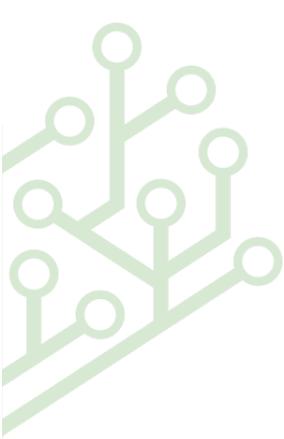




CASE STUDIES OF THE USE OF THE LANDSUPPORT PLATFORM IN URBAN PLANNING

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1.	PREMISE	3
2.	OPERATING TOOLS IN URBAN PLANNING	4
2.1.	REGIONAL AND METROPOLITAN PLANNING	4
2.1.1.	REGIONAL LEVEL	4
2.1.2.	PROVINCIAL LEVEL	5
2.2.	HEADING LVL 2	5
2.2.1.	HEADING LVL 3	5
2.2.	MUNICIPALITY LEVEL	6
3.	CASE STUDIES	9
3.1.	THE CASE OF PROVINCIAL AND REGIONAL PLANNING	9
3.2.	THE CASE OF MUNICIPAL PLANNING	15
4.	ADDENDUM: GREEN URBAN INFRASTRUCTURE	18
5.	BIBLIOGRAPHY	20



1. PREMISE

An early definition of spatial planning comes from the European Regional/Spatial Planning Charter (often called the 'Torremolinos Charter'), adopted in 1983 by the European Conference of Ministers responsible for Regional Planning (CEMAT): "*Regional/spatial planning gives geographical expression to the economic, social, cultural and ecological policies of society. It is at the same time a scientific discipline, an administrative technique and a policy developed as an interdisciplinary and comprehensive approach directed towards a balanced regional development and the physical organisation of space according to an overall strategy.*"

The Italian definition of urban planning as a science derives from Giovanni Astengo. This definition would have a fundamental role in influencing the official definition of «Urban planning» as used by the Italian legislator. As, indeed, art. 80 of DPR 616 of 1977 states: by Urban planning, one refers to «*the discipline of using a territory and all its cognitive, regulatory and administrative aspects in operations of not only safeguarding and transforming the soil, but also the environment*».

With the reform of title V of the Constitution of the republic (approved with L. 3/2001 and aimed at the completed redefinition of the roles of the State and the Regions and of their relative rapports), among the roles of regions, the topic of *urban planning* was substituted with one entitled "*governance of the territory*".

This is not merely a terminological innovation: the concept of territorial governance is much wider than that of urban planning as it includes ecological, landscape, cultural, symbolic, economic and political aspects which the traditional conception of urban planning often omitted.

2. OPERATING TOOLS IN URBAN PLANNING

The operating tools in urban planning may be distinguished on the basis of hierarchy, typology and functionality.

These emerged in Italy with the proclamation of law n.1150 of 17th August 1942.

Its urban planning is hierarchically ordered on three levels:



Figure 1- Spatial Planning Levels

2.1. REGIONAL AND METROPOLITAN PLANNING

The practice of planning over a wider, metropolitan area is a relatively recent phenomenon, both with regard general territorial plans, the Piano Territoriale di Coordinamento Provinciale (Territorial Plan of Provincial Coordination) (PTCP) and the Piano Territoriale Regionale (Regional Territorial Plan) (PTR), and the specialist plans, such as the Piano di Bacino (Hydrological Basin Plan), the Piano del Parco (Plan for the Park) or the Piano Paesaggistico (Landscape Plan).

Due to their different aims, the general territorial plans deal with all of the matters and phenomena regarding the physical and functional organisation of the territory. On the other hand, the specialistic plans set out strategies and a code of conduct with emphasis upon a specific type of objective (territorial safety, environmental care, etc) (Dal Piaz Aprea 2010).

2.1.1. REGIONAL LEVEL

Something of particular relevance in terms of the levels above that of the municipality has been the so-called "Legge Galasso (Galasso Law)" 431/1985 (accepted by DLgs 42/2004 - Code for cultural and landscape heritage, proclaimed following the European Landscape Convention and ratified by L.14/2006).

