DELIVERABLE D.T2.2.3

ACTION PLAN FOR AN INTEGRATED ENVIRONMENTAL MANAGEMENT IN FUNCTIONAL URBAN AREAS

Model for an integrated environmental management structure of the Homogeneous Zone n.11 "Chierese-Carmagnolese"

Version 2

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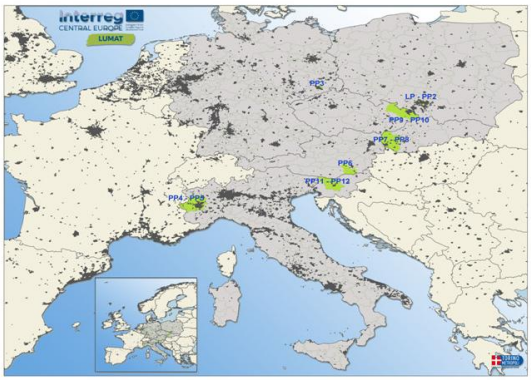
1. INTRODUCTION

The project “LUMAT - Implementation of Sustainable Land Use in Integrated Environmental Management of Functional Urban Areas” (CE 89), is funded by the Interreg Central Europe Programme within the Specific Objective 3.3 Improving the environmental management of functional urban areas to make them more liveable places. The Project, started in April 2016, will last 3 years and finish in April 2019.



The objective of the LUMAT project is to define transnational strategies and instruments for the integrated environmental management of **Functional Urban Areas (FUA),** paying particular attention to the sustainable land use and to the valorisation of **Ecosystem Services (ES)**. In order to achieve this task, project partners have to define an Action Plan which could provide the methodology and tools for the implementation of a **Functional Areas Integrated Environmental Management Strategy (FAIEMS)** for each project FUA.

Italian partners of LUMAT project are the Higher Institute on Territorial Systems for Innovation (SITI), a non-profit association set up between the Politecnico di Torino and the Compagnia di San Paolo, and Città Metropolitana di Torino (CMTo), a territorial entity that has replaced the previous Province of Turin from 1 January 2015 (National Law n. 56/2014), whose institutional aims are:

- Strategic development of the metropolitan area;
- Promotion, protection and enhancement of cultural identities within an organic, integrated and polycentric context;
- Integrated management of services, infrastructures and communications networks;
- Care of institutional relations, guaranteeing and promoting all forms of cooperation with European metropolitan cities and areas.

Within the LUMAT project, CMTo has to identify a FUA on its territorial competence and to implement on it its relative Action Plan. The chosen area is the Homogeneous Zone n. 11, called "Chierese-Carmagnolese", in which a pilot area, called “Fontaneto”, has been identified to test a model of integrated environmental management.

1.1. The concept of Functional Urban Areas (FUA)

The *Organisation for Economic Co-operation and Development* (OECD), in accordance with the European Union (Eurostat e EC-DG Regio) has developed a harmonized Functional Urban Areas (FUA) definition in which they are considered fundamental territorial structures in the achievement of Europe 2020

objectives. FUA are aggregations where the minimum cluster is guaranteed by the smaller administration for which national statistical data are available (LAU2 Eurostat) ; in the Italian case, the minimum cluster is the municipal boundary. The methodology for identifying FUAs was approved by the OECD working group on territorial indicators in 2011 and subsequently applied to 29 countries. Each FUA is a "functional economic unit", created by an urban centre and a hinterland whose market has been integrated with the "*city core* ".

Although the FUA concept is widespread at international and global level, in several European countries the perimeter proposed by OECD does not reflect the real functional structure of urban areas. The Italian FUAs identified by OECD are divided into 5 classes: small urban areas (population between 50,000 and 200,000 inhabitants), medium-sized urban areas (200,000-500,000 inhabitants), metropolitan areas (500,000-1,500,000 inhabitants) and large areas metropolitan areas (more than 1,500,000 inhabitants). Within the Turin Metropolitan City territory 3 FUAs have been identified: Turin (large metropolitan area - 200 Municipalities), Ivrea (50 Municipalities) and Pinerolo (16 Municipalities); moreover, important areas have been reported: Avigliana, Carmagnola, Chieri, Chivasso.

In Italy FUAs are not institutionalized. The National Law n. 56, of 3 April 2014 identifies 10 Italian metropolitan cities (others are defined by the laws of the Regions with special status), but their borders do not correspond to any FUA indicated by OECD. The same Law allows metropolitan cities to identify "Homogeneous Zones" to facilitate a better implementation of the main functions assigned to them.

CMTo's Homogeneous Zones (HZ) are optimal areas for the shared organization of municipal services and for the exercise of the functions that CMTo could delegate to a local administrative level. HZ were designed to be in contrast with internal territorial competition and support dialogue between municipalities, to encourage participation and to share decision-making policies, to facilitate aggregation processes and administrative merging between small municipalities and to promote the integration of services provided at different levels (Municipalities, CMTo, Region).

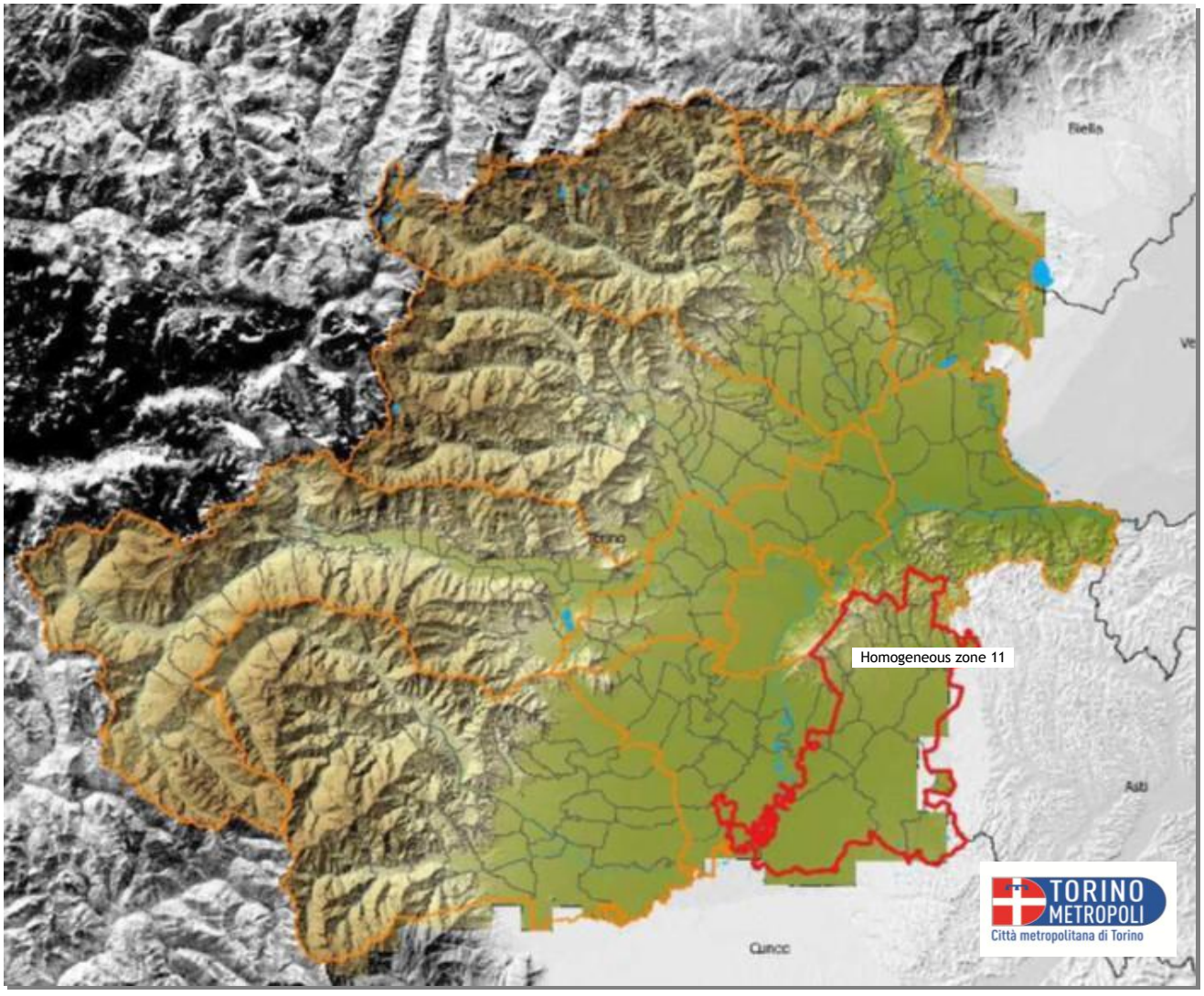
CMTo is characterized by a significant territorial extension (6.827 sq. Km), an extreme morphological heterogeneity (52% of mountain territory, 27% of plains, 21% of hills), and an administrative high-fragmentation (316 municipalities, many of which with less than 5,000 inhabitants).

