

# DELIVERABLE D.T1.6.1

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CONCEPT OF LOCAL TRAINING FOR  
PROFESSIONALS OF ENVIRONMENTAL  
MANAGEMENT AND LAND USE PLANNING

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Version 1  
06.2018

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RUDA Śląska



LANDESAMT FÜR UMWELT,  
LANDWIRTSCHAFT  
UND GEOLOGIE





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## B. Context

In the current period the concept of local training for professionals of environmental management and land use planning has been prepared to be used for national training sessions in the partner countries of the LUMAT project. It is based on the results of training seminars of partnership and on country-specific national policies and conditions. The aim of the internal trainings was to obtain the knowledge which is needed to prepare and organise local training sessions in FUAs.

The concept is based on four modules that cover the most important issues for professionals of environmental management and land use planning in FUAs:

- Building of FUA identity,
- Ecosystem services
- Interactive tools for citizen involvement
- Reduction of land-use conflicts.

The concept has been prepared by PP7 STUBA in two formats: lectures and workshop format. The partners can choose which format is suitable to be used in the partner countries for local trainings.

All four modules have been elaborated as presentations of the topic in powerpoint as ppt-files and support to the trainers of national trainings has been prepared in the form of the file Guidelines/Advice to the trainers that have been elaborated in the proposed structure: Tasks for self-study of the trainers, Training methodology with explanation what training objectives should be reached, Training materials that should be used for the chosen training format. In addition to the logistics of training the Comment/advise to the trainers has been added to each slide in the ppt file.

The training materials will be translated into 6 national languages (CZ, DE, IT, PL, SI, SK) and provided to the participants of the Local training on FUAs integrated environmental management.

## C. Functional Urban Areas - FUA Identity

The training materials have been prepared by dr. Justyna Gorgoń (IETU).

The aim is to define FUAs identity with respect of its characteristics and with reference to the methodology (OECD/ national).

The scope of the training is:

- > FUAs definitions,
- > FUAs typology,
- > FUAs delimitation and criteria for FUAs identity,



- > Discussion on criteria selection,
- > FUAs Identity (interactive exercise based on FUAs presented in the Project),
- > Conclusions on further steps in building FUAs identity.

The objective of training on FUAs identity has been to present framework and criteria for defining FUAs according to its characteristics and with references to the appropriate methodology (OECD and/or national). Identity of FUAs could help create (and evaluate) strategy and others documents focused on FUAs development.

The training seminars of partnership have shown that in addition to the problematized aspects of FUA identity, the joint environmental strategies meeting the climate change challenges can play important role.

#### D. Ecosystem services

The training materials have been prepared by Prof. Maros Finka (STUBA)

The training is composed of introductory lecture and interactive session.

Introductory lecture was prepared by prof. Maros Finka:

- > ecosystem services approach as a framework by which ecosystem services are integrated into public and private decision making
- > environmentally oriented land use planning
- > urban landscape quality and ecosystem services as a phenomenon of urban life quality
- > position and structure of ecosystem services management instruments in integrative planning systems.

Interactive session is focused on:

- > Factors of urban landscape quality.
- > What is the city of the best quality about?
- > Setting priorities of urban life quality factors.
- > Choosing the priorities from the point of view of different groups of stakeholders.
- > What are ecosystem services about?

Professional knowledge and common understanding will be developed in:

- > awareness about the services provided by ecosystems of the FUAs
- > awareness concerning the potential of the ecosystem services concept in planning and management of FUA sustainable development
- > practical use of ecosystem services concept as a basis for nature closed solutions of main problems connected with climate change and problems of urban sprawl.





## E. Interactive tool for citizen involvement - InVito

The training materials have been prepared by Elena Masala and Matteo Tabasso.

The scope of the training covers:

- ✓ Functionalities of InVito
- ✓ Opportunities offered by interactive visualization tool InVito
- ✓ Practical session - how to use and adapt InVito tool to the different FUAs

Professionals' knowledge and common understanding will be enriched by

- ✓ providing information about the logic of InVito concept and mediated the best practice examples
- ✓ improving the understanding of the interplay between ecosystem services planning in FUAs and multilevel governance concept
- ✓ supporting the perception of both concepts as a part of the integrated and iterative approach
- ✓ increase of capacity of stakeholders to be involved in the decision-making providing proper platform for visualisation and better understanding of the objects for the decision.

## F. Reduction of land use conflicts

The training materials have been prepared by dr. Justyna Gorgoń (IETU).

Classification of land-use conflicts in its FUA according to:

- ✓ Framework for classification of land-use conflicts
- ✓ Toolbox proposed
- ✓ Proposal of methods for conflicts resolution

The training of partnerships was closed by a second session of the training seminar on LUMAT tools, with the presentation of a grid to evaluate LUMAT identified soil threats, proposed by the German partner Saxon State Office for Environment, Agriculture and Geology, as WP.T2 (Urban/Peri-Urban Action Plans, Strategies and Tools) responsible partner.

The results of trainings will be reflected in the participatory process of Action Plans and Strategies development and implementation as the knowledge and skills of stakeholders involved are crucial for efficient achievements of strategic goals.



## G. Annexes:

1. FUA Identity: Training Concept and Training Material
2. Ecosystem services: Training Concept and Training Material
3. InVito: Training Concept and Training Material
4. Reduction of Land-Use Conflicts: Training Concept and Training Material



# 1. FUA Identity: Training Concept and Training Material

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# TRAINING MATERIALS ON IDENTITY OF FUNCTIONAL URBAN AREAS

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Version 1  
03.2018

Author: LP: Justyna Gorgoń;



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA OKOLJE IN PROSTOR



MESTNA OBČINA KRANJ



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## B. Context

Training sessions on FUAs identity as well as Reduction of land use conflicts took place, during the project meeting in Trnava 21.03.2017) and in Torino 26.09.2017. These two trainings has been prepared by Justyna Gorgoń (IETU), first one was dedicated to the identity of Functional Urban Areas, the second one has been focused on Conflit's resolutions. These two internal tranings for project partners were prepared in order to discuss the key issues of the topics as a basis for local trainings in the Project partner countries planned for regional/local management of environmental and land use planning bodies.

The aim of these internal trainings was to develop the information and methods which are needed to prepare and organise local training sessions( in partner countries).

Based on the internal trainings the training material and outcomes of seminar has been produced. The training materials will be translated into 6 national languages (CZ, DE, IT, PL, SI, SK) and provided to the participants of the trainings for local/regional stakeholders involved in integrated environmental management and land- use planning.



## C. Training Material on identity of FUAs

### TRAINING MODULE 1 -FUAs IDENTITY

#### INTERACTIVE WORKSHOP

#### C.1 GUIDELINES TO THE TRAINERS

This training activity proposal offers a training mode suitable for local/ regional stakeholders, skilled on integrated environmental management, professionals, planners and decision makers. The goal is to present framework and criteria for defining FUAs according to its characteristics and with references to the appropriate methodology (OECD and/or national). Identity of FUAs could help to create (and evaluate) strategy and others documents focused on FUAs development.

Before you attempt to study or to deliver this module, please familiarize with LUMAT Project. Please make sure that you understand the Project concept, and recognize its specific within the context of your country. Use also your professional knowledge and experiences to illustrate the points and findings arising from these presentations.

#### C.2 TARGET GROUPS

This module is formulated to address the broad representatives of the key stakeholders groups involved in the development of the Strategy as well as others plans and documents supporting sustainable development of functional urban areas. The use of the training material for your local (regional) audience requires its adaptation and flexibility according to country conditions

Target groups	Description of target groups
Local public authority	Representatives of municipalities and inter-municipal organisations in the selected FUA responsible for economic environmental and spatial development.
Regional public authority	Representatives of regional councils or planning bodies where the project functional urban areas are located and of other regions of similar problems.
Sectoral agency	Environment Agencies, Agriculture Agencies, Local Development Agencies.
Higher education and research	Representatives of urban planning and environmental protection departments in universities
Infrastructure and (public) service provider	Departments for traffic networks in FUA including bicycle and walking routes, waterways. Service providers from urban and



	landscape architecture.
Plannig bodies	Institutes, departments or agencies involved in planning procedures and preparation o planning documents.

## C.3 TASKS FOR SELF-STUDY OF THE TRAINERS

To improve the trainers` preparation it is recommended to complete the content with national specific issues and FUAS delimitation methodology.

For the self study we recommend the following:

- The LUMAT project`s deliverables:  
( (<http://www.interregcentral.eu/Content.Node/LUMAT.html>)
- National/ regional specific materials reffering to the concept of FUAs The the strategic materials concerning present situation on your FUAs (delimitation, surface, population, identified problems, etc.)
- Methodological material on FUAs ( based on OECD and national documents)

These are some other tasks we recommend you undertake:

- Discuss with others ( Project`s partners ) what are the main political and methodological approaches in the field of FUA management
- Survey the available books, WebPages( e.g. EEA, ESPON) , articles, concerning the role of FUAs in your country / region, and framework for integrated FUAs management.

## C.4 METHODOLOGY OF THE TRAINING

### Training Objectives

The main task of the training activity is to define (or verify) FUAs identity based on presented criteria, and to draw up development priorities based on common features, problems and threats as well as on assessment of development capabilities of FUAs.

### Training Materials

- The Powerpoint presentation with the main ideas to the topic
- 3-4 copies of FUAs maps (with administrative limits, main urban center, key transport`s communication, etc.)
- The tables/ matrix (A3 paper x according to the number of working groups) with FUAs criteria elaborated by national LUMAT team (matrix tables has been prepared after Trnava workshop).
- Brief information on FUA in the context of spatial planning and integrated environmental management

### Training Format

Interactive workshop






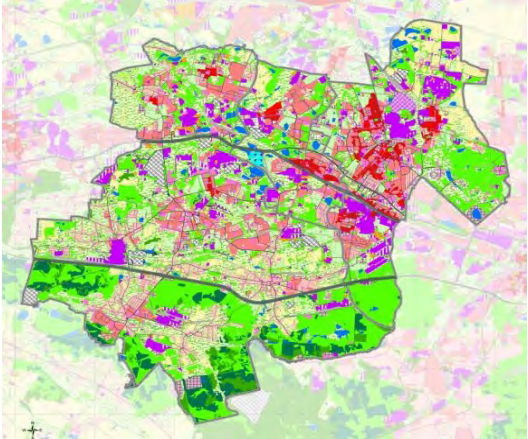
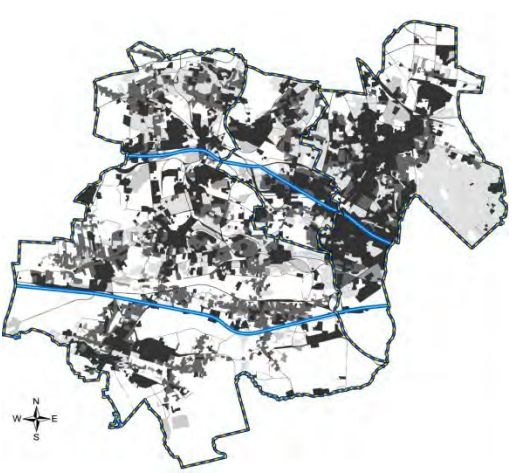
## Training Methods

- Power point presentation- explanatory comments
- Brainstorming on FUAs criteria (on small 4 working groups)
- Critical discussion on groups outcome
- Team work on FUAs identity as a basis for its development

## Logistics

- Max capacity 20 trainees
- Trainers 1 leading + 2 assistants
- Room with 5 tables and 24 chairs
- Screen and laptop with connected projector
- Wall board/ flipcharts, markers 3 colours
- A3 paper' matrix with criteria elaborated for FUAs identity ( based on outcome from Trnava workshop)
- Sheets of paper 5x5 cm (post-in) coloured 300 pcs,
- Time slot: 20' /45' / 20' / x 45' (minuts)












Activity	Basic content of the activity	Comment for the trainer
		<p>Introducing the LUMAT project, the people involved and the trainer is the first step for including people in the project.</p> <p>This should be immediately followed by asking people to present him/herself providing a short description of the reason why he/she is present to the event.</p>
2	Terminology	Trainer presents basic definition and terminology related to FUA, sustainable land-use nad Integrated Environmental Management

	<p><b>BASIC DEFINITION</b></p> <p><b>Functional Urban Area:</b> Spatially continuous settlement system consisting of units separate in administrative terms. An urban functional area covers a compact urban area (core) with a functionally linked urbanized zone.</p> <p><b>Sustainable Land Use:</b> Covers all activities concerned with the management of land as a resource both from an environmental and from an economic perspective.</p> <p><b>Integrated Environmental Management:</b> Aims to improve the environmental performance of an urban area contributing to a better quality of life.</p> <p>         TAKING COOPERATION FORWARD     </p>					
<p>1.</p>	<p>Brief information on FUAs characteristic maps</p>  	<p>The participants obtain the brief information on FUA, which they have to read. The text in national language is explanatory and provides basic information about the FUAs in different countries. The definition of functional urban areas in OECD countries uses population density to identify urban cores and travel-to-work flows to identify the hinterlands (“<i>worker catchment area</i>”) whose labour market is highly integrated with the cores. It is a very formal normative concept not reflecting the complexity of urban/peri-urban interrelations. In LUMAT partner states, FUAs has been defined by using various national definitions (terms) like: urban regions, functional urban regions, functional urban areas. There are two general types of FUAs within LUMAT countries:</p> <ul style="list-style-type: none"> <li>-Monocentric: (with visible core)</li> <li>-Polycentric: (structure of cores belonging to the same functional urban area)</li> </ul> <p>Identity of FUAs based on:</p> <ol style="list-style-type: none"> <li>1) Common features,</li> <li>2) Common problems and threats,</li> <li>3) Common potential / capabilities</li> </ol> <p>The proposal for the text elaborated as a part of LUMAT project is included in this material, but the trainers can use another texts, appropriate to the specific situation in the country.</p>				
<p>2.</p>	<p>Introduction for brainstorming</p> <table border="1" data-bbox="272 1995 826 2078"> <tr> <td>Country-FUA</td> <td>Common Features</td> <td>Common Problems</td> <td>Common Capabilities</td> </tr> </table>	Country-FUA	Common Features	Common Problems	Common Capabilities	<p>The trainer starts the workshop by introducing results of LUMAT meeting in Trnava. The important part of this introduction is presentation of FUAs criteria. Trainer launch discussion on FUAs identity by dividing participants into 4 working groups (number of</p>
Country-FUA	Common Features	Common Problems	Common Capabilities			



	1. <b>Demographic</b> 2. <b>Functional</b> 3. <b>Planning:</b> 4. <b>Economic:</b> 5. <b>Infrastructural:</b> 6. <b>Social:</b> 7. <b>Management</b> 8. <b>Spatial Cohesion:</b>		<p>groups depends on total number of participants. It will be good to have 4-5 people in each of working groups). Each group should work on separate table. The (A3 paper format) - matrix is prepared for each table or fixed on the flipcharts. The trainer should to prepare the working exercise in advance. The colored small sheets of paper( post-it) are necessary in each table as well as markers for writing.</p> <p>The main task of this exercise is to elaborate common approach to the FUAs identity, as a basis to formulate / verify FUAs Integrated Environmental Management Strategy.</p>
3.	Brainstorming on FUAs criteria for FUAs identity	<p>Participants discuss proposed criteria and suggest comments and amendments referring to:</p> <p>1) <b>Demographic:</b> population, density of the population, migration, demographic trends</p> <p>2) <b>Functional:</b> functional relationships, type of common functions,</p> <p>3) <b>Planning:</b> land use, type (state) of built-up areas, soil sealing, peri-urban relationships,</p> <p>4) <b>Economic:</b> -number and character of firms (entities, SME), GDP, industry decline</p> <p>5) <b>Infrastructural:</b> level of technical infrastructure/water/sewage system/roads/ railways/</p> <p>6) <b>Social:</b> education, professional structure,</p> <p>7) <b>Management:</b> political will to co-operate with neighboring administrative units, common strategic vision, ability to solve conflicts,</p> <p>8) <b>Spatial Cohesion</b> : continuity of ecological systems, lack of „spatial island”</p>	
4	Outcomes of brainstorming -summary	<p>The trainer is collecting the outputs from the groups. The outputs are displayed at the flipchart. The trainer in interaction with the trainees makes an overview about the outcomes structuralizing them into the groups of similar or linked results. The trainer is interpreting and commenting the outputs with references to the FUA characteristics and possible development priorities.</p>	



5	<p>Open discussion on on FUAs identity as a basis for its development</p>	<p>The trainer moderate discussion on development priorities for FUA. The audience discuss on common problems, threats as well as capabilities of FUA as a territorial structure. Discussion should take into consideration prior results of LUMAT Project. Development priority (objectives) of FUA should underline integration of environmental aspects with spatial and economic framework of management. This exercise should convinced participants that integrated environmental management is an effective instrument for creation sustainable urban and peri-urban relationships within the FUAs territory.</p>
6	 <p>Thank You !</p> <p>    </p> <p>  <a href="http://www.interreg-central.eu/lumat">www.interreg-central.eu/lumat</a>   <a href="mailto:j.gorgon@ietu.pl">j.gorgon@ietu.pl</a>   +48 32 254 60 31 ext. 287     </p> <p>  <a href="https://facebook.com/lumatproject">facebook.com/lumatproject</a>   <a href="https://linkedin.com/in/lumat-project">linkedin.com/in/lumat-project</a>   <a href="https://twitter.com/Lumat_project">twitter.com/Lumat_project</a> </p> <p>   </p> <p>TAKING COOPERATION FORWARD 20</p>	<p>The teacher should change the final slide by</p> <ul style="list-style-type: none"> <li>- adding the link to national web of the project</li> <li>- replacing the name of involved persons</li> <li>- adding own logo to the logo of IETU in the bottom of the slide</li> </ul>
7	<p style="text-align: center;">References</p> <p>1)ESPON &amp;EUROREG, 2011: The European Metropolises and Their Regions: From Economic Landscapes to Metropolitan Networks. Smetkowski, M - Gorzelak, G - Kozak, M - Olechnika, A - Ploszaj, A - Wojnar, K.</p> <p>2)OECD, 2012: Compact City Policies: A Comparative Assessment. OECD Green Growth Studies, OECD Publishing.</p>	

## Brief notes on Functional Urban Areas in Europe

The OECD made special efforts to make the concept of “functional urban area” more precise, allowing to collect comparable data across European cities. Each functional urban area is an economic unit characterised by densely inhabited “urban cores” and “hinterlands” whose labour market is highly integrated with the cores. The OECD developed a calculation process which started with the identification of core municipalities. The cores are defined using the population grid from the global dataset Landscan, referred to circa year 2000. Polycentric cores and the hinterlands of the functional areas were identified on the basis of commuting data (travel from home - to - work) referred around the 2000 census year. The urban hinterland was identified as worker catchment area, including all settlements from where at least 15% of the workers commute to any of the core settlement(s). *OECD, 2012:89*



The OECD methodology makes possible to compare functional urban areas of similar size across countries. A classification of functional urban areas into four types according to population size is proposed:

- Small urban areas, with population between 50,000 and 200,000
- Medium-sized urban areas, with population between 200,000 and 500,000
- Metropolitan areas, with population between 500,000 and 1.5 million
- Large metropolitan areas, with population above 1.5 million

The functional urban area includes cities, towns and villages that are often physically separated by unbuilt land from the built-up city, but are at the same time economically and socially highly dependent on the urban core. The most common - and easiest - way to understand this interpretation is the travel-to-work area, which would include all communities with more than a substantial percentage (eg: 20 %) of resident workers employed in the core city. It is a very formal normative concept not reflecting the complexity of urban/peri-urban interrelations.

Europe is characterised by a polycentric network in which the FUAs as defined by the OECD and EC are only part of its structure. Important part of FUAs definition is identification of peri-urban relationships.

In LUMAT partner states, FUAs has been defined by using various national definitions (terms).

Example of National Legal Basis for FUA:

*One of the processes affecting public policies across the world and particularly in Europe (including some EU Member States) is the transition from the sectoral approach to the integrated territorial approach. The territorial approach is oriented at the use of endogenous potentials of functionally defined territories, integration of public measures in the spatial dimension and multi-level governance.*

*Similar integrated measures should be addressed to areas that share geographic (socio-economic and spatial) characteristics and are referred to as functional areas. From this perspective, the subject of the national spatial development policy is the entire territory of the country and its objectives and tools are diversified depending on the specificity of individual functional areas and targeted at using their specific geographic potentials determining their development (NATIONAL SPATIALDEVELOPMENT CONCEPT 2030, Warsaw, 2011)*



## E. References

- Babette Wehrmann Land Conflicts- A practical guide to dealing with land disputes, Eschborn 2008)
- A, Torre,.. and others- Identifying and measuring land-use and proximity conflicts: methods and identification, Springer open, 2014)

### Web sources

- The Economics of Ecosystems and Biodiversity (TEEB) [www.teebweb.org](http://www.teebweb.org) (accessed Oct. 30, 2017)
- UK National Ecosystem Assessment [www.uknea.unep-wcmc.org](http://www.uknea.unep-wcmc.org) (accessed Oct. 30, 2017)  
<https://www.eea.europa.eu/highlights/land-use-conflicts-necessitate-integrated-policy>  
<https://www.ufz.de>  
[https://link.springer.com/chapter/10.1007/978-94-009-4822-8\\_10](https://link.springer.com/chapter/10.1007/978-94-009-4822-8_10)  
<https://www.sciencedirect.com/science/article/pii/S0264837714001197>






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**LUMAT**

TAKING  
**COOPERATION**  
FORWARD

-  Functional urban areas -Training on FUAs identity- **Date / 2018**
-  LUMAT - Implementation of Sustainable Land Use in Integrated Environmental Management of Functional Urban Areas
-  **Name & institution / Add or change LOGO**

- Aim of the workshop-(FUAs Identity),
- Basic Definitions,
- FuAs typology,
- FUAS delimitation and criteria for FUAs identity,
- Discussion on criteria selection,
- FUAs Identity (interactive excersise based on FUAs presented in the Project),
- **Conclusions**





# AIM OF THE WORKSHOP

Aim of the workshop is to define FUAs identity with respect of its characteristics and with reference to the methodology (OECD/ national).

The definition of functional urban areas in OECD countries uses population density to identify **urban cores** and travel-to-work flows to identify **the hinterlands** (“*worker catchment area*”) whose labour market is highly integrated with the cores. **It is a very formal normative concept not reflecting the complexity of urban/peri-urban interrelations.**



# BASIC DEFINITION

**Functional Urban Area:** Spatially continuous settlement system consisting of units separate in administrative terms. An urban functional area covers a compact urban area (core) with a functionally linked urbanized zone.

**Sustainable Land Use:** Covers all activities concerned with the management of land as a resource both from an environmental and from an economic perspective.

**Integrated Environmental Management:** Aims to improve the environmental performance of an urban area contributing to a better quality of life.



The OECD methodology makes possible to compare functional urban areas of similar size across countries. A classification of functional urban areas into four types according to population size is proposed:

- Small urban areas, with population between 50,000 and 200,000
- Medium-sized urban areas, with population between 200,000 and 500,000
- Metropolitan areas, with population between 500,000 and 1.5 million
- Large metropolitan areas, with population above 1.5 million

**Europe is characterised by a polycentric network in which the FUAs as defined by the OECD and EC are only part of its structure. Important part of FUAs definition is identification of peri-urban relationships**



# PROPOSED FUAs IDENTITY

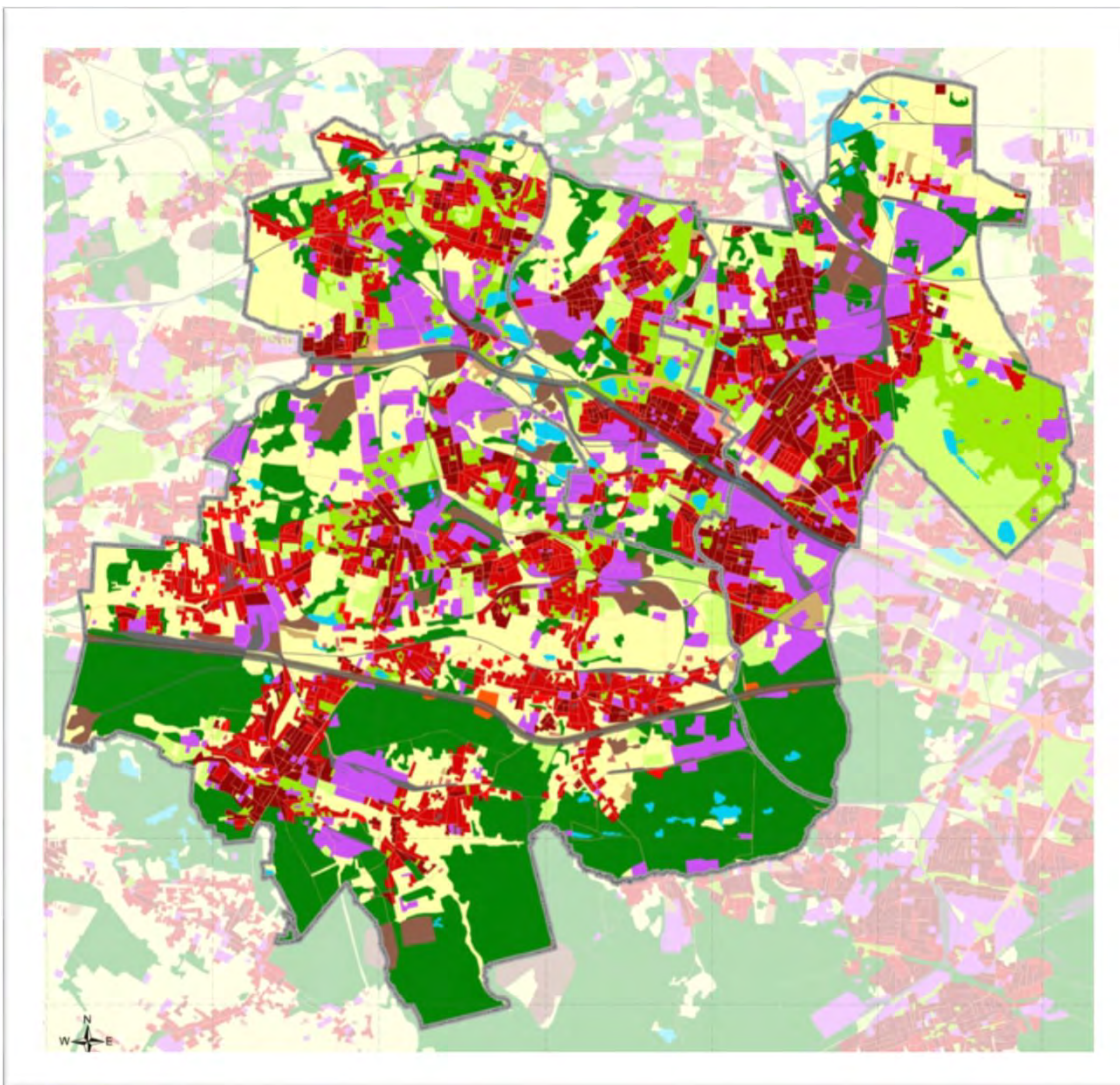
- 1) Delimited based on the degree of urbanization, covering urban areas - core cities and their functional zones,
  - Metropolitan areas
  - Regional
  - Sub-regional
  - Local
- 2) Delimited based on the possibility of spatial conflicts related to the method of using their environmental and cultural potential,
- 3) Requiring restructuring **and/or** development of new functions with the use of regional policy instruments.



in LUMAT partner states, FUAs has been defined by using various national definitions (terms) like:

- **Urban regions,**
- **Functional urban regions,**
- **Functional urban areas**





**Surface [km<sup>2</sup>]- .....**

**Population-.....**

**Population density  
[p/ km<sup>2</sup>]- .....**



## Type of FUA, important data

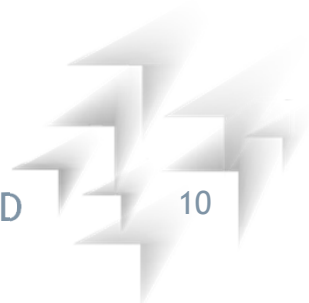
map

- **Monocentric: (with visible core)**
- Polycentric: (structure of cores belonging to the same functional urban area)





- Discussion on criteria selection,
- FUAs Identity (interactive exercise based on FUAs presented in the Project),





# LIST OF CRITERIA FOR FUAs IDENTITY

## 1) **Demographic:**

population, density of the population, migration, demographic trends

## 2) **Functional:**

functional relationships, type of common functions,

## 3) **Planning:**

land use, type(state) of built-up areas, soil sealing, peri-urban relationships,

## 4) **Economic:**

-number and character of firms (entities, SME), GDP, industry decline

## 5) **Infrastructural:**

level of technical infrastructure/water/sewage system/roads/ railways/

## 6) **Social:**

education, professional structure,

## 7) **Management:**

political will to co-operate with neighboring administrative units, common strategic vision, ability to solve conflicts,

8) **Spatial Cohesion** : continuity of ecological systems, lack of „spatial island”



## Identity of FUAs based on:

- 1) Common features,
- 2) Common problems and threats,
- 3) Common potential / capabilities,



# MATRIX OF FUAs IDENTITIES

FUA .....	Common Features	Common Problems	Common Capabilities
1. <b>Demographic:</b>			
2. <b>Functional</b>			
3. <b>Planning:</b>			
4. <b>Economic:</b>			
5. <b>Infrastructural:</b>			
6. <b>Social:</b>			
7. <b>Management</b>			
8. <b>Spatial Cohesion:</b>			

# RESULTS:



## Name and Institution

LUMAT



[www.interreg-central.eu/lumat](http://www.interreg-central.eu/lumat)



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[twitter.com/Lumat\\_project](https://twitter.com/Lumat_project)





## 2. Ecosystem services: Training Concept and Training Material

**Teaching Module: Ecosystem Services**  
**Interactive workshop**

## **1 ADVICE TO THE TEACHER**

This teaching/training activity proposal offers an alternative training mode suitable for highly skilled professionals, planners, decision makers. The goal is to improve their awareness and knowledge about the ecosystem services concept and possibility of its efficient use as one of the core concepts for comprehensive development management in FUA's.

Before you attempt to study or to deliver this module, please make sure that you understand the entire project LUMAT. For delivering this Module effectively and retaining your target groups' interest you need to include, where ever you can, local examples of good or bad practice. Use also your specific professional knowledge to illustrate the points and findings arising from these presentations. You can also contact the author of this module and ask for a consultation on [maros.finka@stuba.sk](mailto:maros.finka@stuba.sk)

## **2 TARGET GROUPS**

This module is formulated to address the highly skilled planners, managers and representatives of the key stakeholders groups involved in the development of the Action plans supporting sustainable development of functional urban areas. The use of the teaching material for broader public requires its adaptation.

## **3 TASKS FOR SELF-STUDY OF THE TRAINERS**

To improve the teachers' preparation it is recommended to complete the content with national specific issues and frame conditions.

For the self study we recommend the following:

- The LUMAT project's deliverables especially the strategic materials
- The materials deepening the knowledge about the concept of ecosystem services
- The materials deepening the knowledge about multiactors decision making
- The materials dealing with the assessment of ecosystem services with special focus on urban ecosystems
- The materials dealing with urban landscape quality aspects and quality of life aspects
- Formal and informal instruments in respective planning culture used for optimization of ecosystem services performance
- National specific materials on ecosystem services

These are some other tasks we recommend you undertake:

- Discuss with others the awareness on ecosystem services issues within professional planners' community
- Discuss with others the context of ecosystem services concept's issues under specific local conditions
- Discuss with others what are the main political and methodological approaches in the field of FUA management
- Survey the available books, WebPages, articles, concerning the best practice in the brownfield regeneration planning
- Discuss with others and write down the lessons what to do and what not to do that you learned while researching the case studies

### 3 Methodology of the training

#### Learning Outcomes:

Improvement of the abilities of the target group to use the concept of ecosystem services as the leading concept in the environmental management of the FUAs.

