ESPON BSR-TeMo
Territorial Monitoring for the Baltic Sea Region

Scientific Platform and Tools Project 2013/3/9

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Part A | Executive Summary

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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.

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This basic report exists only in an electronic version.

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BSR-TeMo: Territorial monitoring for the Baltic Sea Region

1 Objectives of BSR-TeMo

The main objective of the BSR-TeMo project is to develop an indicator-based territorial development monitoring system for the Baltic Sea Region. The objective was also to make sure that this monitoring was designed in line with the policy perspectives and initiatives for promoting territorial cohesion in the Baltic Sea Region.

2 Policy relevant monitoring of the Baltic Sea Region

The Baltic Sea Region (BSR) is a highly heterogeneous area in economic, environmental and cultural terms, yet the countries concerned share many common resources and demonstrates considerable interdependence (CEC 2009). The BSR is characterised by a number of distinctive challenges and opportunities, many of which have their own specific territorial expression. This is the reason why monitoring of territorial development at different geographical scales in the region can help enhance growth and well-being.

The key TeMo feature is the development of the system in close collaboration with its potential users – senior officers in the BSR countries responsible for territorial development. The BSR Committee on Spatial Planning and Development has assisted the project team in its conceptual and testing work. All this was done in order to ensure applicability of the TeMo system for support of the implementation of key BSR policy documents such as the European Union Strategy for the Baltic Sea Region (EU BSR-Strategy) and the VASAB Long Term Perspective (VASAB LTP) in the first instance. In addition however the EU 2020 Strategy, the Territorial Agenda 2020 (TA 2020) and other documents related to the EU Cohesion Policy has also been used as reference for development of the TeMo system.

Baltic filter

The TeMo project complement the broader EU undertaking done by the work on indicators within the ESPON INTERCO project, as well as the ESPON Database Project and the ESPON 2013 project. Still, the TeMo system should not be regarded as a mere adjustment of the INTERCO indicators to the BSR specificity.

In order to identify the main components of the BSR territorial monitoring system, the European territorial debate has been translated to the Baltic Sea Region's specificity and priorities, i.e. a *Baltic filter*. Specific components of the European territorial discourse were given a prominent place in VASAB strategic documents such as the strategy of 1994 (VASAB 1994), the key themes of 2001 (VASAB 2001), the key challenges of 2005 (VASAB 2005), and the action agenda of 2009 (VASAB 2009). The BSR specific objectives constituting territorial cohesion that are agreed upon in the strategic BSR documents include: diminishing territorial divides; enhancing polycentricity of development; contributing to sustainable city (urban region) development and their networking and co-operation; facilitating formation of functional regions in particular those related to innovations and the knowledge-based economy but also those with

specific territorial endowments; promoting wise use of territorial assets (immovable assets or territorial capital); enhancing accessibility and connectivity and parity of access to transport and ICT infrastructure; diminishing pressure on the natural and cultural environment; and finally opening of the space of the Baltic sea for sustainable development. In brief, the desired process resulting from the application of the notion of territorial cohesion is policy integration and territorialisation (making them place-based or territory sensitive) whereas the desired state of territory is depicted by the aforesaid objectives or priorities agreed upon by the BSR countries.

The monitoring system should measure these aspects of territorial cohesion, while being aware that measuring the territorial cohesion process can be extremely difficult and complex. Moreover, any monitoring system – if tailored to the BSR needs – should also provide stakeholders and policy makers with clear measurement of the BSR divides as an important contextual factor conditioning the BSR policies and efforts. The system should also be flexible enough to take advantage of and serve the monitoring purposes of the EU Strategy for the BSR.

3 TeMo territorial monitoring system

A territorial monitoring system consists of numerous elements; first and foremost the indicators and the data for these. However, while these are the basic elements, the analysis and methodological considerations when analysing the development trends and comparing the indicators across the territory are equally important elements of a well-functioning and relevant territorial monitoring system. Only when including these latter elements, it is possible to view the monitoring in its totality.

The full extent of the TeMo territorial monitoring system thus ranges from the identification of indicators - to case studies of the analysis options these indicators provide. Major notions in the process of a territorial monitoring system are, among others, the collection of data, preparation of data, creation of complex indicators, indicator analysis, analytical tests, storage of data, including metadata, editing and channelling the data to a GIS system for the production of maps and other figures (e.g. visualisation), as well as dissemination activities and policy recommendations. All these components make up a well-functioning and "sustainable" monitoring system.