In order to better manage this complexity, since April 2015, CMTo is organized in 11 Homogeneous Zones: functional aggregations of municipalities characterized by territorial contiguity, having a population of at least 80,000 inhabitants, and the presence of one or two cities (sub-poles of the main city, Torino) that act as attractors of adjacent municipalities (offering decentralized services).

The CMTo Action Plan identifies the Homogeneous Zone n. 11, called "Chierese-Carmagnolese", as a functional urban area in which a model of integrated environmental management should be tested and replicated in the other Homogeneous Zones of CMTo.

1.2. HZ11: the "Chierese-Carmagnolese" Functional Urban Area

The Homogeneous Zone n. 11 "Chierese-Carmagnolese" (22 Municipalities, 130.000 inhabitants, 462 sqkm) has the characteristics of a *small* Functional Urban Area, as defined by OECD (population <200,000 inhabitants), and is defined by the presence of two sub-poles: the City of Chieri (in the north) and the City of Carmagnola (in the south).



The territory is predominantly hilly in the northern part, which is closest to the capital city and has elements of high environmental and landscape value, while the southern part has morphological and socio-economic features typical of the plain agricultural areas. It is an area in which different situations coexist such as a high naturalistic potential (green areas), hydrogeological problems (overflowing areas and landslides), brownfields and underused productive areas following the recent economic and financial crisis, and widespread situations of residential sprawl (*See D.T3.2.1_Preparatory activities report*).

Since several years, HZ11 is working to strengthen its territorial identity and to refine tools and cooperation methods at supra-municipal level, with particular interest on environmental issues.

The opportunity offered by the LUMAT project, providing useful methods and tools for the integrated management of environmental issues of a supra-local interest, was immediately welcomed with great interest and participation by the local administrations.

Homogeneous Zone /FUA n. 11 "Chierese-Carmagnolese"	
N. Municipalities	22, including 11 hilly (104 sq km) and 11 lowlands (358 sq km)
Population	about 130.000 inhabitants
Surface (sq km)	462
Location	South-East of the metropolitan area

List of Municipalities included in the Homogeneous Zone.11

n.	ISTAT CODE	MUNICIPALITY	Area (ha)
1	001009	Andezeno	748,7
2	001012	Arignano	816,7
3	001018	Baldissero Torinese	1.540,6
4	001048	Cambiano	1.413,2
5	001059	Carmagnola	9.572,1
6	001078	Chieri	5.419,8
7	001123	Isolabella	477,2
8	001136	Lombriasco	721,0
9	001144	Marentino	1.125,9
10	001153	Mombello di Torino	408,3
11	001158	Montaldo Torinese	465,7
12	001163	Moriondo Torinese	649,0
13	001174	Osasio	457,7
14	001180	Pavarolo	440,7
15	001183	Pecetto Torinese	917,3
16	001192	Pino Torinese	2.182,0
17	001197	Poirino	7.562,0
18	001203	Pralormo	2.984,6
19	001215	Riva presso Chieri	3.583,4
20	001257	Santena	1.619,9
21	001262	Sciolze	1.135,6
22	001308	Villastellone	1.987,7

1.3. Planning and Strategic Framework

The context of planning rules and instruments in which the homogeneous zone is included is characterized by the presence of a national level regulation that normalises environmental and landscape matters (Legislative Decree 152/2006, Legislative Decree 42/2004 ,. .), from two main instruments of regional level, the **Regional Territorial Plan** and **Regional Landscape Plan**, which dictate guidelines aimed at promoting an integrated view of the local overarching scale of government and territorial protection, and which support the promotion of actions and projects to be framed in a context of regional, national and European networks.

At the metropolitan scale, the fundamental reference tool is the **Metropolitan General Territorial Plan (PTGM)**, introduced by the new national law n. 56/14 and transposed, at the end of 2017, by the regional planning law n. 56/7. The PTGM establishes rules and norms regarding communication structures, service networks and metropolitan infrastructures, also defining constraints and objectives for the performance of the functions of municipalities and unions of municipalities. Another reference document is the **Metropolitan Strategic Plan**, which defines a general vision for the development of the entire metropolitan area and annually identifies the actions and priority projects for the territory.

At the local level, national planning strategies and rules, both metropolitan and regional, are outlined in the individual municipal **General Urban Masterplans**.

1.4. Ecosystem Services

The term **Ecosystem Services** (**ES**) refers to the benefits expected from ecosystems to mankind. This concept, introduced at the end of the 1990s in scientific fields such as the environmental impact assessment, the multi-functionality of farms, the landscape according to its broader meaning, has spread in very recent times going to affect new disciplines among the such as spatial planning and urban planning.

The four main ES macro types are[1]:

- provision services, that offers goods such as food, water, timber and fiber;
- regulatory services, regulating climate and precipitation, water (e.g. floods), waste and disease spread;
- cultural services related to beauty, inspiration and leisure that contribute to our spiritual well-being;
- support services, which include soil formation, photosynthesis and the nutritive cycle at the base of growth and production.

1 Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC

A first wide area analysis (*See D.T3.2.1_Preparatory activities report*) has identified the main ecosystems in the Homogeneous Zone n.11, the related ecosystem services and threats. The assessment of these elements is important to define an integrated environmental management strategy.

Main ecosystems2 in the HZ 11		
arable land	woods, rows of tree, single trees	stable meadows and meadow-pastures
timber production	urban green areas	orchards
vineyards	rivers	soils

These ecosystems provide, according to different measures and methods, the following Ecosystem Services:

Ecosystem Services	Ecosystem process and/or feature providing the ES
Provisioning Services	
Food	Ecosystems provide the conditions for growing food. Food comes principally from managed agro-ecosystems but marine and freshwater systems or forests also provide food for human consumption. Wild foods from forests are often underestimated.
Raw materials	Ecosystems provide a great diversity of materials for construction and fuel including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species.
Fresh water	Ecosystems play a vital role in the global hydrological cycle, as they regulate the flow and purification of water. Vegetation and forests influence the quantity of water available locally.
Medicinal resources	Ecosystems and biodiversity provide many plants used as traditional medicines as well as providing the raw materials for the pharmaceutical industry. All ecosystems are a potential source of medicinal resources.
Regulating services	
Local climate and air quality	Trees provide shade whilst forests influence rainfall and water availability both locally and regionally. Trees or other plants also play an important role in regulating air quality by removing pollutants from the atmosphere.
Carbon sequestration and storage	Ecosystems regulate the global climate by storing and sequestering greenhouse gases. As trees and plants grow, they remove carbon dioxide from the atmosphere and effectively lock it away in their tissues. In this way forest ecosystems are carbon stores. Biodiversity also plays an important role by improving the capacity of ecosystems to adapt to the effects of climate change.
Moderation of extreme events	Extreme weather events or natural hazards include floods, storms, tsunamis, avalanches and landslides. Ecosystems and living organisms create buffers against natural disasters, thereby preventing possible damage. For example, wetlands can soak up flood water whilst trees can stabilize