#### Training Materials:

- The Powerpoint presentation with the main ideas to the topic
- The text Ecosystem services as the conceptual basis of sustainable FUAs` integrated environment management process

#### Training Format:

Interactive workshop

#### Training Methods:

- Reading written texts
- Brainstorming
- Silent decision making
- Critical discussion
- Team work on idea development
- Explanatory interpretation exercise

#### Logistics:

Max capacity 21 trainees

Trainers 1 leading + 2 assistants

Room with min 3 tables and 25 chairs free movable

Wall board

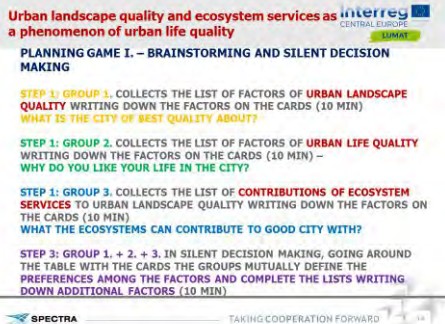
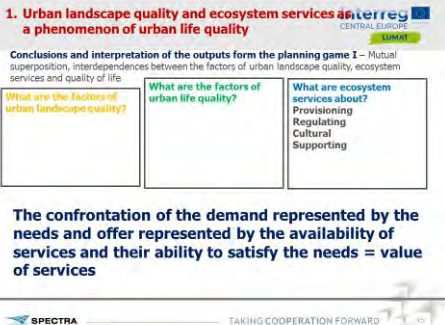

Sheets of paper 5x5 cm colored 300 pcs, with glue

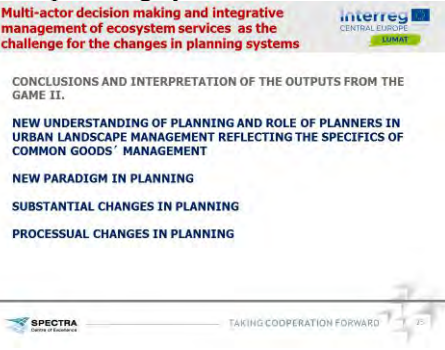


With board or flipcharts, markers 3 colors

Time slot 3 x 50 minutes

Training activity	Basic content of the activity	Comment for the teacher
1.	Reading written texts	The participants obtain the text, which they have to read. The text in national language is explanatory and provides basic information about the ecosystem services as the leading concept for integrative FUA environmental management.  The proposal for the text elaborated as a part of LUMAT project is as annex of this material, but the trainers can use other texts.
2.	Discussing the written texts,	The trainer starts the discussion with the understanding question and



	<p>explanation in reaction to the question</p>	<p>two/ three questions for all participants</p> <ol style="list-style-type: none"> <li>1. What do you think, can the knowledge about concept of ecosystem services influence your own work/ decision making</li> <li>2. What the ecosystem concept can improve the common approaches to the territorial development with</li> </ol> <p>Each participants have 5 minuts to write the answers to the sheets</p>
3	<p>Summarisation</p>	<p>The trainer in interaction with the trainees makes an overview about the answers structuralizing them into the groups of similar or linked answers</p>
4	<p>Planning game 1. Urban landscape quality and ecosystem services as a phenomenon of urban life quality</p> 	<p>The teacher has to prepare the planning game in advance. The colored small sheets of paper are necessary as well as markers for writing.</p> <p>The teacher has to divide auditorium into the groups and explain their tasks individually. The assistance of assistants would be welcomed in order to save time. After 10 minutes of writing the ideas the teacher stops the first phase. All sheets with the ideas are at the table and the second phase starts – silent decision making. The teacher explains to the whole auditorium the principles of silent decision making and technicalities of the procedure. After two runs inside of the group, the groups can change.</p>
5.	<p>Planning game 1. Urban landscape quality and ecosystem services as a phenomenon of urban life quality – outputs form the game</p> 	<p>The teacher is collecting the outputs form the groups incl. the defined priorities. The outputs are displayed at the table. The teacher demonstrates the comparison between the outputs form all 3 groups showing the overlapping and parallels.</p>
6.	<p>Planning game 2. Multi-actor decision making and integrative management of ecosystem services</p> 	<p>The teacher is using this game for showing different modes of actors` behaviour and possible harmonisation of the interests across the whole scale of stakeholders. The game supposes to distribute the roles in the auditorium with prepared description of the roles they have to play in the game. Each role is characterised with formulated positions and demands.</p> <p>The model situation for the decision making is described by a map and several sentences. The best model situation is linked to the city, all of participants know and a plan to invest on certain plot.</p> <p>The roles are e.g. journalist, owner of the plot, citizen, eco-activist, investor, representatives of the self-government, and representative of the opposition in the city parliament, representative of the sport and cyclist initiative, and planner. The role of planner is to moderate the discussion and to argue against not objective or extremistic requirements.</p> <p>After the game, the teacher is comparing the outputs form the game of different groups. Although the descriptions of the role are identic as well as the composition of the players, the results form interactive decision making are different from group to group as the personalities and personal abilities to argue are different.</p>

<p>7</p>	<p><b>Multi-actor decision making and integrative management of ecosystem services as the challenge for changes in/of planning systems</b></p>  <p>Multi-actor decision making and integrative management of ecosystem services as the challenge for the changes in planning systems</p> <p>CONCLUSIONS AND INTERPRETATION OF THE OUTPUTS FROM THE GAME II.</p> <p>NEW UNDERSTANDING OF PLANNING AND ROLE OF PLANNERS IN URBAN LANDSCAPE MANAGEMENT REFLECTING THE SPECIFICS OF COMMON GOODS' MANAGEMENT</p> <p>NEW PARADIGM IN PLANNING</p> <p>SUBSTANTIAL CHANGES IN PLANNING</p> <p>PROCESSUAL CHANGES IN PLANNING</p> <p>SPECTRA TAKING COOPERATION FORWARD</p>	<p>The teacher is interpreting and commenting the outputs from the planning game stressing the role of the planners in the process of the game.</p> <p>In the same time the teacher is addressing the territorial governance, mainly understood as “the manner in which territories of a national state are administered and policies implemented with particular reference to the distribution of roles and responsibilities among the different levels of government (supranational, national and sub-national) and the underlying processes of negotiation and consensus building” (COM 2007).</p> <p>The practice of European spatial development management is experiencing the movement from traditional model of hierarchical territorial government, connected closely to the very sensitive issue of territorial sovereignty across different levels of territorial units (local, regional), to the system of governance where the power is shared and split among a variety of stakeholders creating overlapping vertical and horizontal co-operation patterns between governmental and non-governmental public and private structures across various levels of decision making. This natural process is driven by the development of new types of spatial structures not only overstepping the borders of administrative units like national states, counties or municipalities, but representing new qualities – increased permeability of territorial borders and openness for new spatial organization of human activities and the self-organizational mechanisms. The FUA's belong to such spatial structures including the territory of several municipalities but only seldom creating institutionalised territorial unit with adequate governmental or self-governmental bodies.</p> <p>This, together with other current challenges requires to look for new paradigm in planning bringing changes in the substantial and processual aspects of planning and of the role of planners.</p>
<p>8</p>	<p><b>Web references</b></p>  <p>WEB REFERENCES</p> <ul style="list-style-type: none"> <li>■ The Economics of Ecosystems and Biodiversity (TEEB) <a href="http://www.teebweb.org">www.teebweb.org</a></li> <li>■ UK National Ecosystem Assessment <a href="http://www.uknea.unep-wcmc.org">www.uknea.unep-wcmc.org</a></li> </ul> <p>Reports</p> <ul style="list-style-type: none"> <li>■ 'An Introductory guide to valuing ecosystem services' <a href="http://www.defra.gov.uk">www.defra.gov.uk</a></li> <li>■ 'Delivering a healthy natural environment' <a href="http://www.defra.gov.uk">www.defra.gov.uk</a></li> <li>■ 'No charge? Valuing the natural environment' <a href="http://www.naturalengland.org.uk">www.naturalengland.org.uk</a></li> </ul> <p>SPECTRA TAKING COOPERATION FORWARD</p>	
<p>9</p>	 <p>THANK YOU, ENJOY THE DAY! YOU ARE WELCOMED TO JOIN US AT <a href="http://WWW.INTERREG-CENTRAL.EU/CONTENT.NODE/LUMAT.HTML">WWW.INTERREG-CENTRAL.EU/CONTENT.NODE/LUMAT.HTML</a> FACEBOOK / LUMAT PROJECT INKED IN / LUMAT.INTERREG TWITTER / @LUMAT_PROJECT</p> <p>SPECTRA TAKING COOPERATION FORWARD</p>	<p>The teacher should change the final slide by</p> <ul style="list-style-type: none"> <li>- adding the link to national web of the project</li> <li>- replacing the picture by the picture from the model area</li> <li>- adding own logo to the logo of SPECTRA in the bottom of the slide</li> </ul>

**Interreg** 

CENTRAL EUROPE European Union  
European Regional  
Development Fund

**LUMAT**

TAKING  
**COOPERATION**  
FORWARD



Date of training activity: .....

Trainer:.....

Locality of training: .....



**Topic: ECOSYSTEM SERVICES**

Coauthors: Maros Finka, .....



Institutions: SPECTRA Centre of Excellence EU, STU Bratislava, Slovakia

## INITIAL IDEA OF THE TRAINING MODULE



“By 2050 there will be about 9.7 billion people sharing the earth’s resources, 66% of whom are expected to live in urban areas (UNDESA 2014; 2015). With this growth in urban population and expansion of cities, the relationship between human settlements and ecosystems is increasingly vital, both in terms of environmental sustainability and vulnerability to shocks and stresses.”  
(Policy unit 8 Habitat III. Conference Quito 2016)

Due the scale, extend and **complexity of the development in FUAs**, the partial/sectoral approaches do not allow efficient management of the problems - **comprehensive approaches and policies are needed in which the management of ecosystem services is an inherent part**

# GOALS OF THE TEACHING UNIT

- To develop awareness about the services provided by ecosystems of the FUAs
- to develop awareness concerning the potential of the ecosystem services concept in planning and management of FUA sustainable development
- to develop the knowledge about common international institutional frameworks of the ecosystem services concept
- to provide information about the logic ecosystem services concept
- to mediate the best practice examples
- to improve the understanding of the interplay between ecosystem services planning and multilevel governance concept
- to support the perception of both concepts as a part of the integrated and iterative approach



# CONTENT OF THE TEACHING UNIT

- INTRODUCTORY LECTURE - Part 1. (20 min.)
- PLANNING GAME I. (25 min.)
- LECTURE - Part 2 (20 min.)
- PLANNING GAME II. (35 min.)
- LECTURE - Part 3 - CONCLUSIONS (20 min.)

# Urban landscape quality and ecosystem services as a phenomenon of urban life quality

## PLANNING GAME I. – BRAINSTORMING AND SILENT DECISION MAKING

**STEP 1: GROUP 1.** COLLECTS THE LIST OF FACTORS OF **URBAN LANDSCAPE QUALITY** WRITING DOWN THE FACTORS ON THE CARDS (10 MIN)  
**WHAT IS THE CITY OF BEST QUALITY ABOUT?**

**STEP 1: GROUP 2.** COLLECTS THE LIST OF FACTORS OF **URBAN LIFE QUALITY** WRITING DOWN THE FACTORS ON THE CARDS (10 MIN) –  
**WHY DO YOU LIKE YOUR LIFE IN THE CITY?**

**STEP 1: GROUP 3.** COLLECTS THE LIST OF **CONTRIBUTIONS OF ECOSYSTEM SERVICES** TO URBAN LANDSCAPE QUALITY WRITING DOWN THE FACTORS ON THE CARDS (10 MIN)  
**WHAT THE ECOSYSTEMS CAN CONTRIBUTE TO GOOD CITY WITH?**

**STEP 3: GROUP 1. + 2. + 3.** IN SILENT DECISION MAKING, GOING AROUND THE TABLE WITH THE CARDS THE GROUPS MUTUALLY DEFINE THE PREFERENCES AMONG THE FACTORS AND COMPLETE THE LISTS WRITING DOWN ADDITIONAL FACTORS (10 MIN)

# 1. Urban landscape quality and ecosystem services as a phenomenon of urban life quality

**Conclusions and interpretation of the outputs from the planning game I** – Mutual superposition, interdependences between the factors of urban landscape quality, ecosystem services and quality of life

**What are the factors of urban landscape quality?**

**What are the factors of urban life quality?**

**What are ecosystem services about?**

Provisioning  
Regulating  
Cultural  
Supporting

**The confrontation of the demand represented by the needs and offer represented by the availability of services and their ability to satisfy the needs = value of services**



## Planning game II.

Interactive exercise – **identification of different interests on urban ecosystem services, their holders, positioning and power**

Step 1: Brain storming and discussion: identification of the stakeholders in the development of urban green areas and their different activities in urban green

Step 2: Role game: division into the groups representing main stakeholders and expression of their interests – prepare the preferences of the activities in the green areas

Step 3: Assessment/comparing the power and position of the stakeholders in planning and decision making

# Multi-actor decision making and integrative management of ecosystem services as the challenge for the changes in planning systems

**CONCLUSIONS AND INTERPRETATION OF THE OUTPUTS FROM THE GAME II.**

**NEW UNDERSTANDING OF PLANNING AND ROLE OF PLANNERS IN URBAN LANDSCAPE MANAGEMENT REFLECTING THE SPECIFICS OF COMMON GOODS' MANAGEMENT**

**NEW PARADIGM IN PLANNING**

**SUBSTANTIAL CHANGES IN PLANNING**

**PROCESSUAL CHANGES IN PLANNING**

# Multi-actor decision making and integrative management of ecosystem services as a challenge for changing role of professionals

## NEW ROLES OF PROFESSIONALS/PLANNERS?

- 1. PROFESSIONAL/PLANNER AS MEDIATOR AND PROCESS CATALYST (UNCERTAINTY)**
- 2. PROFESSIONAL/PLANNER AS COORDINATOR**
- 3. PROFESSIONAL/PLANNER AS ONE OF STAKEHOLDERS - SHIFT FROM GOVERNMENT TO GOVERNANCE APPROACHES**
- 4. PROFESSIONAL/PLANNER AS INTEGRATOR - SHIFT TO INTEGRATIVE APPROACHES**

- The Economics of Ecosystems and Biodiversity (TEEB)  
[www.teebweb.org](http://www.teebweb.org)
- UK National Ecosystem Assessment  
[www.uknea.unep-wcmc.org](http://www.uknea.unep-wcmc.org)

## Reports

- ‘An Introductory guide to valuing ecosystem services’  
[www.defra.gov.uk](http://www.defra.gov.uk)
- ‘Delivering a healthy natural environment’  
[www.defra.gov.uk](http://www.defra.gov.uk)
- ‘No charge? Valuing the natural environment’  
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**FACEBOOK / LUMAT PROJECT**  
**INKED IN / LUMAT.INTERREG**  
**TWITTER/ @LUMAT\_PROJECT**

## Ecosystem services as the conceptual basis of sustainable FUAs` integrated environment management process

The concept of ecosystem services is seen by the LUMAT project as the conceptual basis for integrated environmental management including the land and soil management. As an attempt to express the benefits form eco-systems for human wellbeing by economic means it offers a common denominator for the **harmonization of different interests in the urban/peri-urban areas and threats based on the dichotomy** between core and periphery as well as seeming dichotomy between economic and social on one hand and environmental development on the other hand. In the past, environmental dimension in the decision making in spatial development management was represented by issues as mitigating the impact of development activities or establishing areas to protect wildlife and cultural landscape.

**Ecosystems** are rather complex dynamic functional units consisting of all plants and animals (biodiversity) in an area, together with the non-living, physical components of the environment (water, soil and air) with which they interact. The cities and FUAs represent the socio-ecosystems as they include ecosystem and man as a social being.

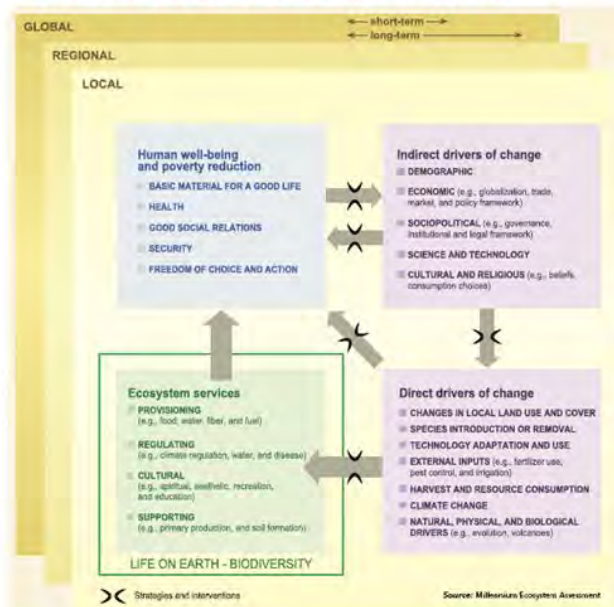
**ECOSYSTEM SERVICES** are the services provided by the natural environment which benefit people addressing their well-being, satisfying their needs **existential security, social and economic prosperity.**



Scheme: Satisfaction of human needs Source: Maslow, A. H. (1943). [A Theory of Human Motivation](#). *Psychological Review*, 50(4), 370-96.



# ECOSYSTEM SERVICES AS AN OBJECT OF INTEGRATIVE DEVELOPMENT MANAGEMENT IN FUAs



The values/benefits/function of ecosystem services as the basis for their position in integrative development management / integration of 5 components of well-being/quality of life:

- basic material for a good life** (adequate livelihood, food, shelter, other goods);
- health** (strength, feeling well, access to clean air and water);
- good social relations** (social cohesion, mutual respect, ability to help others);
- security** (personal safety, access to resources, safety from disasters); and
- freedom of choice and action** (ability to control personal circumstances).

Scheme: Ecosystem services as an object of integrative FUA environment management Based on: *Millennium Ecosystem Assessment (2005)*. [Ecosystems and human well-being: synthesis \(PDF\)](#). Washington, DC: Island Press. [ISBN 1-59726-040-1](#). Retrieved 7 August 2014.

The confrontation of the demand represented by the needs and the offer represented by the availability of services and their ability to satisfy the needs represents the value of services.

We need to consider not only mitigation and protection within a broader approach, but the fact that the people in their daily lives depend on a range of services that ecosystems provide and our role is not only to protect but to develop them in parallel. These services are fundamental to attaining quality of life of the citizens as main integrative development goal. There is no single way to implement an Ecosystem Services Approach.

FUAs represent very complex, dynamic socio-ecological systems of biophysical and social factors defined at several spatial, temporal and organizational hierarchically linked scales. The biophysical factors are represented by **ecosystems** as rather complex dynamic functional units consisting of all plants and animals (biodiversity) in an area, together with the non-living, physical components of the environment (water, soil and air) with which they interact. The ecosystems are significant with different levels of self-organisational and adaptive abilities. The social factors are

represented first of all by social units consisting of citizens, visitors, local economy players, and other subjects of social life in the FUA, their mutual interactions as well as interactions with the subjects of society they are imbedded in.

The main task of integrated FUA environment management is to safeguard that they regularly interact in a resilient, sustainable manner, especially in the context of the presence of critical resources whose flow and use is regulated in the interaction between natural and societal processes.

This concept of the cities and their peri-urban areas as socio-ecological systems is crucial in integrated concept of FUAs sustainable development management as it stress the fact that the delineation between social systems and ecological systems is artificial and arbitrary (Berkes, F., Colding, J., and Folke, C. (2001) *Linking Social-Ecological Systems*. Cambridge: Cambridge University Press), as they are linked through multi feedback mechanisms and that both display resilience and complexity. The most comprehensive theoretical background is created by Elinor Ostrom`s Social-Ecological Systems framework, within which much of the still-evolving theory of common-pool resources and collective self-governance is located (see as well Cumming, G.S. (2011), *Spatial Resilience in Social-Ecological Systems*, Springer, London). It also draws heavily on systems ecology and complexity theory incorporating ideas from theories relating to the study of sustainability, vulnerability, resilience and robustness, which makes this theoretical framework much more relevant for the common FUAs integrated environment management in the context of challenges resulting from climate change and growing uncertainties in the development of FUAs among other reasons resulting from the growing role of multi-actors of FUAs development and their individual decisions.

For the LUMAT concept of the common FUAs integrated environment management is important the conceptualized knowledge resulting from the research of the teams around Elinor Ostrom that the management processes in such complex systems as cities and FUAs can be improved only by making them adaptive and flexible, able to deal with uncertainty and surprise, and by building capacity to adapt to change.

The object of the FUA integrated environment management are the processes in both - social systems and eco-systems and especially their mutual interaction where the biggest challenge represents the question of harmonisation of different demands of different elements of social systems as well as eco-systems in the confrontation with the limitation of the available resources and preferences in the access to them and function of sustainability.

There is a whole scale of different conceptual frameworks for addressing these tasks of harmonisation of social systems and eco-systems development (e.g. circular economy), but the complexity of the tasks of FUA integrated environment management is not every time properly covered by them, as they mostly use to focus on particular human activities and are not fitting to the complexity of FUA functioning and development processes.

As proper interface between social aspects and ecological aspects of this harmonisation can be understood the concept of **the ecosystem services** - services



provided by the natural environment which benefit people. Understanding of the ecosystem services is 'challenging the misconception that we must choose between the natural environment and economic growth' (Natural Environment White Paper Consultation, Sept. 2010).

The ecosystem services reach from providing the products satisfying the basic needs of humans as biological elements - food, clean air, fuel, timber (provisioning ecosystem services) via creating a proper framework for their existence by influencing climate, floods etc. (regulating ecosystem services), safeguarding sustainability of the processes framing the existence of humans - water cycling, soil formation (supporting ecosystem services) up to human needs at the top of Maslow's pyramid - aesthetic and cognitive inputs, health, recreation and tourism (cultural ecosystem services).

The confrontation of the demands represented by the needs and the offer represented by the availability of services and their ability to satisfy the needs define the value of services. In regard to the common FUA integrated environment management the most important questions using the concept of ecosystem services are as follows:

- how much an ecosystem contributes to the society and its economy?
- what are the benefits and costs of an intervention that alters the ecosystem (conservation, restoration, development project, regulation or incentive)
- how are costs and benefits of a change in ecosystem distributed and how to secure justice in this distribution?
- how to compare ecosystem goods and services with other inputs into the economy and other societal processes (e.g. investments)
- how to internalise the ecosystem externalities of economic and non-economic activities
- how to balance the short and long term effects in economy and environment

One of the crucial connected questions for FUAs` integrated environment management is the problem of multi-dimensional impacts of landscape fragmentation on ecosystem services which is one of main features especially in urban and peri-urban areas. At this scale one of the main challenges is how to optimise the allocation and management of different land uses and their sprawl and how to minimise the implications for ecosystem services (see Rodriguez, J. P., Beard, T. D., Bennet, E. M., Cumming, G. S., Cork, S. J., Agard, J., et al. (2006). Trade-offs across space, time and ecosystem services. *Ecology and Society*, 11).

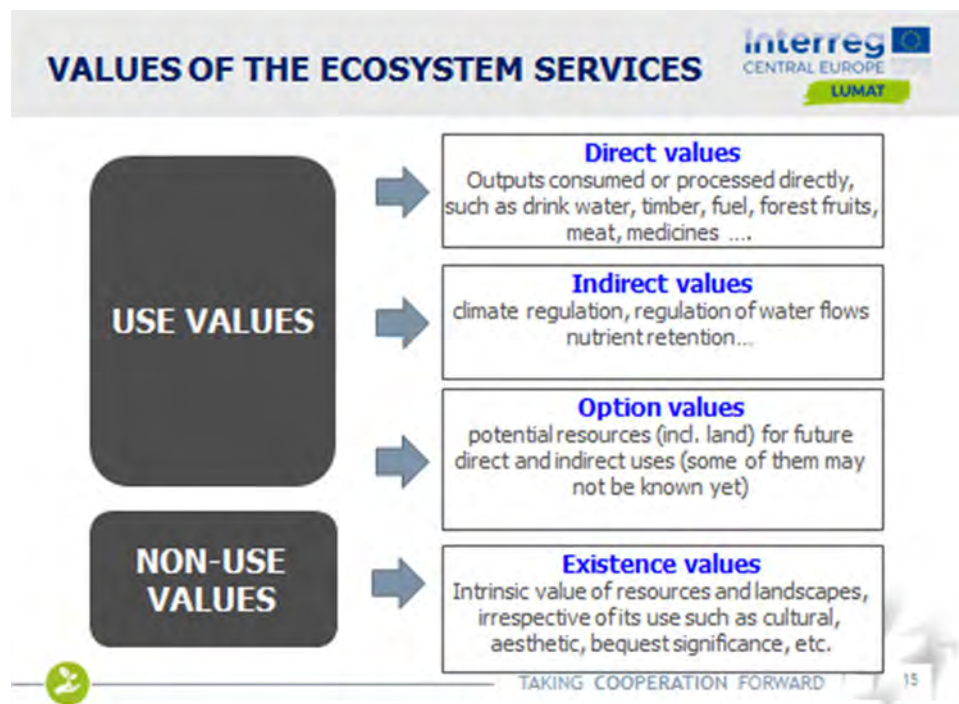
In answering the questions above we have to be aware about the limits of the concepts of ecosystem services as it is not easy to put a cash value on nature. On the other hand the use of this concept can support wider understanding and rising awareness about the services provided by nature, their values and with this introduction of innovations in economic valuation addressing the value of ecosystem services.

The incorporation of the ecosystem services in the concept of FUA integrated environment management allows to take the value of the natural environment into

account in cost-benefit analysis and to solve the problem of the imbalance among beneficiaries and losers.

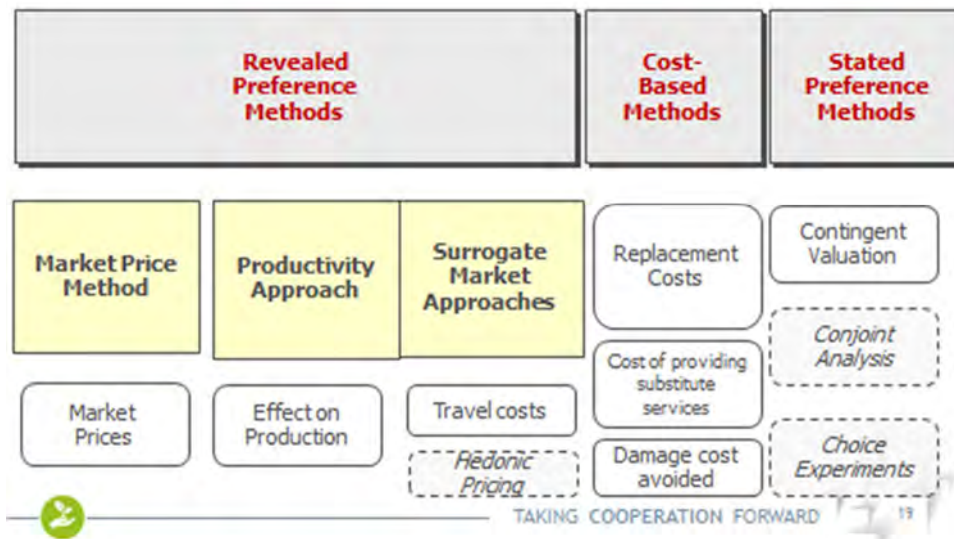
Understanding the value of the natural environment enables:

- ✓ decisions on the land use that do not compromise benefits to society, business and the economy
- ✓ decisions on the land use able to balance real costs and benefits and secure the justness of their distribution
- ✓ improved delivery of services through better use of the land and linked natural environment
- ✓ reduced business risk and increased business opportunity

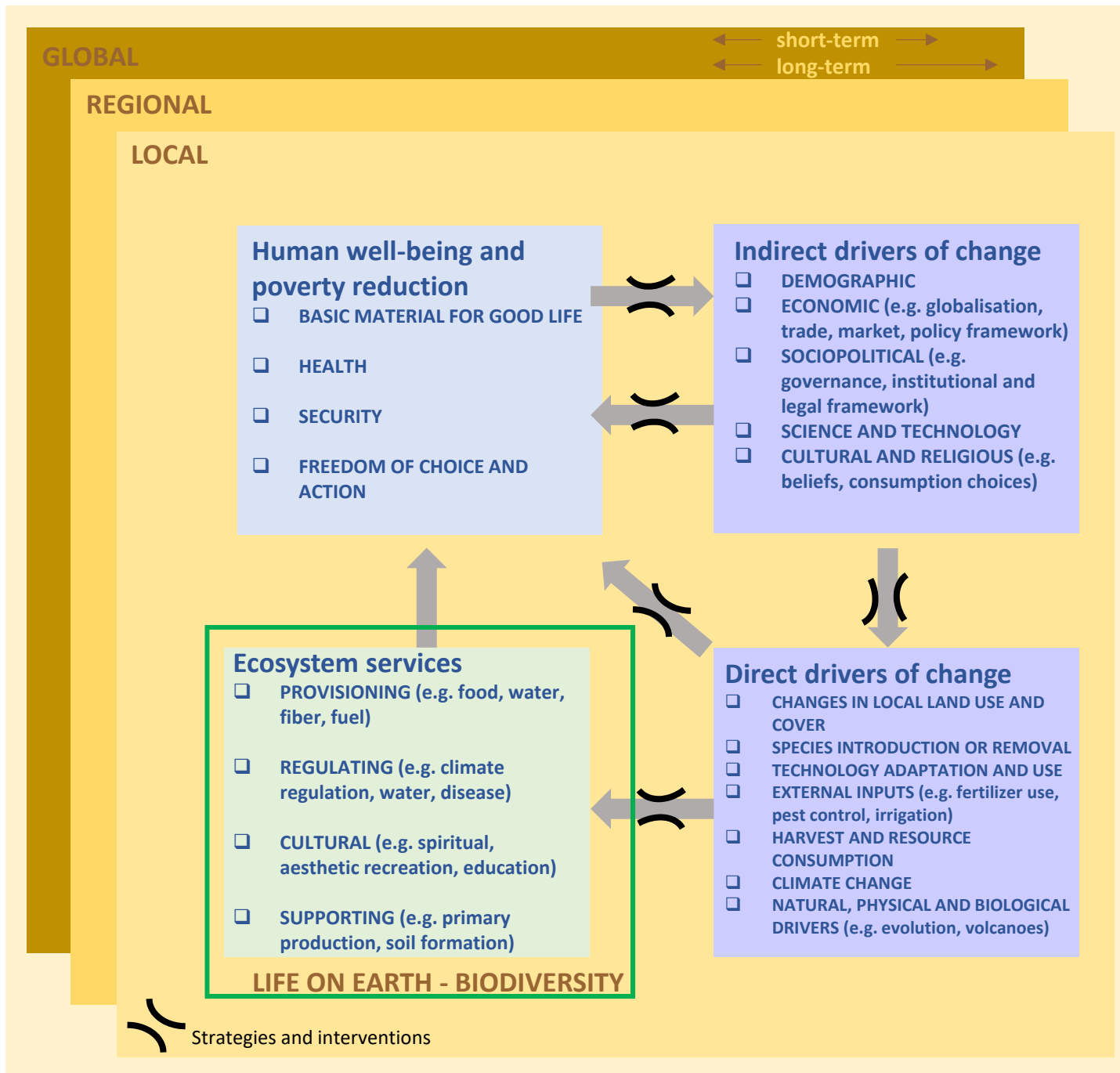


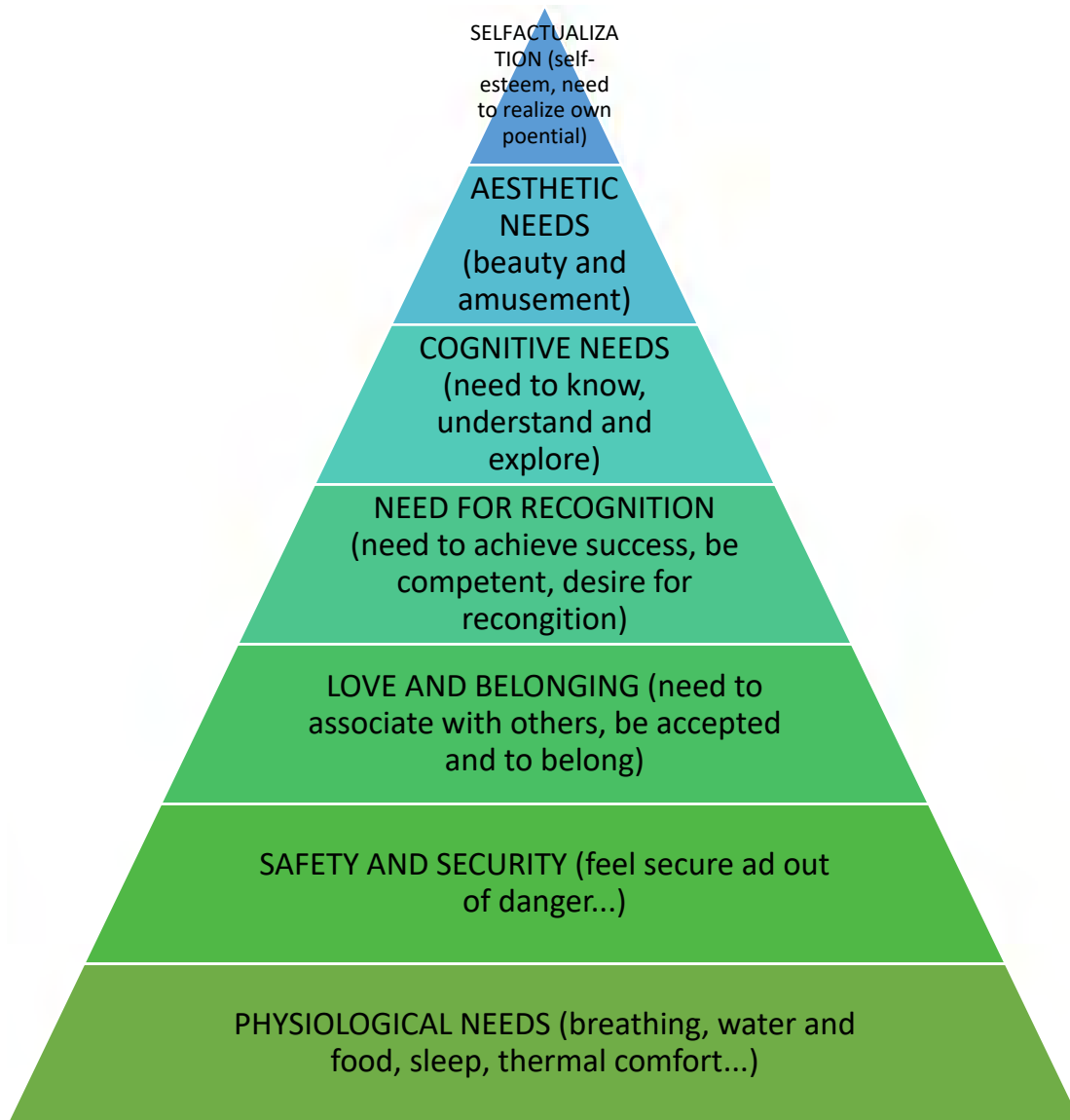
**Scheme: The values of ecosystem services and their identification. Source: Perrot-Maître, D. (2005) Valuing ecosystem services-advantages and disadvantages of existing methodologies and application to PES. Seminar on environmental services and financing for the protection and sustainable use of ecosystems, Geneva, 10-11 October 2005**

# VALUE IDENTIFICATION METHODS



Scheme: Value identification methods usable for integrated FUA environment management. Source: Perrot-Maître, D. (2005) Valuing ecosystem services-advantages and disadvantages of existing methodologies and application to PES. Seminar on environmental services and financing for the protection and sustainable use of ecosystems, Geneva, 10-11 October 2005





## USE VALUES



### Direct values

Outputs consumed or processed directly, such as drink water, timber, fuel, forest fruits, meat, medicines ....



