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Inspire policy making by territorial evidence

GRETA - “GReen infrastructure: Enhancing biodiversity and ecosysTem services for territoriAl development”

Applied Research

Trnava Region

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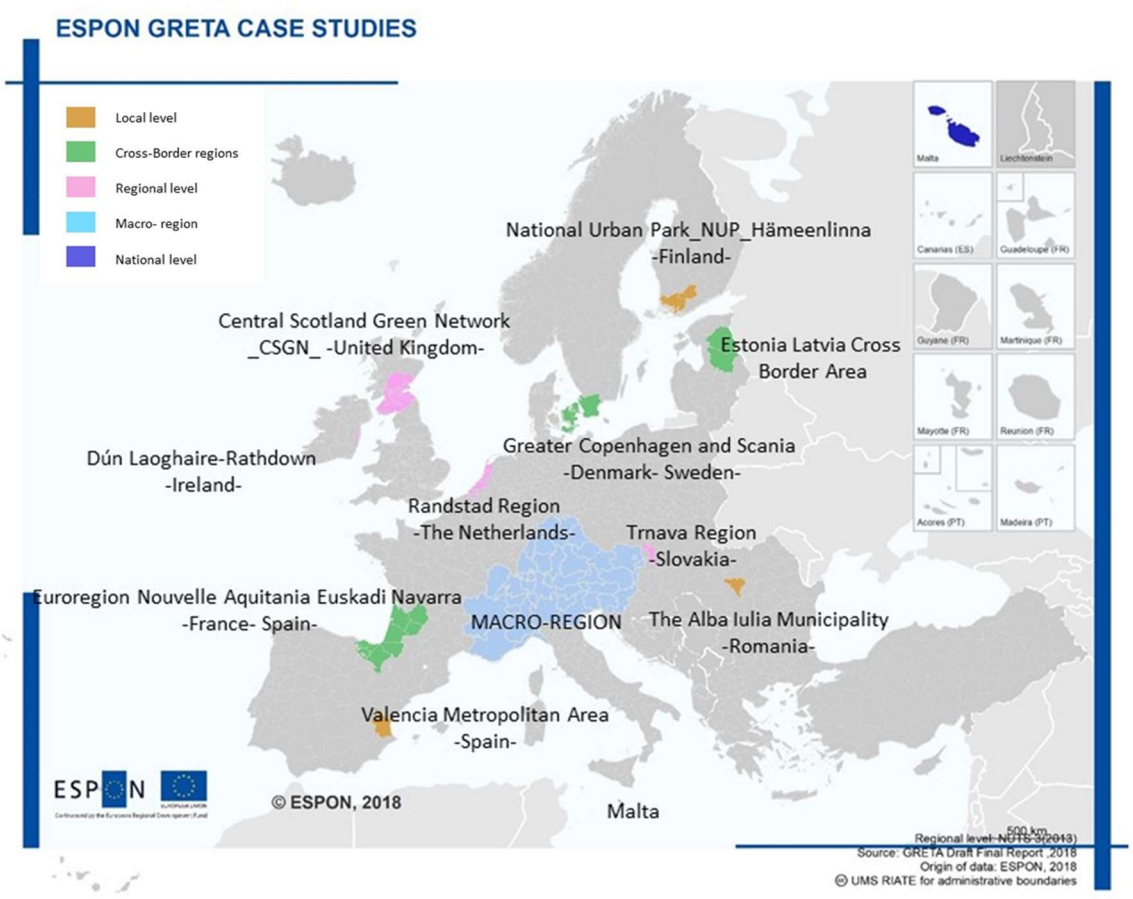
Abbreviations

EC	European Commission
ES	Ecosystem Services
ESPON	European Territorial Observatory Network
EU	European Union
GI	Green Infrastructure
NUTS	Nomenclature of Territorial Units for Statistics
TSES	Territorial System of Ecological Stability

1 Introduction

GRETA investigated 12 case studies that represented different spatial, institutional and governance settings and that ranged from urban centres to rural countryside. The case studies served to:

i. gain knowledge on implementation factors, drivers and constraints in different planning systems and territorial realities;
ii. gain insights on the use and applicability of economic methods in decision making; and
iii. gather knowledge for policy and practice as input and inspiration for the policy recommendations.



Map 1. ESPON GRETA selected case studies

Method

The activities undertaken at the case study level incorporated a combination of desk-based analysis alongside online questionnaires and pre-structured interviews to key actors in each of the case study areas, including: (i) decision and policy making representatives; and (ii) those involved in designing, planning, implementing and managing green infrastructure (GI).

A series of three consultations were developed to gather relevant information from case studies on different aspects of GI spatial analysis, policies, planning and implementation. The consultation process was seen as a combined approach of an online survey and or a telephone interview (which used the survey questions as the basis) with stakeholders to facilitate getting good engagement and to address any clarifications needed.

Consultation A – Economic Valuation

The questionnaire included 20 questions structured in 2 main parts. The first part aimed at understanding the current use and awareness of valuation methods by respondents while the second part aimed at identifying their perceived barriers and interest of using such methods. We used a mix of open-ended and closed-ended questions to combine comparable results as well as qualitative material; respondents also had the possibility to comment on their responses. Analysis of Consultation A is described in Annex III-C.

Access to Consultation A

https://survey.tecnalia.com/limesurvey/index.php/214247?lang=en

Consultation B – Characterising green infrastructure and ecosystem services characterisation

The objective of this consultation was to identify good practice guidelines, opportunities and challenges that could be useful for a variety of regions and cities. Responses to Consultation B were used to assess the usefulness of the GRETA methodology, a methodology specifically developed to delineate and map the main green infrastructure (GI) elements and their multifunctionality, as well as identifying their capacity to support three main policy domains: Biodiversity, Climate Change and Disaster Risk Reduction, and Water Management. Questions in Consultation B were designed to help us gain further insight into the enabling factors that exist in different regions and cities. We also sought to gather information on the challenges and barriers that may compromise the implementation of GI. The final set of questions focused on identifying the general benefits and potential synergies and trade-offs associated with GI projects.

The maps produced for Consultation B in the GRETA project were intended to provide a starting point for discussion about the applicability of the GRETA methodology from European to local application. As such they did not aim to be a substitute for the maps or other planning material that already exist at local case study level nor were they aiming to characterize the GI on regional or local level. They were not developed to be used as an output from case study levels.