Simple module, including headline indicators, and advanced module

The TeMo territorial monitoring system comprise of two modules: a simple module and an advanced module, see Figure 1.

The simple module – the basic part of the monitoring system with regard to indicators – contains the compilation and analysis of the chosen indicators, while the advanced module identifies standardized cross-indicator analysis options by relating different indicators with each other, and by producing complex indicators through statistical procedures (such as GINI coefficients etc.) in order to address key policy challenges related to territorial cohesion.

The indicators of the simple module are structured into 5 overall policy domains and 12 subdomains.

On top of that we propose to prioritise some indicators within the simple module in terms of frequency of their updating. This is important in order to ensure that the monitoring system will allow for identification of changes in territorial cohesion in relatively short time after their occurrence. These indicators are named *headline indicators* and are NOT to be confused with the complex indicators of the advanced module of the monitoring system.

The headline indicators thus functions as a short list of indicators for each policy domain, but one indicator is not sufficient to cover a whole policy domain, nor is it sufficient to identify development trends for territorial cohesion in the BSR.

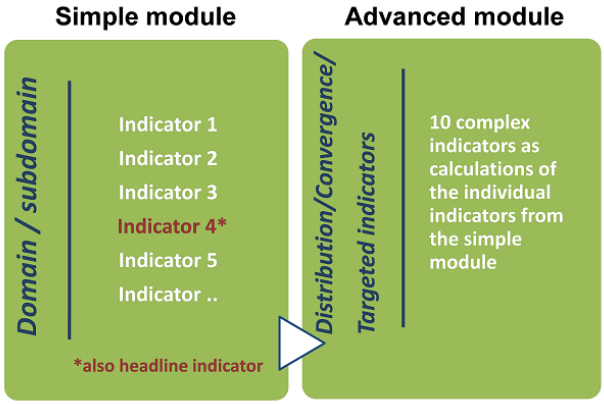

Figure 1 Simple and Advanced module of the TeMo monitoring system

Complex indicators of the advanced module

The ten separate complex indicators that comprise the advanced module cover all major aspects of territorial cohesion in the BSR, i.e. 1) distribution, 2) convergence, and 3) specifically targeted BSR territorial cohesion objectives.

The chosen indicators have a clear territorial character since they each in their different form are able to highlight the interplay and performance of the regions of the BSR and they make extensive use of the ESPON territorial typologies.[1] Each indicator (with the exception of "the urban/rural ratio", see below) is also fully inclusive in the sense that they take into account all regions of the BSR.

In comparison to any single indicator, the first strength of this palette is that it allows for a comprehensive measurement including multiple corroboration opportunities in order to safeguard a sound interpretation of the trends observed. The second strength of this set of indicators is that they can be applied on any variable in the monitoring system, provided that it meets certain simple criteria. The collection of indicators is therefore highly flexible.

The ten complex indicators are the following:

[1] The TeMo TPG has made extensive use of the ESPON typologies in the testing/application phase as well as in the construction of the complex indicator module.

- 3 Distribution indicators that measure overall cohesion in a distributive manner, each from its own specific point of view: the Gini Concentration Ratio (GCR), the Atkinson index, and the 80/20 ratio;
- 2 Convergence indicators that measure the *process* of convergence by means of two commonly used standard techniques, namely the Sigma-convergence and the Beta-convergence;
- 5 Targeted BSR territorial cohesion indicators which are targeting five specific aspects of territorial cohesion with particular relevance in a BSR context. One aim of these is to capture the principal divides of the BSR. These are: The east/west ratio, The south/north ratio, The urban/rural ratio, The non-border/border ratio, and The coast/inland ratio.

Domains and indicators

The TeMo territorial monitoring system consists of 5 policy domains, 12 subdomains as well as 29 indicators included therein, see Table 1.