This introduced an extensive, articulated acceptance of the concept of environmental care and set out in detail the regulations for the Landscape Plan, making obligatory its elaboration by the Regions.

The Territorial Landscape Plans (PTP), which are the Regions responsibility, are aimed at identifying actions and regulations for care and development of the natural environment of the Landscape and the territory's historical and cultural patrimony.

With L. 183 of 1989, notable innovations were achieved in the functions and instruments in soil conservation, in particular with the introduction of the Hydrological Basin Plan (Piano di Bacino) to which a complex set of objectives and contents was attributed.

To these can be added the Plans for the Parks, instituted within the framework law on protected areas 394/1991, sectorial environmental plans, aimed at planning the care and structure of particular protected areas.

2.1.2. PROVINCIAL LEVEL

The originally complex functions of the Province have been simplified with the new sectorial plans (Hydrological Basin Plans, Plans for Parks, Transport Plans, Landscape Plans...). Today, the provincial plan prevalently performs a function of coordination and liaison between the various plans.

Function originally foreseen by art. 14 of L. 142/90

The administrative functions of provincial interest which regard large inter-municipal areas or the entire provincial territory for the sectors below are the responsibility of the province:

- a) soil conservation, environmental protection and development, and prevention of calamity;
- b) protection and development of water and energy resources;
- c) exploitation of cultural assets;
- d) roads and transport;
- e) protection of flora and fauna, parks and natural reserves;
- f) hunting and fresh-water fishing;
- g) organisation of rubbish disposal on a provincial level, surveying, regulation and control of water drainage and atmospheric and sound emissions;
- h) public sanitation, hygiene and prevention services, attributed to state and regional legislation;
- i) tasks connected to high schools and artistic and professional education institutions, including school building, attributed to state and regional legislation;
- l) collection and elaboration of data, technical and administrative assistance to local bodies.

2.2. MUNICIPALITY LEVEL

The new municipal plans for urban planning: from PRG to Puc (and more)

The national law on urban planning, i.e. law 1150/1942, regulates urban planning activity and its objectives. Art. 4 dictates that “Urban planning regulation applies through territorial regulatory plans, municipal regulatory plans and the rules on building activity as sanctioned by the present law or prescribed by regulation”.

For the first time, this law has presented a unitary, organic solution for the plan tools, identifying articulated plan typologies and levels. For instance, it has introduced the general regulatory plan (PRG) as an ordinary planning and governance tool for the transforming of the entire municipal scale.

The reform of title V of the Italian Constitution, which took place through the approbation of Constitutional Law n. 3 of 2001, recognises that Regions, Provinces and Municipalities are no longer in a hierarchical rapport within which the State occupies the apex, but rather a rapport of parity.

From an urban planning point of view, the Regions have been recognised as having legislative autonomy and this has meant that almost all of the Italian regions have elaborated an autonomous regional law with regard urban planning.

For example, in Campania, the regional urban planning law is LUR 16/2004.

The municipal urban planning Plan is no longer called PRG, but PUC, and it is the only plan level to define soil use with reference to land use limitations.

It is easier to understand the new denominations given to municipal plans due to the new regional laws on urban planning by looking at a map of Italy.