2 An ecosystem is a "dynamic complex made up of communities of plants, animals and micro-organisms and their non-living environment, which, thanks to their interaction, constitute a functional unity" (Convention for Biological Diversity)

	slopes. Coral reefs and mangroves help protect coastlines from storm damage.
Waste-water treatment	Ecosystems such as wetlands filter both human and animal waste and act as a natural buffer to the surrounding environment. Through the biological activity of microorganisms in the soil, most waste is broken down. Thereby pathogens (disease causing microbes) are eliminated, and the level of nutrients and pollution is reduced.
Erosion prevention and maintenance of soil fertility	Soil erosion is a key factor in the process of land degradation and desertification. Vegetation cover provides a vital regulating service by preventing soil erosion. Soil fertility is essential for plant growth and agriculture and well-functioning ecosystems supply the soil with nutrients required to support plant growth.
Pollination	Insects and wind pollinate plants and trees which is essential for the development of fruits, vegetables and seeds. Animal pollination is an ecosystem service mainly provided by insects but also by some birds and bats.
Biological control	Ecosystems are important for regulating pests and vector borne diseases that attack plants, animals and people. Ecosystems regulate pests and diseases through the activities of predators and parasites. Birds, bats, flies, wasps, frogs and fungi all act as natural controls.
Supporting services	
Habitat for species	Habitats provide everything that an individual plant or animal needs to survive: food; water; and shelter. Each ecosystem provides different habitats that can be essential for a species' lifecycle. Migratory species including birds, fish, mammals and insects all depend upon different ecosystems during their movements.
Maintenance of genetic diversity	Genetic diversity is the variety of genes between and within species populations. Genetic diversity distinguishes different breeds or races from each other thus providing the basis for locally well-adapted cultivars and a gene pool for further developing commercial crops and livestock. Some habitats have an exceptionally high number of species which makes them more genetically diverse than others and are known as 'biodiversity hotspots'.
Cultural Services	
Recreation and mental and physical health	Walking and playing sports in green space is not only a good form of physical exercise but also lets people relax. The role that green space plays in maintaining mental and physical health is increasingly being recognized, despite difficulties of measurement.
Tourism	Ecosystems and biodiversity play an important role for many kinds of tourism which in turn provides considerable economic benefits and is a vital source of income for many countries. In 2008 global earnings from tourism summed up to US$ 944 billion. Cultural and eco-tourism can also educate people about the importance of biological diversity.
Aesthetic appreciation and inspiration for culture, art and design	Language, knowledge and the natural environment have been intimately related throughout human history. Biodiversity, ecosystems and natural landscapes have been the source of inspiration for much of our art, culture and increasingly for science.
Spiritual experience and sense of place	In many parts of the world natural features such as specific forests, caves or mountains are considered sacred or have a religious meaning. Nature is a common element of all major religions and traditional knowledge, and associated customs are important for creating a sense of belonging.

To evaluate the Ecosystem Services, CMTo has recently developed a simulator named "PlaySoil", during the *Life SAM4CP* project. PlaySoil mapping Ecosystem Services and quantifies economically the cost of environmental loss caused by soil sealing.

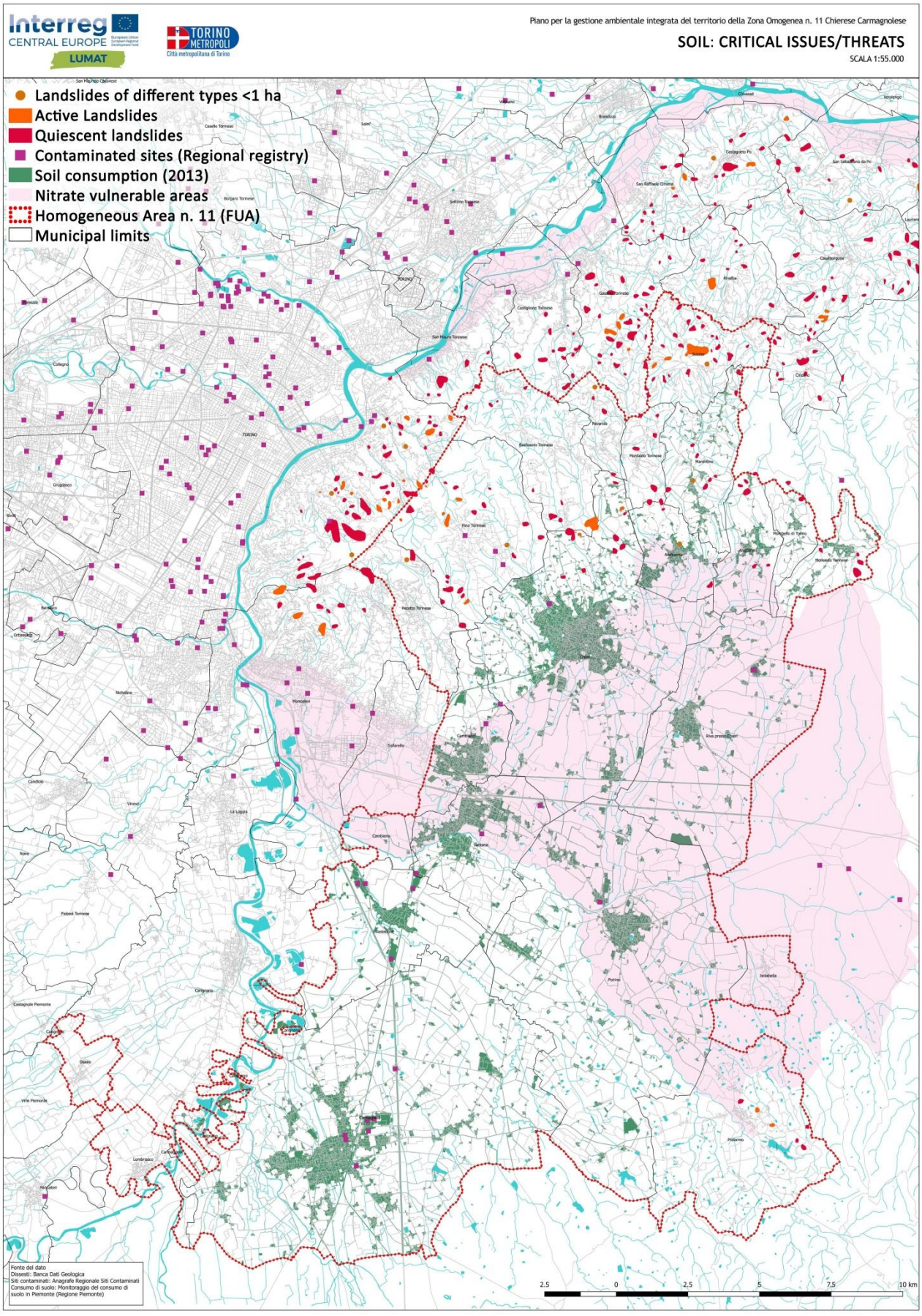
Other CMTO and Regione Piemonte's projects financed by European Program on Ecosystem Services.

Projects	Programme	Local Partner
SAM4CP (Soil administration Models 4 Community Profit)	Life + 2007 - 2013 – Environment	Città Metropolitana di Torino (capofila)
AlpES (Alpine Ecosystem Services – mapping, maintenance and management)	Alpine Space	Regione Piemonte
MaGIC Landscapes (Management of Green Infrastructure in Central European Landscapes)	Interreg Central Europe	Città Metropolitana di Torino
Los_Dama (Landscape and Open Space Development in Alpine Metropolitan Areas)	Alpine Space	Regione Piemonte

1.5. Soil threats

The main soil threats of the H.O. n.11 are summarised in the following table:

HZ11 **Ecosystems**	soil threats +++ = widespread and relevant threats ++ = non-widespread threat, relevant in some cases + = non-relevant threats - = negligible or absent						
	Soil erosion (including landslides)	Urban Sprawl, soil sealing	Brownfield	Flooding and high level of water risk	Contamination	Loss of biodiversity	Excessive fertilization
Arable land	+	++	++	+	++	+++	+++
wood	++	+	-	-	-	-	-
Rows, single trees	-	++	++	+	+	-	+
Stable meadows and meadow-pastures	+	++	++	+	++	-	+
Arboriculture from wood	-	++	++	+	-	++	+
Urban green areas	-	++	-	+	-	++	-
Orchards	++	+	-	-	-	++	-
Vineyards	+++	-	-	-	-	++	-
Water bodies	++	-	+	n.a.	++	n.a.	+++
Soils	+	+++	++	-	++	++	++


Interreg CENTRAL EUROPE
LUMAT
TORINO METROPOLI
Città metropolitana di Torino
Piano per la gestione ambientale integrata del territorio della Zona Omogenea n. 11 Chierese Carmagnolese
SOIL: CRITICAL ISSUES/THREATS
SCALA 1:55.000
Landslides of different types <1 ha
Active Landslides
Quiescent landslides
Contaminated sites (Regional registry)
Soil consumption (2013)
Nitrate vulnerable areas
Homogeneous Area n. 11 (FUA)
Municipal limits
Fonte del dato
Dissesti: Banca Dati Geologica
Siti contaminati: Anagrafe Regionale Siti Contaminati
Consumo di suolo: Monitoraggio del consumo di suolo in Piemonte (Regione Piemonte)
2.5
0
2.5
5
7.5
10 km

1.6. Strategic development perspectives (FAIEMS)

LUMAT partners have developed a "*Functional Areas Integrated Environmental Management Strategy*" – FAIEMS using scientific inputs (e.g. Ecosystem Services), innovative transnational value (see D.T1.5.1_Document of the common Functional Areas Integrated Environment Management Strategy – FAIEMS) technological models and tools (InViTo) for planning and design at municipal scale so to enhance the exchange of experiences within the FUA and support an active participation of citizens in the decision making process.