### Indirect values

climate regulation, regulation of water flows  
nutrient retention...



### Option values

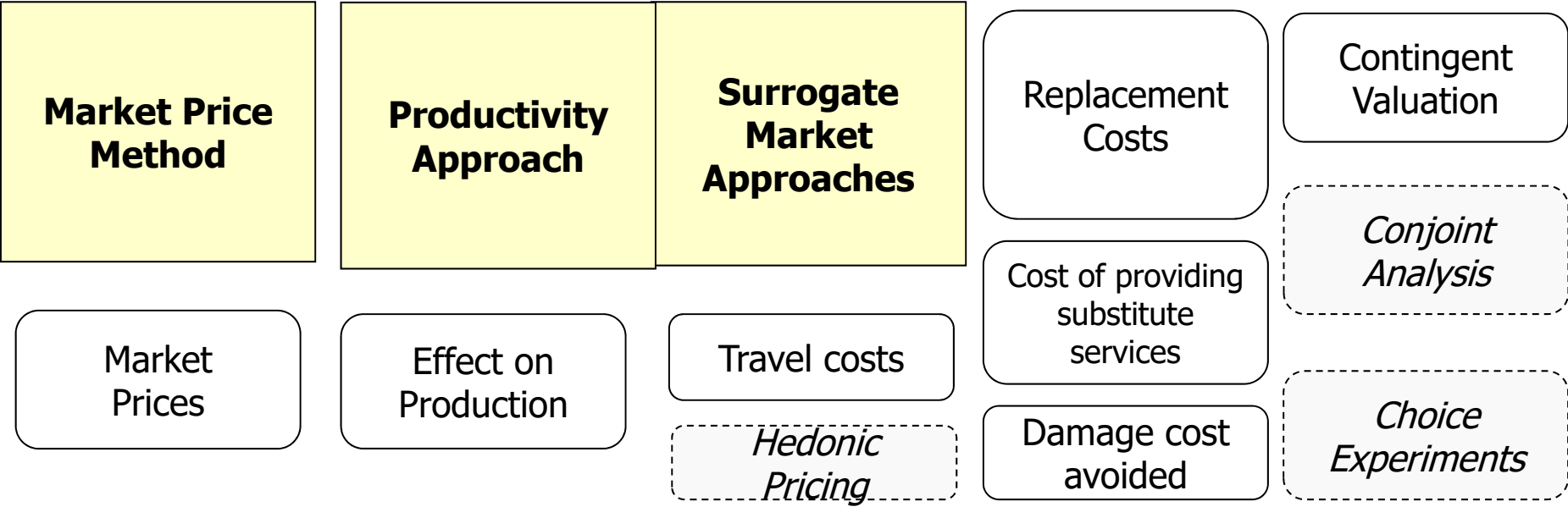
potential resources (incl. land) for future  
direct and indirect uses (some of them may  
not be known yet)



### Existence values

Intrinsic value of resources and landscapes,  
irrespective of its use such as cultural,  
aesthetic, bequest significance, etc.

## NON-USE VALUES





### 3. InVito: Training Concept and Training Material





## TUTORIAL

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### 1. GETTING STARTED

- 1.1 Uses and purposes
- 1.2 User's account

### 2. PROJECT EDITOR

- 2.1 "Projects" section
  - 2.1.1 Add a new project
  - 2.1.2 Settings
  - 2.1.3 People
  - 2.1.4 Components
  - 2.1.5 Tables
    - 2.1.5.1 Add private table
    - 2.1.5.2 Forbidden characters
    - 2.1.5.3 Forbidden words
    - 2.1.5.4 Type of data
    - 2.1.5.5 Configure a table
    - 2.1.5.6 Appearance setting
    - 2.1.5.7 Filter setting
    - 2.1.5.8 Weighting setting
- 2.2 "Curves" section
- 2.3 "Map Styles" section
- 2.4 "Color Sets" section
- 2.5 "Log" section

### 3. DATA EXPLORER

- 3.1 Data Filtering
- 3.2 Map Weighting
- 3.3 Data Visualization
  - 3.3.1 Colour and size
  - 3.3.2 Inverse selection
  - 3.3.3 Map styles
  - 3.3.4 Tables
  - 3.3.5 Graphs
- 3.4 Description of the project
- 3.5 Export data
- 3.6 Comments and feedbacks

### 4. REFERENCES

## 1. Getting started

The Interactive Visualisation Tool (**InViTo**) is an instrument conceived as a toolbox for visually supporting the analysis, the exploration, the visualisation and communication of both spatial and non-spatial data in order to facilitate policy and decision making. InViTo focuses on data sharing and visualisation of information as a vehicle for the social inclusion in the planning processes. InViTo produces maps, where the correlation between information and their localisation generates an essential instrument for the knowledge of urban dynamics and resilience in answering to specific policies. A higher knowledge enhances the decision-making process, providing opportunities for better choices. For this reason, it can be classified within the category of spatial Decision Support System (sDSS) as a Web-GIS tool.

In particular, InViTo does not provide spatial solutions, but it aims at facilitating the analysis, exploration, visualisation and communication of data in order to improve the communication between actors coming from various backgrounds and with different interests. Projects can be managed and set in an easy and accessible way by people also with a low expertise in GIS technologies. Meanwhile, users have a high level of possibilities for customising their project and relative visualisations. In addition, InViTo can be part of instrumental equipment for collaborative working sessions, such as meeting or workshops, thanks to its interactive and dynamic usability. Its quick responses and visual interface can improve the discussion among people, offering a shared basis for enhancing the debate.

As a toolbox, InViTo was developed as a set of instruments for dealing with different spatial issues, disciplines and case studies. InViTo allows the **weighting** of different maps, as in a simplified multi-criteria analysis, and the **exporting** of maps with filters and weights to different formats (\*.csv; \*.pdf; \*.jpg), so that the outcomes can be re-used for many other purposes.

InViTo can be accessed on the base of individual involvement in projects. In particular, there are **three different kind of users**: the project contributors, who have a personal account for full access to the creation and editing of a project; the project advisors, who have a personal account for accessing to non-public project, download maps and leave comments; and, finally, the public users, who do not need an account but can only view and explore the data within public projects.

### *The structure of InViTo*

This configuration implies that the structure of InViTo is based on two main sections: the **project editor**, and **data explorer**.

The **project editor** is designed for GIS technicians, planners and administrators of projects. Here the logged-in users can create new projects and manage existing ones deciding the information that need to be seen by exploring users. Moreover, in the back-end interface, the logged-in users can decide the filter modality choosing among checkbox, dropdown menu, range sliders or single choice range sliders. Finally, specific buttons provide possibilities for customising the visualisation or for enabling particular elements such as tables, analysis grids or background maps.

The **data explorer** is designed for final users. In fact it can be public and allows people visualizing, filtering and exploring data related to specific projects.

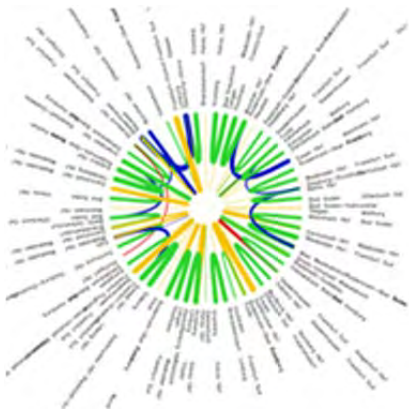
The structure of data explorer can be in turn divided into three subsections:

- the **data filtering** section;
- the **map weighting** section;
- the **data visualization** section.

The distinctive features of InViTo are therefore dynamicity and interactivity, which make it open to variously skilled users and suitable to be part of instrumental equipment for meetings and workshops. It can be used by a single person or collectively during discussion sessions. In this case, the displayed map can become the interface for sharing opinions and reasoning. Its quick responses and visual interface offers possibilities for improving the discussion among people, providing a shared basis for enhancing the debate.

### 1.1 Uses and purposes

The main task of InViTo is to create opportunities for reasoning on data.



InViTo can be used to:

- detect critical areas and areas with more opportunities;
- design alternative options;
- evaluate "what if" scenarios;
- investigate data spatial distribution;
- data mining;
- customise data visualisation;
- stimulate discussions;
- elaborate shared solutions.

### 1.2 User's account

According to the individual involvement in projects, InViTo has three different kinds of user's access.

In order to create, edit or delete projects:



users need to login with a "*project contributor*" account. In order to have a personal account, please, request it to stefano.pensa@polito.it.

In order to explore an existing project, there are two possible cases:



If it is a **non-public project**, users need to login with a "*project advisors*" account. Such kind of users can also download maps and leave comments to the project. In this case of private project, the log-in permission is provided directly by the project administrator.



If it is a **public project**, log-in is not needed and you have open access to its visualisation. Public users can not download data, nor leave comments.

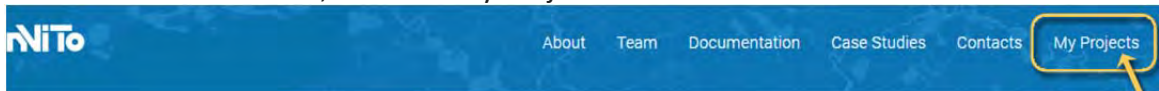
## 2. PROJECT EDITOR

**WARNING!** This section is only for logged-in users. Depending on user's profile, InViTo allows different options on the visibility and editing of projects.

See paragraph 1.2 to know the possible options. If you are a Project Advisor or a Project Contributor (logged-in user) continue reading Section 2 to discover the possibilities for editing and customising projects. Otherwise, skip to Section 3 and discover how explore data.

If you are a logged-in user, you can access to your project list and back-end interface in two ways:

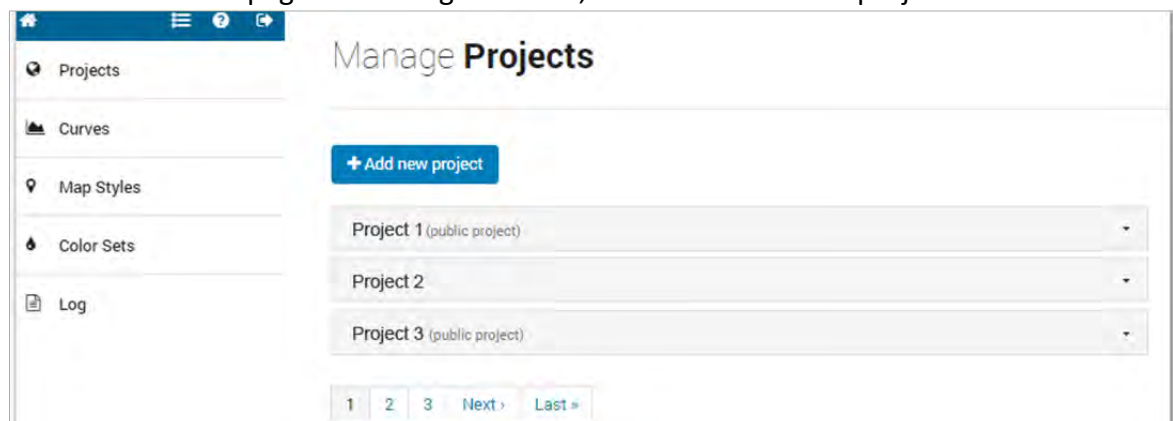
- from the InViTo website, click on “My Projects” menu.



- from the data explorer window, clicking on the project list icon.



Then, you will access to a page containing a toolbar, a menu and a list of projects:



The toolbar, on the upper left side, allows the access to the following activities:

- *Home icon*: link to the home page of Urban Toolbox;
- *List icon*: link to the list of projects accessible by each single user;
- *Question point*: access to the documentantion useful for the use of InViTo;
- *Arrow icon*: link to the home page of Urban Toolbox.

The menu on the left allows the access to the different sections for setting the visualization and interaction of each project. The sections are:

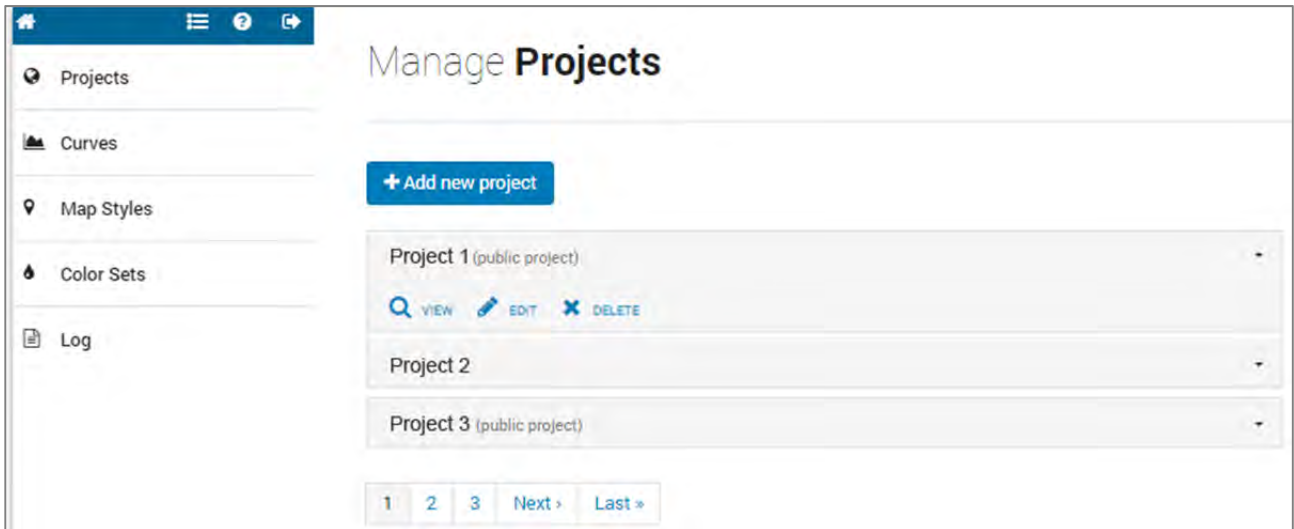
- *Projects section*: it allows to configure a project;
- *Curves section*: it allows to decide the mathematical curves necessary to build the relationships between data;
- *Map Styles section*: it allows to configure the style of background map;
- *Color Sets section*: it is necessary for defininf the colours used in the visualization of data;
- *Log section*: here you can see the last days of InViTo logs.

## 2.1 “Projects” section

**WARNING!** This section is only for logged-in users.

If you have a project advisors account, you can view the list of projects you are involved in.

If you have a project contributor account, clicking on the arrow on the right of project’s name, you can View, Edit or Delete your projects.



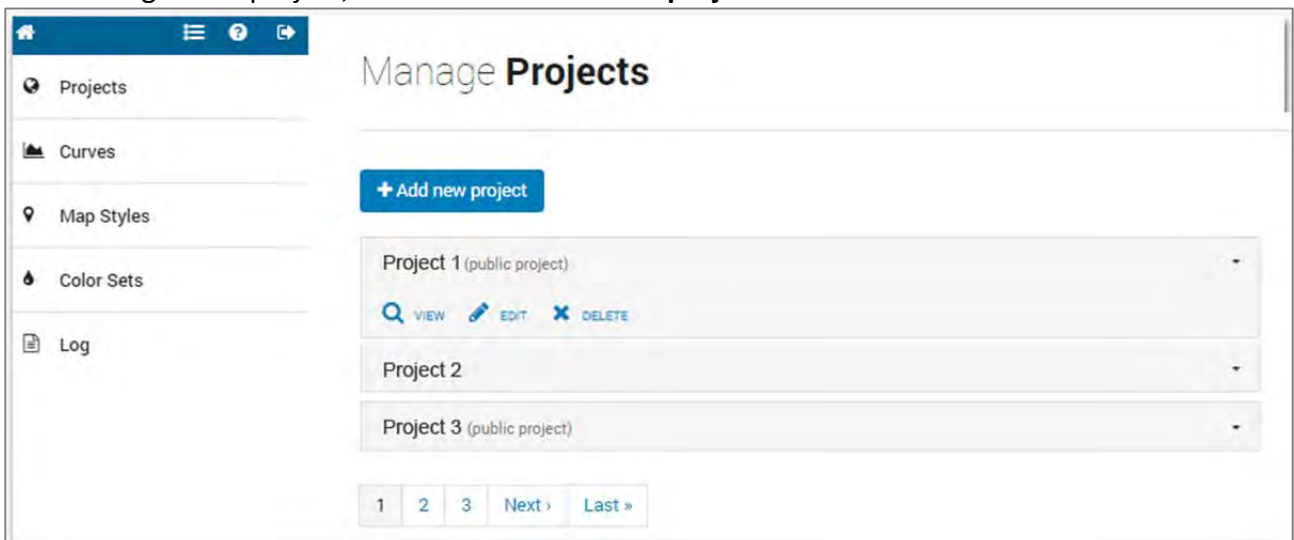
Through this section, you can configure/edit or delete a project in InViTo.

In order to start your project, go the Project Manager page (**section 2.1.1**).

### 2.1.1 Add new project

- If you have a project advisors account, clicking on the arrow on the right of project’s name, you can click on “View” button to display the project.
- If you have a project contributor account, clicking on the arrow on the right of project’s name, you can View, Edit or Delete the project.

For building a new project, click on the “+Add new project” blue button.



The “+Add new project” button opens a setting page where providing a title and a description of the project.



The screenshot shows a web form titled "Create new project". At the top left, there is a tab labeled "SETTINGS". Below the title, there are two input fields: "Title" with the text "Tutorial" and "Description" with the text "Description of the project". A small "Project description" label is visible below the description field. In the bottom right corner, there is a blue button labeled "Register new project".

After that, click on “Register new project” button and you will be redirected to the Edit project page.



The screenshot shows a web page titled "Edit Tutorial Demo Project". Below the title, there is a "Schema user: user\_160" and a "Schema password: %yQ2qL&^JvcM". At the bottom, there is a navigation bar with five tabs: "SETTINGS", "PEOPLE", "COMPONENTS", "TABLES", and "Q VIEW". The "Q VIEW" tab is highlighted with a blue background.

Here *Project Contributor* users have to compile 4 sections and view the model as it appears in the **data explorer view**:

- **Settings** (section 2.1.2)
- **People** (section 2.1.3)
- **Components** (section 2.1.4)
- **Tables** (section 2.1.5)

## 2.1.2 Settings

When you create a New Project or click on the edit button near to the project list, you access to the settings project page.

**Edit Tutorial Demo Project**  
Schema user: user\_160  
Schema password: %yQ2qL&^JvcM

SETTINGS PEOPLE COMPONENTS TABLES VIEW

Title: Tutorial Demo Project

Subtitle:   
Short sentence after the title

Description:   
Project description

Public project:  Yes  
check yes if you want to use this project as Public

Project Logo: Add Logo  
Add jpg or png file (max 300x150px)

Project Logo Link:   
The link that will appear by clicking on the logo.

Project Color:  Select Color

Background: GoogleMaps

Flat Background Color:  Select Color

Default Map Style: -- Select One --

Save Changes

Compile the form considering suggestions as follow:

- “*Project contributors*” users can assign a title, a sub-title and a description related to each single project. They can also upload the project logo picture and link it to project website. Among the front interface appearance settings, also the main colour can be chosen, so that each project visualised in InViTo can maintain the same graphic line of its parent project.
- *Title*: title of the project visible on the front-end interface
- *Subtitle*: short sentence after the title.
- *Description*: description visible in the front-end interface (par. 3.4).



- *Public project*: check yes if you want to use this project as Public. You can keep this button unchecked while you need to work on the project. In this case, the project will be accessible only by the users included in the “people” list.
- *Public export*: check yes if you want data included in the project can publicly exported.
- *Project Logo* :add jpg or png file (maximum size: 300px x 150px).
- *Project Logo Link*: web address that will appear by clicking on the logo.
- *Project Color*: define the main colour theme for the front-end interface.
- Background:
  - **Google Maps**. You can choose among different Maps styles or customize it.
  - **Open Street Maps (OSM)**,
  - or a **flat colour** map within the RGB palette colours. In addition, you can customise the and use it for your project. Flat colour maps (non-geographical maps) are very useful to visualise non-spatial data which should be represented through an abstract mode, such as charts, diagrams or info-graphics. In that case, a geometry can be upload to be used as background for the exploration of non-spatial data.
- *Flat Background Color*: choose which colour should be visualised in the case the user will select a flat colour map style.
- *Default Map Style*: choose which map style do you want when accessing to the project.

Then, save the setting.

### 2.1.3 People

In the “People” section, “Project Contributors” users can include people in the project:

- people in the “Project contributors” are enabled to edit/delete the project;
- if the project is **public**, this field can be left empty; if the project is not public, people in the “Project advisors” are allowed to assess to the project.

The screenshot displays the 'PEOPLE' settings page. At the top, there is a navigation menu with tabs for 'SETTINGS', 'PEOPLE', 'COMPONENTS', 'TABLES', and 'Q VIEW'. The 'PEOPLE' tab is active. Below the navigation, there are two input fields: 'Project Contributors' and 'Project advisors'. Both fields are currently empty. A blue 'Save Changes' button is positioned at the bottom right of the form area.



### 2.1.4 Components

In the components section are listed external configuration of the project.

- **Color Set:** a list of color sets through which users can set the color of geometry in the data explorer view.
- **Curve Configuration:** a list of pre-defined curves which describes how an element generates attraction or repulsion on the basis of the distance. The application of curves is at the basis of the weighted sum of maps in the **Weighting section** (3.2).
- **Map Style:** a list of pre-defined map styles through which users can set the background map in the data explorer view.



### 2.1.5 Tables

The Tables menu is the data core. Here you have to upload your tables in **.Json** or **GeoJSON** file format. The tables show the attributes of data to be filtered, providing pre-set additional information field by field.

The setting of table visualization allows a high level of customization on **colours, dimensions, styles, map styles** and on a series of utilities by means of which the tool is expected to offer a wide range of possibilities for users to improve their analytical skills and enhancing the discussion.

To add a private table, click on the blue button **“+Add private table”**



**WARNING!** for a correct use of InViTo, Json files have to be projected as follows:

- Projected Coordinate System: WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere
- Projection: Mercator\_Auxiliary\_Sphere

### 2.1.5.1 Add private table

**TIP #1!** Pay attention to the editing of the table. Each table you add, will be displayed in the filtering section of the data explorer as last layer. Thus, if you want to maintain a specific order of layers when you access to the viewer, keep in mind the order of uploading. However, this order can be modified just clicking on the layer's name and moving it up and down the other layers.

**TIP #2!** The name of table's columns (field name) will determine the order of filtering data. The way data are displayed respect the alphabetical order.

### 2.1.5.2 TIP #3! Check Forbidden characters (see section 2.1.5.2)

**TIP #4!** Check Forbidden words (see section 2.1.5.3).

After clicking on the blue button "+Add private table", a form will be displayed. First of all, click on "Scegli file" button and browse your folder to choose the .json or .geojson file.



The screenshot shows a web form titled "Add new Table". At the top, it says "Table associated to Tutorial project". There are three input fields: "Name", "Description", and "File to upload". The "File to upload" field has a button labeled "Scegli file" and the text "Nessun file selezionato". Below the fields is a table with the following structure:

Name	PRIMARY KEY	Type	MaxLength

A blue "Save table" button is located at the bottom right of the form.

As the file is uploaded on InViTo's server, a green text will confirm the file is "Uploaded with success".

Then, provide a name and a description to the table.

**WARNING!** Before save changes

- check the Primary Key relative to the FID field;
- check the type for each field corresponds to your setting.

## Add new Table

Table associated to **Tutorial** project

**Name**

**Description**

**File to upload**  TWX\_BCN\_2015Ottobre03.json

Upload with success.

Name	PRIMARY KEY	Type	MaxLength
FID	<input checked="" type="checkbox"/>	<input type="text" value="SERIAL"/>	<input type="text"/>
USER_ID	<input type="checkbox"/>	<input type="text" value="DOUBLE PRECISION"/>	<input type="text"/>

[Save table](#)

When it is all ok, click on **save changes and wait** until green banner on the top confirms the table has been created. Then, click on the name of the project (in blue).

## Add new Table

Table table-1 created.

Table associated to **Tutorial** project

**Name**

**Description**

**File to upload**  Nessun file selezionato

Name	PRIMARY KEY	Type	MaxLength
------	-------------	------	-----------

[Save table](#)

### 2.1.5.3 Forbidden characters

When editing a table, please consider that a number of characters can generate some errors due to the incompatibility between some platforms.

In order to avoid errors, some letters are automatically substituted or, in case a proper substitution is not found, trimmed from strings during upload a table in InViTo.

The following list shows the substitutions:

from	to																
α	a			À	A	c	c	d	d	Ē	E	Ĥ	H	Î	I		
-	--	/	-	Á	A	Ć	C	e	e	Ė	E	Ħ	H	İ	!		
-	-	/	-	Â	A	ć	c	e	e	Ě	E	Ĩ	H	ı	!		
-	-	v	V	Ã	A	Ĉ	C	é	e	Ĝ	E	Ī	H	ı	!		
-	-	ç	C	Ä	A	ĉ	c	è	e	Ğ	E	Ĵ	H	ı	!		
-	-	\$	\$	Å	A	Č	C	ë	e	Ĥ	E	Ķ	H	ı	!		
¿		£	£	Ā	A	č	c	Ě	E	Ħ	E	Ĵ	H	ı	!		
i	i	€	€	Ă	A	ċ	C	ě	e	Ĩ	E	Ĵ	H	ı	!		
...	...	A	A	Ą	A	ċ	c	Ě	E	Ĵ	E	Ĵ	H	ı	!		
·	·	a	a	Ȧ	A	Ç	C	ê	e	Ź	E	Ĵ	H	ı	!		
'	"	ª	a	Ǻ	A	ç	c	ê	e	Ʒ	E	Ĵ	H	ı	!		
'	"	Á	A	ǻ	A	Ç	C	ë	e	Ʒ	E	Ĵ	H	ı	!		
,	,	á	a	Ǽ	A	ç	c	Ě	E	Ʒ	E	Ĵ	H	ı	!		
<	<	À	A	Ǿ	A	%	%	è	e	Ʒ	E	Ĵ	H	ı	!		
>	>	à	a	ǿ	A	Ʒ	C	ě	e	F	F	Ĵ	H	ı	!		
"	"	Ǻ	A	ǿ	A	Ʒ	C	Ě	E	f	f	Ĵ	H	ı	!		
"	"	ǻ	A	ǿ	A	Ʒ	C	Ě	E	Ʒ	F	Ĵ	H	ı	!		
"	"	Ǽ	A	ǿ	A	Ʒ	C	Ě	E	Ʒ	f	Ĵ	H	ı	!		
"	"	Ǿ	A	ǿ	A	Ʒ	C	Ě	E	Ʒ	f	Ĵ	H	ı	!		
„	"	ǿ	A	ǿ	A	Ʒ	C	Ě	E	Ʒ	f	Ĵ	H	ı	!		
«	<	ǻ	A	ǿ	A	D	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
»	>	Ǿ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
(	(	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
)	)	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
[	[	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
]	]	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
{	{	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
}	}	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
@	@	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
*	*	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
*	*	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
&	&	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
%	%	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
%	%	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
=	=	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
=	=	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
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°	°	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
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®	P	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
®	P	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
€	e	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
€	e	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
+	+	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
+	+	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
±	±	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
±	±	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
:	:	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
:	:	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
x	x	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
x	x	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
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<	<	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
=	=	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
=	=	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		
>	>	Ǻ	A	ǿ	A	đ	d	Ě	E	Ʒ	f	Ĵ	H	ı	!		
>	>	ǻ	A	ǿ	A	Đ	D	Ě	E	Ʒ	f	Ĵ	H	ı	!		