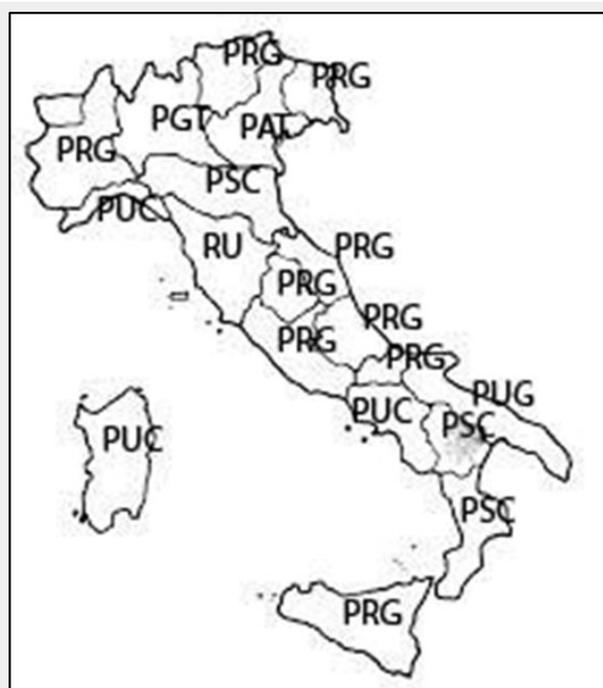


Figure 2 - The new denominations given to municipal plans in Italy (source: Coppola 2016)

However, the new plans for municipal urban planning are more complex than the old PRG.

The PRG were simply plans for spatial organisation based on the principle of zoning, subdivision into zones in order to regulate the land rent processes.

These plans proved to be more attentive to quantitative (density, rules, indices) than qualitative and morphological aspects.

Attention was mainly focused upon the urban territory.



Figure 3 - Prg of Sassano – Zoning

The new municipal urban plans (PUC) adopted new criteria for planning based on limiting land consumption and make use of the landscape or its ecology as the guide to transformation.

3. CASE STUDIES

3.1. THE CASE OF PROVINCIAL AND REGIONAL PLANNING

Problem 1: The increasing recognition of the relevance of environmental and landscape issues (safety of the territory, conservation of biodiversity, safeguarding the landscape) and emphasis on the inter-municipal nature of structural factors which orientate actual social and urban planning dynamics have reinforced the role of large scale territorial planning by the territorial government and the need to give it a dimension which is appropriate to the complexity of territorial phenomena. The general territorial plans perform a directing and coordination function.

For administrations (particularly smaller administrations), it is very important to acquire a support tool to manage both ordinary and extraordinary (drafting of a provincial coordination plan) activity, as well as the conflict between land consumption and the definition of ecological corridors.

The LANDSUPPORT solution (prevalent use):

LANDSUPPORT helps draft territorial analysis, in particular:

- Analysis of land use and soil quality (agricultural and non);
- Analysis and monitoring of land take
- Statistical and demographic analysis correlated (dynamically) with spatial aspects of the territory

Example of statistical, demographic and spatial analysis

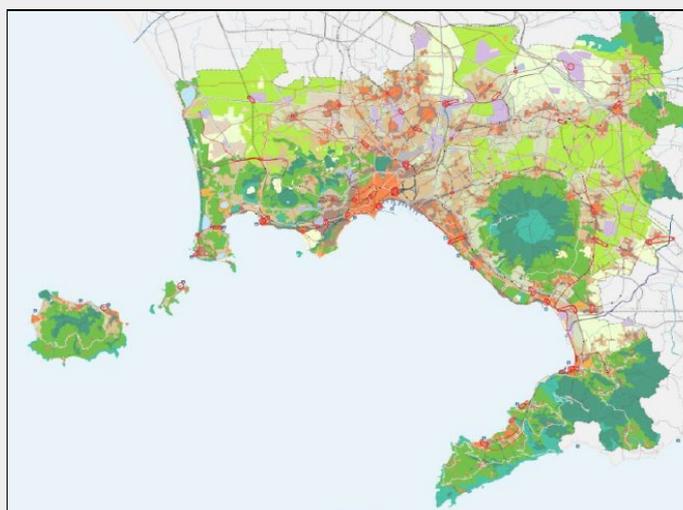
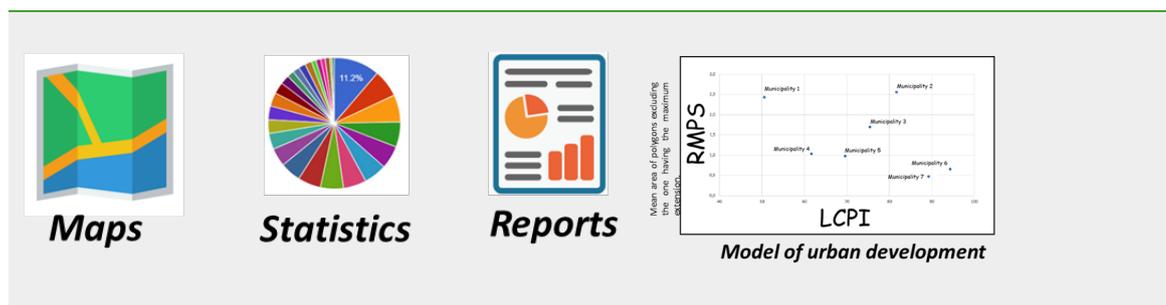