The development of a Transactional Integrated Environmental Management Strategy is developed by each partner through an Action Plan which includes institutional solutions and the description of the financial instruments necessary for their implementation. Each Plan is implemented in the reference FUA through the implementation of a demonstration Pilot Project.

Starting from the consideration that the territorial planning must satisfy different kinds of interests of and must often resolve conflicts between different kinds of land use (protection of the green areas, productive fields, residence, ...), the CMTo Action Plan is based on the idea that an effective supra-municipal management plays a fundamental role in the pursuit of sustainable development in environmental, social and economic terms.

2. ACTION PLAN FOR HOMOGENEUS ZONE N.11

2.1. Vision

CMTo is organized in Homogeneous Zones to improve the public administration management and its different functions identified by National laws. Every Zone has Mayors Assembly and a Spokesman that take part to the Strategic Metropolitan Plan and Metropolitan Spatial Plan drawing up, also thought shared suggestion, with the Homogeneous zone.

In this context the HZ Chierese-Carmagnolese vision is make the HZ a quality place where people want to live and work. To achieve this, it is necessary to improve the attractiveness of the entire territory, enhancing the existing landscape and environmental elements without, at the same time, abandoning the productive vocation, both manufacturing (in the Chierese area) and agriculture (the Carmagnola area).

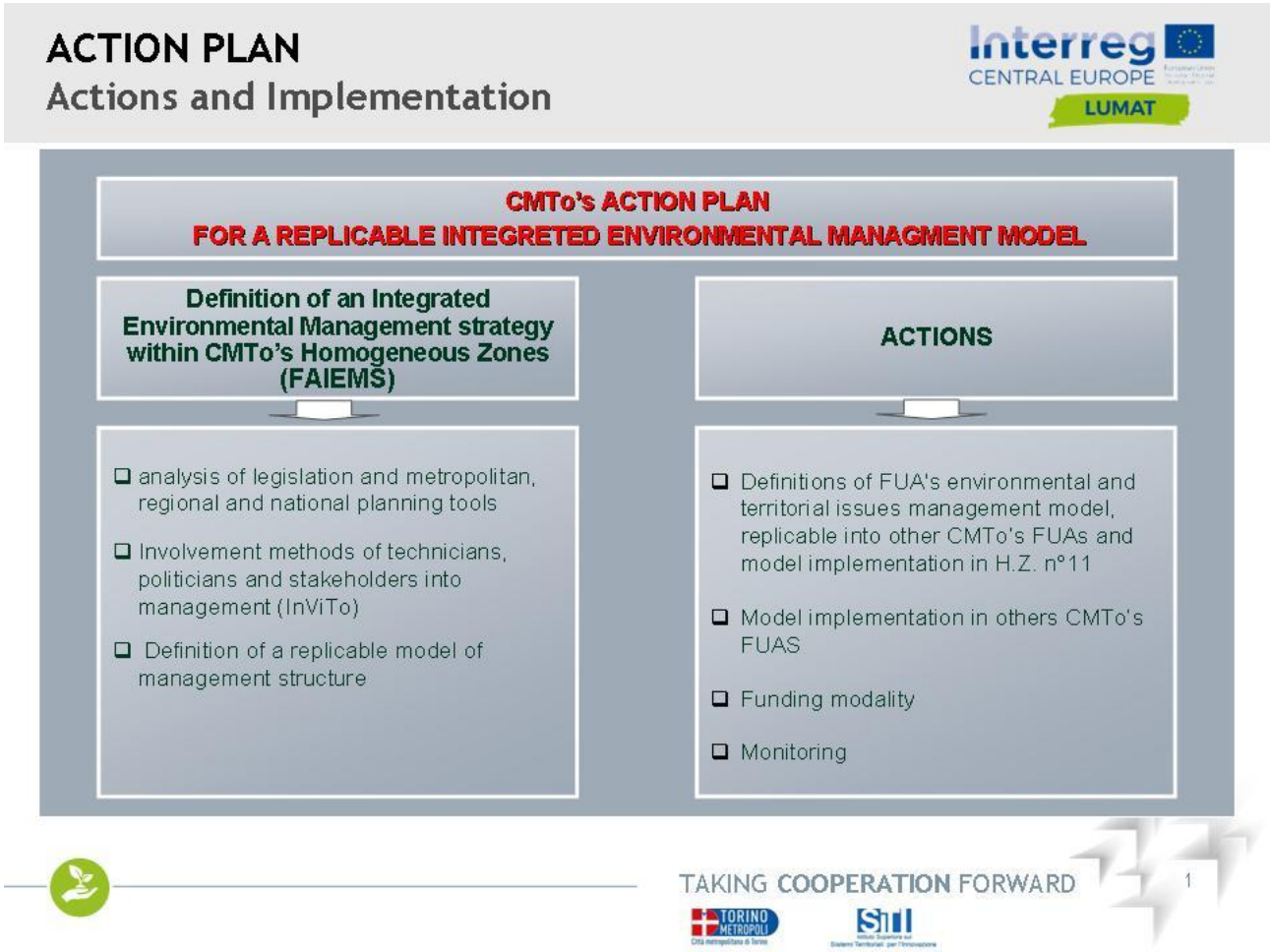
About this in 2016 the HZ11 municipalities joined the "Identity Pact of the Chierese-Carmagnola-Alto-astigiano territory" which also involves some municipalities located outside CMTo administrative boundaries. The aim of the Pact is to share experiences and solutions with respect to issues of common interest such as: sustainable economic development, welfare, culture, tourism and cultural heritage, mobility, environment, landscape, soil defence, land use planning, territorial security and control, innovation, technology, smart city, organizational optimization of the public administration.

The Lumat Project offers the possibility to realize the Identity Pact idea and assist the 22 municipalities to define the inter-municipality government structure aimed to territory integrated environmental management and provide essential tools for its operating.

2.2. FUA objectives and priorities

The Action Plan defines an integrated environmental management strategy from transnational strategy (FAIEMS) developed jontly by the LUMAT partners and defines several actions must be implemented.

The Action Plan draws the path to build an inter-municipal Structure for an integrated management of territorial and environmental issues at large area (FUA) from transnational strategy developed jointly by the LUMAT partners and starts, through a **Pilot Project**, the practical experimentation of the management model, accompanying the FUA n. 11 in the definition of an **integrated environmental territorial program of supra-municipal interest actions**, and proposing a **working method** and an **instrument (InViTo)**, useful in the of local actors and citizens involvement in administrations choices. Lastly, the Action Plan, with the Pilot Project, accompanies the new Management Structure to the **implementation of one action** identified in the FUA territorial program.



The CMTo **general objectives** in the Lumat project are:

A. define an **integrated environmental management model** of the territory, replicable in all CMTo's FUAs able to deal with various problems types related to conflicts arising from different land uses;

B. test the model inside the FUA "Chierese-Carmagolese". The Action Plan intends to test the functioning of the management model and at the same time solve some specific FUA environmental problems;

C. define ways to **resolve / mitigate conflicts** between different land use needs.

The HZ11 Action Plan priorities are:

1. **Involve all the 22 FUAs' Municipalities in the territory integrated management**, starting from the experience of the "identity territorial table ", to obtain a structure able to dialogue in a constant and constructive way in order to identify strategies, solutions and actions that guarantee a return in terms of **environmentally sustainable socio-economic growth** for the entire FUA;

2. **Combining the green areas protection needs with development**, including through brownfields redevelopment (disused or underused production areas) and the enhancement of areas with high environmental and landscape value;
3. Use, for the management, the existing municipal technical structures, **without other local administrations**;
4. Provide the FUA with **support tools** for data sharing, monitoring of activities on land and decision-making process;
5. Provide the FUA with a " proposals / projects package " ready to be candidates if appropriate economic resources become available;
6. Provide **contributions to metropolitan strategic planning and metropolitan general spatial planning;**
7. Strengthen **FUA identity within the metropolitan context**.

In addressing these issues, the soil protection and the **ecosystem services** value improvement involved in the transformation of the territory are priority.

2.3. Timeline and funding programme

The timeline definition for the actions implementation is strictly linked at available funds. In this respect, the proposed management model is also aimed to facilitate public (Regional, National, European) and private (banking foundations) financial resources interception thanks to the identified projects significance. For example, some banking foundations, support strategic development projects addressed to supra-municipal spatial area. (i.e. Fondazione San Paolo, Cassa di Risparmio di Torino[3]).