Table 1 Domains, subdomains and indicators

Domains	1. Economic performance and competitiveness
Baltic raster / Normative aspect of domain	Place-based economic development. Development of territorial assets/territorial capital. Context indicators.
SUBDOMAINS AND INDICATORS	**Macroeconomic development**
	GDP per capita
	GDP per person employed
	Labour market
	Unemployment rate, total
	Employment rate (20-64 years)
	Demography
	Net migration rate
	Total population change
	Economic dependency ratio

Domains	2. Access to services, markets and jobs
Baltic raster / Normative aspect of domain	Balancing territorial development, diminishing territorial divides or alleviating their consequences. Maintaining at least the existing polycentricity level of the settlement structure. Ensuring accessibility, connectivity and parity of access to transport and ICT infrastructure, development of TEN-T.
SUBDOMAINS AND INDICATORS	**Potential accessibility**
	Accessibility potential by road
	Accessibility potential by rail
	Accessibility potential by air
	Multimodal accessibility potential
	Spatial structure
	Functional areas: access to cities
	Population potential within 50 km
	Border crossings
	Internet
	Households with internet access at home

Domains	3. Innovative territories
Baltic raster / Normative aspect of domain	Ensuring high quality of urban nodes, and their networking with focus on diffusion of innovation and enhancement of knowledge-based development. Emergence and development of regional clusters of competition and innovation.
SUBDOMAINS AND INDICATORS	**Human capital**
	Population with tertiary education (25-64 years)
	Employment in technology & knowledge sectors
	Financing and institutions
	Gross-domestic expenditures on R&D, business
	Gross-domestic expenditures on R&D, total

Domains	4. Social inclusion and quality of life
Baltic raster / Normative aspect of domain	Brought forward at the stakeholder workshop in Potsdam, as result of present economic, financial and social crisis in Europe
SUBDOMAINS AND INDICATORS	**Social inclusion**
	At-risk-of-poverty rate
	Severe material deprivation rate
	Youth unemployment rate (15-24 years)
	Gender imbalances
	Health
	Life expectancy at birth, in years
	Self-assessed general health status

Domains	5. Environmental qualities
Baltic raster / Normative aspect of domain	networks, ecological corridors and preservation of areas of high ecological value. Development of renewable energy resources (also on the sea) and the BSR transmission grid.
SUBDOMAINS AND INDICATORS	**Consumption and production**
	New soil sealing per capita
	Air pollution (PM10)
	Eutrophication
	Natural resources
	Fragmentation index

Headline indicators

The principal task of a monitoring system is its ability to provide direct policy advice. Simplicity and sensitivity to rapid changes are key features that should be strived for. If a monitoring system consists of a large number of specific indicators, then a frequent updating of these consumes considerable time and resources. Due to resource efficiency, a limited number of variables are usually chosen to be collected more frequently than the remaining large mass of indicators in a monitoring system. Such indicator short lists or headline indicator systems are the norm rather than the exception in most comprehensive and frequently updated policy strategies, the EU 2020 strategy, the EU Sustainable Development strategy, the Lisbon/Gothenburg strategy, OECD Green Growth strategy, and a large number of UN monitoring systems, to mention but a few.

If properly chosen, the limited set of indicators can generate warning signals much faster than the complex set of information and at the same time point out the need for more comprehensive analysis to be undertaken. In an ideal case, this limited group of indicators is not only more resource efficient (i.e. easy/economic/etc.) to collect, but they are also able to provide a general picture of what the entire monitoring system is measuring. They may be missing out on some particular details or aspects, but by and large they are able to efficiently communicate the principal trends.

One, or two, headline indicators are suggested for each domain for the BSR-TeMo, see table 2 below. The selection criteria for the headline indicators are based on many criteria, examples include: Conceptual coverage of entire domain; Policy relevance of indicator; Data availability for entire BSR; Data update frequency; and Principal Component Analysis for results in domain.

Table 2 Headline indicator(s) for each domain

Domain	Suggested headline indicator
1. Economic performance and competitiveness	GDP/capita in PPS
2. Access to services, markets and jobs	Multimodal accessibility potential
3. Innovative territories	Gross expenditure on R&D
4. Social inclusion and quality of life	At-risk-of-poverty rate
5. Environmental qualities	Soil sealing *and/or* Eutrophication

Data, scales and method

Regarding the data used for the indicators within the project, five basic principles have been adhered to.

(1) Data needed for the project has been collected in the form of variables rather than indicators. E.g. the TeMo indicators are most often based on several variables (i.e. GDP, population data) that were later combined (calculated) in order to build the indicator (i.e. GDP/capita). This is an analytical prerequisite in that further calculations should be based on the variables rather than indicators themselves.

(2) Before collection started during the winter 2012-2013, the time frame for data to be collected was set to start in 2005, up to latest data available. In cases

where data was released seldom, for example in 5-years cycles, an extended time frame was used, starting in year 2000.