The landscape elements in the maps are produced based on standardized European data sets with a minimum mapping unit of 25ha (i.e. CORINE Land Cover 2012) – smaller geographical features are not depicted. The Consultation B aimed at finding the gaps between datasets produced at the European level and any other data sets produced at regional and local scales.

Access to Consultation B

https://survey.tecnalia.com/limesurvey/index.php/614564?lang=en

Consultation C - Analysis of governance, policy and financial frameworks

The successful implementation of green infrastructure (GI) projects requires a combination of governance structures, integrated policies and financial support. This consultation therefore aimed to investigate the governance systems in place in each case study area in order to determine how policies and policy makers enable the implementation of GI projects in the case study areas.

Responses to Consultation C aimed to help us identify: (i) how much funding (money and personnel) is currently used for GI in the case study regions; (ii) if this funding is sufficient for implementing and maintaining GI; and (iii) the main sources of funding (public tax-based funds, private investments, NGOs or others). Consultation C also examined whether policies compliment or conflict with GI and assesses policy makers' knowledge needs for making full use of GI development potential.

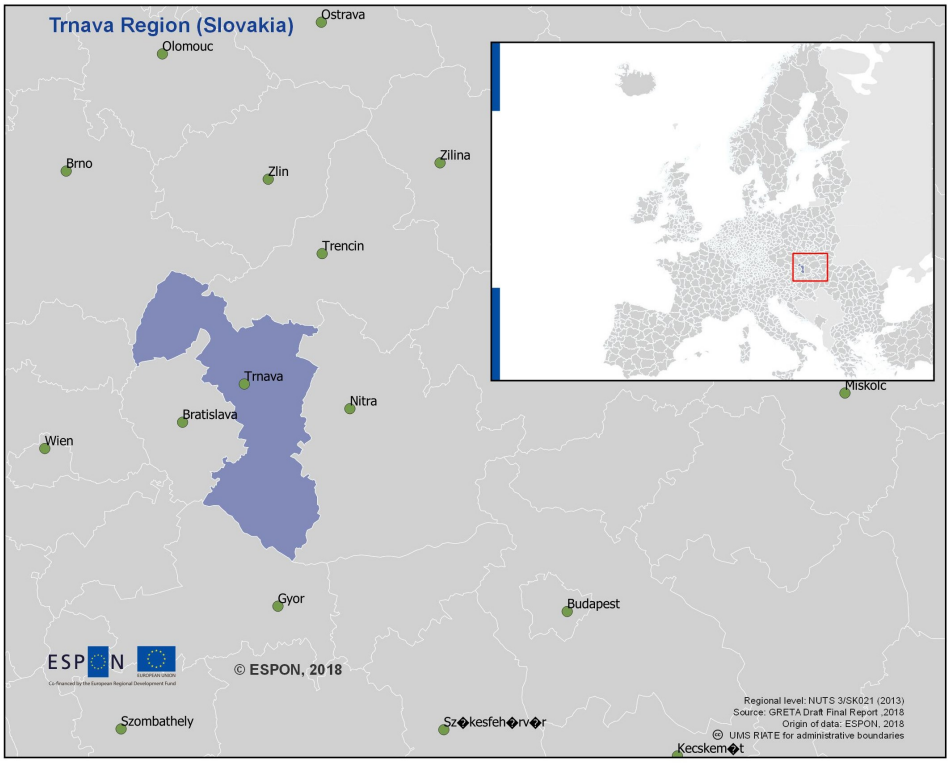
Access to Consultation C

https://survey.tecnalia.com/limesurvey/index.php/129674?lang=en

The content in this report is based on a mixed-method approach. The results presented are interpretations of semi-structured interviews, responses to a questionnaire on national policy and planning, responses to three consultations (Consultation A, B and C) via email, document analysis of plans and strategies (via desk-based analysis), and statistics.and spatial analysis using GIS resulting from the GRETA project. For all case studies, telephone conversations (and for some cases face-to-face meetings i.e. Copenhagen and Scania, Alpine region, Euroregion Aquitania- Euskadi-Navarra) allowed the completion of the consultations B and C.

The respondents who have contributed to this case study are people working in different institutional levels in public administration and researchers.

2 (Geographic) description of the Trnava Region



Map 2. Trnava Region

2.1 Case study outline

The **Trnava Region** (NUTS3 SK021**)** lies in western Slovakia and is one of the eight Slovak administrative regions. The region is located almost in the geographical centre of Europe and has a common border with three states – the Czech Republic, Austria in the north and Hungary in the south– which creates favourable conditions for developing cross-border cooperation. The Morava marks the border with the Czech Republic and Austria, while the Danube forms the border with Hungary in the south. It shares a border with the Bratislava, Nitra and Trenčín regions.It was established in 1996, before which date most of its districts were parts of Bratislava Region.The region has a continental climate with oceanic influence and it is crossed by many of the most important European rviers, which is translated into rich and complex landscape. the largest area is occupied by the Danubian Lowland in the south and the Záhorie Lowland in the north. They are separated by the Malé Karpaty (Little Carpathians), a thrust mountain belt, with Záruby being the highest peak.

Geographically, there is an interesting case to be analysed from the perspective of Green Infrastructure characterization, planning, implementation and management processes.

Nowadays Trnava Region is an administrative, economic, cultural and science-research centre in Western Slovakia. In terms of territorial administration. It has 4.145 Km^2 and encompasses 251 municipalities, from which 17 have a town status. it is divided into seven districts: Dunajská Streda, Galanta, Hlohovec, Piešťany, Senica, Skalica, and Trnava. The largest is Dunajská Streda, with 25.9% of the region's surface area, and the smallest is Hlohovec, with 6.4%.

In terms of population, the region is smallest of all Slovak regions. With 562.372 inhabitants (in Januray 2017), and a density of 135.16 inhabitants/ km^2 Trnava is the second most densely populated region in Slovakia. The population density varies between the districts within the region. Most inhabitants, averaged per 1 km^2, live in the Trnava district (175 inhabitants). The lowest population density is in the Senica district where, on average, 89 inhabitants live per km$^{2.}$. The level of urbanization is around 49%, represented by inhabitants living in the 17 towns. Trnava Region is one of the most rapidly developing areas in the country, having an umployment rate of 4,6 % , just below the national average.[1]

Figure 1 Trnava strategically localtion in Slovaquia

2.2 Territorial challenges

The region is quite productive in both industry and agriculture.