#### 2.1.5.4 Forbidden words for table name or column name

When editing a table, please consider that the following words cannot be used for table name or for column name.

Most of those words are commands and are misinterpreted in the database.

More info in [official Postgresql documentation](#).

a	bernoulli	cs	constraint	estamp	dense_rank	equals
abort	between	characters	constraint_c	current_tra	depth	escape
abs	bigint	check	atalog	nsform_gro	deref	escaped
absolute	binary	checked	constraint_	up_for_type	derived	every
access	bit	checkpoint	name	current_use	desc	except
accessible	bit_length	class	constraint_s	r	describe	exception
action	bitvar	class_origin	chema	cursor	descriptor	exclude
ada	blob	clob	constraints	cursor_nam	destroy	excluding
add	boolean	close	constructor	e	destructor	exclusive
admin	both	cluster	contains	cycle	deterministi	exec
after,aggreg	breadth	coalesce	continue	data	c	execute
ate	by	cobol	conversion	database	diagnostics	existing
alias	c	collate	convert	databases	dictionary	exists
all	cache	collation	copy	date	disable	exit
allocate	call	collation_ca	corr	datetime_in	disconnect	exp
also	called	talog	correspondi	terval_code	dispatch	explain
alter	cardinality	collation_na	ng	datetime_in	distinct	external
always	cascade	me	count	terval_preci	distinctrow	extract
analyse	cascaded	collation_sc	covar_pop	sion	div	false
analyze	case	hema	covar_samp	day	do	fetch
and	cast	collect	create	day_hour	domain	filter
any	catalog	column	createdb	day_micros	double	final
are	catalog_na	column_na	createrole	econd	drop	first
array	me	me	createuser	day_minute	dual	float
as	ceil	command_f	cross	day_second	dynamic	float4
asc	ceiling	unction	csv	deallocate	dynamic_fu	float8
asensitive	chain	command_f	cube	dec	nction	floor
assertion	change	unction_cod	cume_dist	decimal	dynamic_fu	following
assignment	char	e	current	declare	nction_code	for
asymmetric	char_length	comment	current_dat	default	each	force
at	character	commit	e	defaults	element	foreign
atomic	character_le	committed	current_def	deferrable	else	fortran
attribute	ngth	completion	ault_transfo	deferred	elseif	forward
attributes	character_s	condition	rm_group	defined	enable	found
authorization	et_catalog	condition_n	current_pat	definer	enclosed	free
n	character_s	umber	h	degree	encoding	freeze
avg	et_name	connect	current_role	delayed	encrypted	from
backward	character_s	connection	current_tim	delete	end	full
before	et_schema	connection_	e	delimiter	end-exec	fulltext
begin	characteristi	name	current_tim	delimiters	enum	function

fusion	inner	left	middleint	nullif	alog	ref
g	inout	length	min	nulls	parameter_	references
general	input	less	minute	number	specific_na	referencing
generated	insensitive	level	minute_mic	numeric	me	regex
get	insert	like	rosecond	object	parameter_	regr_avgx
global	instance	limit	minute_sec	octet_lengt	specific_sch	regr_avgy
go	instantiable	linear	ond	h	ema	regr_count
goto	instead	listen	minvalue	octets	parameters	regr_interce
grant	int	ln	mod	of	partial	pt
granted	int1	load	mode	off	partition	regr_r2
greatest	int2	local	modifies	offset	pascal	regr_slope
group	int3	localtime	modify	oids	password	regr_sxx
grouping	int4	localtimesta	module	old	path	regr_sxy
handler	int8	mp	month	on	percent_ran	regr_syy
having	integer	location	more	one_shot	k	reindex
header	intersect	locator	move	only	percentile_c	relative
hierarchy	intersection	lock	multiset	open	ont	release
high_priorit	interval	login	mumps	operation	percentile_	rename
y	into	long	name	operator	disc	repeat
hold	invoker	longblob	names	optimize	placing	repeatable
host	io_after_gti	longtext	national	option	pli	replace
hour	ds	loop	natural	optionally	position	require
hour_micro	io_after_gti	low_priority	nchar	options	postfix	reset
second	ds	lower	nclob	or	power	resignal
hour_minut	io_before_g	m	nesting	order	preceding	restart
e	tids	map	new	ordering	precision	restrict
hour_secon	io_before_g	master_bin	next	ordinality	prefix	result
d	tids	d	no	others	preorder	return
identity	is	master_ssl_	no_write_to	out	prepare	returned_ca
if	isnull	verify_serve	_binlog	outer	prepared	rdinality
ignore	isolation	r_cert	nocreatedb	outfile	preserve	returned_le
ilike	iterate	match	nocreaterol	output	primary	ngth
immediate	join	matched	e	over	prior	returned_oc
immutable	k	max	nocreateuse	overlaps	privileges	tet_length
implementa	key	maxvalue	r	overlay	procedural	returned_sq
tion	key_membe	mediumblo	noinherit	overriding	procedure	lstate
implicit	r	b	nologin	owner	public	returns
in	key_type	mediumint	none	pad	purge	revoke
including	keys	mediumtext	normalize	parameter	quote	right
increment	kill	member	normalized	parameter_	range	rlike
index	lancompiler	merge	nosuperuser	mode	rank	role
indicator	language	message_le	not	parameter_	read	rollback
infile	large	ngth	nothing	name	read_write	rollup
infix	last	message_oc	notify	parameter_	reads	routine
inherit	lateral	tet_length	notnull	ordinal_posi	real	routine_cat
inherits	leading	message_te	nowait	tion	real	alog
initialize	least	xt	null	parameter_	recheck	routine_na
initially	leave	method	nullable	specific_cat	recursive	me

routine_sch	smallint	sublist	treat	utc_date
ema	some	submultiset	trigger	utc_time
row	source	substring	trigger_cata	utc_timesta
row_count	space	sum	log	mp
row_numbe	spatial	superuser	trigger_nam	vacuum
r	specific	symmetric	e	valid
rows	specific_na	sysid	trigger_sche	validator
rule	me	system	ma	value
savepoint	specificity	system_user	trim	values
scale	sql	table	true	var_pop
schema	sql_after_gt	table_name	truncate	var_samp
schema_na	ids	tablesample	trusted	varbinary
me	sql_before_	tablespace	type	varchar
schemas	gtids	temp	uescape	varcharacte
scope	sql_big_res	template	unbounded	r
scope_catal	ult	temporary	uncommitte	variable
og	sql_calc_fou	terminate	d	varying
scope_nam	nd_rows	terminated	under	verbose
e	sql_small_re	text	undo	view
scope_sche	sult	than	unencrypte	volatile
ma	sqlcode	then	d	when
scroll	sqlerror	ties	union	whenever
search	sqlexceptio	time	unique	where
second	n	timestamp	unknown	while
second_mic	sqlstate	timezone_h	unlisten	width_buck
rosecond	sqlwarning	our	unlock	et
section	sqrt	timezone_m	unnamed	window
security	ssl	inute	unnest	with
select	stable	tinyblob	unsigned	within
self	start	tinyint	until	without
sensitive	starting	tinytext	update	work
separator	state	to	upper	write
sequence	statement	toast	usage	xor
serializable	static	top_level_c	use	year
server_nam	statistics	ount	user	year_month
e	stddev_pop	trailing	user_define	zerofill
session	stddev_sam	transaction	d_type_cata	zone
session_use	p	transaction_	log	
r	stdin	active	user_define	
set	stdout	transactions	d_type_cod	
setof	storage	_committed	e	
sets	straight_joi	transactions	user_define	
share	n	_rolled_bac	d_type_na	
show	strict	k	me	
signal	structure	transform	user_define	
similar	style	transforms	d_type_sch	
simple	subclass_ori	translate	ema	
size	gin	translation	using	



### 2.1.5.5 Type of data

List of available data type in InViTo tables. This is a small subset of the available data in Postgresql.

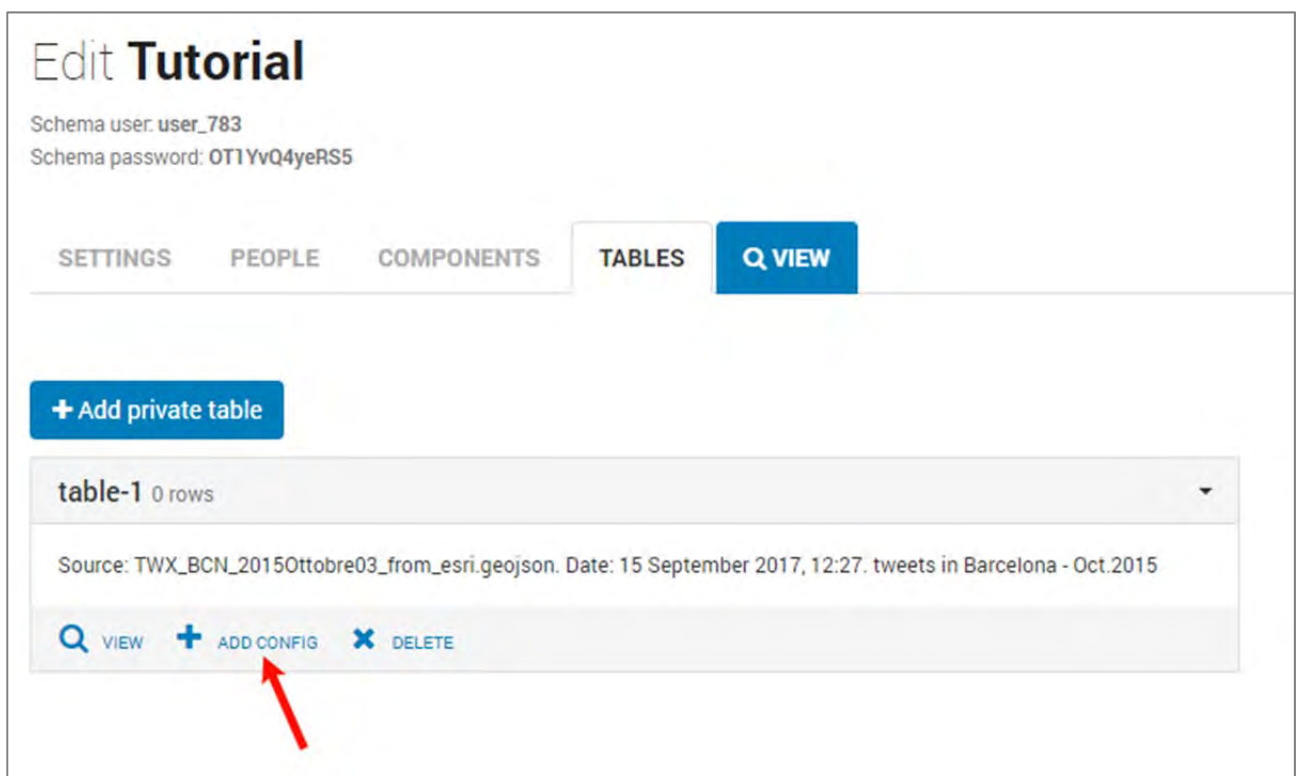
For more information have a look to the official documentation on the specific types:

<http://www.postgresql.org/docs/9.3/static/datatype.html>

SMALLSERIAL  
SERIAL  
BIGSERIAL  
SMALLINT  
INTEGER  
BIGINT  
BOOLEAN  
TEXT  
CHARACTER  
CHARACTER VARYING  
REAL  
DOUBLE PRECISION  
INTERVAL  
NUMERIC  
JSON

### 2.1.5.6 Configure a table

In order to configure the visualisation of a table, in the table section click on the arrow near the table name and click in the “+Add Config” button.



You will access to the Configuration Setting page

The screenshot shows a web interface for adding a new table configuration. The main heading is "Add new Table configuration". Below it, there's a sub-heading "New configuration for Tutorial project, table-1 table". The form has several sections:

- Name:** A text input field containing "Table 1".
- Description:** A text area containing "Example of table configuration".
- Configuration:** A text area with a placeholder "Insert a short description".
- Active in project:** A toggle switch that is currently turned on.
- Filter hierarchy:** A text area with a placeholder "Is this configuration loaded in this project?". Below it, there's a small JSON snippet: `json defining filter visual hierarchy: [{"filterName": "Active", "filterParent": "isLoaded", "onValue44": "onValue45"}]`

Below the form, there are three tabs: "APPEARANCE", "FILTERS", and "WEIGHTING". The "APPEARANCE" tab is selected. It contains the following settings:

- Default visibility:** A checked checkbox.
- Background only:** An unchecked checkbox.
- Fill style:** A color picker showing "#bebebe" and an opacity slider set to 80%.
- Line style:** A color picker showing "#020202" and an opacity slider set to 80%.
- Point style:** A color picker showing "#123456" and an opacity slider set to 80%.
- Info box content:** A text area.

At the bottom right, there is a blue button labeled "Create configuration".

Here you have to compile the form as follows:

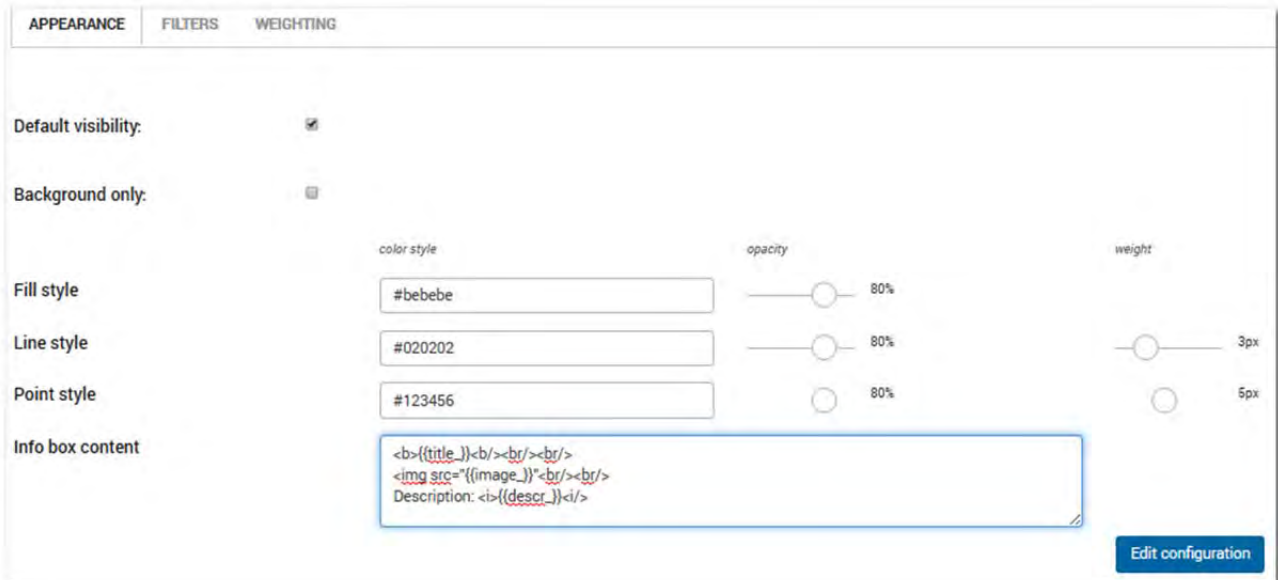
- **Name:** provide a name to the table configuration which could be easily understood by final users. This name will be the title of layers in the visualisation.
- **Description:** this field can be used to add a description to the layer.
- **Configuration:** for advanced users, this field can be used to copy and paste the same configuration from other projects.
- **Active in Project:** if not enabled, the table will not be visible in the project visualisation
- **Filter Hierarchy:** for advanced users, this field allows to create a hierarchy between filters.

Then, further 3 sections have to be compiled:

- Appearance (see section 2.1.5.6)
- Filters (see section 2.1.5.7)
- Weighting (see section 2.1.5.8)

### 2.1.5.7 Appearance setting

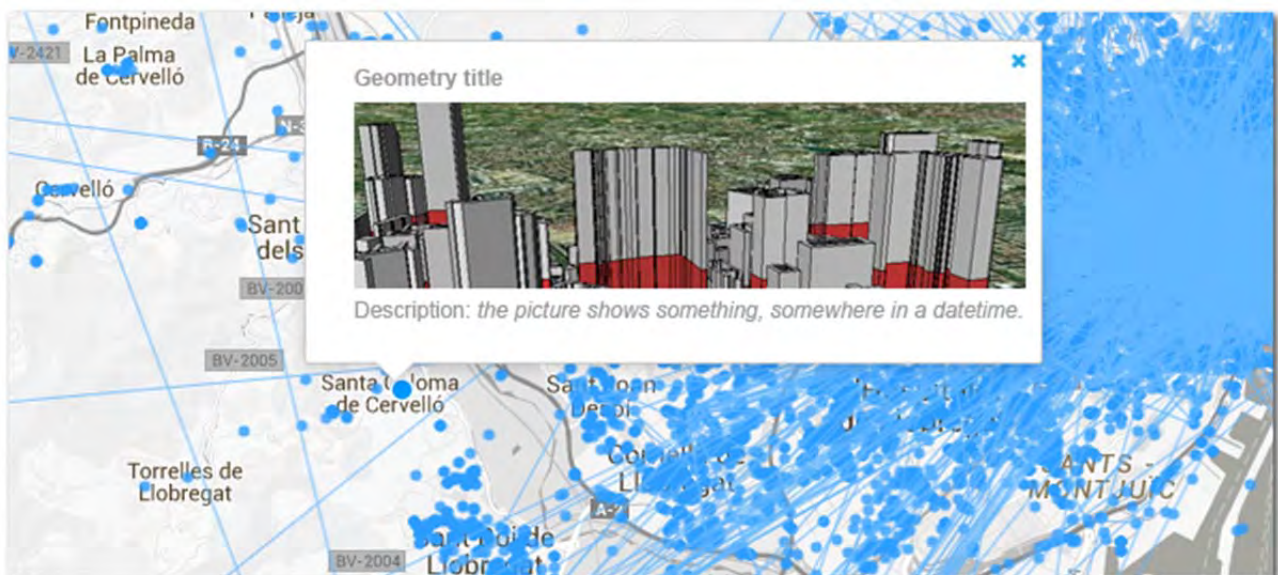
The appearance setting of geometries has to be done layer by layer, field by field. In the appearance menu, "project contributors" users can choose the basic aspect of all geometries when no map style is enabled.



A difference is considered among points, lines and areal geometries as well as in GIS data. For all of these elements, a colour, a dimension and a level of opacity have to be assigned.

A checkbox allows users to decide if the layer should be visible when opening the project, and if the layer can be filtered by the final user or it should be used only as a background image.

An info box content window can be compiled in order to have a **pop-up window** for each geometry when double-clicking on it in the front interface.



The pop-up window containing the info box. It appears when double-clicking on a geometry in the map window.

The info box window should be compiled in html. Here below an example shows the content of an info-box window where:

- the title of the image, included in the database field named "title\_", is in bold.
- a picture of the geometry is loaded from an url contained in the database field named "image\_".
- a description (in italic style) of the feature is loaded from the database field named "descr\_".

```
<b>{{title_}}</b><br/>
```

```

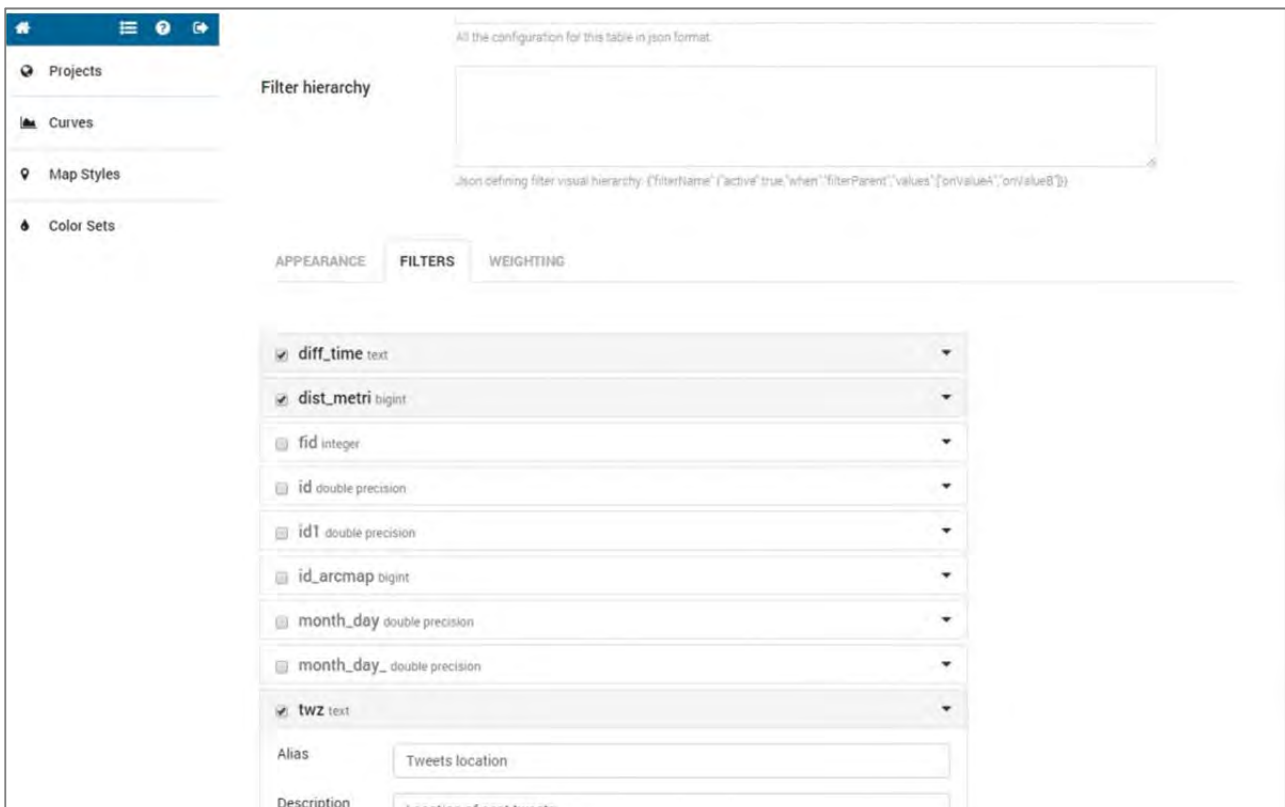
```

```
Description: <i>{{descr_}}</i>
```

#### 2.1.5.8 Filters setting

Through the filtering section, *project contributor* users are guided to design the visualisation of data, which will be displayed in the front-end interface. Project contributors can decide which layers and sub-layers of data can be visualised in the front interface, and how data should be displayed. Therefore, they can decide the degree of freedom of final users in knowing the information included within data.

When opening the filtering section, you will find the list of fields included in the table.



For each field, click on the arrow, then open and compile the form.

- *Alias*: is the name visible in the filtering section of data explorer.
- *Description*: is the name visible when passing with the mouse over the field's name in the filtering section of data explorer.
- *Appears in table*: checking it enables the field to be visible in the table in data explorer.
- *Draw graph*: checking it enables the field to be visible in the graph in data explorer.

## FILTERING

- *Filtering*: checking it enables the field to be visible in the filtering section of data explorer.
- Each kind of data can be visualised through different types of filters:

- *checkbox*: for text fields.
- *dropdown menu*: for text fields.
- *range sliders*: for numeric fields.
- single choice range slider: numeric fields.
- *tag*: text fields in ["txt1","t2",".."] format.

- *Filtering panel*: writing a name, you automatically create a panel containing the field. You can use the same panel's name for different field in order to create sub-folders for visualization.

## APPEARANCE (how to visualise data)

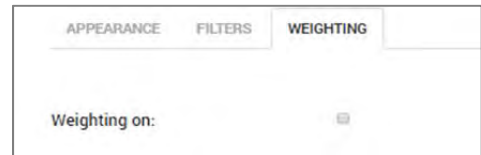
- *Filtered opacity*: set the geometry opacity;
- *Fill Style*: choose the set of colours for filling the geometry in relation to the values included in the table field.
- *Line Style*: choose the set of colours and width for lines and polygons' perimeters in relation to the values included in the table field.
- *Point Style*: choose the set of colours and radius (n. of pixels) of point geometries in relation to the values included in the table field.

The screenshot shows the 'FILTERS' tab in the QGIS Data Explorer. It displays the configuration for a field named 'user\_id' (double precision). The configuration includes:

- Alias**: user\_id
- Description**: (empty text area)
- Appears in table**:
- Draw graph**:
- Filtering**:
- Filtering panel**: (empty text area)
- Appearance**:
  - Filtered opacity**: 100%
  - Fill style**: Traffic light
  - Line style**: Traffic light
  - Point style**: Traffic light
  - Weight**: 3px
  - Point weight**: 5px

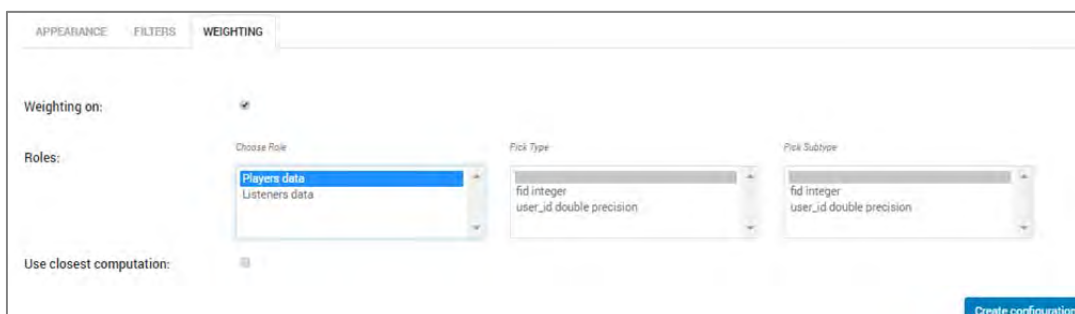
### 2.1.5.9 Weighting setting

The weighting section allows data to have an influence on other data on the basis of mathematical curves.

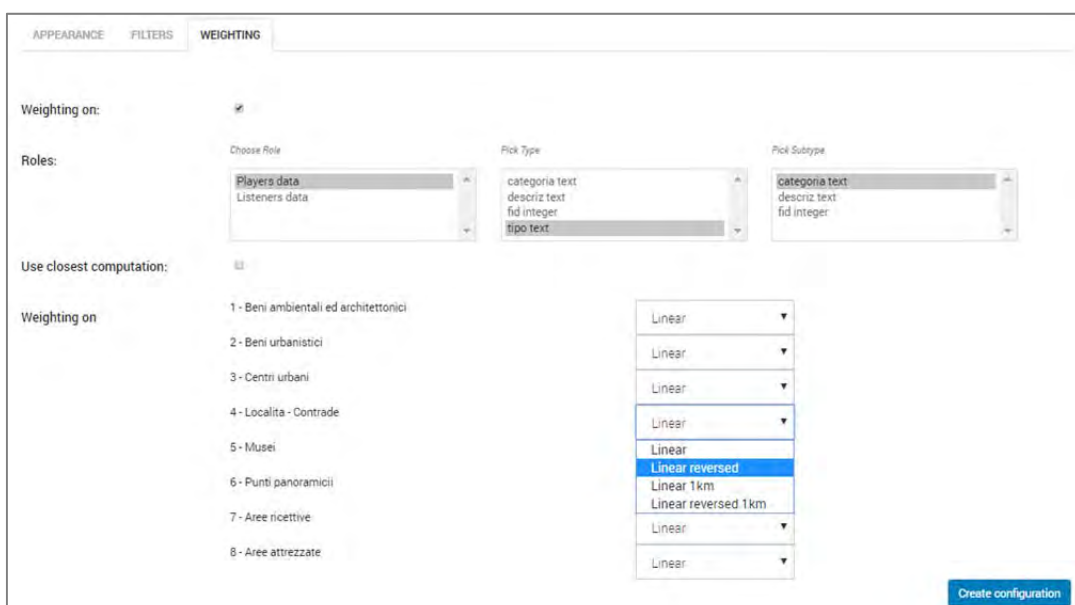


Through this section, users can assign a curve to each value included in a specific field of the table. In order to weight maps, firstly check the “Weighting on” box. Then, Roles should be assigned to the layer:

- **“Listeners data”** : this role can be assigned to one map for each project. This map has the function of defining the land subdivision. For this purposes, it can be used a grid, a census map, a zoning map or whatever land classification map.
- **“Players data”**: all the other layer can be weightd assigning them a “players data” role. Then, two fields of the table must be chosen for defining the role:
  - *Type field* is the field of the table which contains the family name of the values to be weighted (i.e. Transport network).
  - *Sub-Type* field is the field which contains the sub-type of the values to be weighted. To each subtype, users can assign a different curve (i.e. Public Transport, Bykelanes, Highways,..).



By default, mathematical curves have been previously set to linear functions. Clicking on the dropdown menu, users can choose between the curve types associated to the project.

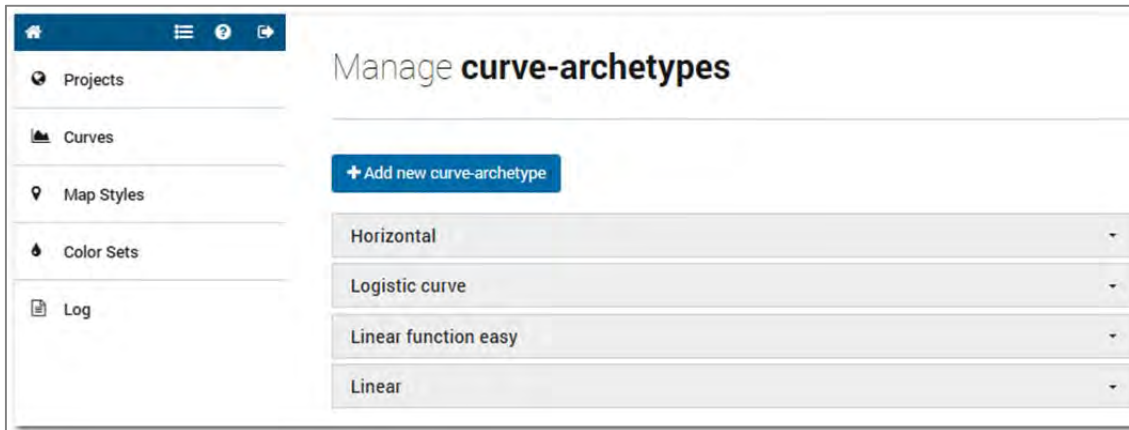




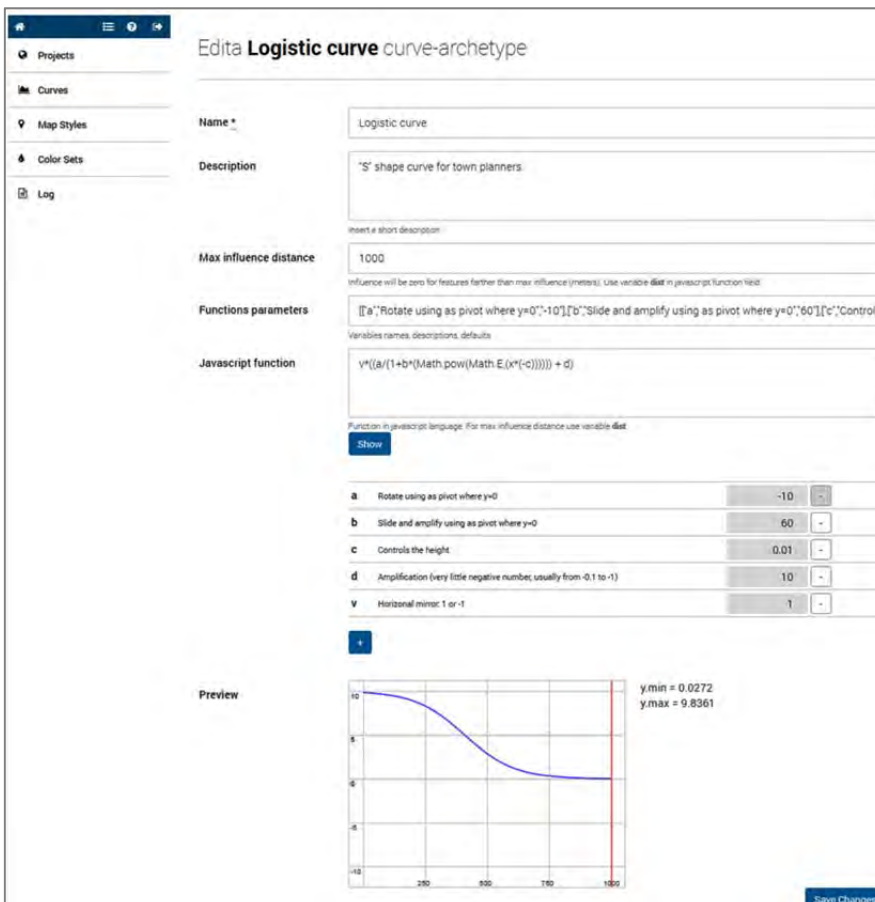
## 2.2 “Curves” section: configuration

In order to calculate the influence of each layer on the other layers, InViTo makes use of mathematical curves which describe the behaviour.