(3) The main spatial levels for collected data have first and foremost been NUTS-3 regions in those BSR countries where such exist, e.g. the BSR EU states and Norway, and, for Russia and Belarus, on *oblast* (SNUTS-2) level. For indicators for which NUTS-3 data were not available, NUTS-2 data have been used. Full spatial coverage beyond NUTS-3 level (i.e. LAU-2) is not feasible for a functioning macro-regional monitoring system (see 4 below) but the TPG have investigated the possibilities to go beyond NUTS-3 and SNUTS-2 levels, for example LAU-2, which, however, for most indicators involves a number of issues. Use of LAU-2 data has been exemplified in some of the case studies and has been included in the presentation of indicators where possible. In the scientific report (volume C2) we have also devoted a chapter to explain the aspects of monitoring using LAU2 data in the BSR region. This gives some evidence on how it is possible to at least partly cover the BSR TeMo space on LAU-2 or similar level for some indicators.

(4) Ease of updating the monitoring system has been a focus, e.g. the TPG has aimed at using three main sources, which provide data free of access and – to a certain extent – on a yearly basis: Eurostat (BSR EU countries and Norway), ROSSTAT (Russia) and BELSTAT (Belarus). For those indicators not covered by the above sources, others have been used, such as international institutes or agencies, or previous ESPON (or similar) projects. In cases of data gaps, data has to a wide degree been supplemented by data from national statistical bureaus and for Russia and Belarus from regional sources.

However, although ease of further updating has been one of the basic principles for the development of the territorial monitoring system, it is important to point out that the major part of the data handling (e.g. harmonisation) happens after the data collection regardless of source, wherefore this post-preparation comprises a significant part of the future data work load.

(5) Coherence regarding methodology and availability for data covering the BSR countries has been considered crucial. This has been of particular importance regarding combining data from BSR EU states and Norway on the one hand (Eurostat methodology) and Russia and Belarus on the other. This is a major challenge regarding the data usage within the project. Russian statistical experts of PETROSTAT have assisted the TPG with confirmation regarding comparability and availability of data for Russia and Belarus.

4 Application and testing

The monitoring system was tested by means of four case studies, namely: territorial cohesion, migration, border regions, and macro regional benchmarking.

A selection of key findings indicate that recent trends in general territorial development in the BSR point towards increasing spatial polarisation further aggravating the already existing unbalanced regional structures. Also opposite trends leading to more balanced development and increasing convergence were discernible, not least the rapidly decreasing east-west economic divide. The east-west border is no longer the most pronounced material welfare gap in the BSR as disparities across national borders have generally diminished.

In contrast, territorial disparities between adjacent regions inside countries have in the past 15 years exploded, particularly in eastern BSR, but most major metropolitan areas also in the west are being segregated from their surroundings wealth-wise. It is evident that the urban hierarchy is a decisive factor across the BSR in dictating the magnitude of on-the-ground territorial disparities.

In terms of specific types of BSR territories the messages are, with certain distortions, fairly clear: these areas are with the exception of coastal areas generally lagging behind in most aspects of socioeconomic development. At the same time harnessing the potential in such territories poses considerable possibilities and must be addressed in order to reach the EU 2020 employment target and develop 2 million new jobs in this region.

Eastern BSR is still lagging behind in accessibility, but catch-up is rapid. Most inaccessible types of territories are sparse and border regions whereas capital regions and secondary city metropolitan areas have increased their accessibility most.

In the migration case study, a multivariate data analysis indicated that among the specific territorial features relevant for the BSR, the east-west dimension has by far the strongest influence on migration. Also having the status as the national capital or a secondary city, being a predominantly urban or an intermediate region, as well as lying by the coast, all have a positive effect on net migration.

Sparsity, closeness to a city as well as border status however does not affect migration when all other aspects are held constant. It is noteworthy that it should not be interpreted as if such characteristics would not matter. Rather to the contrary, the results reveal specifically the persistently handicapping socio-economic and locational characteristics of these areas for which targeted policies are direly needed. Hence: territories matter.

The eastern BSR displays huge internal variations in life expectancy and the gap to western BSR is substantial. The development trends are cohesive, however. In terms of general health, the east-west divide is not clear-cut. Economic welfare only partly explains existing patterns in health. East-west differences in both relative and absolute poverty are fairly large within the BSR, but no straightforward territorial pattern is discernible.