The Trnava region is one of the most productive agricultural regions in Slovakia (second to the Nitra region). Agricultural land accounts for 69.9% of the total land area. Its arable land index (89.7%) is the highest of all Slovak regions. The production capacity of agricultural land in this region is very good. The breakdown of land under crops reflects this as well, with the majority growing cereals, oil plants, sugar beet and multiannual fodder crops, achieving the highest yields per hectare among all regions of Slovakia. Livestock production complements the plant production, with a significant proportion used for cattle and pig rearing.

Nowadays Trnava Region and in particular the city of Trnava belongs to the most rapidly developing areas in Slovakia. Almost all industrial activities are represented in this region, with strong industrial investments (e.g. Peugeot-Citroën, Samsung, Johns Manville). The proximity to the capital city of Bratislava is an asset, as many Trnava residents travel daily to work there. The territorial distribution of industry is uneven, with the northern and central part being industrial and the southern part agro-industrial in nature. Food production (milk and dairy products, meat and meat products, sugar, confectionery and sparkling wines) has developed

[1] EURES The European Job Mobility portal https://ec.europa.eu/eures/main.jsp?countryId=SK&acro=lmi&showRegion=true&lang=en&mode=text&regionId=SK0&nuts2Code=%20&nuts3Code=null&catId=2813

in connection with the primary agricultural production. A large part of production in the region consists of the manufacture of computer, electronic and optical products and motor vehicles. The major industries include the production of metal structures; production of machinery and equipment not classified elsewhere; production of chemicals and chemical products; production and processing of metals; production of basic pharmaceutical products and more.

Urban growth causes strong environmental problems in the area - air and water pollution, agricultural land take and low ecological stability of landscapes. The adjacent area to the city of Trnava represents intensively managed large-scale farmland.

The city of Trnava (LAUSK007L1) it is one of the oldest and most beautiful mediaeval towns in Slovakia. Trnava, is a significant transportation hub from the perspective of national and international transport. It includes road, railway and river transport. The largest routes cross the region, from Bratislava through Trnava to Žilina and from Hodonín through Trnava to Nitra. Railway transport covers the major routes, such as Bratislava – Žilina and the electrified single-track line from Trnava – Galanta and Trnava – Kúty, which connects to the southern railway heading to the Czech Republic. The Bratislava – Galanta – Štúrovo line is also important. The construction of the Gabčíkovo dams substantially improved the shipping conditions on the Slovak part of the Danube.

3 The GI network and its potentialities for territorial development in Trnava Region

3.1 What is the approach to GI and Ecosystem Services

In the Slovak Republic the GI is adopted as a territorial system of ecological stability (TSES), which is also legally anchored. Compared to other countries, besides the creation of an ecological network, this concept includes also the proposal for ecostabilization measures, that reflects the need for efficient use and protection of ecosystem services.

GI principles are included within sectors of land use and spatial planning; climate change mitigation and adaptation; environmental protection; cultural heritage; health; social services and rural development. Transportation; agriculture, forestry and fisheries; disaster prevention; finance and energy were policy sectors that weren't considered as including elements important for green infrastructure in Slovakia[2].

The main services provided by the current GI network in the Trnava Region are: biodiversity protection, maintenance of ecosystem services, cultural, wellbeing and health, and more specifically, spatial stabilization of the landscape, climate regulation and landscape aesthetics.

The concept of Landscape -as conceived by the European Landscape Convention- has a particular relevance within the Slovak approach to GI.

[2] National Fact Sheet Slovakia Annex IV of the Draft Final Report

The main opportunities for GI development are identified as: economic investment, territorial planning, local community, legislative instruments (since in Slovakia the creation of the TSES is determined by law). However, agriculture, sustainable forest management, organic farming is not recognized as an opportunity by the consultated stakholders.

In Trnava region the GI and Ecosystem Services concept and approach are included in current policies and or strategic plans, formally by: the TSES, basic document about environment, its quality, proposal of ecological network (within the urban planning framework), the Integrated Environmental Management Action Plan, and the Urban plan. And informally by Local Agenda 21 and the Eeconomic and Social Development Plan.

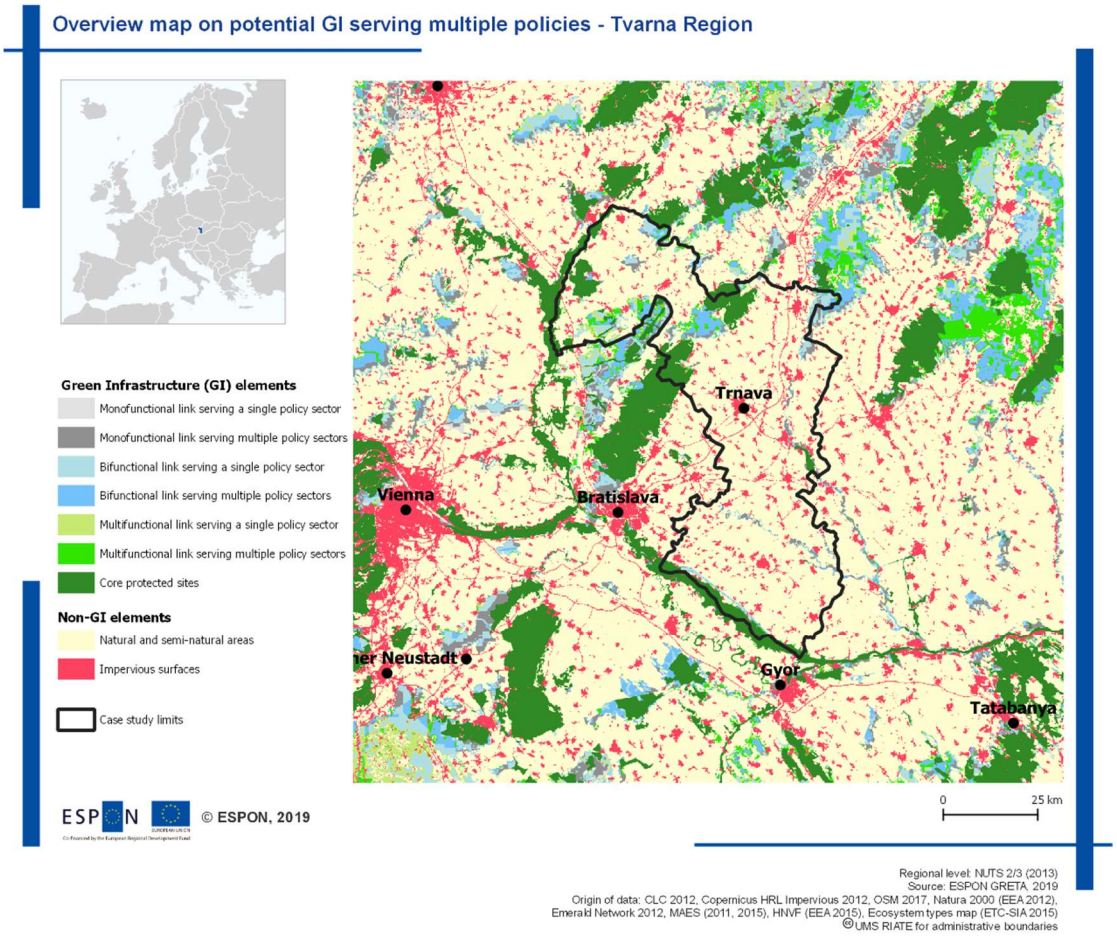
Trnava region has an Urban Green Infrastructure mapping, a Climate Adaptation Strategy that defines the region vulnerability and its adaptation potential, and a Biotope mapping specially interesting for ES delivery in the periurban area**.**

