivity of the regions the territorial impact can be calculated automatically into 9 classes of impact.

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

The results calculated in the territorial impact matrix allows for a first plausibility check. All values, typologies of regions and decisions about the exposure can be changed at this stage. The modified Territorial Impact Matrix (TIM) is then recalculated with the new values.

(7) Which regions will be affected in which fields? (mapping)

When the results are reliable, maps showing the impact along the different indicators can be drawn up. This can be followed by another plausibility check.

(8) 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 question on the potential adaptive capacity could be started as well as governance issues.

(9) 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.

Options for policy development

The Commission's Impact Assessment (IA) practice qualifies as one of the best opportunities to get TIA implemented at the EU level. The TIA as developed in ESPON ARTS could serve as a first pre-check on the expert level of the Commission and add the territorial dimension to the Commission's Impact Assessment procedure. It can be used for a first ex-ante analysis of policy proposals in two ways:

- Analysing the full range of potential impacts at a general level the **standard TIA quick check** helps to identify the relevant thematic that are effected by a policy proposal. Based on common indicators for European NUTS 2 regions it allows to

select the regions with a potentially high positive or negative impact. This information helps to set a focus an further and more detailed impact analysis.

- The **advanced TIA quick check** allows users to define special indicators describing the exposure to policy proposals and to combine these with indicators describing regional sensitivity. As the tool provides the technical framework, but the indicators are defined individually, the advanced TIA quick check can serve for a more detailed analysis of a specific potential impact of policy proposals.

The result of TIA quick check could feed in into the further stakeholder driven process of the Commission's Impact Assessment.

Issues for further analytical work and research

The results reached in this project confirm that a quali-quantitative methodology is absolutely necessary when dealing with an ex ante assessment of the territorial impact of policy proposals covering all European regions and a wide array of impact dimensions. It is possible to devise and design a simple methodology even in a complex and wide field like the one at stake. The operational application to 12 different and diversified Directives confirms this flexibility of the TIA quick check.

Nevertheless, the results of the TIA on the selected Directives show clearly what kind of additional analytical work is still needed:

- Additional indicators are required in order to cover all relevant fields of territorial development.
- An extended list of pre-selected types of regions matrix would be necessary to sharpen the analysis of the regional exposure to policy proposals.
- Compared to the NUT2 level statistical information on the list of indicators as well as on regional typologies at NUTS 3 level would help to get territorially more detailled results.
- A solution for describing summative effects easy and reliable would be interesting to get also an overview about "summative" impacts of a policy proposal in each region.
- The analysis focuses an depicts the impact of the EU legislation within single region. Additionally also spillover effects and cross border effects could be analysed.