Other similar experiences on national and international territory have seen fit that the integrated environmental management could be carried out by recognisable legal entity (Committee, Foundation, association)[4].

Such solution was not considered suitable for the FUA management objectives because is intended proceed with much simpler model, without other superstructures.

3 CRT, as part of the contributions to the Welfare and Territory area, supports projects that support economic development and environmental protection, the operational cohesion between public and private actors in the area from a network and collaboration point of view (www. fondazionecrt.it/attività/welfare-e-territorio/2017-welfareterritorio-ordinarie.html). The publication of tenders usually takes place in February (expiring in April) and July (expiry in September) of each year.

4 There are many examples on the national territory of similar projects that have identified the most appropriate legal reason in the associational form (e.g. the District Rural Quality of the Parteolla, in Sardinia, http://www.comune.dolianova.ca.it, promoted by 'Asti Paleontological Park Authority https://www.astipaleontologico.it/distretto-paleontologico/).

The entity entitled to intercept financial resources will be (in addition to the single municipality) the homogeneous zone as a whole (as recognized by the Statute of the Metropolitan City of Turin).
For the realization of certain projects, will also be possible financial compensation jointly to the management of municipal urbanization charges.

2.4. Funding programme

The funding of activities foreseen by Action Plan occur through different ways.

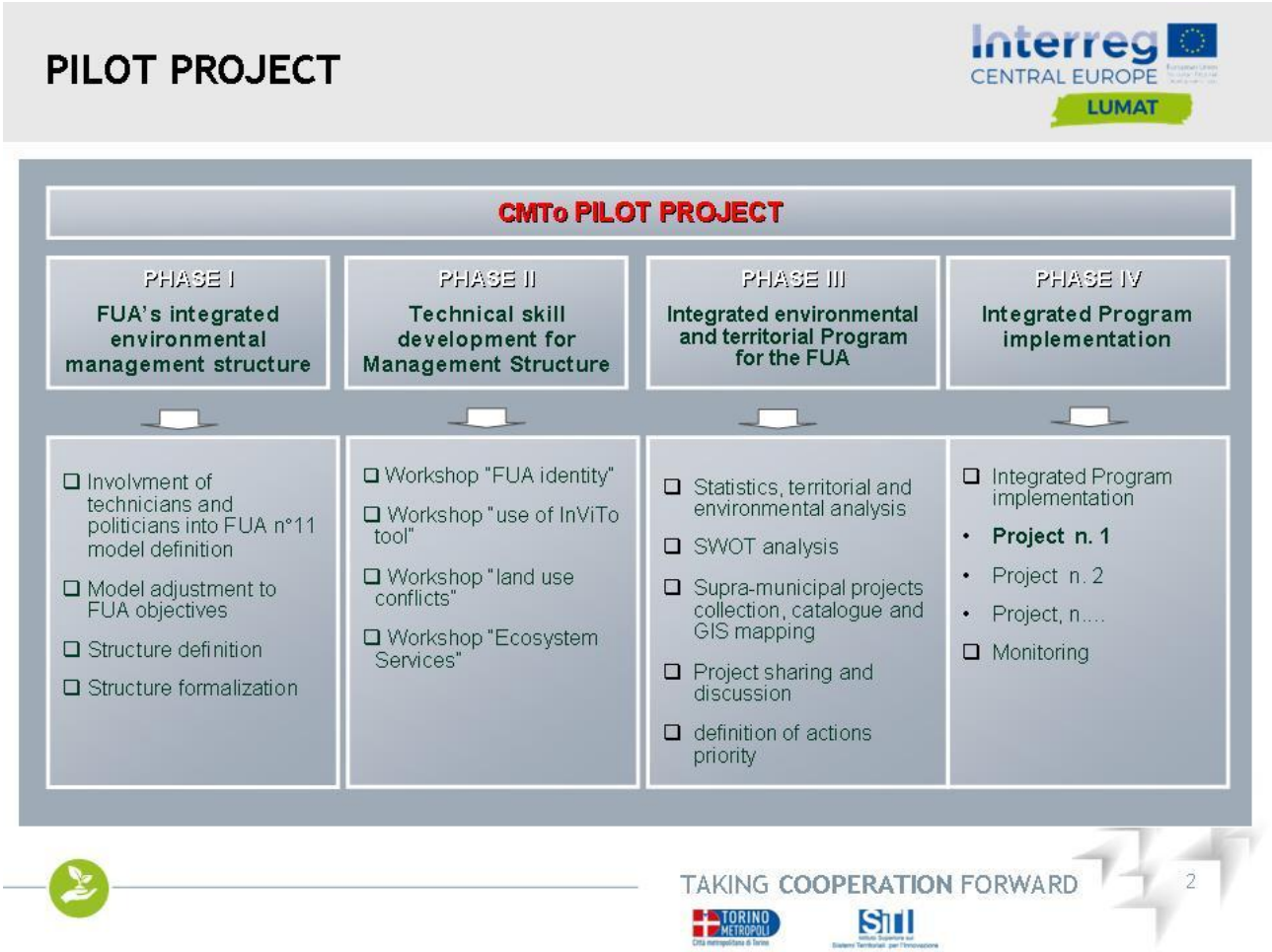
Action Plan general definition. Funded within LUMAT project.

Pilot Project - Definition of HZN.11 Management Structure. The model developing and the start of Structure activities are funding partly by LUMAT project, and partly based on with the staff valorisation and on the allocation of involved local administrations (offices, personal computers, etc.).

Pilot Project - Preparation of the integrated territorial and environmental program. The Program preparation is financed in part by the LUMAT project, partly based on the staff enhancement and on the facilities already available to the municipal administrations involved (offices, PCs, ...).
Pilot Project - Territorial Program Implementation and "Fontaneto" project realization: the realization of the Project is financed in part by the LUMAT project, in part by Chieri Municipality that co-finances the action through an economic contribution, both through the enhancement of its staff engaged in the action. For the realization of the other projects, the Homogeneous Zone will have to find adequate resources (National, Regional, CE, Banking Foundations, ...).

3. PILOT ACTION

The Pilot action is organized in 4 phases. Within the LUMAT Project are developed the I, II, III e IV phases about the "Fontaneto n.1 project" realization.



3.1. I Phase – Integrated Environmental Management structure for the HZ "Chierese-Carmagnolese"

The proposed model provides the definition of an **Integrated Environmental Management structure** that, through the application of a specific **work methodology** and a **GIS-based tool** (**InViTo**) for the involvement of territorial actors in management decisions, will be able to build an **integrated territorial and environmental program of wide area** aimed at resolving situations of brownfield degradation, combating conflicts between different land uses, and environmental protection objectives at national, regional and local levels. This structure will be able to operate for the implementation of the individual redevelopment interventions included in the integrated territorial program.

The proposal takes into account some interesting experiences in progress, such as the "LOS_DAMA! - Landscape and Open Space Development in Alpine Metropolitan Areas "(Alpine Space 2014-2020, www.regione.piemonte.it/ambiente/los_dama/) of which the Piedmont Region is a partner, which intends to define an Integrated Management System (SGI) - Environment-Territory-Landscape (possibly registered EMAS) for the sustainable management of CMTo's green areas ("Corona Verde").

The model proposed by CMTo within LUMAT project is embodied in the Management Structure which is experimentally tested in the HZ Chierese-Carmagnolese, and which has elements of replicability within all the other homogeneous Zones of the CMTo.

The Management Structure is composed:

- stimulate the collaboration, planning and implementation of inter-municipal scale actions;
- research, improve and aggregate data for an analysis of the context of the vast area;
- exchange good practices on issues of interest;
- facilitate the interception of regional, national and European resources, in particular with reference to the 2014/2020 Structural Funds;
- contributing to the definition of the Strategic Plan of the Metropolitan City of Turin.