In the Trnava Region there is updated spatial data being developed in 2014 on Ecosystem services, Land cover/land use data, Green urban areas inventories, Protected areas/nature parks/areas of special ecological value. This information materializes in an active landcover map (i.e. editable shape files) with 1:10000 resolution.

This information is available in the central government's web page (Geoportal, 2018).

There is also a methodological guidance for spatial planning published by the national institute for urban planning (URBION, 2009). It provides more GI related information, like share of woody plant land cover, share of vegetation surface or so called 'impermeability index'. A tool that is supposed to facilitate the climate change adaptation in spatial planning process by maintaining more permeable land in urban areas.

3.2 Benefits of GI and ecosystem services for smart, sustainable and inclusive territorial development;



Map 3. Trnava Region of GRETA case study. Overview map on potential GI serving multiple policies.

Potentialities for GI network in Trnava Region.

Potential GI covers about 16% on the region, concentrated in few spots. However, broadening the scope, it could be observed that there are large corridors, which include the connection between Vienna and Bratislava.

- This case study reflects the need to consider the different scales since from a broader perspective there is a good network of GI. However, when zooming at the Trnava region the limitations emerge
- Most of the Trnava region has a very low coverage of GI, concentrated in few spots, and part of a larger network that extends its borders. Agricultural areas, currently not included in the potential GI, could play an important role increasing the connectivity and availability of GI at landscape level. This would require appropriate agricultural practices, and land management, to have such a role on improving connectivity of GI. Moreover, ensuring connectivity with rivers, which already contribute to the potential GI, could improve its coverage.

In terms of integration of protected areas, although the potential GI integrateds most of the protected areas, there are still some spots that remain isolated. About half of the GI is covered by protected areas.

- The potential GI does not ensure the integration of all protected areas. Therefore, the efforts should focus on connecting these isolated spots and consolidating areas not protected that already contribute to the GI.

The potential GI, and related ES, have a limited capacity to support the three policies, in particular climate change and water manageme. Biodiversity is the policy objective best covered by the different ecosystem services.

- Multifunctionality is very limited since most of the area is only capable to support one or two policy objectives. The existing capacity to support biodiversity should be consolidated, indicating future actions to integrate other natural and semi-natural areas. More detailed information, at local level, would be required to confirm where specific ecosystem services could be improved by appropriate management.

In relation to the synergies and trade-offs between the ES, most of the ES have a neutral relationship, i.e. there is no interaction or no influence between ES.

- There are no spatial issues related to synergies or trade-offs. It is not expected that improving certain conditions would have no side effects on other ES.

At the city level, the share of green urban areas inside the city and in peri-urban area is relatively high (about 76%). However, there is no continuity between the city and the peri-urban area since, in the later, the GI mostly concentrates on the most external area. Green urban areas slightly decreased between 2006 and 2012.

- Share of green urban areas inside the city and in peri-urban area is relatively high (about 76%). However, there is no continuity between the city and the peri-urban area since, in the later, the GI mostly concentrates on the most external area. Green urban areas slightly decreased between 2006 and 2012.

4 Capacity of GI network in Trnava to meet the demand of ES

Cost-Benefit Analyses have been used in the decision-making process when deciding about best ways to manage or invest in GI- particularly as ex-ante and also ex-post evaluation. The analyses have been undertaken mainly for: recreation, biodiversity and health.

4.1 What do GRETA analysis on ES supply and demand reveal?

GRETA have explored the capacity of GI network to meet the demand of ES where:

ES supply is defined as the capacity of ecosystems to provide ES, irrespective of them being used.

ES demand can be defined as the amount of a service required or desired by society in a given location and time. This demand depends on several factors such as socio-economic conditions, cultural/behavioural norms, technological innovations, availability of alternatives, among others.

	ES Supply – benefits provided	ES Demand -specific definitions	Approaches to quantify Demand
Regulating services	Benefits are provided by maintaining desirable environmental conditions	Amount of regulation needed to meet target conditions	Reduction of risk
Cultural services	Benefits are provided by experiencing the natural environment	Desired total use (if rival service) or individual use (if nonrival service)	Preference and values // direct use
Provisioning services	Benefits are derived from consumption of final goods	Amount of goods obtained per unit of space and time or per capita	Direct use // Consumption

Table 1 Relation between benefits provided by ES supply and the corresponding ES demand definitions and operationalisation approaches. Adapted from: Villamagna et al., 2013 and Wolff et al., 2015.

Demand for **regulating services** can be defined as the amount of those environmental conditions that ensure the provision of a desired regulation level. A reduction of risk approach has been usually applied to quantify demands for these services. Vulnerability to potential changes in regulating services may provide valuable insight into society's needs capturing main linkages from the socio-ecological system.

Demand for **cultural services** has been mostly assessed by preferences and values for attributes of certain landscapes, ecosystems or heritage sites. Preferences may be either quantified through stated preferences that relate to the desired level of services, or through revealed preferences (a proxy for the actual use of the service). Demand for cultural services has also been assessed by the direct use of a specific ecosystem, e.g. for recreation. This can be quantified by total visitor days per year or the number of fishing/hunting licenses, the presence of tourists or accounting the accessibility or proximity to recreational areas.