The curve configuration sub-menu allows administrator users to create or edit one of the already available curve. For each curve archetype, users can set the radius of action, the intensity, and all the parameters that define the behaviour of the curve. Once curves are edited, users assign them to the relative layer. Their working is then visible in the front interface.



In the curves setting page, administrator users can set the typology and the parameters of each curve to be used to weight maps in the front interface.



The weights are calculated on the data filtered in the previous section of data filtering. Therefore, both administrator and public users have the opportunity to evaluate the response of different scenarios through an interactive and dynamic visualisation, which immediately provides the response of land to specific planning choices or policies.

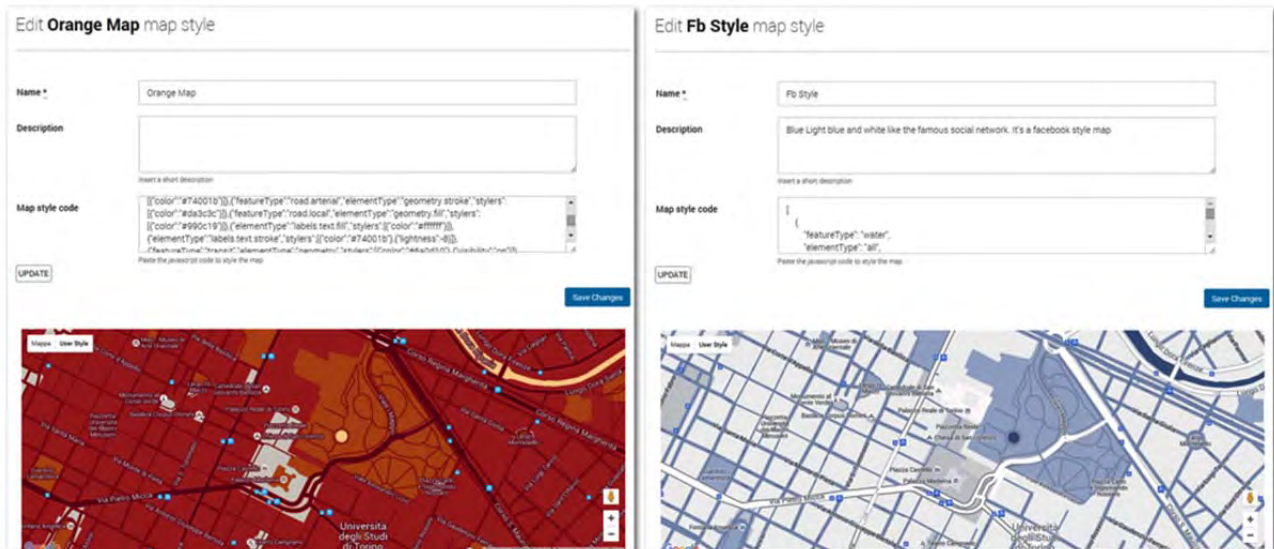
Curves assign a behaviour on the basis of a distance:

$$f(x)=d$$

## 2.3 “Map Styles” section: configuration

Here, "Project contributors" users can choose or customise the map style(s), through assigning different setting to a **Google Maps style**.

For example, map styles can be customised by the use of html script provided by specific open source data repository, where communities share their own map styles and allow users to create their own. One of this portal is for example Snazzy Maps (<https://snazzymaps.com/>), which allows highly detailed generation of map styles under the Creative Commons licence.



Back interface of InViTo: definition of map styles. Here, "Project contributors" users can set the Map styles parameters, to be visualised in the front interface.

## 2.4 “Color Sets” section: configuration

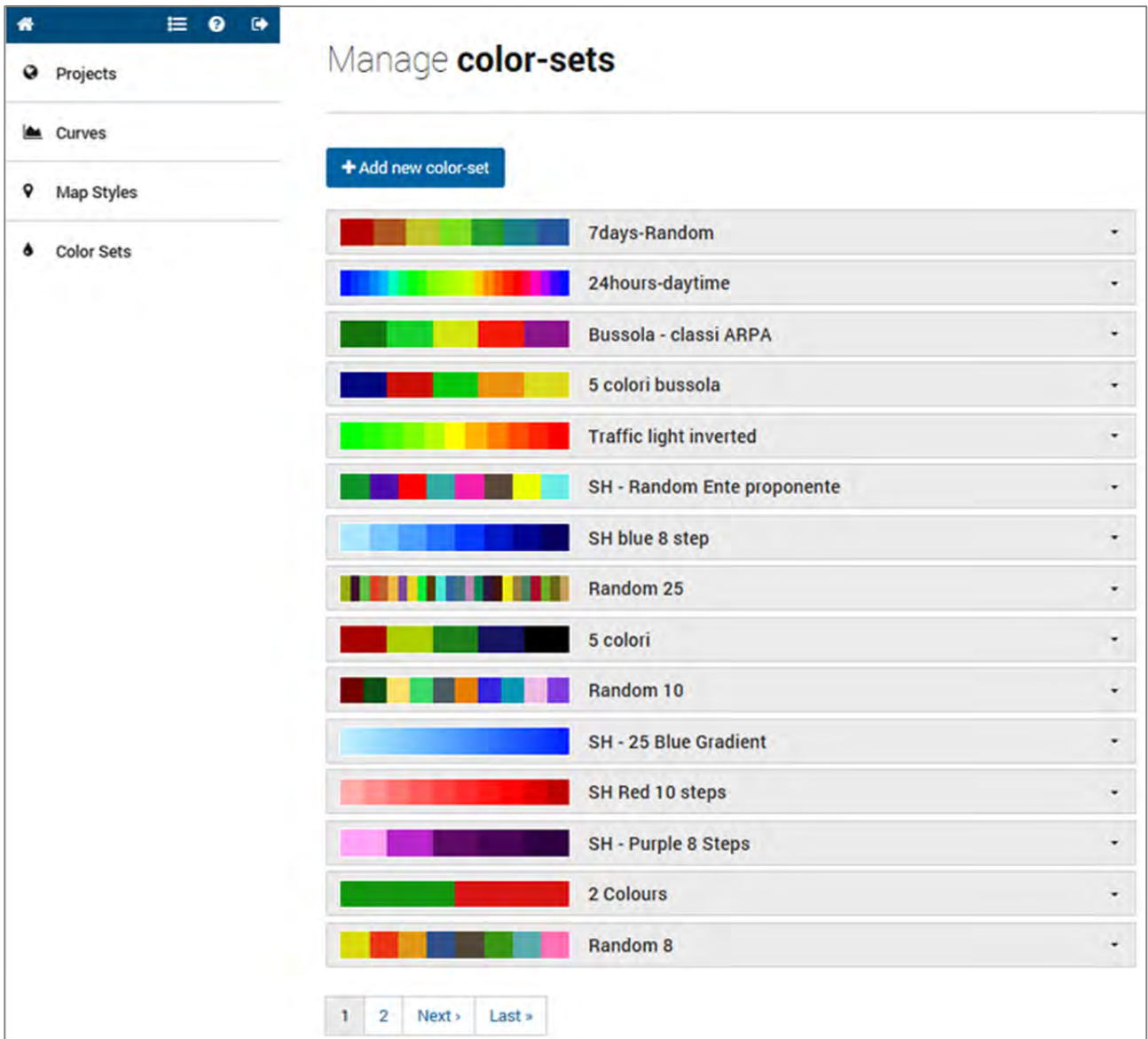
A specific menu for colour-set management is available in order to choose the map style to be assigned to each layer when selected. Here, *project contributors* users can choose, edit or create a specific set of colour to be assigned to a specific field of data. This set of colours will be visible when the final user will click on the **fill** icon (section 3.3.1) near each layer name on the front-end interface.

For creating a new color set, click on the blue button on the top. Provide it with a name and a related project. If you want that your color set could be used in other projects, enable the Public check box. Then choose the Color set nature between:

- *Blending*: choose the number of colours (Color steps) and the key colours to be used for creating a graduated scale.
- *Random*: choose the number of random colours you need and click to update the view. Clicking on the colour you can change it.
- *Code*: write your code as this example: [FFFFFF, 000000]

If you need to change an existing color set, click on the arrow near the color set name and click on the edit icon.





The menu for the color-sets management.

**WARNING!** In changing a color set, verify that the color set is not used by other projects. If so, please, build a NEW color set in order to not damage other project.

## 2.5 “Log” section

In this page you can see the last days of InViTo logs.

Timestamp with with time zone, host, application, [pid]: [client ip], user(wodpress user id if wpUser:id else postgresql user), message.

### 3. DATA EXPLORER

The data explorer interface is graphically structured by two main elements:

- a viewer window containing an interactive map;
- a vertical menu on the left side containing all the parameters setting.



The interactive map can be both geographical or not, so that also non spatial-data can be visualised and explored. This means that the geographical maps can be replaced by info-graphics, according to the choice of the project project contributor.

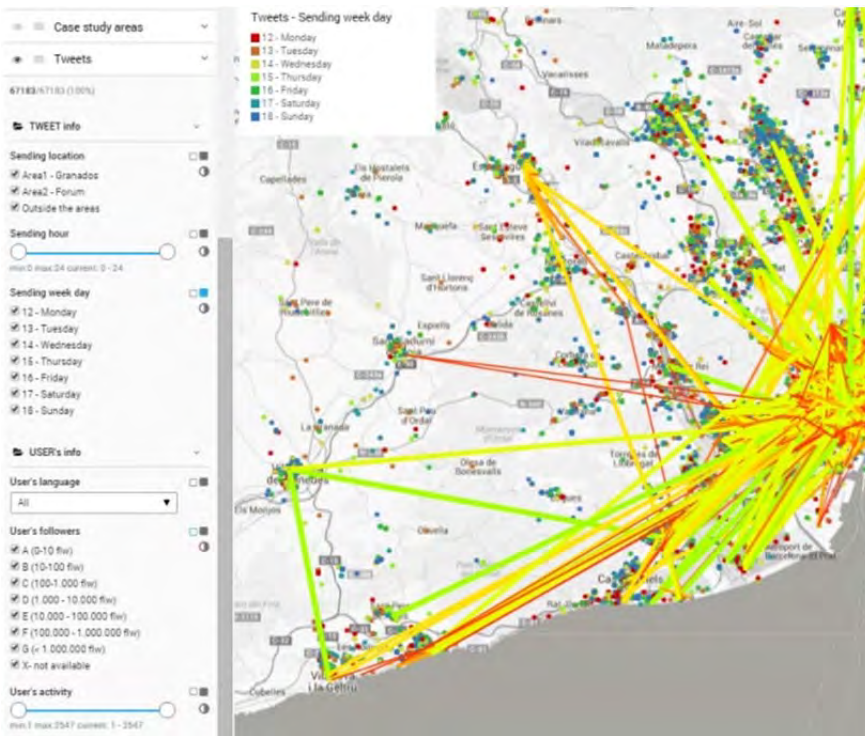


The menu on the left side contains all the elements for exploring data and interact with the information.

The map scale and the zoom commands are on the upper right side of the dynamic map frame.

### 3.1 Data Filtering

InViTo proposes a web interface where people can easily decide the information to see. The data filtering section allows data to be interactively selected and filtered by the end users in order to customise the visualisation.



Despite basically InViTo works as other GIS viewers, it does not visualise only the different layers of a set of data, but it allows users to explore the single records of a dataset by the use of different kind of filters.

All data can be selected and filtered through checkbox windows, dropdown menu or sliding cursors.

Filters can be grouped in specific panels, so that the visualisation of data is supported by specific steps to follow.

Specific buttons provide possibilities for enabling particular elements such as tables, analysis grids or background maps.

InViTo allows data to be investigated at different levels with also intersection of attributes, in order to analyse data clusters in relation to specific parameters.

In order to filter data, explore the content of each layer clicking on the arrow on the right of the layer's name. A number of sub-layers appear. Data in sub-layers can be filtered in five ways:

- moving the sliders and selecting the range of interest;
- (un)checking the checkbox;
- selecting the tag you want to include in your visualisation;
- selecting the sub-menu from a list of possibilities;
- clicking on the Invert icon, so that you can invert the selection of data.

Last but not least, during the visualisation on the front-end interface, some changes in the order of layers can be necessary. Therefore, users can change this order simply dragging up and down the layer name in menu on the left side of the front interface.

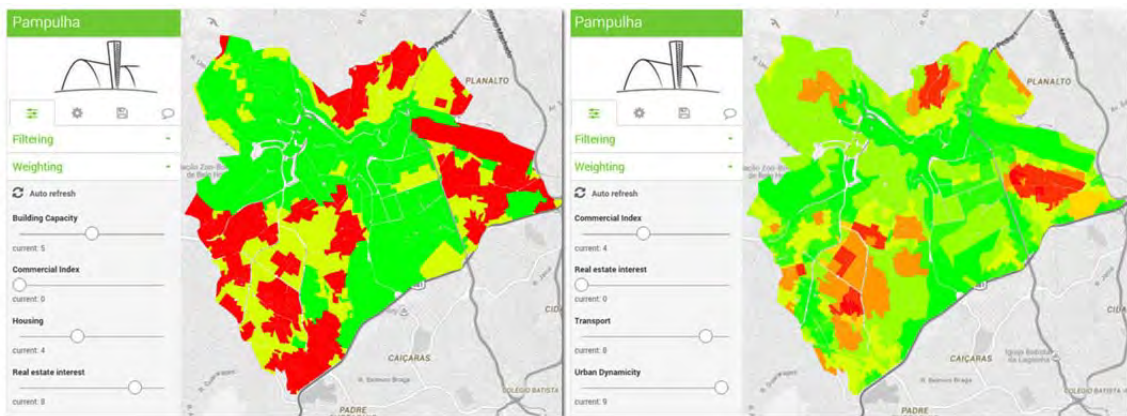


### 3.2 Map Weighting

The map weighting section allows the filtered maps to be overlapped and weighted on the basis of their priority.

The aim of the map weighting section is to provide users with a tool for analysing the localisation of expected effects of specific elements and evaluating the sum of effects on the basis of a specific mathematical curve associated to the layers.

On the basis of a green-yellow-red gradient colour scale, InViTo shows where specific requested aspects are present (green colour) or absent (red colour).



*The maps show the spatial effect of selected criteria depending on assigned weights.*

*The variation of weights on the left side menu makes the map changing in colours through a traffic-light colour gradient scale.*

The weighting section can be used to determine the presence of specific elements in an area and to understand the influence of these elements on their surroundings. Combining the effects of each aspect, InViTo generates one single map which highlights the suitability of the area to respond to a specific question according to the chosen parameters. Through the resulting maps, actors could understand which areas already had the requirements to fit their preferences. InViTo can be useful in suggesting new planning decisions, providing responses in real time to “what if” questions and displaying the effects of planning choices.

This section is an on-going part of the research. In fact, the map weighting is currently based on the sum of maps as in the basic methodology of Multicriteria Decision Analysis (MCDA) [1]. Further developments of InViTo will improve this section in order to integrate the opportunity to develop MCDA directly in the tool as the spatial Multicriteria Analyses combining GIS and MCDA [2, 3].

The weighting section is set as follows:

- It is composed by a set of slider cursors, which allow users to set the importance of each element on a scale from -10 to 10.
- The computing can be performed not only on regular grids but in any kind of irregular grid.
- The calculation of values can be given not only by a function of distance as in the previous version of the tool, but also by considering a proper value of each single cell.
- The mathematical curves, that calculate the effect of an element on land, can be easily set up by users through a specific submenu of InViTo named “curve configuration”.

The weighting section includes a further range filter, which allows weighted maps to be filtered on the basis of their resulting values. By this filter, users can select the areas which respond to a specific range of selected criteria and visualise which areas are over or under a specific threshold or comprised between a defined range.

### 3.3 Data Visualization

The setting of data visualization allows a high level of customization on:

- **Colours** (section 3.3.1)
- **Dimensions** (section 2.1.5.7)
- **Styles** (section 2.1.5.8)
- **Map styles** (section 2.3)

and on a series of utilities by means of which the tool is expected to offer a wide range of possibilities for users to improve their analytical skills and enhancing the discussion.

Furthermore, users can visualize:

- **Tables** (section 3.3.5)
- **Graphs** (section 3.3.6)

showing data according to the filters activated in the filtering section. The tables show the attributes related to the filtered data, providing pre settled additional information field by field. The charts show the values of the filtered data in relation to the whole set of data, highlighting the selected geometries.

Colours and thickness of lines change according to the setting made by the users, providing further information on the selected elements.

#### 3.3.1 Colour and size

Data visualisation can be customised by the user clicking on the following icons:

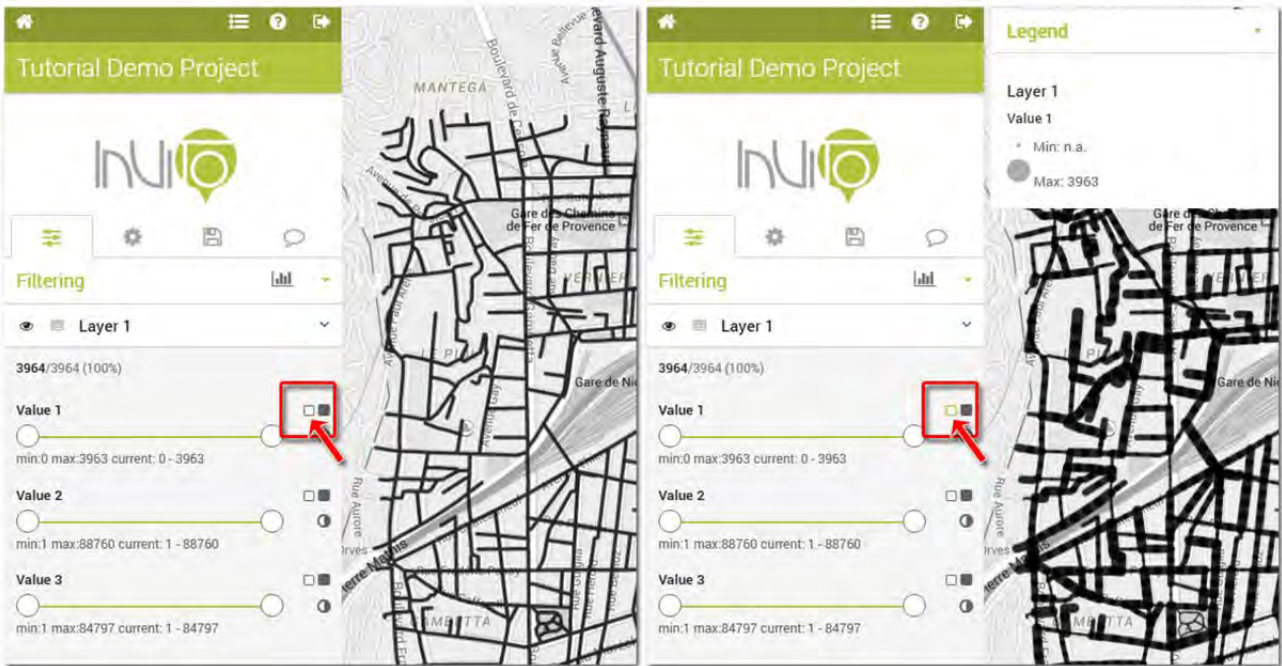
- Weight feature's stroke with thickness dependent on this property. Clicking on this button you can modify the thickness of lines or the radius of points.
- Fill feature's area with color dependent on this property. Clicking on this button you can enable and disable the colour map style associated to each layer.

---

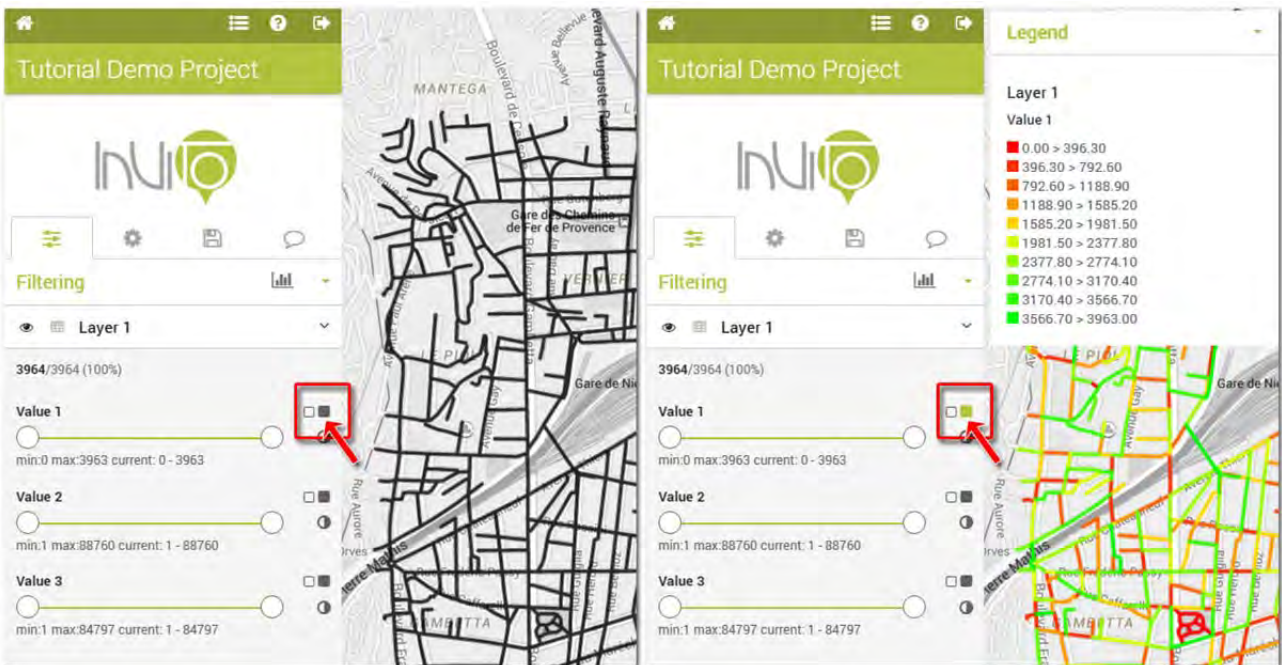
[1] Figueira, J., Greco, S., & Ehrgott, M. (Eds). (2005). *Multiple Criteria Decision Analysis: State of the Art Surveys*. New York, NY, USA: Springer.

[2] Malczewski, J. (1999). *Gis and Multicriteria Decision Analysis*. New York, NY, USA: Wiley.

[3] Ferretti V. (2013). *Le Analisi Multicriteri spaziali a supporto delle procedure di pianificazione e valutazione: analisi e classificazione della letteratura scientifica, Geoingegneria Ambientale e Mineraria, (2), 53-66.*

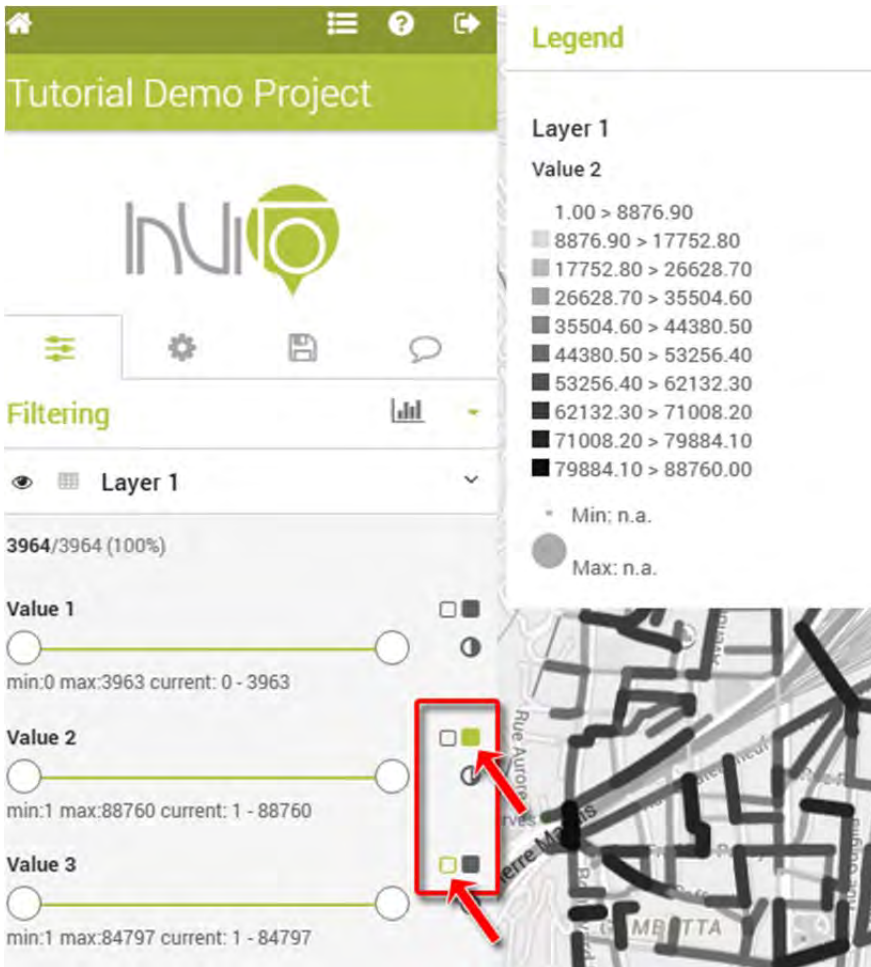


Clicking on the thickness button, lines assume different thickness according to their value, as shown in the legend window. The selected button has a different colour dependent on the colour configuration of the project interface.



Clicking on the fill button, lines assume different colours according to their value, as shown in the legend window. The selected button has a different colour dependent on the colour configuration of the project interface.



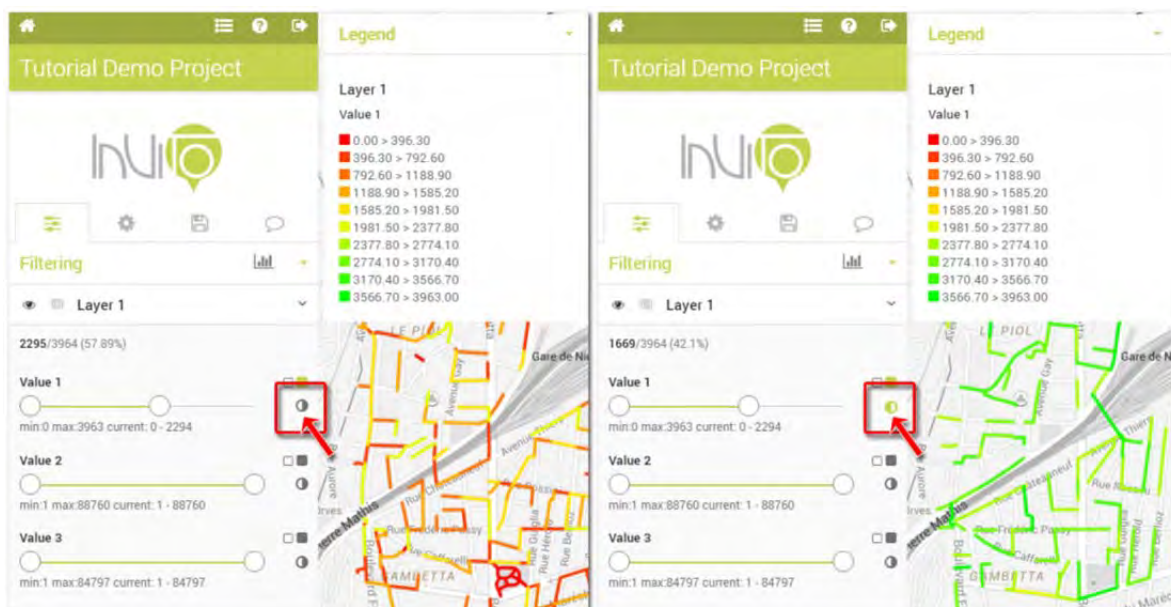


The intersection of the colour style from one layer with the thickness relative to another layer, provide interesting opportunities for reading maps and increasing the knowledge which can be achieved from data visualisation. In this case, you can visualise the colour scale according to a field (value 2) and the size according to another field (value 3). Such a visualisation can provide a number of outcomes. For example black and thicker lines correspond to the maximum values of two fields (value 2 and 3), while thinner white lines refer to minimum values.

### 3.3.2 Inverse selection



Clicking on this icon, you can invert the data selection of each single field.



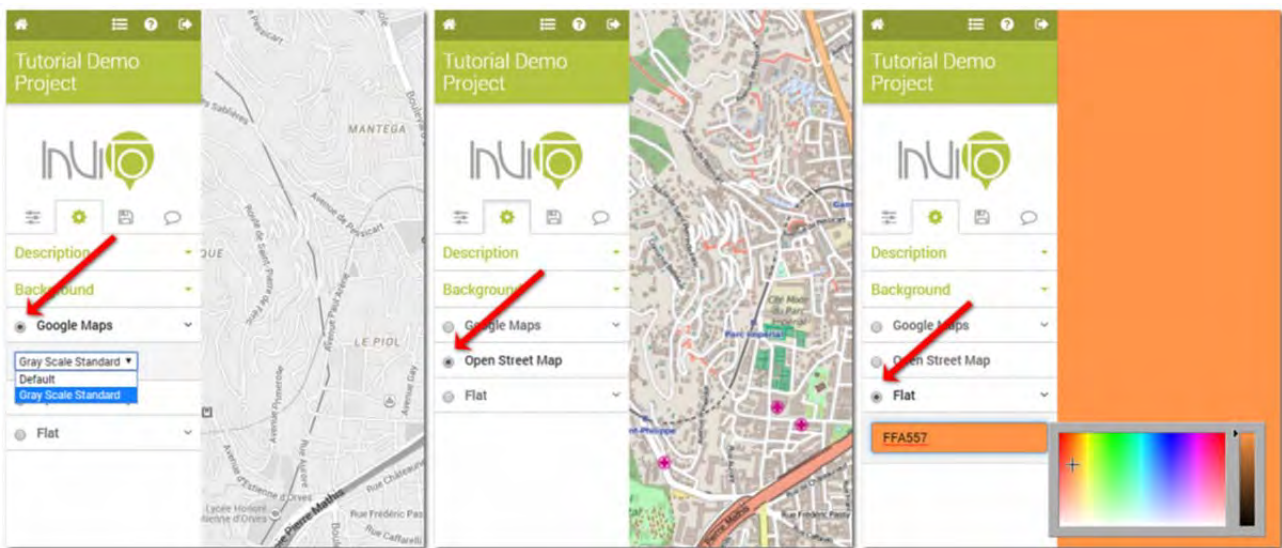
### 3.3.3 Map styles

Users can customise the visualisation of the background map.