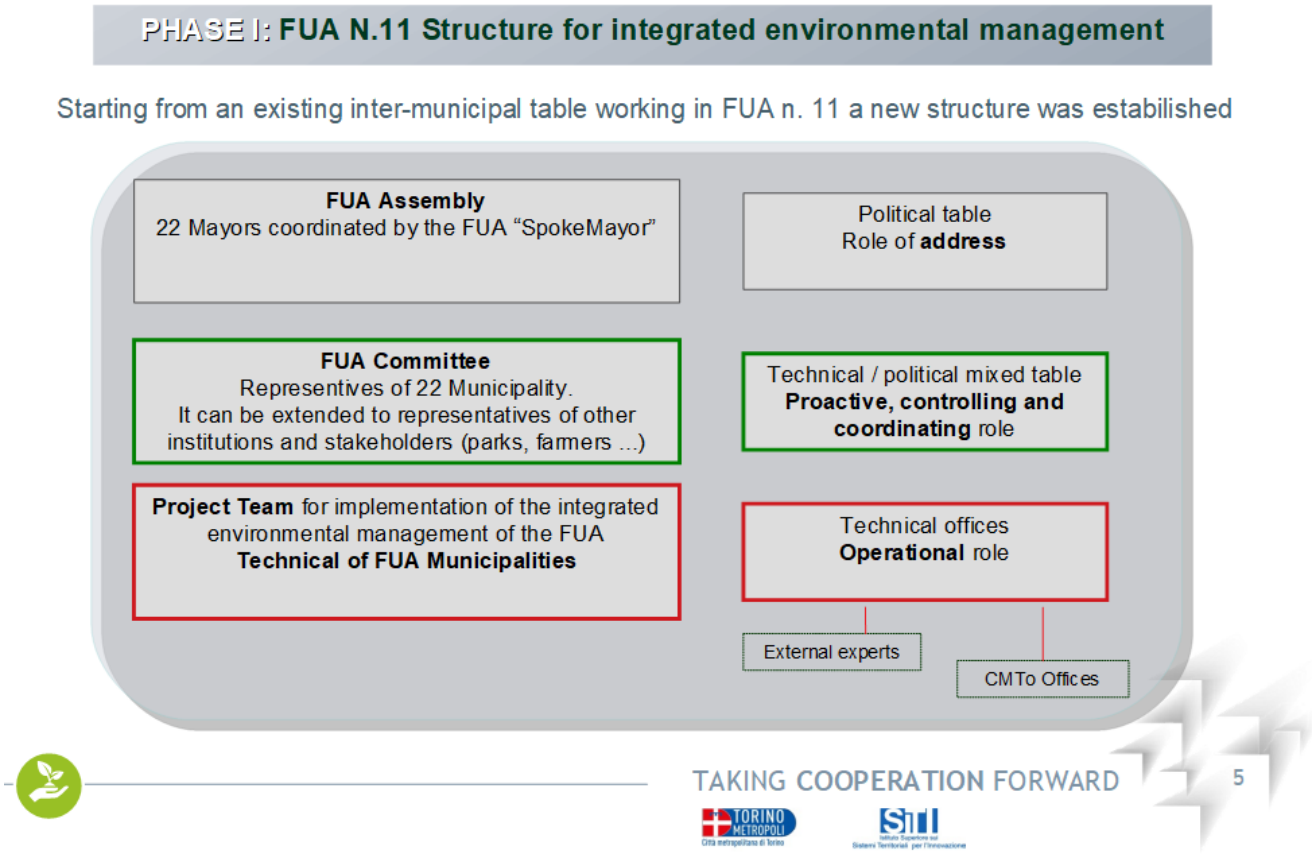
The Structure is therefore configured as an instrument of "territorial cooperation" capable of implementing and implementing a real action program, whose implementation responsibilities, coordinated by the individual identified, can be identified, on a case-by-case basis, by the participating subjects (Municipalities).

The Structure can define the policies, strategies and projects at the FUA level, ensuring both the satisfaction of the specific needs of the specific reference context, and adherence to the strategies and general objectives of the Metropolitan City of Turin (Territorial Plan and Metropolitan Strategic Plan).

The action program (Integrated Territorial and Environmental Plan), will define the priority intervention strategies for the FUA and detail the operational areas on which to focus its action.

The proposed Management Structure provides for the establishment of the following elements:

1. **Assembly of the Mayors of the Homogeneous Zone**, coordinated by the Mayor "Spokesman of the Homogeneous Zone", as identified by the Statute of the CMTo, with general duties.
2. **Control room**, made up of political representatives and officials of the 22 Municipalities belonging to the FUA (Mixed Political / Technical Table)
3. **Project unit**. It involves the various technical / administrative offices and representatives of the Municipalities for the implementation of specific actions and projects. The Project Unit can be supported, where necessary by external technical support (Technical / Administrative Table).



The Structure may also refer to the technical offices of the Metropolitan City which for their Statute carry out technical assistance activities on specific issues (urban planning, environment, etc.).

The Plan provides for the signing of a document of intent through which the administrations belonging to the FUA no. 11 undertake to adopt the model and methodology proposed for the implementation of the Action Plan, also for the period following the end of the LUMAT Project.

3.2. II Phase – Development of technical skills for the Management Structure (CAPACITY BUILDING)

Developing activity of technical skills of staff that will operate within the Management Structure is based on a specific training activity (Workshop) and on the operational activity of the structure involved in the integrated territorial and environmental program drafting, with experts identified by the LUMAT project tutoring.

The specialized themes faced in the workshops context, aimed to increase the Structure skills both political and technical components, are:

1. **FUA Identity:** (with particular attention to CMTo's HZ definition and its link with FUA concept defined by OECD). Such activity provides tools and suggestions to define the management structure for the FUA identity reinforcement;
2. **Land uses conflict management.** The activity aims to update the framework of main environmental and territorial critical issues of the FUA n. 11 and to provide useful tools for resolution processes and to solve complex problems related to territorial transformations;
3. **Citizens involvement.** Through **InViTo tool**, the training activity (both theoretical and practical) wants provide to decision making and technical staff the opportunity to use a simplified GIS tool, thus to be usable also by non-expert. The tool can facilitate the sharing of information during spatial analysis processes and the involvement of citizens and stakeholders into planning and programming choices.
4. **Ecosystem services.** Training activity is aimed to provide a general knowledge framework on this thematic which is of regional and European interest.

Moreover a territorial (public and private) stakeholders consultation activity is foreseen that will be useful for:

- identifying and sharing implementation modality of projects identified on spatial Programme;
- identifying and elaborating new projects useful to pursue and strengthen objectives for a correct integrated environmental management of HZ.

It is therefore conceivable to define an involvement and consultation activity with stakeholders that will be articulated with various tools depending on the meetings object and purpose. Both plenary meetings and focus groups can be hypothesized, last one concerning specific thematic areas.

Both types may be open to local institutional subjects and to other stakeholders, potentially interested to discuss projects already identified in this Action Plan or specific thematic areas and the related projects to be developed.

The organization is delegated to the person responsible for the Territorial Cooperation Model implementation that is the Management Structure.

3.3. III Phase – Integrated Environmental and Territorial Programme of supra-municipal projects and actions

Based on preliminary analysis of the territorial, socio-economic and environmental components characterizing the FUA n. 11, there have been issues / critical issues that the administrations considers to face and solve with supra-municipal approach, because both concern more FUA 's territories or they represent replicable experiences with common interest for different area.
Such need is enhanced by recent institutional framework modification (metropolitan cities and homogenous zones identification) and by general trends within environmental and spatial planning, addressed into research of innovative tools and methods suitable to overcame mechanism consolidated and based on location choices and visions.

The territorial programme realization process produce several intermediate outputs, such as:

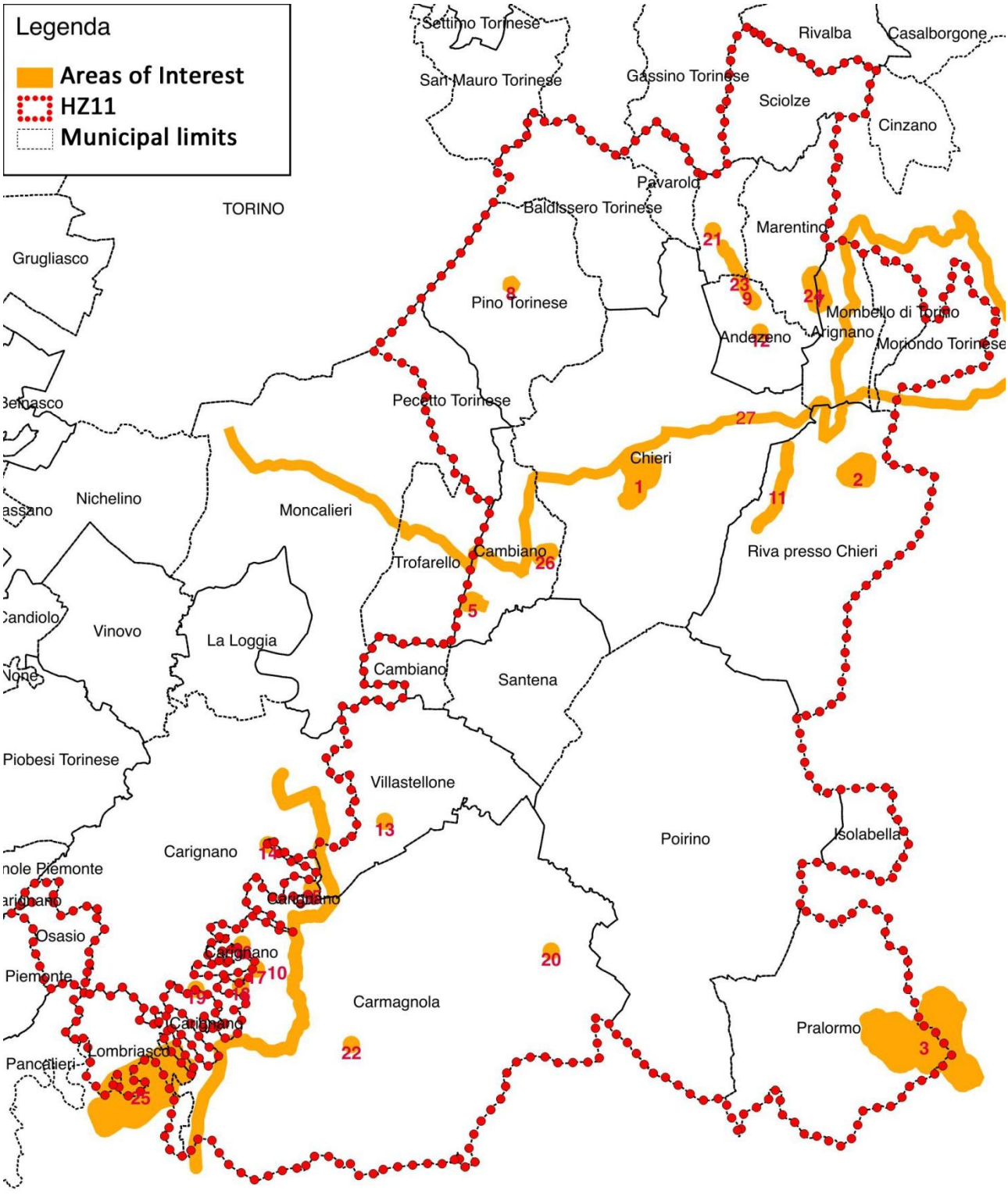
- Drafting of FUA'S socio-economic, territorial and environmental analysis document, aimed to identify FUA's potential and critical issues (in environmental terms) (*See D.T3.2.1_Preparatory activities report*);
- Definition of FUA integrated environmental vision **from** SWOT analysis, coherent with metropolitan, regional, national and european strategies with particular attention to LUMAT project themes;
- Definition of *integrated environmental and territorial programme* with environmental improvement objectives and target, in particular focused on soil protection and ecosystem services enhancement

During preliminary analysis, into SWOT analysis and into **integrated environmental and territorial programme** drafting and sharing activities is used the *InViTo (Interactive Visualisation Tool).*

3.4. IV Phase – Integrated Programme implementation

The members of the Executive Board of the Management Structure presented to the working table of the Structure some interesting areas for the implementation of interventions considered to be of supra-local value (as beneficiaries of wide area/FUA or with widespread and replicable interest in various areas of the FUA) for the testing of an integrated environmental management process according to the vision of LUMAT project.

The table and figure below indicate the proposed areas of intervention, collected and analysed by the Management Structure, which make up the First Integrated Territorial and Environmental Program of the homogeneous zone.


Legenda
Areas of Interest
HZ11
Municipal limits
Settimo Torinese
San Mauro Torinese
Gassino Torinese
Rivalba
Casalborgone
Sciolze
Cinzano
Pavarolo
Baldissero Torinese
TORINO
Marentino
Grugliasco
Pino Torinese
Mombello di Torino
Arignano
Andezeno
Moriondo Torinese
Pecetto Torinese
Chieri
Nichelino
Moncalieri
Riva presso Chieri
Trofarello
Cambiano
Vinovo
La Loggia
Santena
Piobesi Torinese
Villastellone
Poirino
Isolabella
Carignano
Osasio
Carmagnola
Pralormo
Lombriasco
Pancalieri
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N.	PROJECT AREA	MUNICPALITY
1	Fontaneto	Chieri
2	Area "Embraco"	Riva presso Chieri
3	Lago della Spina	Pralormo
5	Zona Ex Militare	Cambiano
7	Lago di Arignano	Arignano
8	Area Ex Ferrero	Pino Torinese
9	Strada Andio	Andezeno
10	Pista Ciclabile Laghi	Carmagnola
11	Ex Rio Mulino del Castello	Riva presso Chieri
12	Centro Storico Chiocciola	Andezeno
13	Borgo Cornalese	Villastellone
14	Cave Monviso	Carmagnola
15	Cava Provana	Carmagnola

N.	PROJECT AREA	MUNICIPALITY
16	Bosco del Gerbasso	Carmagnola
17	Cave Monviso	Carmagnola
18	Cave Germaire	Carmagnola
19	Cave Ceretto	Carmagnola
20	Abbazia di Casanova	Carmagnola
21	Piazza Fornace	Montaldo
22	Centro Storico	Carmagnola
23	Strada Andio	Montaldo
24	Lago di Arignano	Marentino
25	Riserva Naturale Confluenza Maira	Lombriasco
26	Zona CRA Fornace Carena	Cambiano
27	Tracciato principale “PISTAAA”	Vari comuni

The implementation of the Integrated Program by the Management Structure involves the implementation of the projects contained therein. The time schedule depends on three elements:

- Recognized supra-municipal level priority (defined by the control room);
- Design level (assigned to the Project Unit, possibly assisted by external technicians);
- Availability of resources.

On the basis of these elements, the Management Structure of the Homogeneous Zone 11 identified as the first project to be developed within the LUMAT project, the intervention located in the area called "Fontaneto", in the Municipality of Chieri.

3.4.1. Ecosystem Services valorization project in the “Fontaneto” area in the City of Chieri

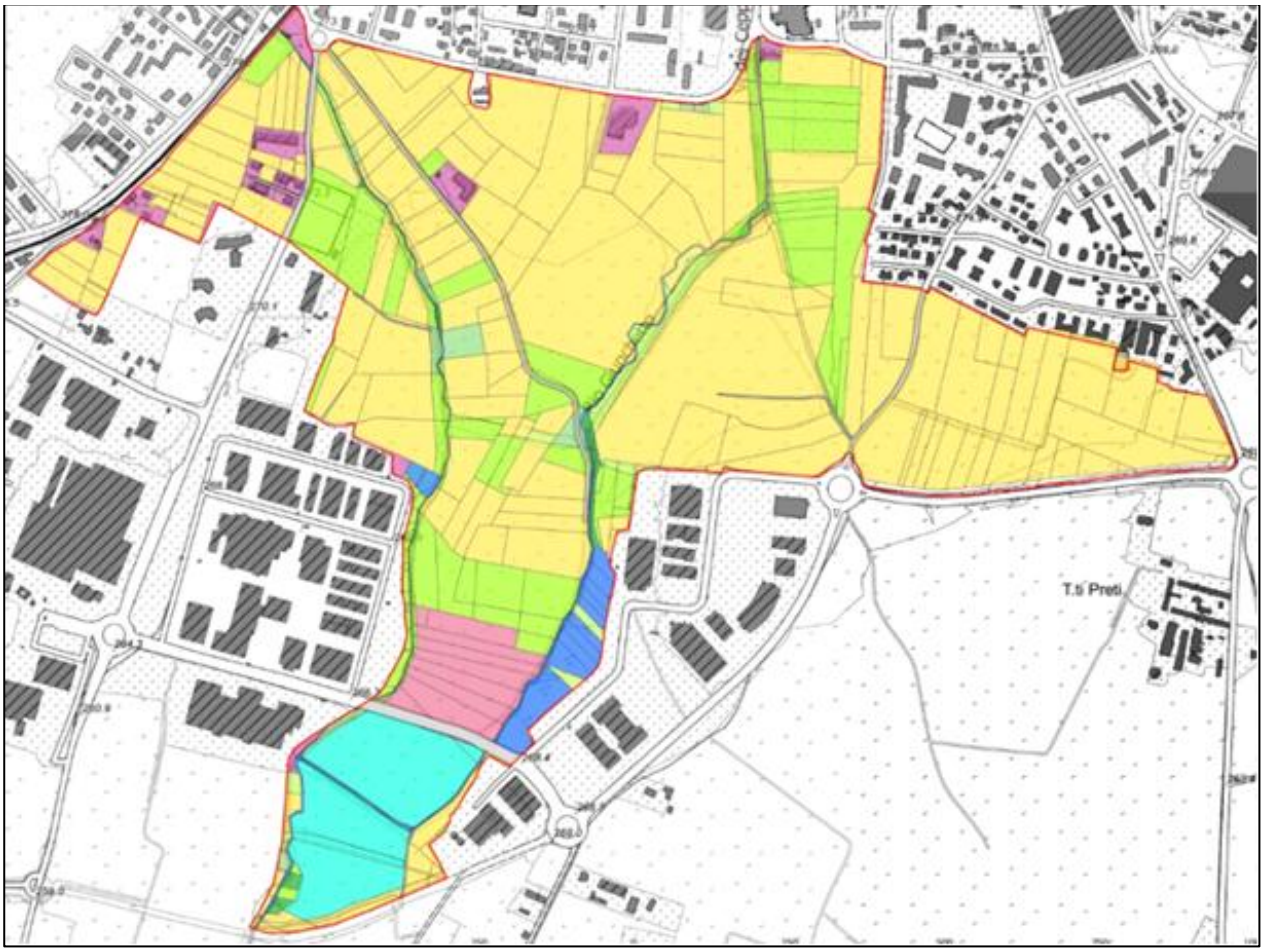
The choice was dictated by the following reasons:

- On the area the LIFE + SAM4CP Project is defining an interesting urban planning change;
- The project involves the transformation of an dedicated to production, according to the Urban Masterplan, into a green area, with a significant increase in terms of Ecosystem Services;
- The intervention is considered an innovative (and replicable) experience within the entire CMTo;
- Costs and times for the implementation of the project are affordable within LUMAT (co-financed by the Municipality of Chieri).

The area of intervention

The area (measuring about 80 hectares) is located south of the town of Chieri in the area called "Fontaneto" which is wedged between two industrial land leases developed since the '90s, that extend up to the ring road of the town.

The area is currently mostly destined to equipment and sports facilities (golf course) and, to a lesser, extent to services for productive and agricultural activities. Currently, the area is almost entirely used for agricultural purposes, with the exception of the small band along the banks of the "Gioncheto" and "del Vallo" rivers where some arboreal and shrubby specimens are arranged in rows.



Objectives of the project

The aim of the project is to experiment an innovative methodological path to evaluate the effectiveness of the payment procedure of Ecosystem Services as a tool to be adopted in planning tools and in territorial management procedures.

The activity is conceived with the aim of reaching the formalization of a replicable methodology in the territory of the functional urban area considered.

Activities

The project activities are structured as follows:

1. Evaluation, through a systematic work on the field and at farms, of the initial state (baseline) of the study area in terms of land use, quality and complexity of existing ecosystems, management practices and ecosystem services (SE) generated.
   Ecosystem Services to be evaluated: *habitats quality, carbon sequestration and storage, pollination, agricultural production, timber production, mitigation of soil water erosion, water purification*.
2. Identification of possible land use scenarios consistent with municipal planning tools and their subsequent characterization in terms of SE offered. Some scenarios of overall structure of the area will be hypothesised with possible alternatives regarding the landscape and functional aspects (for example, crop systems, minor ecological network, fund management techniques, etc.), identifying the optimal solution in terms of ecosystem balance;
3. Economic evaluation of the increased value of the ESs for each of the considered scenarios. The Ecosystem Services that are primarily intended to increase are: habitat quality, visual quality of the landscape, usability, nutrients regulation;
4. Definition of the associated management methods of the area, aimed at achieving the increase of the Ecosystem Services offered;
5. Definition of a draft statute and regulation for the identified management body.

Stakeholders

The owners and/or the tenants of the land that fall into the intervention area will be involved.

The Management Structure of the Homogeneous Zone will participate in the activity.

Timetable (proposal)

	2018											
Activities	Jan.	Feb.	Mar.	Apr.	May	jun.	jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												

4. LUMAT TOOLS: InViTo

Interactive Visualization Tool (InViTo) http://www.urbantoolbox.it/

The Interactive Visualisation Tool (InViTo) is an ongoing research on Spatial Decision Support Systems (SDSS). InViTo has been developed in SiTI – Higher Institute on Territorial Systems for Innovation in order to guide users in building their spatial knowledge and awareness by means of high interaction with dynamic maps. This process is intended to allow decision-makers to be informed before making their choices.

Its framework is based on a web platform which makes use of open collaborative web tools, so that InViTo is nowadays a freely accessible instrument for building spatial knowledge.

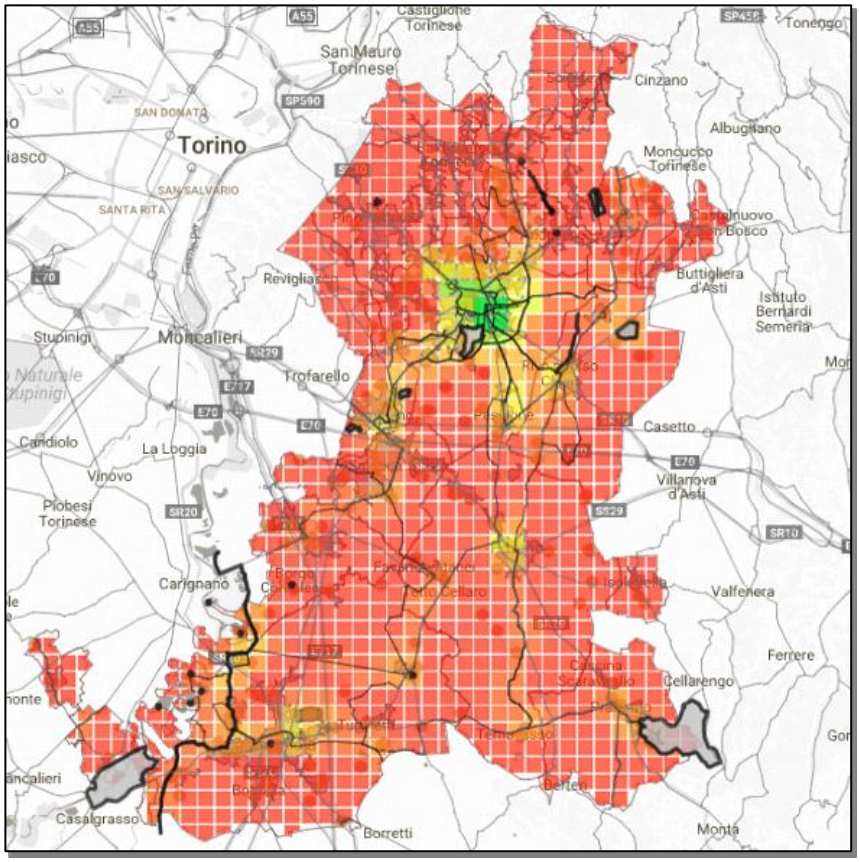
The main task of InViTo is to create opportunities for reasoning on data. Thus, InViTo can be used to:

- 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.

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 too.

In particular, InViTo does not provide spatial solutions, but it aims at facilitating the analysis 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.

Nowadays, InViTo offers:

- an open source tool: InViTo is based on open source software and initiatives, especially on GNU General Public Licence. Its geographic database management is based on PostGIS.
- Spatial and non-spatial data visualisation
- Data filtering
- Data exploration/interaction
- Data sharing (.GeoJSON, .csv, .png files)
- Map weighting

- Web accessibility
- High compatibility with spreadsheets, tables and GIS data
- Possibility to create own projects
- Easy and quick data update
- User's friendliness
- Easy customisation of interface configuration
- Easy customisation of map configuration
- Different accessibility based on specific user's permissions

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: to filter displayed data.
- the map weighting section: to weight maps depending on personal preferences.
- the data visualization section: to customize the visualization.

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.

5. CAPACITY BUILDING

The new management structure established among the 22 municipal administrations belonging to the FUA draws its professionalism among the technicians and administrators of the area. For this reason, the Action Plan envisaged a series of training activities through the organization of workshops on the topics

- Ecosystem Services
- FUA Identity
- Land use problems
- Citizens and Stakeholders Involvement

The training activities were carried out by experts in: spatial planning, environmental planning and ecosystem services, communication methodologies, GIS tools.

At the end of the training course, the technical offices of the CMTo remain available to the structure for future updates. The Structure will also have the InViTo tool and related tutorials available to refine their skills according to specific needs.