Demand for **provisioning services** has been quantified based on direct use and consumption of final. It is worthy to note that there is normally a spatial mismatch between the area where the service is provided and the area where the service is consumed, especially true for provisioning services. For this reason, interregional linkages have to be considered in order to properly identify faraway dependencies and assess magnitude of potential impacts

Following the proposed conceptual framework, we have combined demand and supply for each of the selected ES. The focus of this approach was to highlight those areas where there is a high demand and a low supply, i.e. those areas where GI is unable to cover the ES demand. It should be noted that these results are of a more exploratory nature in the whole GRETA project considering the following limitations:

- This is a research area still under development;

- There is need for a higher resolution of the data sources given the nature of the phenomena analysed;
- Balance between supply and demand is semiquantitative; and
- In some cases, a more sophisticated modelling would be required to have an appropriate quantitative balance.

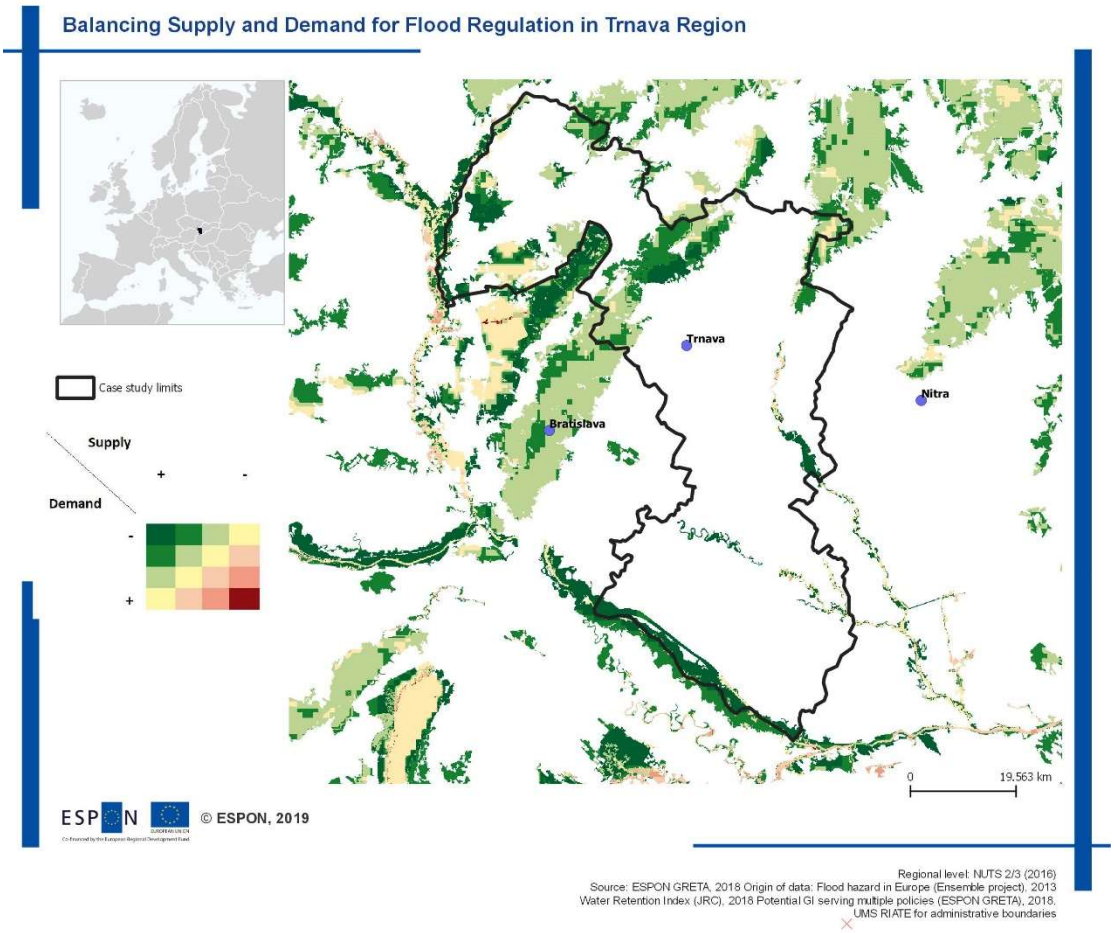
Therefore, these results should be seen as illustration on how this demand and balance could be approached.

4.1.1 Analysis of supply and demand for Flood Regulation in Trnava

We have quantified demand for flood regulation based on the potential flood hazard. Exposure is described by the projected potential flooding risk[3]. On the other hand, benefits are provided by the water storage capacity of land to regulate floods. The supply for flood regulation is quantified by the Water Retention Index, which assesses the capacity of landscape to retain and regulate water passing through. This index is dimensionless and considers the role of interception by vegetation, the water-holding capacity of the soil, and the relative capacity of both the soil and the bedrock to allow percolation of water. The influence of soil sealing and slope gradient are additionally considered.

Map 4 presents a semi-quantitative analysis of the balance between supply and demand for flood regulation in Trnava. Dark green areas are those with maximum capacity of supply and demand is very low. These conditions are met in the core protected areas and north-west part of the region where natural and semi-natural areas (i.e. agricultural land) are more prominent. The other parts of the area that are still green could be considered areas where the balance tend to be positive, in the sense that the supply is slightly higher than the demand. In practical terms it would mean that improving or reinforcing GI with the objective of water retention will have a substantial benefit.

[3] for the period 2011-2044 that results after applying the LISFLOOD model from the ENSEMBLES project