⚙ In the options menu, select "background".

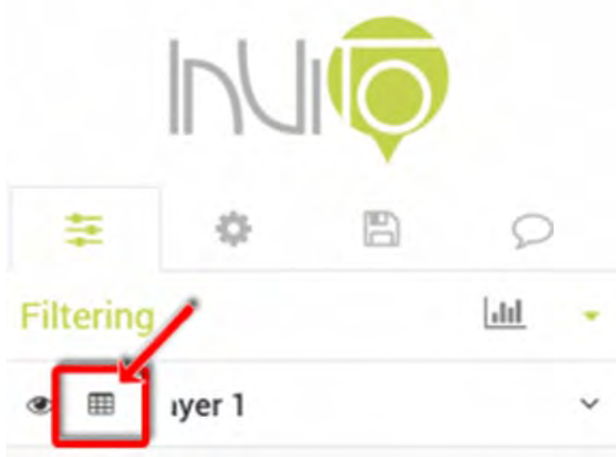
Here you can choose between different [map styles](#), as set by the "Project contributors" user. Generally, map styles can vary on a number of:

- **Google Maps styles** (with pre-set colours listed in a menu);
- **Open Street Map** (OSM);
- and **flat colours** (well indicated for non-geographical representations such as info-graphics or interactive diagrams).



Example of background map: a gray scaled Google Maps style (left), an Open Street Map (center) and a flat colour (right).

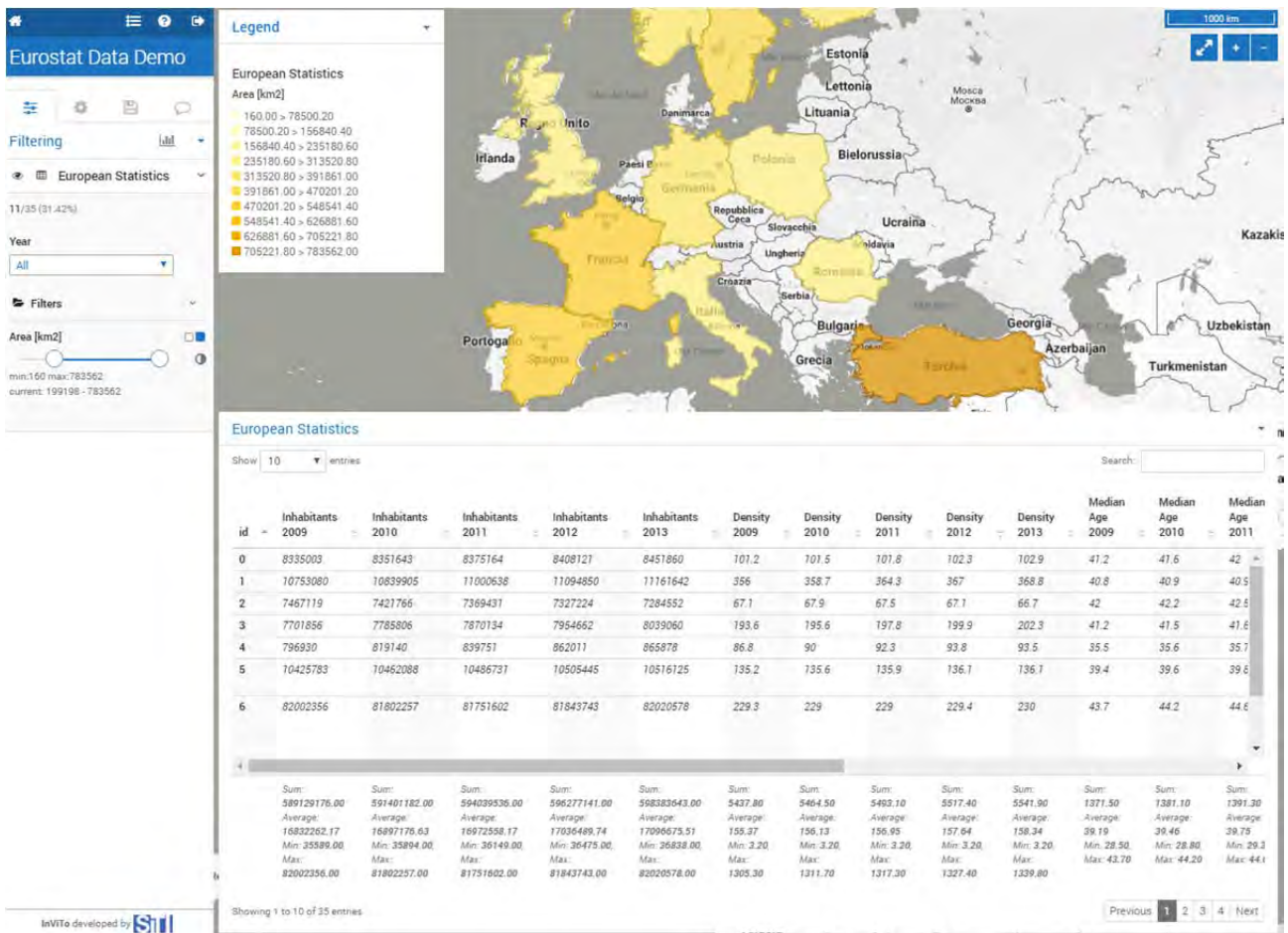
### 3.3.4 Tables



Filtered data can be displayed also within a table, providing pre-settled additional information field by field.

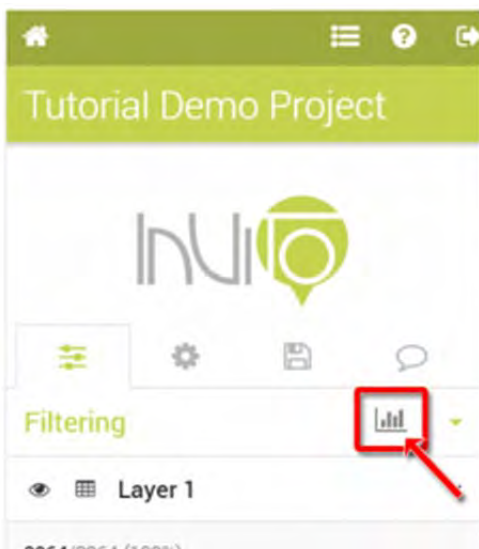
On the front interface, clicking on the table icon near the layer name, a table appears on the bottom side of the screen. It contains the attributes relative to the filtered data, providing some more information on the sum, average, minimum and maximum values, field by field. In order to determine which attributes should be visible to the final users, administrators have to choose the setting of the table.



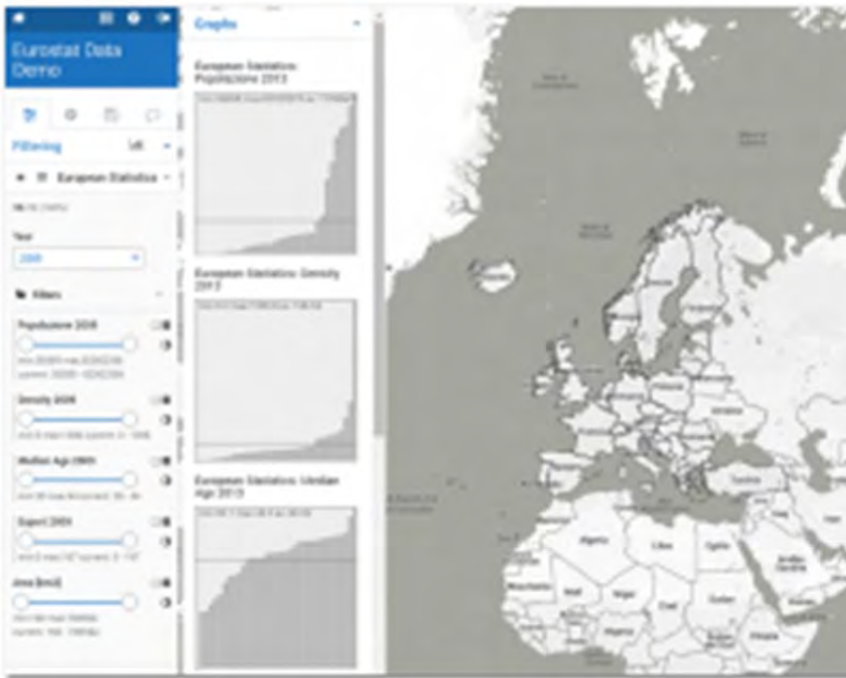


Example of table relative to the data displayed in the map.

### 3.3.5 Graphs



Clicking on the graphs icon (as shown in the image on the left), you can open the graphs relative to the project database.

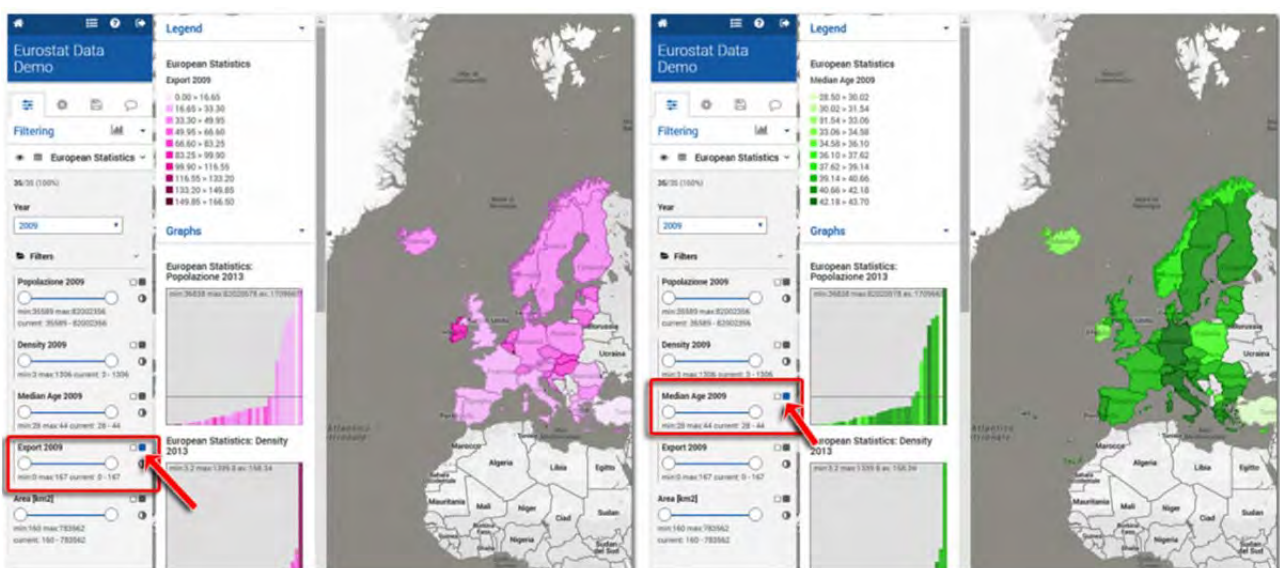


If you do not have selected any colour styles, the graphs appear gray. In this case, the graphs show only the trend of data and they average value (the horizontal line within the graph).

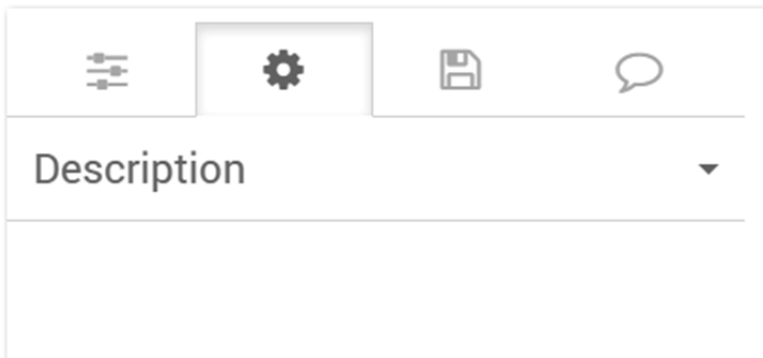
If you click on a colour style, the bar of the charts will assume the same colours of the geometries within the map, showing data according to the filters activated in the filtering section.

The tables show the attributes related to the filtered data, providing pre settled additional information field by field.

The graphs show the values of the filtered data in relation to the whole set of data, highlighting the selected geometries.

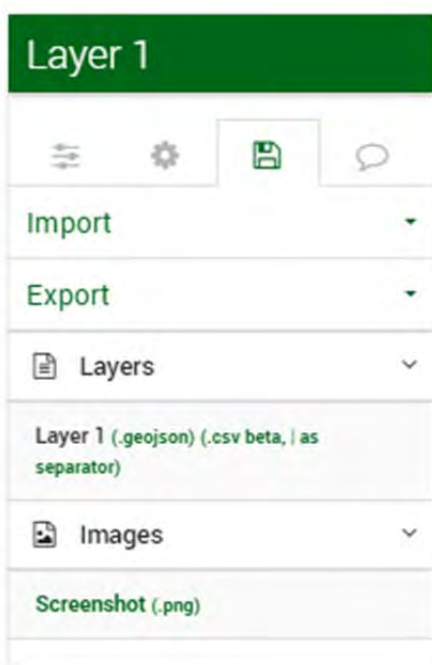


### 3.4 Description of the project



In this section you will find a brief description of the project.

### 3.5 Export data



Maps created through InViTo can be exported and used to produce further elaborations such as analysis or visualisations. This function is available only for authorised projects.

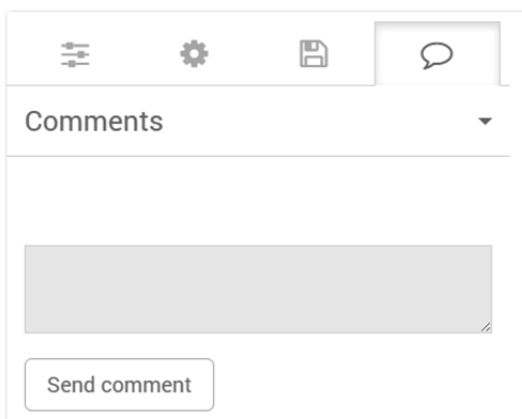
Currently, only the export function is activate, while the import one is under construction.

You can export data in three different formats:

- .GeoJSON
- .csv, | as separator
- .png

To export data, click on the Floppy icon and select the file format you prefer.

### 3.6 Comments and feedbacks



Here, users can leave their own comments to the use of InViTo or on the project usability. Any feedback is always welcome!

## 4. References

- Bawa-Cavia A. 2010, Sensing the Urban. Using location-based social network data in urban analysis, 1st workshop on Pervasive URban Applications PURBA '11. San Francisco.
- Belton V., Pictet J. 1997, A framework for Group Decision Using MCDA model: Sharing, Aggregating or Comparing individual Information? *Journal of decision systems* 6(3), pp. 283-303.
- Belton V., Stewart T. 2010, Problem Structuring and Multi Criteria Decision Analysis . In: Hergot et al. (eds.) *Trends in Multiple Criteria Decision Analysis*, International Series in Operations Research and Management Science, 142. Springer Science and Business Media, pp. 209-239.
- Borja J. 2007, Counterpoint: Intelligent cities and innovative cities, *E-Journal on the Knowledge Society*, 5. Available at <http://www.uoc.edu/uocpapers/5/dt/eng/mitchell.pdf>.
- Chourab H., Nam T., Walker S., Gil-Garcia J., Mellouli S., Nahon K., Pardo T.A., Scholl H.J. 2012, Understanding smart cities: an integrative framework, in: *System Science (HICSS)*, 45th Hawaii International Conference on, Grand Wailea, Maui, Hawaii, pp. 2289–2297.
- Chua A., Marcheggiani E., Serrvillo L., Vande Moere A. 2014, FlowSampler: Visual Analysis of Urban Flows in Geolocated Social Media Data. In M. Aiello, & D. McFarland (Eds.), *International Conference on Social Informatics*. Barcelona.
- Dodge M. 2005, Information Maps: Tools for Document Exploration, *CASA*, working paper series 94. University College London, London, Retrieved November 5, 2013, from <http://www.bartlett.ucl.ac.uk/casa/publications/working-paper-94>.
- Ferretti V. 2013, Le Analisi Multicriteri spaziali a supporto delle procedure di pianificazione e valutazione: analisi e classificazione della letteratura scientifica, *Geingegneria Ambientale e Mineraria* (2), pp. 53-66.
- Figueira J., Greco S., Ehrgott M. 2005, *Multiple Criteria Decision Analysis: State of the Art Surveys*, Boston, Dordrecht, London: Springer Verlag.
- Goodspeed R. 2011, The Coming Urban Data Revolution, Retrieved January 8, 2015, from Planetizen: <http://www.planetizen.com/node/51158>.
- Goodspeed R. 2012, The Democratization of Big Data, Retrieved January 2015, 02, from Planetizen: <http://www.planetizen.com/node/54832>.
- Hilty L., Lohmann W., Huang E. 2011, Sustainability and ICT - An overview of the field with focus on socio economic aspects, *Notizie di Politeia* 17(104), pp. 13-28.
- Kamenetz A. 2013, How Cities Are Using Data To Save Lives, Retrieved January 13, 2015, from Fast company: <http://www.fastcoexist.com/3021498/how-cities-are-using-data-to-save-lives>.
- Keeney R.L. 2013, Identifying, prioritizing and using multiple objectives, *EURO Journal on Decision Processes* 1, pp. 45-67.
- Kokalitcheva K. 2014, How a swarm of data is helping Chicago re-map urban life, Retrieved January 12, 2015 da Venture Beat: <http://venturebeat.com/2014/05/14/how-a-swarm-of-data-is-helping-chicago-re-map-urban-life>.
- Johnson B. 2008, Cities, systems of innovation and economic development. *Innovation: Management, Policy & Practice* 10(2-3), pp.146-155.
- Lami I.M., Abastante F., Bottero M., Masala E., Pensa S. 2014, Integrating multicriteria evaluation and data visualization as a problem structuring approach to support territorial transformation projects, *EURO Journal on Decision Processes* 2(3-4), pp 281-312.
- Lami I.M., Franco, L.A. 2016, Exploring the Affordances of Collaborative Problem-Solving Technologies in the Development of European Corridors, in: H., Drewello, & B., Scholl (Eds.), *Integrated Spatial and Transport Infrastructure Development: The case of European North-South Corridor Rotterdam-Genoa*, pp. 65-80, London: Springer Publishers.
- Lanzerotti L., Bradach J., Sud S., Barmeier H. 2013, Geek Cities: How Smarter Use of Data and Evidence Can Improve Lives, Retrieved January 13, 2015 da The Bridgespan Group: <http://www.bridgespan.org/Publications-and-Tools/Performance-Measurement/Geek-Cities-Data-Improves-Lives.aspx#.VLZ9BSvF9Ks>.
- Lövehagen N., Bondesson A. 2013, Evaluating sustainability of using ICT solutions in smart cities – methodology requirements, in: M. Hilty, B. Aebischer, G. Andersson, W. Lohmann (Eds.), *ICT4S 2013: Proceedings of the First International Conference on Information and Communication Technologies for Sustainability*, Switzerland, Zurich, pp. 184–191.
- McCormick B.H., De Fanti T.A., Brown M.D. 1987, *Visualization in Scientific Computing*. Computer Graphics, 21(6).
- Malczewski J. 1999, *GIS and Multicriteria Decision Analysis*, John Wiley and Sons, New York.
- Marceau J. 2008, Introduction: Innovation in the city and innovative cities, *Innovation: Management, Policy & Practice* 10(2-3), pp. 136-145.
- Mingers J., Rosenhead J. 2004, Problem structuring methods in action, *European Journal of Operational Research* 152, pp. 530-554.
- Montibeller G., Belton V., Ackermann F., Ensslin L. 2008, Reasoning maps for decision aid: an integrated approach for problem-structuring and multi-criteria evaluation, *Journal of the operational research society*, 59, pp. 575-589.
- Neuhaus F. 2011, Twitter Data - Seeking Spatial Paettern. Retrieved January 09, 2015, from UrbanTick: [http://urbantick.blogspot.it/2011/03/twitter-data-seeking-spatial-pattern.html?utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed:+urbantick+\(urbanTick\)](http://urbantick.blogspot.it/2011/03/twitter-data-seeking-spatial-pattern.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+urbantick+(urbanTick))
- Pensa S., Masala E., Lami I.M., Rosa A. 2014, Seeing is knowing: data exploration as a support to planning, *Proceedings of the ICE - Civil Engineering* , 167(5), pp. 3-8.
- Pensa, S., Masala, E. 2014, InViTo: An Interactive Visualisation Tool to Support Spatial Decision Processes. In: N. N. Pinto, J. A. Tenedorio, A. P. Antunes, & J. R. Cladera (Eds.), *Technologies for Urban and Spatial Planning: Virtual Cities and Territories*, Hershey, PA: IGI Global Book, pp. 135-153.
- Resch B., Summa A., Sagl G., Zeile P., Exner J.P. 2014, *Urban Emotions – Geo-semantic Emotion Extraction from Technical Sensors, Human Sensors and Crowdsourced Data*, Heidelberg: German Research Foundation (DFG – Deutsche Forschungsgemeinschaft).
- Rittel H.W.J., Webber M. 1973, Dilemmas in a general theory of planning, *Policy Sciences*, 4, pp. 155-169.
- te Brömmelstroet M.C. 2010, Equip the warrior instead of manning the equipment: Land use and transport planning support in the Netherlands, *Journal of Transport and Land Use* 3, pp. 25-41.
- Toppeta D. 2010, *The Smart City Vision: How Innovation and ICT Can Build Smart, “Livable”, Sustainable Cities*. The Innovation Knowledge Foundation. Available at [http://www.thinkinnovation.org/file/research/23/en/Toppeta\\_Report\\_005\\_2010.pdf](http://www.thinkinnovation.org/file/research/23/en/Toppeta_Report_005_2010.pdf).
- United Nations 2012, *The future we want, Cities*, fact sheet for the Rio United National Conference on Sustainable Development, Rio de Janeiro, Brazil, June 20-22, 2012, Accessible at [http://www.un.org/en/sustainablefuture/pdf/Rio+20\\_FS\\_Cities.pdf](http://www.un.org/en/sustainablefuture/pdf/Rio+20_FS_Cities.pdf).
- Vonk G., Geertman S., Schot P. 2005, Bottlenecks blocking widespread usage of planning support systems, *Environment and Planning A*. 37(5), pp. 909 – 924.
- Weber E.P., Khademian A.M. 2008, Wicked problems, knowledge challenges, and collaborative capacity builders in network settings, *Public Administration Review* 68(2), pp. 334-349.
- Washburn D., Sindhu U., Balaouras S., Dines R.A., Hayes N.M., Nelson L.E. 2010, *Helping CIOs Understand "Smart City" Initiatives: Defining the Smart City, Its Drivers, and the Role of the CIO*, Cambridge, MA: Forrester Research, Inc.
- White L. 2006, Evaluating Problem-Structuring Methods: Developing an Approach to Show the Value and Effectiveness of PSMs, *The Journal of the Operational Research Society* 57(7), pp. 842-855.



**Interreg** 

CENTRAL EUROPE European Union  
European Regional  
Development Fund

**LUMAT**

TAKING  
**COOPERATION**  
FORWARD



Date of training activity: .....

Locality of training: .....

Trainer:.....



**Topic: Citizens Involvement**

**Coauthors: Elena Masala, Matteo Tabasso**

**Insitutions: SiTI, Torino, Italy**



# GOALS OF THE TEACHING UNIT

- To provide citizens with information about FUAs, in order to allow them to develop knowledge and awareness about risks and opportunities of each FUA
- To interactively develop a common vision of a territory through discussions, debates and pro-active approaches
- To support FUAs planning and integrated management



## TOOLS

### Inter-municipal committee

A structure for the inter-municipal management of land-use issues

### Interactive Visualization Tool - InViTo

WebGIS platform for data sharing and support to decision-making processes



# INNiTO





# Interactive

InViTo does not provide solutions,  
but it aims at enhancing the  
**dialogue**



# InViTo visualisation

InViTo uses a

**visual language**

because **easier to understand**,

also for **non-experts**.





InViTo is conceived as a  
**spatial decision support  
system (sDSS)**

which combines **GIS data** with  
**dynamic visualisations.**

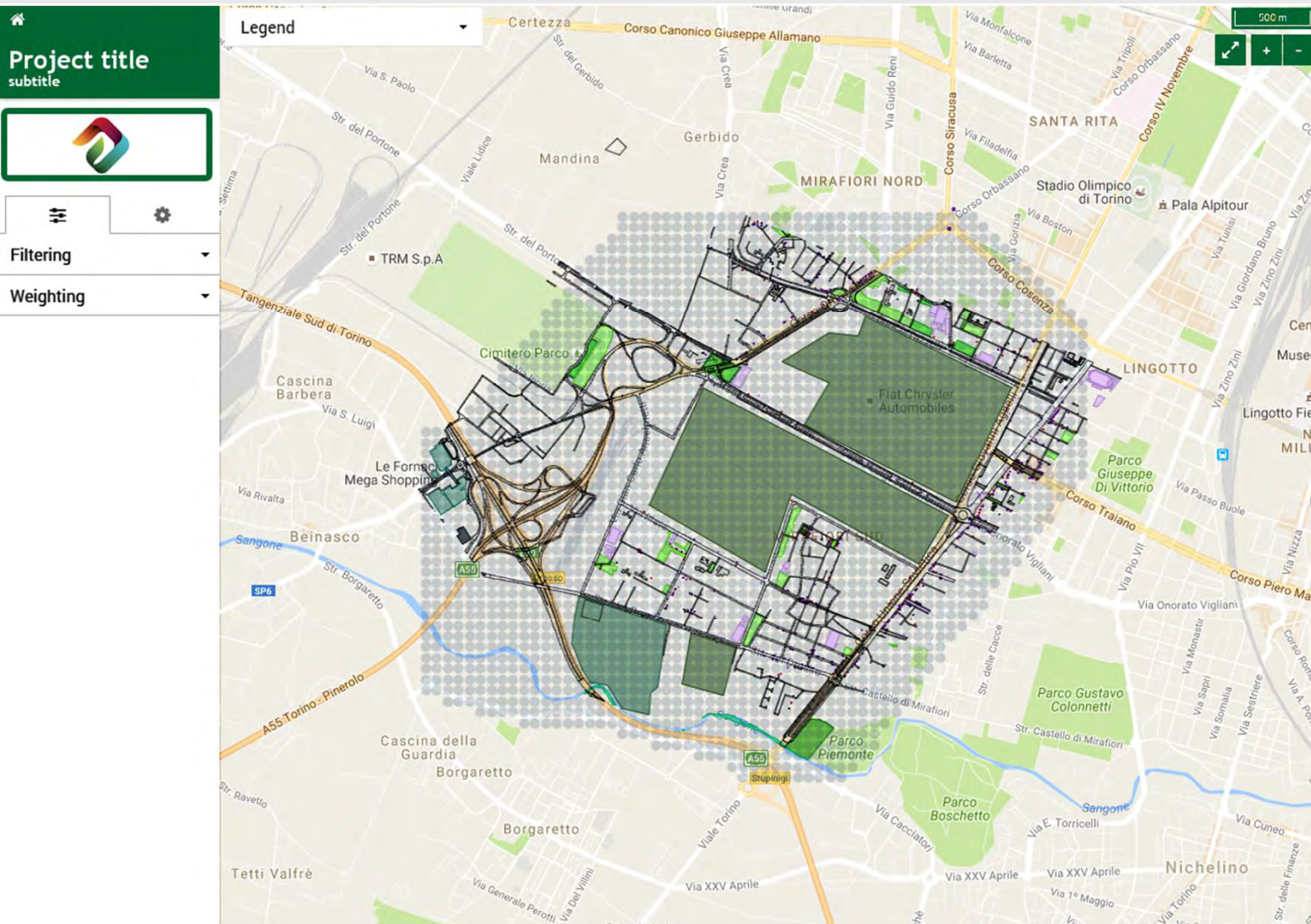


# INNiTO

is a tool which aims at creating a **shared language** for supporting the **dialogue** between actors **overcoming** different *geographical* and *disciplinary* barriers.




# THE USER INTERFACE





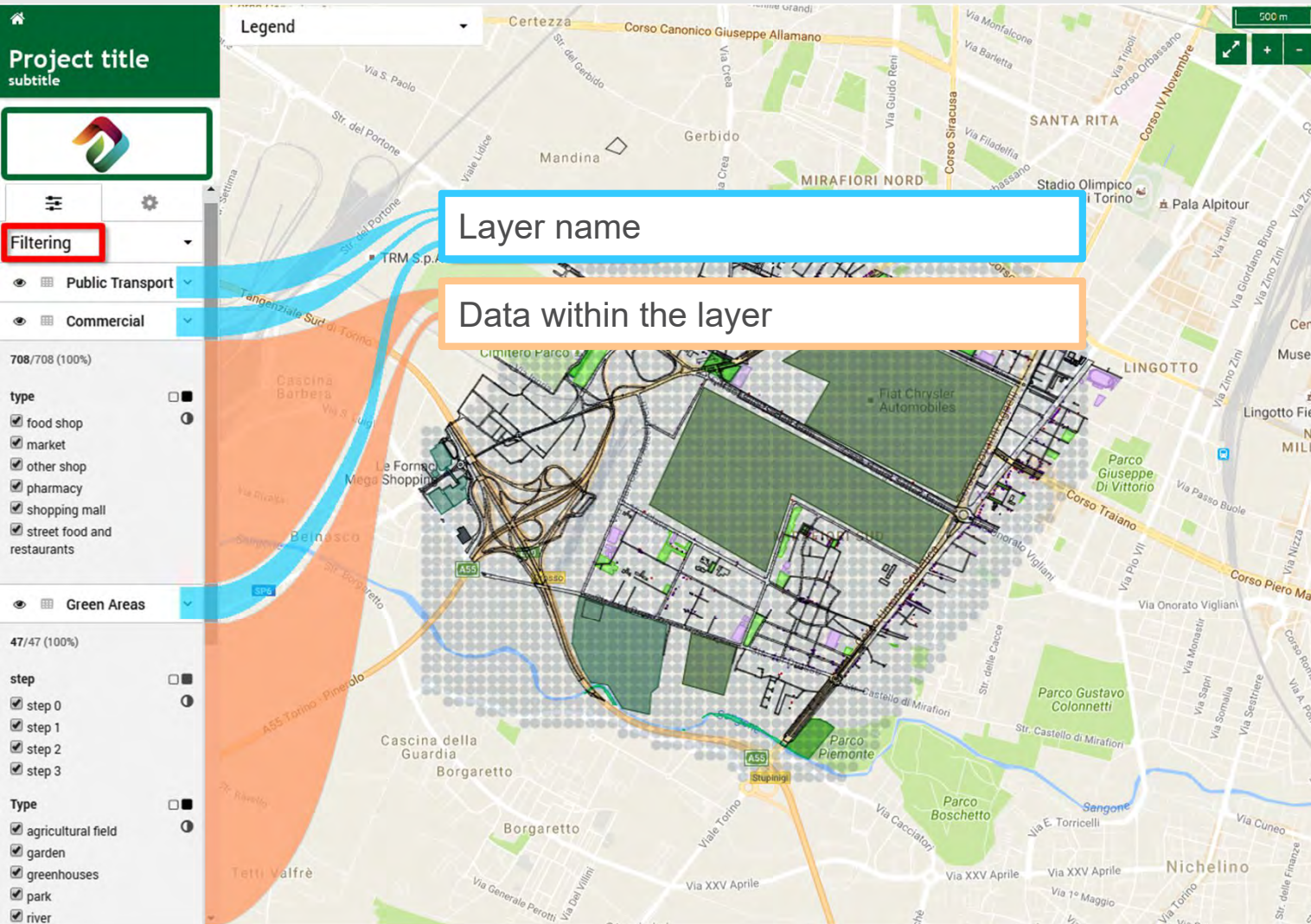
# THE USER INTERFACE



The screenshot displays the LUMAT user interface. On the left, a vertical sidebar contains several control elements: a home icon, a text input for 'Project title' and 'subtitle', a logo placeholder, a menu icon, a settings gear, and buttons for 'Filtering' and 'Weighting'. The main area is a map of an urban area with various buildings, parks, and roads. A legend is visible at the top left of the map area. Four red-bordered boxes are overlaid on the interface, pointing to specific features: 'Project title and subtitle' points to the title input; 'Project logo' points to the logo placeholder; 'Data filtering section' points to the 'Filtering' button; 'Map weighting section' points to the 'Weighting' button. A blue-bordered box at the bottom of the map area is labeled 'Dynamic map'.