The introduced ten complex indicators for measuring territorial cohesion in the BSR can be applied successfully in order to highlight general mega trends in territorial cohesion in the region. A multidimensional approach in applying these further ensures coherent interpretation of mixed trends stemming from different techniques.

The three principal BSR divides were also assessed. Both the North-South gap as well as the urban-rural gap of the BSR is growing further still. The East-West gap also exists, but it is changing form. From having been a primarily economic gap sharpest along the former iron curtain, it has now changed into a far more multifaceted divide, where social differences today are possibly the most pronounced ones.

5 Visualisation

The territorial monitoring system entails a strong visual component. Different means of visualisation of indicator results are required to illustrate the project output and to provide different views on each indicator; both the BSR view and the ESPON space as a whole.

The visualisation component of the monitoring system focuses on three types of analytical approaches, which are the portraying of disparities at one point in time, to look at developments over time (trends), and to benchmark the Baltic Sea Region with other regions in Europe. As outputs, analysis results are documented in maps (i.e. the main form of illustrations in ESPON), diagrams, as well as in tables and as time series graphs.

Since the TeMo monitoring system focuses on the Baltic Sea Region, a new map template (BSR mapkit) in ArcGIS for this territory based upon the general ESPON map templates was developed.

Furthermore a *Presentation Tool* has been developed. This *Presentation Tool* acts as the standard gateway for the users to access the content of the territorial monitoring system for the Baltic Sea Region. The easy-to-use *Presentation Tool*, in the form of a local browser application as well as a webpage, not only provides access to the indicator maps, but also grants easy access to the domain and subdomain descriptions, indicator metadata and indicator descriptions, the conducted analyses, as well as to specific implementation recommendations for each single indicator.

6 TeMo Outputs

The concrete outputs from the TeMo project consist of a *Summary publication* of the monitoring system (published both in English and Russian), the aforementioned *Presentation Tool*, a User Manual to the *Presentation Tool*, ESPON deliveries (including technical specifications of the monitoring system), and a range of dissemination activities of the system to relevant stakeholders. Last, but not least, one output is also a database (delivered to the ESPON Database) of variables and indicators of the monitoring system.

7 Ensuring continued relevance of the TeMo

The territorial monitoring system developed should be flexible enough to take advantage of and serve the monitoring purposes of the EU Strategy for the BSR, to respond to new policy challenges and directions, and at the same time be stable enough to allow temporal comparison and reveal long-term trends and in particular warn about changes in them.

All of this is achieved by combining relevant statistical information with relevant territorial typologies. Most statistical information can be collected more or less in routine nature for all territorial units of the BSR over the longer period of time.

The key challenge is to turn it into a meaningful policy indicator system responsive to the current policy needs and appealing to the minds of policy makers. The system allows for construction of different indicators, in line with the key policy needs, based on the limited set of routinely collected statistical

information (variables). This is an essential condition of the success of any territorial monitoring system.

However, one should keep in mind that the key role of any territorial monitoring system is not to provide easy answers to the policy problems but rather to stimulate discussions and provide relevant evidence to be used together with other (more qualitative) inputs in the decision making processes. This pinpoints the importance of the context type of information.

Framing and construction of the system is only a first step in providing right policy support. Relevance of the system would depend on many factors. The most important are listed below:

(a) understanding among policy makers of the role and opportunities provided by the monitoring system and their ability to use them,

(b) permanent and timely updating of the statistical information forming the core of the monitoring system, struggling with constant changes of the borders of territorial units for which statistical information is collected,

(c) constant critical examination of the system's ability to meet the needs of the policy making, resulting in construction of new indicators and abandonment of the outdated ones,

(d) encouragement of the usage of the system for providing more complex spatial and temporal analysis in order to ensure integrative territorial development and avoiding a "silos" type of thinking in judgement of territorial development.

The TPG of the TeMo project has addressed all those challenges in the current report. *First*, the challenge of producing relevant documents and elaborating a visualization system; *Second*, the challenge of deciding on the limited set of core variables to be collected at BSR level divided into domains and subdomains; *Third*, the challenge of proposing concrete indicators; and *Fourth*, the challenge of examining their relevance under four thematic assessments.

However, all this indicates that running such a system will require specific skills and knowledge. It must be done in a pro-active way in constant collaboration with policy makers, the research sector (academia), and other relevant actors and sectors. Without such an approach, the system relevance would fade as time passes. Thus the ownership of the system – in mental not in legal terms – is a precondition of its usability in the future.

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