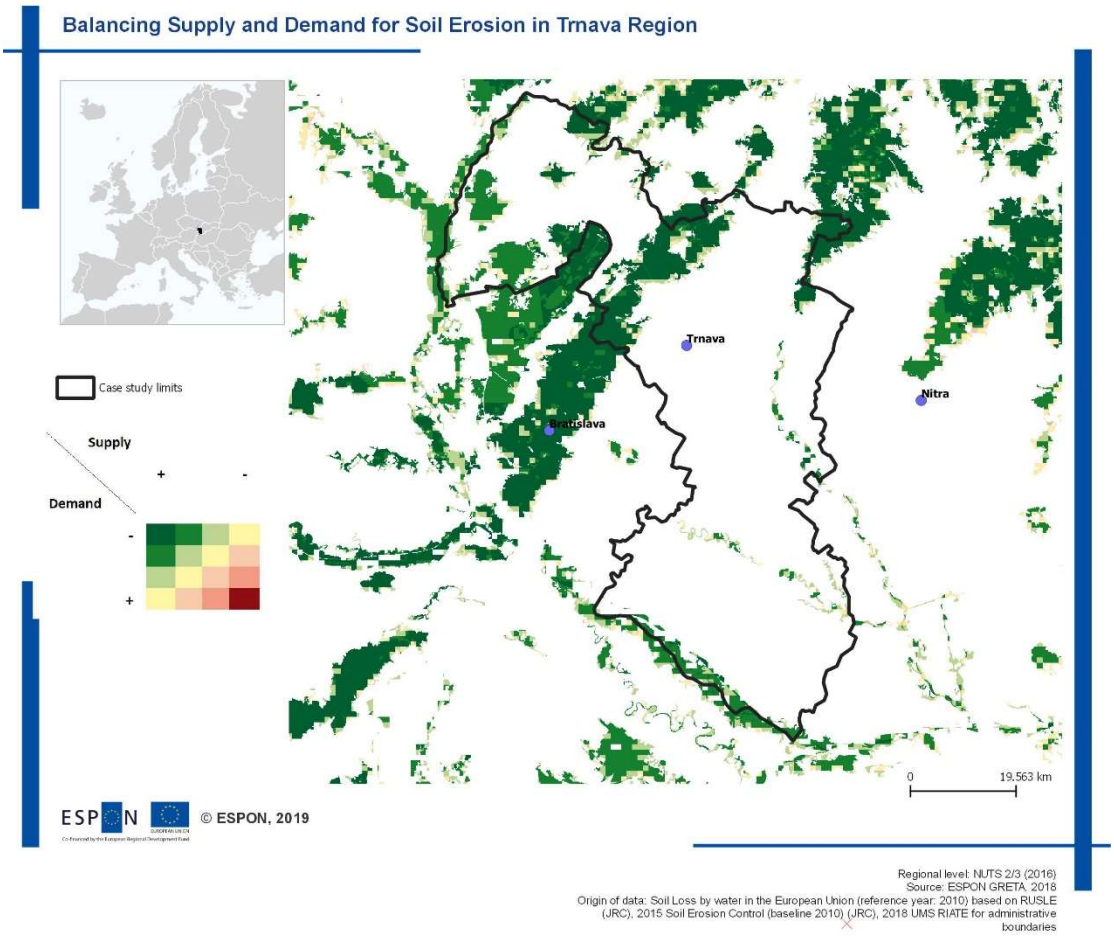
Map 4 Balancing Supply and Demand for Flood Regulation in Trnava.

4.1.2 Analysis of supply and demand for Reducing Soil Erosion in Trnava

We have assessed the demand for the reduction of soil erosion by water producing a negative impact on several ES; in particular to the ones related to crop production, drinking water and carbon stocks. Soil erosion by water is mainly affected by precipitation, soil type, topography, land use and land management. Exposure is described by the soil loss rate[4] (t ha^{-1} yr^{-1}). Benefits are provided by the capacity of vegetation to control or reduce erosion rates. The supply is quantified by the Soil Erosion Control dataset (JRC) that describes the capacity of ecosystems to avoid soil erosion.

From the resulting Map 5, we can observe that the GI network supplies high capacity to control or reduce soil erosion rates. Thus, no specific policy action may be required..

[4] as estimated by the modified version of the Revised Universal Soil Loss Equation (RUSLE) model



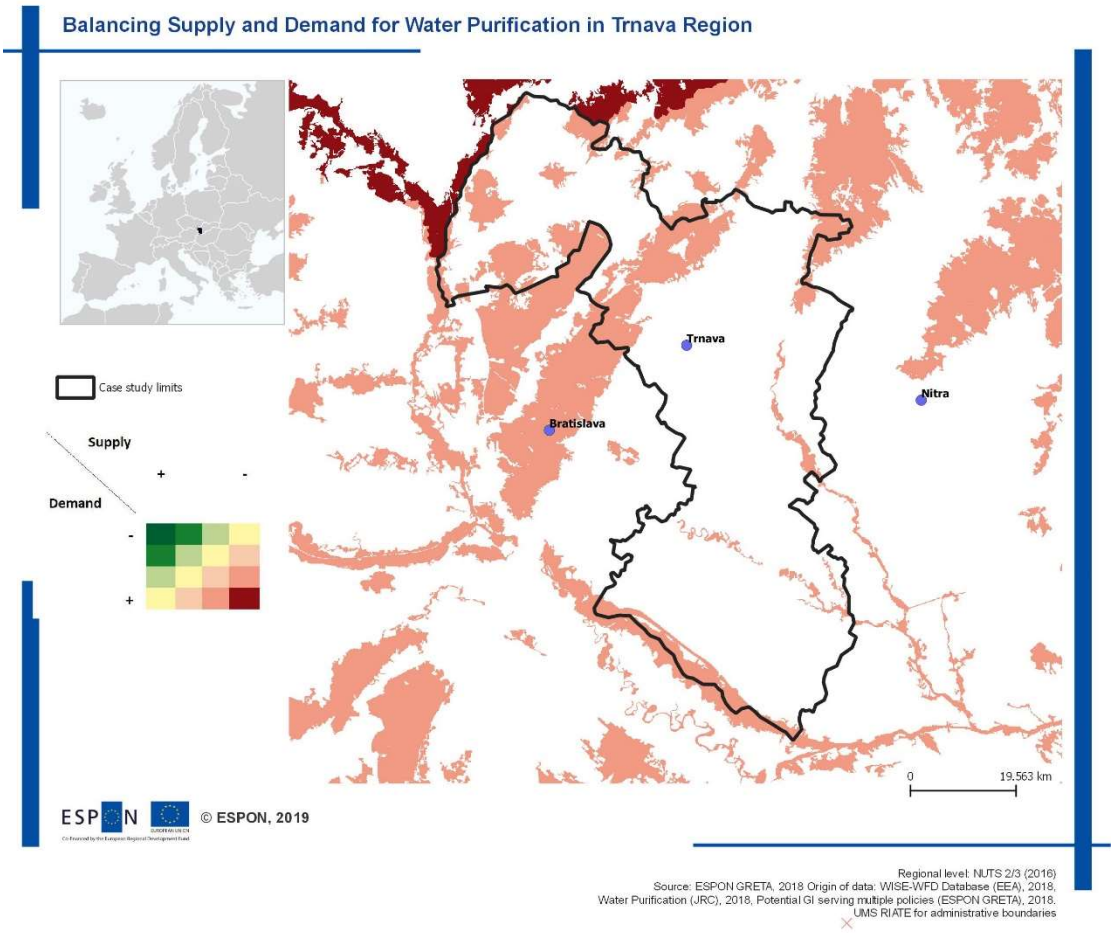
Map 5. Balancing Supply and Demand for Soil Erosion in Trnava

4.1.3 Analysis of supply and demand for Water Purification in Trnava

We have quantified demand for water purification based on the level of pollutants emitted to freshwater ecosystems by polluting sectors, primarily agriculture and waste water treatment discharges from industry and households. Exposure is described by mean annual concentration of nitrates in water [5](. The supply is quantified by the Water Purification dataset (JRC) that assesses the in-stream retention efficiency of ecosystems to dilute or degrade nutrients.