# THE USER INTERFACE



The screenshot displays the LUMAT user interface. On the left, a sidebar contains a 'Project title' field, a logo, and a 'Filtering' menu. The 'Filtering' menu is expanded, showing categories like 'Public Transport' and 'Commercial'. Below these are checkboxes for various types of facilities (e.g., food shop, market, pharmacy) and 'Green Areas'. The main map area shows a city street grid with several layers overlaid: a blue line representing a public transport route, an orange shaded area representing commercial zones, and green shaded areas representing green spaces. A blue callout box points to the 'Layer name' field in the sidebar, and an orange callout box points to the 'Data within the layer' field. The map also includes a legend at the top left and navigation controls at the top right.

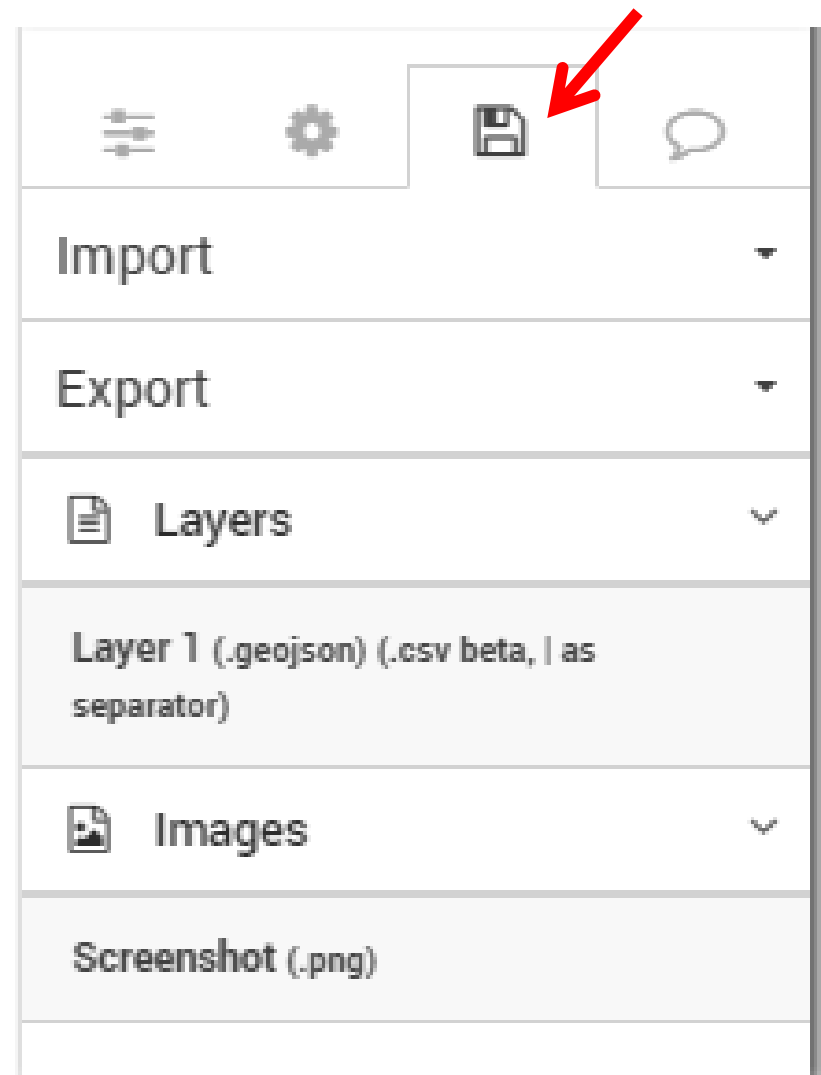
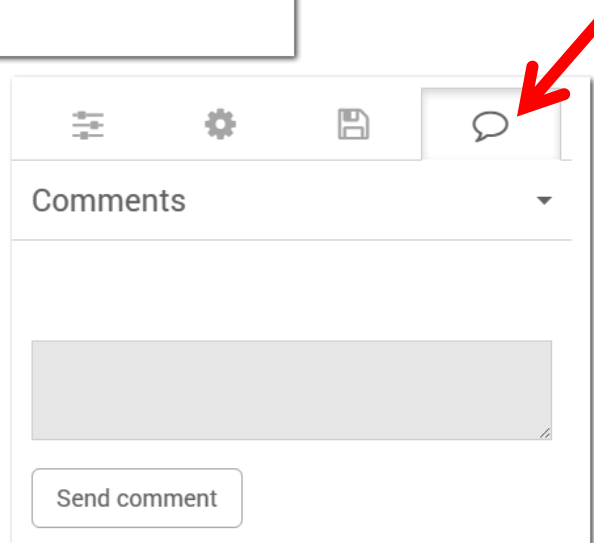
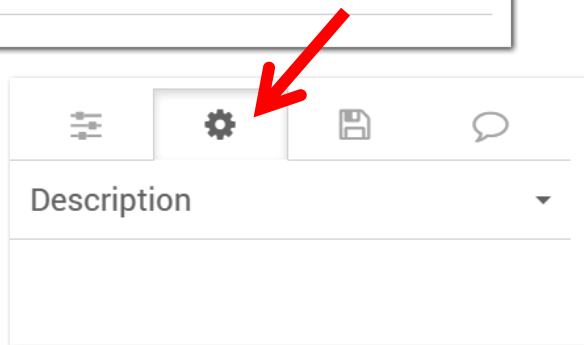
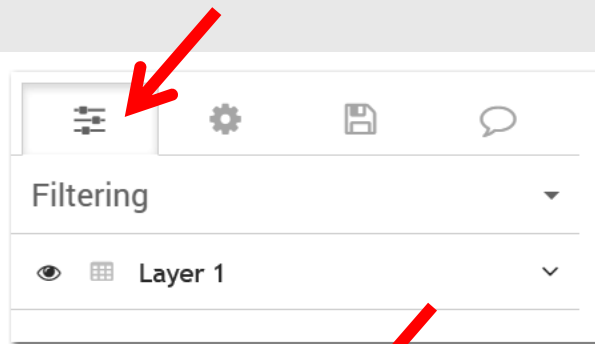




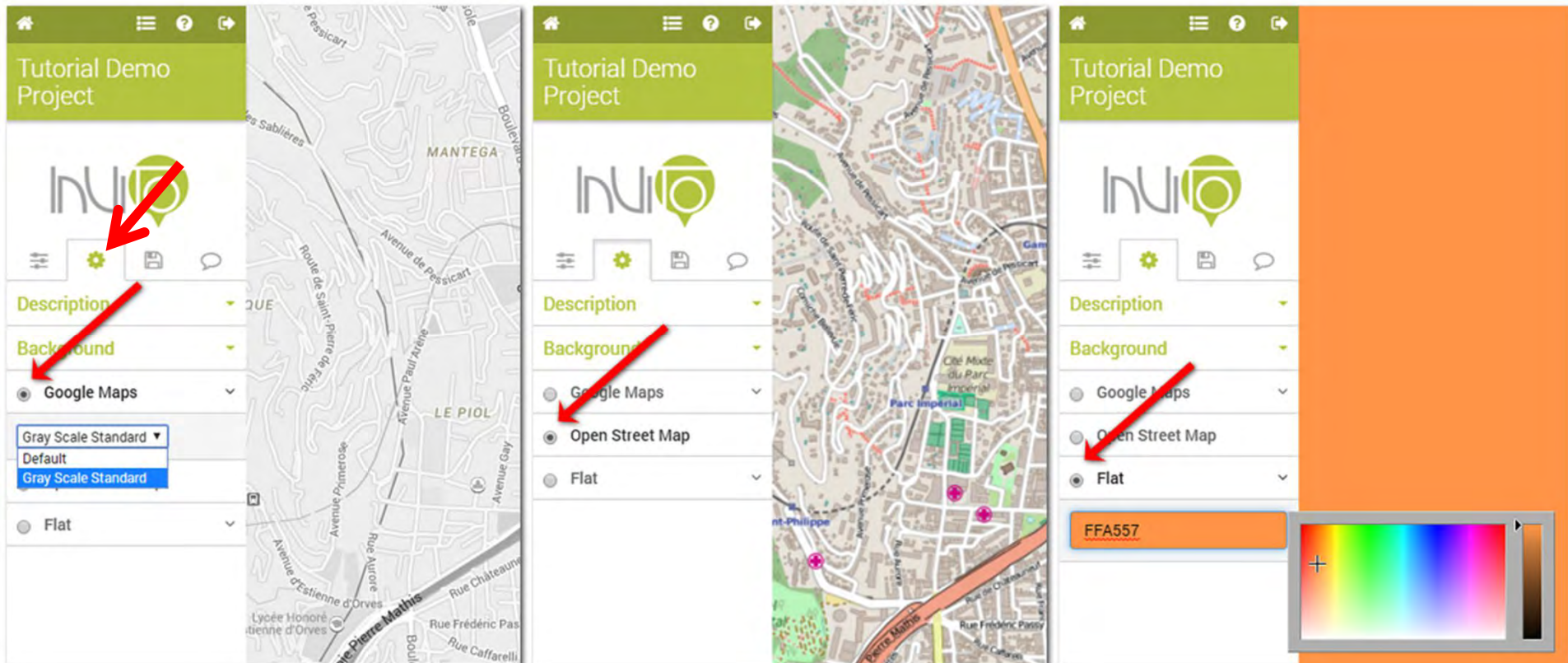




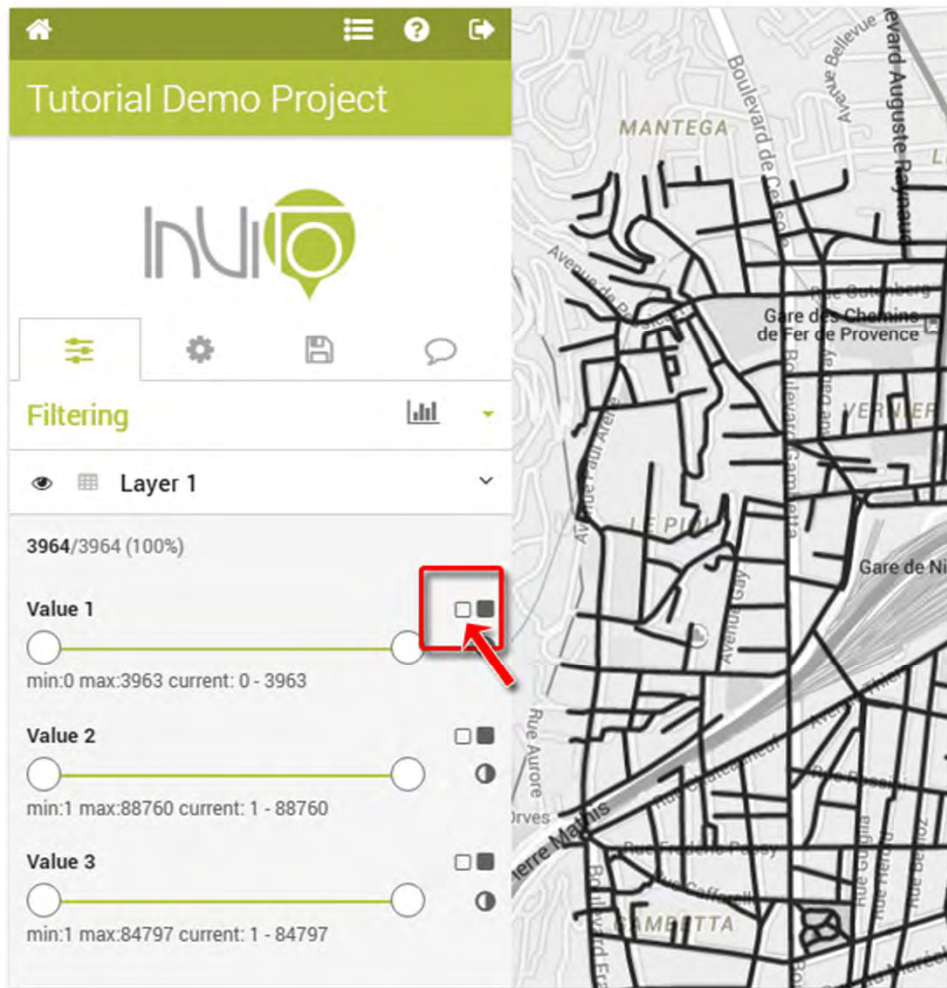
# THE FILTERING SECTION



# THE FILTERING SECTION



# THE FILTERING SECTION



Tutorial Demo Project

INUITO

Filtering

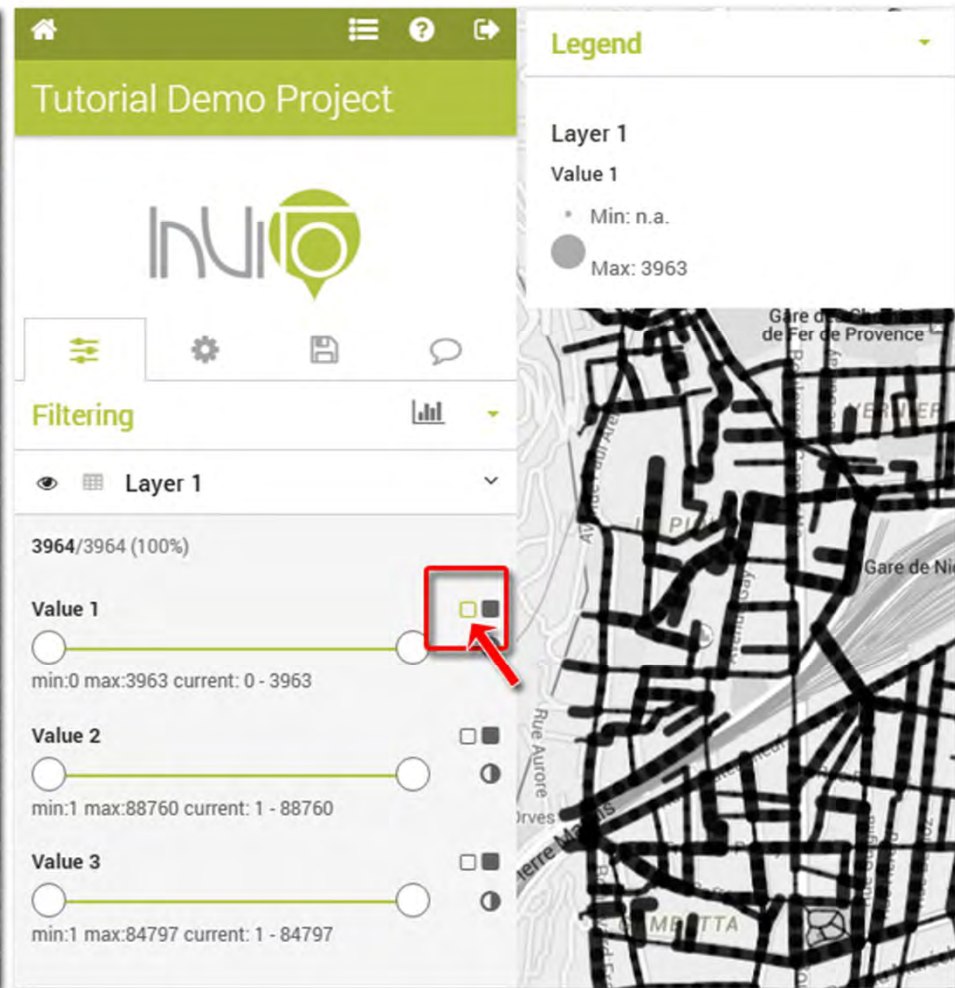
Layer 1

3964/3964 (100%)

Value 1  
min:0 max:3963 current: 0 - 3963

Value 2  
min:1 max:88760 current: 1 - 88760

Value 3  
min:1 max:84797 current: 1 - 84797



Tutorial Demo Project

INUITO

Filtering

Layer 1

3964/3964 (100%)

Value 1  
min:0 max:3963 current: 0 - 3963

Value 2  
min:1 max:88760 current: 1 - 88760

Value 3  
min:1 max:84797 current: 1 - 84797

Legend

Layer 1

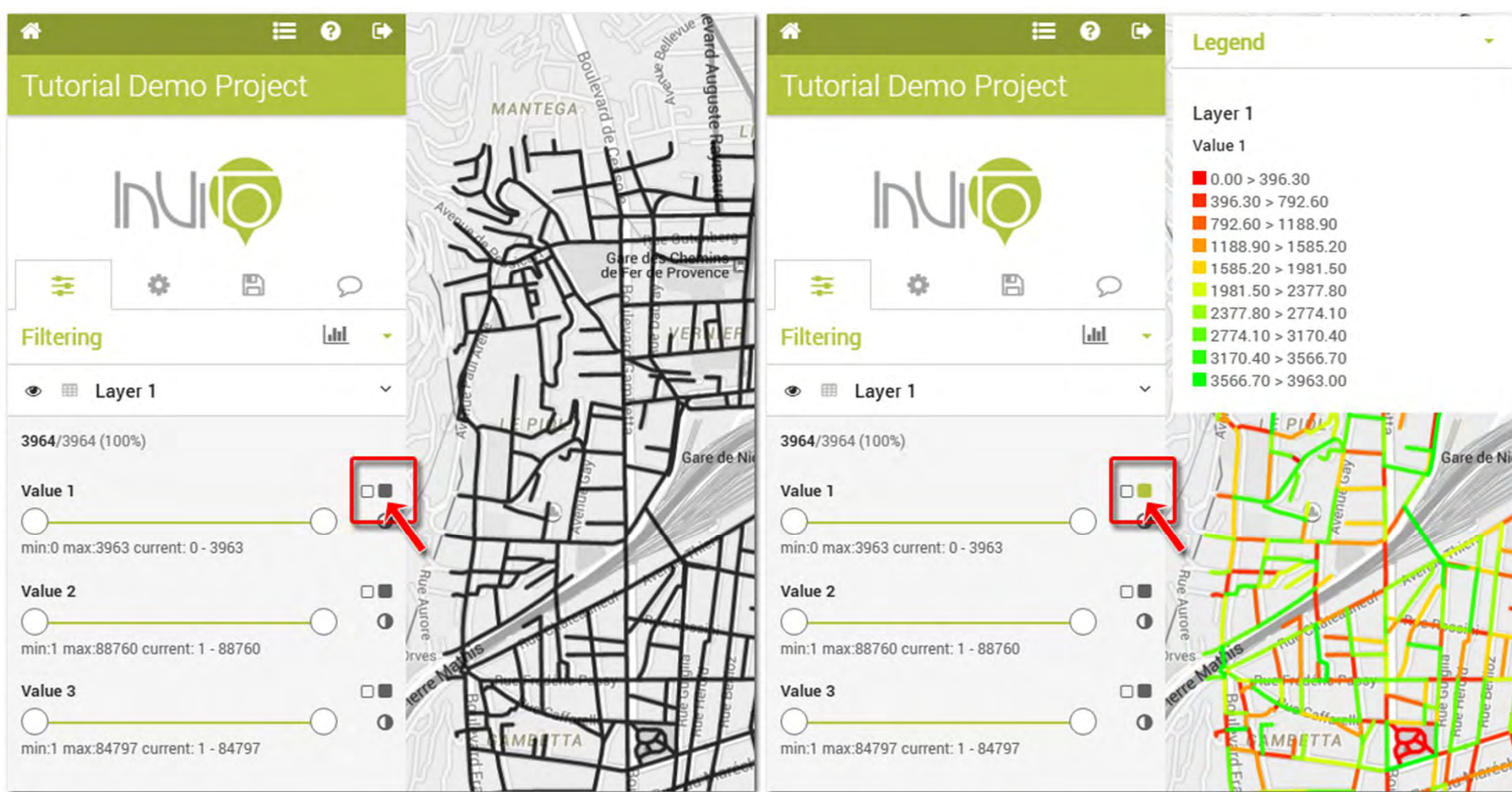
Value 1

- Min: n.a.
- Max: 3963





# THE FILTERING SECTION



The image displays two screenshots of a web application interface, likely a GIS or data visualization tool, showing a map of a city area (Mantega) with a filtering overlay. The interface includes a header with the text "Tutorial Demo Project" and the INUITO logo. Below the header, there are navigation icons and a "Filtering" section. The filtering section shows three value ranges (Value 1, Value 2, Value 3) with sliders and checkboxes. The map shows a grid of streets and buildings, with a red box highlighting a specific area. The right screenshot shows the map with a color-coded overlay, and a legend on the right side of the map area. The legend lists the value ranges and their corresponding colors.

**Legend**

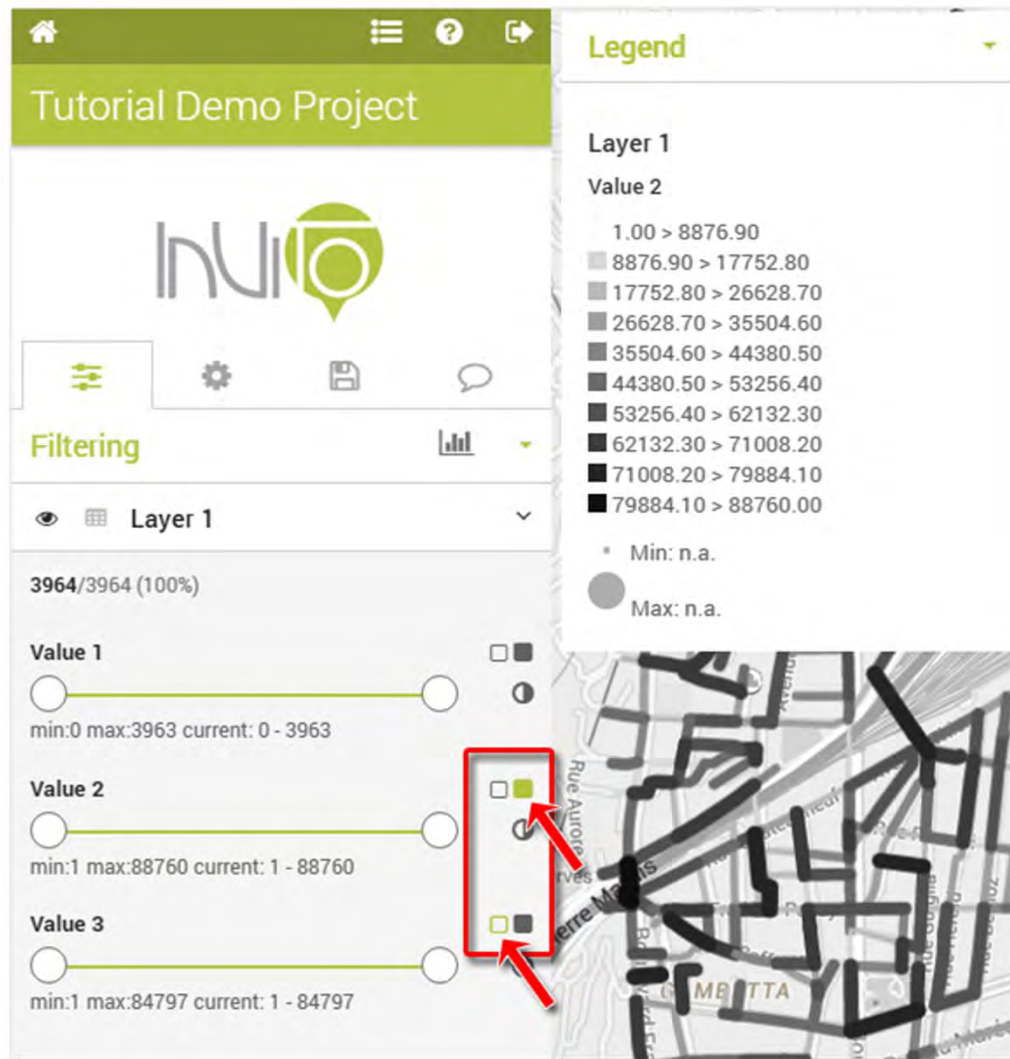
Layer 1

Value 1

- 0.00 > 396.30
- 396.30 > 792.60
- 792.60 > 1188.90
- 1188.90 > 1585.20
- 1585.20 > 1981.50
- 1981.50 > 2377.80
- 2377.80 > 2774.10
- 2774.10 > 3170.40
- 3170.40 > 3566.70
- 3566.70 > 3963.00



# THE FILTERING SECTION

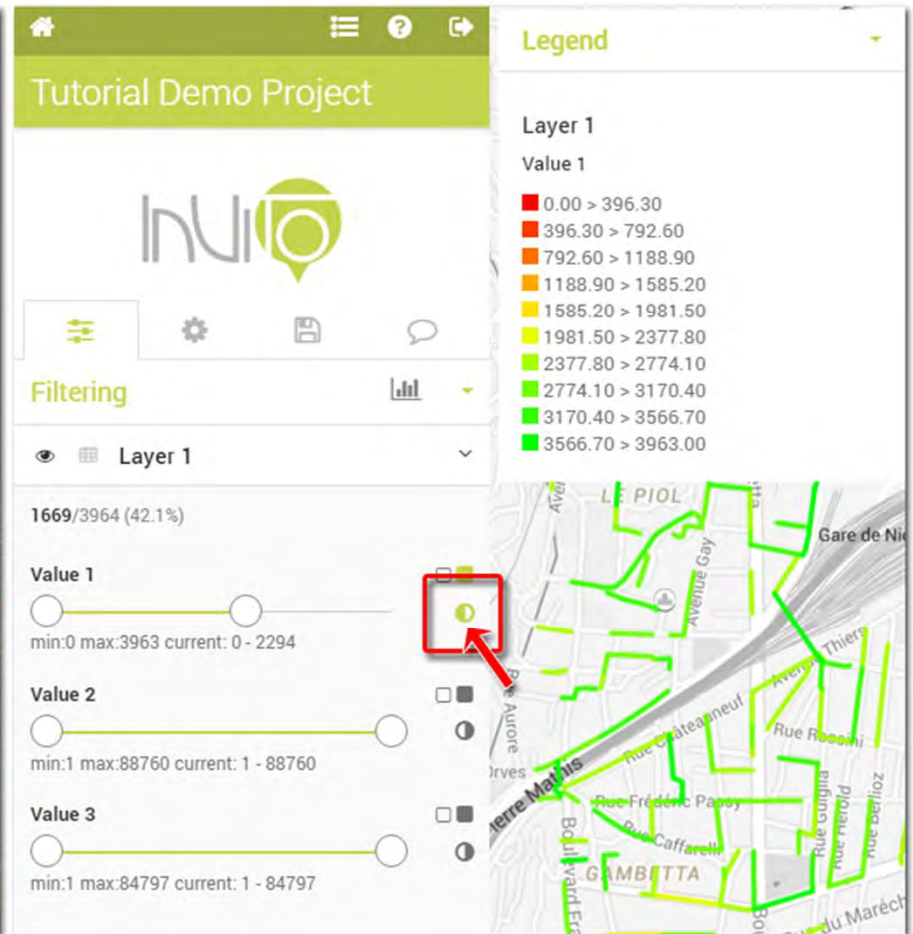
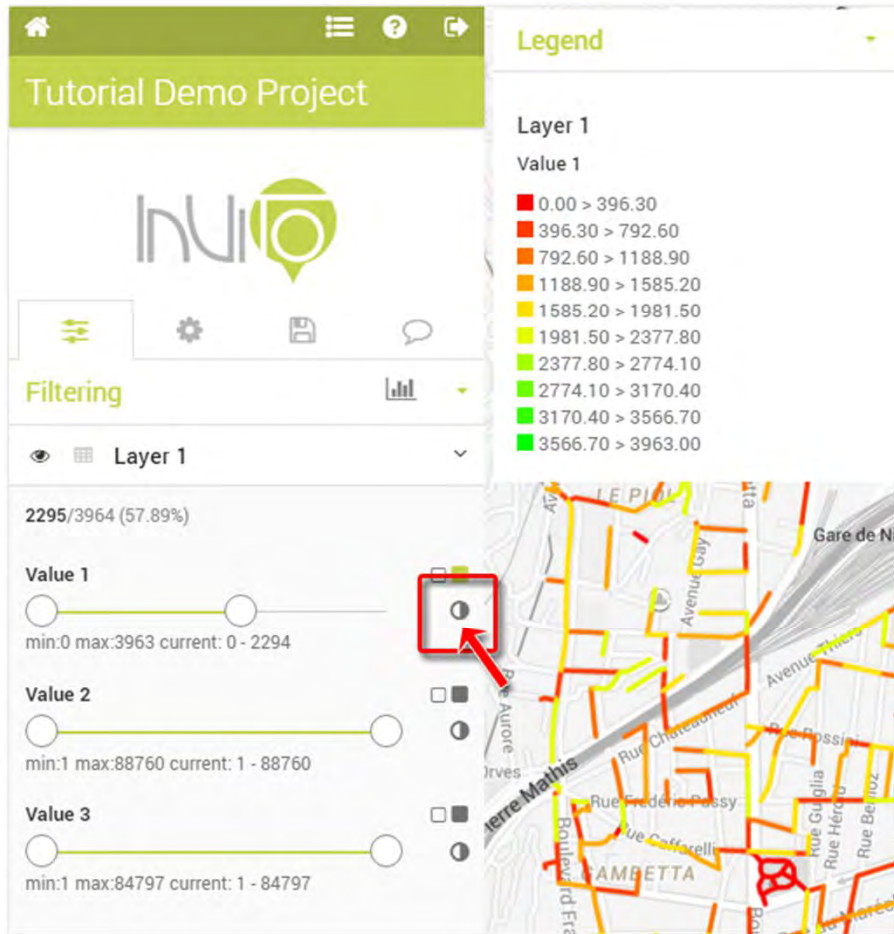


The screenshot shows a GIS application interface for a 'Tutorial Demo Project'. The interface is divided into several sections:

- Header:** 'Tutorial Demo Project' with navigation icons (home, menu, help, share).
- Filtering Section:** Located on the left, it contains three value sliders:
  - Value 1:** min:0 max:3963 current: 0 - 3963
  - Value 2:** min:1 max:88760 current: 1 - 88760
  - Value 3:** min:1 max:84797 current: 1 - 84797
- Legend:** Located on the right, it shows a color scale for 'Layer 1' with 'Value 2'. The scale ranges from 1.00 to 8876.90, with 10 discrete color swatches representing different value ranges. Below the scale, it indicates 'Min: n.a.' and 'Max: n.a.'.
- Map:** A street map is visible at the bottom right, showing a grid of streets. A red box highlights the legend's color swatches, with two red arrows pointing to the first and second swatches.