Resulting **¡Error! No se encuentra el origen de la referencia.** shows that water pollution is still a big challenge and substantial increase on the provision of water purification by the GI network is still required under current status in most of the study area, hus, specific policy action may be benficial.

[5] tonne per year) captured in monitoring stations and aggregated by rivers (the WISE-WFD database)

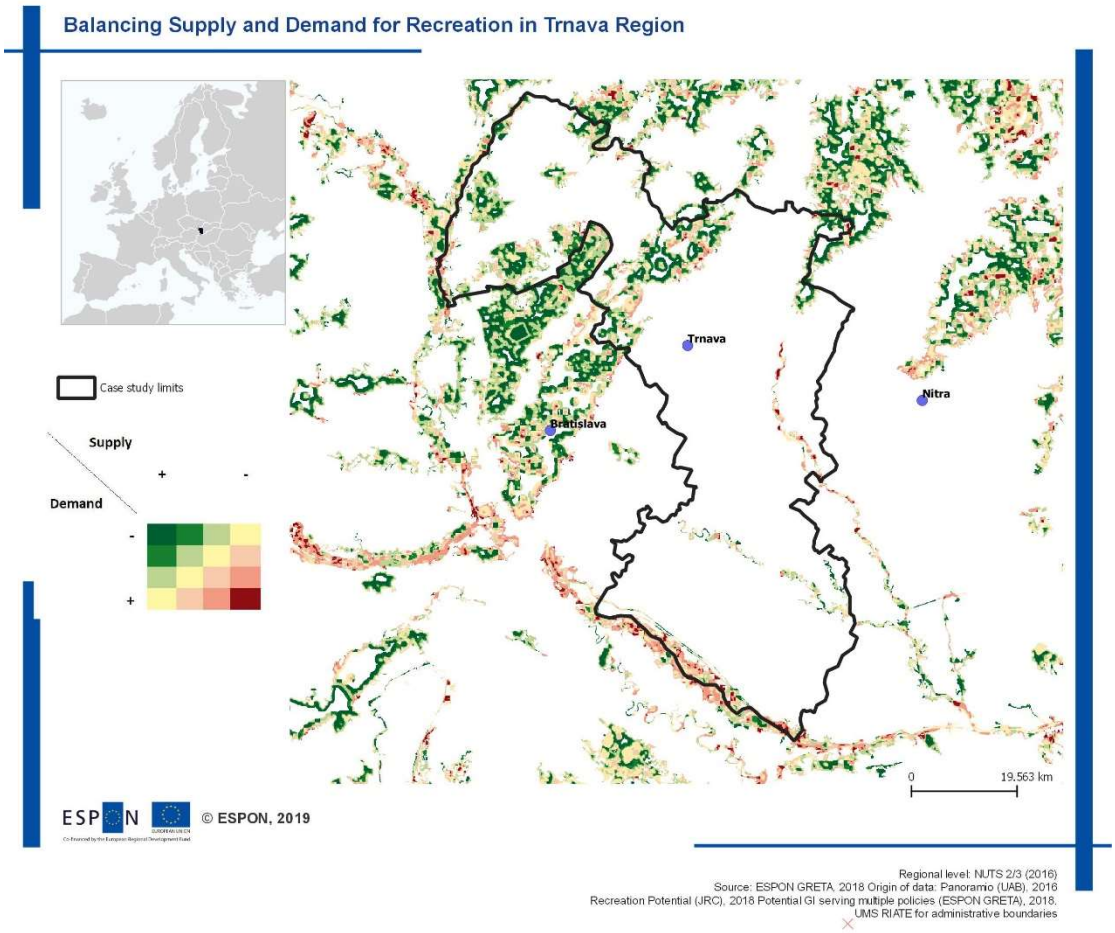


Map 6. Balancing Supply and Demand for Water Purification in Trnava

4.1.4 Analysis of supply and demand for Recreation in Trnava

We have described demand for recreation by means of a proxy for visitation. Recreation and tourism are important elements for national and local economies, that also contribute to other intangible benefits. Recreation directly depends on environmental attributes like species richness, diversity of habitats, and climate. The usability of crowd-sourced information by means of location photographs has already been shown to be as a reliable proxy for visitation rates to recreational sites. We have used the location of photographs in Panoramio as a proxy for landscape attractiveness for visitors. Demand is quantified by the number of pictures per square km. On the other hand, supply is described by the Recreation Potential dataset (JRC) that quantifies the potential for citizens for outdoor recreation.

The resulting **¡Error! No se encuentra el origen de la referencia.** does not show a clear pattern but a diversed mixed of areas where supply meet the demand together with areas in need for reinforcing supply. This situation is hardly explained as direct link with population density so further analysis may be required to understand the pattern.



Map 7. Balancing Supply and Demand for Recreation in Trnava

5 Governance practices, policy and planning instruments to implement GI and enhance ecosystem services in Trnava Region

Existing policies, planning instruments and initiatives

There is no direct national policy or strategy for green infrastructure (GI) in Slovakia. Instead, GI is included in different sectoral policies and strategies like the updated National Biodiversity Strategy 2020 (2014), the updated Wetlands Program 2015-2024 and the Environmental Strategy of the Slovak Republic 2030, which is currently undergoing a strategic environmental assessment (SEA) process. Consequently, Slovakian GI strategy is based on already existing legislations, policies and governance measures. This in line with the EU Green infrastructure strategy (2013, p.10).

Above mentioned strategies and programs acknowledge the multifunctional benefits of GI, especially its benefits to climate change adaptation as well as for nature and biodiversity protection. The National Biodiversity Strategy for 2020 (2014) acknowledges GI as one of its main target areas. GI is seen as an explicit tool to ensure ecosystem preservation and to enhance ecosystem services.