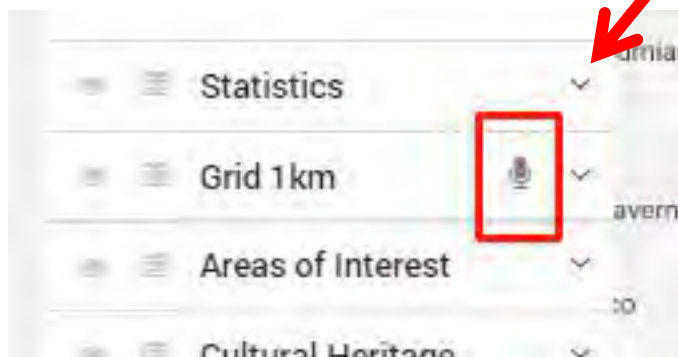
# THE FILTERING SECTION



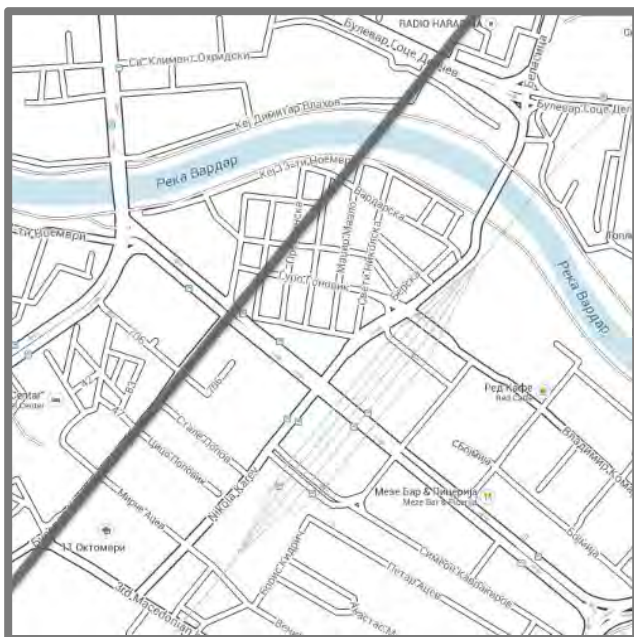


# THE WEIGHTING SECTION

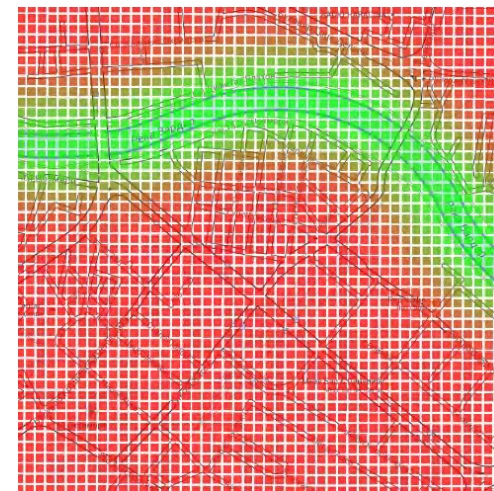
In order to enable the weighting grid,  
click on the the microphone icon and wait for the grid becomes red.



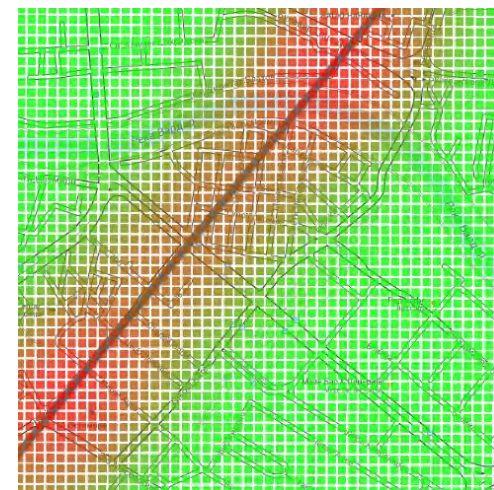
# THE WEIGHTING SECTION



Example of positive effect given, in this case, by the river



Example of negative effect given, in this case, by the highway.





# THE WEIGHTING SECTION

BOULEVARD

RAILWAY

BUS STOPS

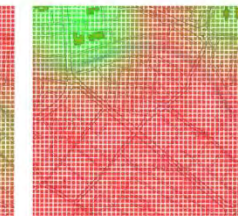
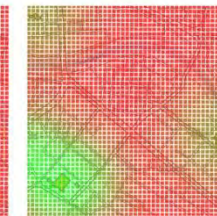
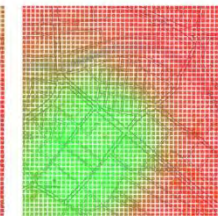
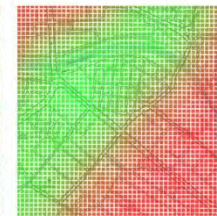
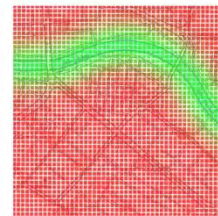
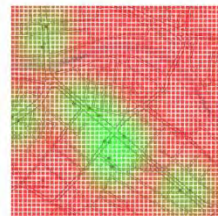
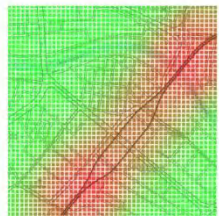
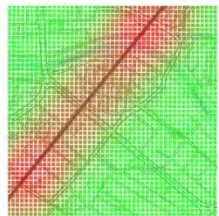
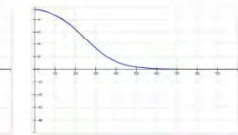
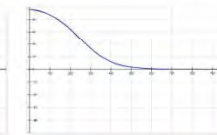
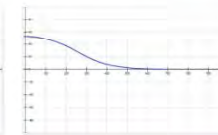
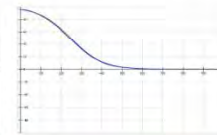
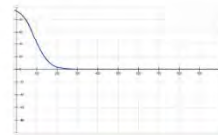
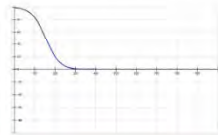
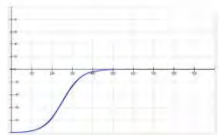
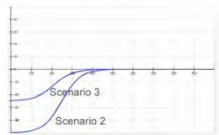
RIVER

GREEN AREAS

COMMERCIAL

EDUCATION

CULTURE



# [www.urbantoolbox.it](http://www.urbantoolbox.it)

InViTo is now a user-friendly **Decision Support System (DSS)** which provides the opportunity to **filter data**, to **generate maps** on the basis of specific behaviors, to **overlap** these **maps** and assign them a weight on the basis of their relative importance.

InViTo is under the **Creative Commons** licence

Considering the global need for more **sustainable and smart environments**, InViTo offers the possibility to explore spatial data and spatial parameters in relation to their localization.

InViTo stimulates the debate and discussion among people with different expertise, background and skills.



# CONTACTS



[www.interreg-central.eu/Content.Node/LUMAT.html](http://www.interreg-central.eu/Content.Node/LUMAT.html)



[www.urbantoolbox.it](http://www.urbantoolbox.it)

[info@lumatproject.eu](mailto:info@lumatproject.eu)



[infositi@siti.polito.it](mailto:infositi@siti.polito.it)

[facebook.com/lumatproject/](https://facebook.com/lumatproject/)



[www.facebook.com/invitool/](https://www.facebook.com/invitool/)

[twitter.com/Lumat\\_project](https://twitter.com/Lumat_project)



<https://twitter.com/InViTool>

[linkedin.com/groups/12019206](https://linkedin.com/groups/12019206)



**THANK YOU!**

TAKING COOPERATION FORWARD



---

## 4. Reduction of Land-Use Conflicts: Training Concept and Training Material



---

# TRAINING MATERIALS ON CONFLICT'S RESOLUTION

---

Version 1  
03.2018

Author: LP: Justyna Gorgoń;



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA OKOLJE IN PROSTOR



MESTNA OBČINA KRANJ





## A. Table of content

<b>Version 1</b>	<b>0</b>
<b>03.2018</b>	<b>0</b>
<b>A. Table of content</b>	<b>1</b>
<b>B. Context</b>	<b>2</b>
<b>C. Training Material on Reduction of land use conflicts</b>	<b>3</b>
<b>D.1 ADVICE TO THE TRAINER</b>	<b>3</b>
<b>D.2 TARGET GROUPS</b>	<b>3</b>
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## B. Context

Training sessions on FUAs identity as well as Reduction of land use conflicts took place, during the project meeting in Trnava 21.03.2017) and in Torino 26.09.2017. These two trainings has been prepared by Justyna Gorgoń (IETU), first one was dedicated to the identity of Functional Urban Areas, the second one has been focused on Conflit's resolutions. These two internal tranings for project partners were prepared in order to discuss the key issues of the topics as a basis for local trainings in the Project partner countries planned for regional/local management of environmental and land use planning bodies.

The aim of these internal trainings was to develop the information and methods which are needed to prepare and organise local training sessions( in partner countries).

Based on the internal trainings the training material and outcomes of seminar has been produced. The training materials will be translated into 6 national languages (CZ, DE, IT, PL, SI, SK) and provided to the participants of the trainings for local/regional stakeholders involved in integrated environmental management and land- use planning.



## C. Training Material on Reduction of land use conflicts

# TEACHING MODULE2 -LAND-USE CONFLICTS MANAGEMENT AND RESOLUTION

## D.1 ADVICE TO THE TRAINER

The training activity on land-use conflict management and conflict's resolution is addressed to the broad group of stakeholders connected to decision processes on land-use management - land authority, planners, land owners and land users etc.

The goal is to present issue of land-use conflicts in the context of planning and integrate environmental management in the FUA, explain conflict's typology and proposed way of its resolving.

Before you attempt to study or to deliver this module, please make sure that you understand the entire LUMAT project. Use also your specific professional knowledge to illustrate the points and findings arising from this presentation.

## D.2 TARGET GROUPS

This module is formulated to address different target groups, which can include both experts and non-experts as illustrated in the following table (included also in D.C.4.1 and annex IV of the application manual).

Target groups	Description of target groups - see examples in annex IV of the application manual
Local public authority	Representatives of municipalities and inter-municipal organisations in the selected FUA responsible for economic environmental and spatial development.
Regional public authority	Representatives of regional councils or planning bodies where the project functional urban areas are located and of other regions of similar problems.
Sectoral agency	Environment Agencies, Agriculture Agencies, Local Development Agencies.
Higher education and research	Representatives of urban planning and environmental protection departments in universities
Infrastructure and (public)	Departments for traffic networks in FUA including bicycle and





service provider	walking routes, waterways. Service providers from urban and landscape architecture.
SME	Local farmers, land owners, construction companies, local food co-operatives, leisure and tourism service provider.
Business support organisation	Chamber of Commerce and Agriculture, Technological and Industrial Parks, Revitalization Clusters.
General public and NGOs	Inhabitants of functional urban areas, local community associations, future users of new peri-urban (green infrastructures).

## D.3 TASKS FOR SELF-STUDY OF THE TRAINERS

This module is addressed to the broad representatives of the key stakeholders groups involved in the entire process of planning and implementing integrated environmental management within FUA. It is highly recommended that trainers acquaint with documents and outcomes of LUMAT Project, especially with those related to the development of FUAs Strategy and implementing activity (action plans and pilots). The use of the training material for your local (regional) audience requires its adaptation and flexibility according to country conditions as well your own experience on conflicts' solving technics.

For the self study we recommend the following:

- The LUMAT project`s deliverables:  
(<http://www.interregcentral.eu/Content.Node/LUMAT.html>)
- Examples of land-use conflicts (based on available literature and best practices. The bibliographic references section at the end of the module provide you some material to deepen knowledge on land-use conflicts).
- List of proposed methods and strategies for conflicts resolution (based on available literature and best practices).

## D.4 METHODOLOGY OF THE TRAINING

### Training Objectives

Main task of the training activity is to strengthen stakeholder's awareness about nature of land-use conflicts and ways of its solving.

### Training Materials

- The Powerpoint presentation with the main ideas to the topic
- 3-4 copies of FUAs maps (with administrative limits, main urban center, key transport's communication, green open spaces, etc.)

### Training Format

- Interactive workshop



## Training Methods

- Explanation of land-use conflict issue
- Explanation of exercises
- Exercises - game
- Brainstorming / Debate
- Team work on idea development
- Use not scientific language

## Logistics

- Capacity 20 trainees
- Trainers 1 leading + 2 assistants
- Room with 4 tables and 24 chairs
- Screen and laptop with connected projector
- Wall board/ flipcharts, markers 3 colours
- Sheets/ cards for writing comments and statements
- Time slot: 3 x 40' (minutes)






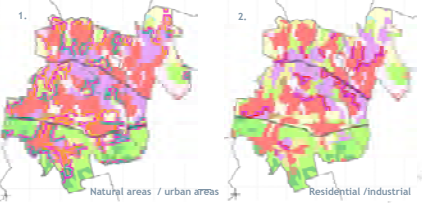
It is highly recommended that teacher translates the presentation into local language so to ensure proper forms of communication.

## Concepts

Land conflicts often have extensive negative effects on economic, social, spatial and ecological development. This is especially true in developing countries and countries in transition, where land market institutions are weak, opportunities for economic gain by illegal action are widespread and many poor people lack access to land. Land conflicts can have disastrous effects on individuals as well as on groups and even entire nations. Many conflicts that are perceived to be clashes between different cultures are actually conflicts over land and related natural resources. (*Babette Wehrmann Land Conflicts- A practical guide to dealing with land disputes, 2008*)

Land use conflicts have a territorial dimension. They rest on a physical basis: they take place between actors (sometimes, but not always neighbours) affected by a problem that has emerged and they develop around the use of localized support material or immaterial goods. (*A, Torre,.... and others- Identifying and measuring land-use and proximity conflicts: methods and identification, Springer open, 2014*). Achievement of a successful and sustainable pattern of land use requires planning, regulation and monitoring, as well as effective resolution of unanticipated conflicts as they arise. The involvement of various stakeholders in the process of conflicts management is crucial for effective, integrated environmental management. For this reason it is important to prepare broad audience composed of: planners, decision makers, land owners and land users for proactive and mindful approach to the possible land-use conflicts within FUAs territory.


The following slides explain how to approach to the possibility of conflict's arising and how select appropriate tools and methods for conflicts resolving. It is important to aware participants, that they can play different role in conflicts, depending on their competences and interests.

Activity	Basic content of the activity	Comment for the teacher
1	 <p>Training - Reduction of land use conflicts - Torino 26.09.2017          LUMAT - Implementation of Sustainable Land Use in Integrated Environmental Management of Functional Urban Areas          Justyna Gargol - IETU</p>	<p>Introducing the project, the people involved and the trainer is the first step for including people in the project.</p> <p>This should be immediately followed by asking people to present him/herself providing a short description of the reason why he/she is present at the event.</p>
2	<p><b>AIM OF THE TRAINING</b></p> <ul style="list-style-type: none"> <li>&gt; To define possibility of land-use conflicts within FUAs,</li> <li>&gt; To analyse type and scope of possible conflicts,</li> <li>&gt; To present methods and ways for conflicts resolution,</li> <li>&gt; To identify parties (partners) involved in this process,</li> <li>&gt; To contribute creation of framework for conflict's resolution scenarios.</li> </ul> 	<p>Trainer presents the aim of the training, and explains his/her role in this training. In order to involve people, the trainer has to remember that his/her attitude to be pro-active is essential for enhancing the interest and willingness to participate of people.</p>
3	<p><b>BASIC INFORMATION / DEFINITION</b></p> <ul style="list-style-type: none"> <li>&gt; Definition: <b>CONFLICT</b> (contradiction of interests, incompatibility, opposition )</li> <li>&gt; <i>It is important to understand distinction between conflict and competition.</i></li> <li><b>CONDITIONS FOR EXISTANCE OF CONFLICT:</b></li> <li>&gt; Conflict is the proces involving minimum two parties,</li> <li>&gt; Conflict is connected to scarcity of goods (space, land,resources),</li> <li>&gt; Actions (activities) of the involved parties are mutually opposed,</li> <li>&gt; Conflicts are related to power, control, profit, values (assets)</li> <li>&gt; Conflicts always affect social relations and can transform existing order</li> </ul> 	<p>The trainer presents and comments the key definition, encourages participants to refer recognised examples.</p>
4	<p><b>CAUSES OF CONFLICTS</b></p> <ul style="list-style-type: none"> <li>&gt; Objective- resulting from the current state of space:             <ol style="list-style-type: none"> <li>1)The socio-economic attractiveness of space, stimulating the development of many functions.</li> <li>2. Limited,decreasing supply of space (land) for investment needs.</li> <li>3. Outstanding natural and landscape values and various forms of their legal protection.</li> <li>4. The effects of the current spatial development, including the state of infrastructure.</li> <li>5. Dynamics and evolution of the natural environment.</li> </ol> </li> <li>&gt; Formal- resulting from the spatial planning system, the state of law and from the administration and management of space/ land,</li> <li>&gt; Subjective- resulting from individual and group feelings or ignorance, such as NIMBY</li> </ul> 	<p>The trainer presents example of land-use conflicts, and facilitates the discussion about the case study area (FUA), presents possible causes of land-use conflicts. At this point the trainer has to illustrate the causes of conflicts by using well known examples (local or national). It is recommended to have selected examples which could help to understand the differences among these three group of causes (objective, formal and subjective).</p>
5	<p><b>IDENTIFICATION OF CONFLICT'S PARTIES</b></p> <p><b>Parties involved in the land-use conflict's process:</b></p> <ol style="list-style-type: none"> <li>1) Public administration of all level (regional, local, etc..)</li> <li>2) Planners/ architects,</li> <li>3) Land owners,</li> <li>4) Private investors,</li> <li>5) NGOs,</li> <li>6) Local group of interests,</li> <li>7) Professional group of interests,</li> <li>8) Citizens,</li> </ol> 	<p>Afterwards, trainer introduces the exercerie title "City hall debate on new function for (area name) in FUA's territory". Trainer has to prepare the training game in advance, he/she should prepare appropriate information and maps (paper version or on powerpoint slides) for this exercerie. He/she should also recognise key conflict's parties, active in this FUA. The small sheets of paper are necessary as well as markers for writing.</p>
6	<p><b>EXAMPLE OF LAND-USE CONFLICTS</b></p> 	<p><b>Exercise1</b></p> <p>The exercise begins with a powerpoint presentation outlining the different types of urban land use that participants find in FUA. With this background information, participants are then encouraged to work together to think about possible land use conflicts that may arise when different types of land use (i.e. industrial v/s residential) are planned to be located in this area.</p>



7	<p><b>SCENE OF CONFLICT</b></p> <p><b>Structure / scene of conflict/:</b></p> <ul style="list-style-type: none"> <li>Parties,</li> <li>Contradictions,</li> <li>Subject,</li> <li>Time-(duration),</li> <li>Dynamics and intensity.</li> </ul> <p><b>Conflicts approach:</b></p> <ul style="list-style-type: none"> <li>Prevention,</li> <li>Avoidance,</li> <li>Calming,</li> <li>Adaptation,</li> <li>Compromise,</li> <li>Competition,</li> <li>Resolving</li> </ul> <p>TAKING COOPERATION FORWARD</p>	<p><b>Scene of conflict</b></p> <p>People are asked to participate in the training game. Participants are evenly and randomly divided into four (or more) groups, representing conflicting points of view (land owner, land users, local/regional administration, citizens etc.). They discuss and represent their assigned point of view (make notes and statement on paper). Each group has 10 minutes to write the answers. Trainer and assistants collect statements and pin-up them into flipchart. Then trainer launches discussion on conflicting interests evaluation and possible conflicts approach. The trainer is using this game for showing different modes of stakeholders` behaviour.</p>
8	<p><b>LAND USE CONFLICT- DEBETE ON CONFLICTS IN FUA</b></p> <p>Parties involved: local/ regional authorities; planners, developers land owners, land users citizens,NGOs</p> <p>Define potential conflict(s) within FUAs area.</p> <p>Type of land use conflict :</p> <ol style="list-style-type: none"> <li>Goods/ resources       <ol style="list-style-type: none"> <li>availability of: (goods/ resources)</li> <li>sustainability of use: (goods/ resources)</li> </ol> </li> <li>Environmental aspects:       <ol style="list-style-type: none"> <li>physical</li> <li>functional</li> <li>legal</li> <li>institutional</li> </ol> </li> <li>Opposite functions:       <ol style="list-style-type: none"> <li>threats and conflicts of future functions / investment</li> </ol> </li> </ol> <p>TAKING COOPERATION FORWARD</p>	<p><b>Discussion on described conflict</b></p> <p>Next step is devoted to defining type of the conflict and propose way for its resolution. Before the exercise is focused on conflict`s resolution, it is important to define type of this land-use conflict. Therefore trainer proposes distinction of subject of conflict. Based on the type of conflict as well as taking into consideration the involved parties, the trainer launches debate on type of described conflict and proposes the next exercise focused on methods of conflicts resolution. It is important to underline existence of many types of conflicts - for example concerning right property, vicinity of opposite functions, distribution of revenue from land use, etc.</p>
9	<p><b>METHODS OF LAND-USE CONFLICTS RESOLUTION</b></p> <p><b>Strategies for conflicts resolution:</b></p> <ul style="list-style-type: none"> <li>Administrative decision,</li> <li>Land- use analysis(multicriteria analysis)</li> <li>Conciliation</li> <li>Mediation,</li> <li>Public hearing,</li> <li>Participatory planning (workshops/Charette, round- table,etc.)</li> </ul> <p>TAKING COOPERATION FORWARD</p>	<p><b>Exercise2</b></p> <p>Trainer prepares list of strategies for conflicts resolution and presents it before the exercise. It is important to select appropriate methods and technics for conflicts resolution, based on existing best practices and well-known, local, national experiences. Participants are divided into four groups, representing different approach to the conflict resolution (trainer fixes selected method to the group). Each group will be asked to elaborate appropriate strategies based on presented list. After 15 minutes each group is asked to present elaborated solution. Then participants debate on proposed solutions.</p>
10		<p><b>Debate</b></p> <p>Open debete helps to understand various ways for land conflicts resolution. At the end of this debate participants link best strategy for conflicts resolution with “described” conflict`s type. Trainer is interpreting and commenting the outputs from debate stressing the role of the moderation/ mediation in the process of the conflicts resolving.</p>
11	Slide with references	References based on local/ national best practices



12	<p style="text-align: right;">interreg CENTRAL EUROPE</p> <p style="text-align: center;">THANK YOU FOR ATTENTION</p> <p>Trainer INSTITUTION / PARTNER LUMAT</p> <p>  <a href="http://www.interreg-central.eu/lumat">www.interreg-central.eu/lumat</a>   mail   phone         </p> <p>  <a href="https://facebook.com/lumatproject">facebook.com/lumatproject</a>   <a href="https://linkedin.com/in/lumat-project">linkedin.com/in/lumat-project</a>   <a href="https://twitter.com/lumat_project">twitter.com/lumat_project</a> </p> <p>    </p> <p style="text-align: right;">TAKING COOPERATION FORWARD </p>	
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## E. References




- Babette Wehrmann Land Conflicts- A practical guide to dealing with land disputes, Eschborn 2008)
- A, Torre,.. and others- Identifying and measuring land-use and proximity conflicts: methods and identification, Springer open, 2014)

### Web sources

- The Economics of Ecosystems and Biodiversity (TEEB) [www.teebweb.org](http://www.teebweb.org) (accessed Oct. 30, 2017)
- UK National Ecosystem Assessment [www.uknea.unep-wcmc.org](http://www.uknea.unep-wcmc.org) (accessed Oct. 30, 2017)  
<https://www.eea.europa.eu/highlights/land-use-conflicts-necessitate-integrated-policy>  
<https://www.ufz.de>  
[https://link.springer.com/chapter/10.1007/978-94-009-4822-8\\_10](https://link.springer.com/chapter/10.1007/978-94-009-4822-8_10)  
<https://www.sciencedirect.com/science/article/pii/S0264837714001197>



TAKING  
**COOPERATION**  
FORWARD

-  Functional urban areas - **Reduction of land use conflicts** - **Date / 2018**
-  LUMAT - Implementation of Sustainable Land Use in Integrated Environmental Management of Functional Urban Areas
-  **Name & institution / Add or change LOGO**

- To define possibility of land-use conflicts within FUAs,
- To analyse type and scope of possible conflicts,
- To present methods and ways for conflicts resolution,
- To identify parties (partners) involved in this process,
- To contribute creation of framework for conflict's resolution scenarios.



# BASIC INFORMATION / DEFINITION

- Definition: **CONFLICT** (contradiction of interests, incompatibility, opposition )
- *It is important to understand distinction between conflict and competition.*

## CONDITIONS FOR EXISTANCE OF CONFLICT:

- Conflict is the proces involving minimum two parties,
- Conflict is connected to scarcity of goods (space, land,resources),
- Actions (activities) of the involved parties are mutually opposed,
- Conflicts are related to power, control, profit,values (assets)
- Conflicts always affect social relations and can transform existing order



# CAUSES OF CONFLICTS

- **Objective-** resulting from the current state of space:
  - 1) The socio-economic attractiveness of space, stimulating the development of many functions.
  2. Limited, decreasing supply of space (land) for investment needs.
  3. Outstanding natural and landscape values and various forms of their legal protection.
  4. The effects of the current spatial development, including the state of infrastructure.
  5. Dynamics and evolution of the natural environment.
  
- **Formal-** resulting from the spatial planning system, the state of law and from the administration and management of space/ land,
  
- **Subjective-** resulting from individual and group feelings or ignorance, such as NIMBY

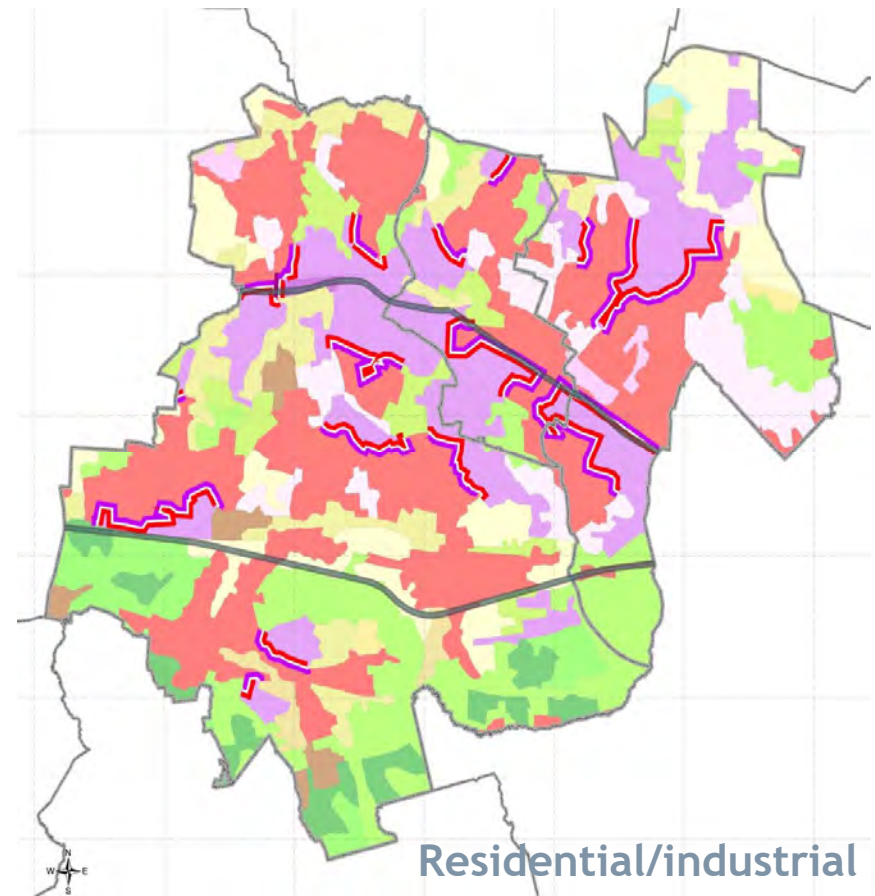
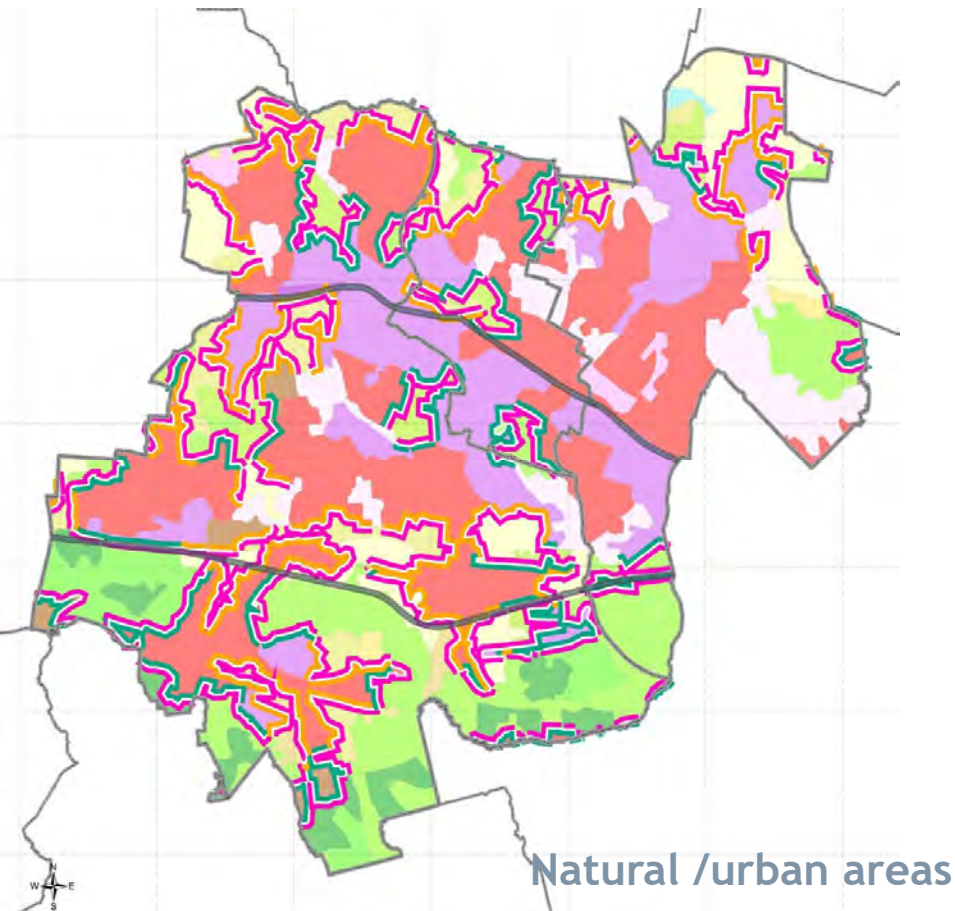


## Parties involved in the land-use conflict's process:

- 1) Public administration of all level (regional, local, etc.,)
- 2) Planners/ architects,
- 3) Land owners,
- 4) Private investors,
- 5) NGOs,
- 6) Local group of interests,
- 7) Professional group of interests,
- 8) Citizens,



# EXAMPLE OF LAND-USE CONFLICTS





# SCENE OF THE CONFLICTS

**Structure of conflict:**

Partners

Contradictions

Subject

Time( duration)

Dynamics and intensity

**Conflict's approach**

Prevention

Avoidance

Calming

Adaptation

Compromise

Competition

Resolving



# LAND USE CONFLICT- DEBETE ON CONFLICTS IN FUA

**Define potential conflict(s) within FUAs area.**

Type of land use conflict :

**1. Goods/ resources**

- a) availability of: (goods/ resources)
- b) sustainability of use: (goods/ resources)

**2.Environmental aspects:**

- a) physical
- b) functional
- c) legal
- d) institutional

1. **3.Opposite function:**

- 2. threats and conflictS of future functions / investment



# METHODS OF LAND-USE CONFLICTS RESOLUTION

## Strategies for conflicts resolution:

- Administrative decision,
- Land- use analysis(multicriteria analysis)
- Conciliation
- Mediation,
- Public hearing,
- Participatory planning (workshops/Charette, round- table,etc.)



# RESULTS AND CONCLUSION



## Name and Institution

LUMAT



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