For spatial planning processes on national and regional levels the National Building Act and The Act N0.543/2002 on Nature and Landscape Protection regulates the placement of green spaces, and the green networks of the so called Territorial System of Ecological Stability (TSES). GI related elements are regulated as an obligatory part of spatial planning process at the national and regional level through this instrument. In addittion, to national guidelines and regulations, there are various GI related local projects and initiatives which facilitate the implementation of GI in Slovakia. (BISE, 2018)

In Trnava region the GI and Ecosystem Services concept and approach are included in current policies and or strategic plans, formally by: the TSES, basic document about environment, its quality, proposal of ecological network (within the urban planning framework), the Integrated Environmental Management Action Plan, and the Urban plan. And informally by Local Agenda 21 and the Eeconomic and Social Development Plan.

There are also some building regulations and so called “coefficient of vegetation areas” available in Slovakia that notice the importance of green space when developing areas in to housing, commercials or other built up land in the spatial planning process. The National Building Act regulates for example the placement of green spaces, important landscape elements and other elements of the Territorial System of Ecological Stability. This system is a type of ecological network with GI elements like connectivity of core green areas, so called ‘bio-centres’.

Governance and decision making framework

In terms of governance and decision-making framework, in the Slovak Republic, the TSES is legally enshrined in Act No. 543/2002 Coll. on nature and landscape protection and its creation is an obligatory part of the land-use planning documentation and also part of the land modifications projects, through these documents it gets into real practice. Documentation may only be processed by professionally qualified person. Subsequently, the project regulations are transferred to land-use planning documentation and land modification projects. The land-use planning documentation is a binding development document for municipalities and regions. This model is also applied in the territory of our case study.

The existence of too many sectoral plans is perceived as a policy challenge.

Based on the GRETA National Fact Sheet for Sloakia[6] municipal policy and stakeholders, followed by the national policy and stakeholders, have the main responsibility for *developing* the GI policy and strategy in Slovakia. Actors within research followed by regional policy and stakeholders were considered also relevant actors for developing GI policies and strategy. NGOs and business community were ranked as the fifth and sixth relevant body for developing

[6] Nationa Fact Sheet Slovakia p XX Annex X of the Draft Final Report

GI policy in Slovakia. European policy and stakeholders were considered to have least responsibility.

The *implementation* of the GI policy and strategy is considered a national responsibility. Municipal policy and stakeholders followed by regional policy and stakeholders were considered to have the second and third highest responsibility. Also, actors within NGOs and research were stated to have somewhat important role for implementing GI policy and strategy. The business community and European policy and stakeholders were considered as having the least responsibility.

6 Lessons learned and good practice examples from the Trnava Region

Challenges and opportunities

Many of the GI aspects have been included in the national spatial planning and decision-making process in Slovakia. However, the respondent to the GRETA-questionnaire states that the implementation of GI, especially in urbanised areas, is still lacking behind. For the implementation to take place, the respondents ask for more methodological support from national level. Also, good practice examples and more guidance for methodology to elaborate GI strategy on local levels would be needed. Important to provide evidence on GI broad benefits and cost-effectiveness to compare with the most traditional technical “hard” solutions – in relation to investment.

Institutional promotion and motivation (from the public administration) is needed, by means of incentives and financial support (i.e. small grants), the public administration as main tractor and co-investor.

Need for private funding as well i.e offsetting.

Good practice examples

The Trnava Region is very active in the analysis of ES- being involved in FPVII EC research projects such as Openness project[7] Operationalization of Natual Capital and Ecosystem Services.

[7] http://www.openness-project.eu/

7 Policy messages and recomendations in Trnava Region

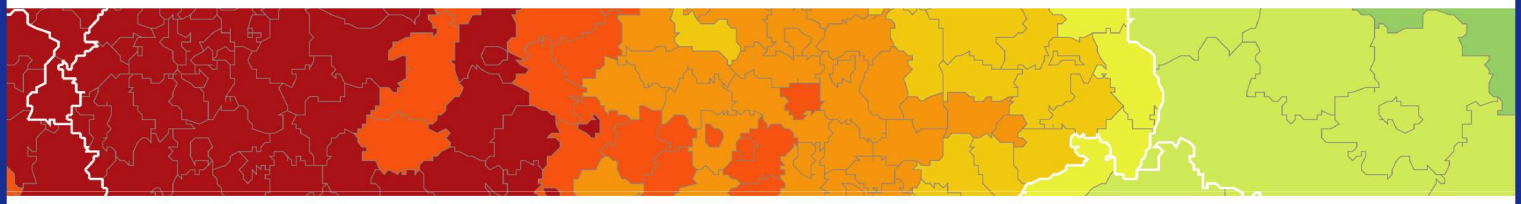
Messages in terms of GI and ES evaluation process:

- Integrated regional perspective is crucial – and the prominent role of the TSES. For spatial planning processes on national and regional levels the National Building Act and The Act N0.543/2002 on Nature and Landscape Protection regulates the placement of green spaces, and the green networks of the so called Territorial System of Ecological Stability (TSES).
- It is important to analyse future demand for main groups of ES (more stakeholders involved, more methods...)
- There is a need for a broader discussion between researchers and planners towards knowledge based decision making.
- Inconsistencies between spatial resolution of biophysical data and urban planning data are seen as constraints for GI development and moreover for tis implementation–There is need to find appropriate spatial resolution, with a multiscale approach.
- Although the selected policies in the GRETA network evaluation are perceived as the most relevant ones the resulting maps are not detailed enough to show all existing or potential networks, and for making decisions and spatial planning more level of detail is inevitable. i.e. larger scale map would be needed.
- Need for ES valuation in more quantitative way (biophysical, financial, value-based ...)

8 Apendix

The below table give an overview of the stakeholder engagement.

Type of stakeholder	**Workplace**	**Type of interaction**	**Date**
Technical expert	Researcher/academia	Baseline information on case study	21/03/2018
Technical expert	Researcher/academia	Responses to Consultation A	14/06/18
Technical expert	Researcher/academia	Responses to Consultation A	26/06/18
Policy maker/ decision maker	Regional level	Responses to Consultation A	26/06/18
Technical expert	Researcher/academia	Responses to Consultation A	10/07/18
Technical expert	Researcher/academia	Responses to Consultation A	10/07/18
Policy maker/ decision maker	Regional level	Responses to Consultation A	19/07/18
Technical expert	Researcher/academia	Responses to Consultation B	18/09/18
Technical expert	Researcher/academia	Responses to Consultation C	18/09/18



ESPON 2020 – More information

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