Figure 5- PTCP of the Province of Naples

Problem 2: The safeguarding, conservation and development of the landscape are becoming increasingly central to territorial planning. These actions require careful analysis of the elements making up the landscape, from a spatial (natural, semi-natural and agricultural territory), a linear (rivers, nature trails, ridges, etc.) and a punctual (springs, summits, etc.) point of view. Landsupport can be of help for this analysis.

LANDSUPPORT solution (other uses) on a provincial level

- Assistance in drafting a table for protection and development of the agrarian landscape;
- Assistance in defining the characteristics of value and the potential of the natural systems and human systems in the territory;
- Assistance in defining the zones in which establishing protected natural areas of local interest would be opportune.

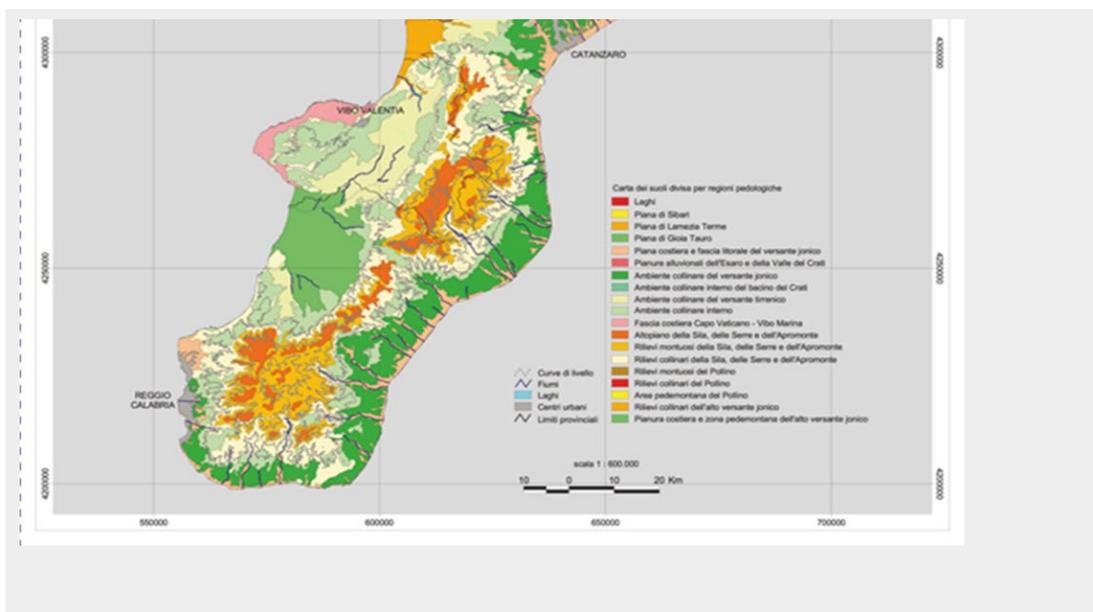


Figure 6- Regional Pedologic Map of Calabria

Problem 3: The definition of a map of possible transformations is one of the most complex and responsible operations for a planner at both provincial and municipal levels.

LANDSUPPORT solution: Helps draft a table of possible transformation at provincial level.

The map of possible transformation identifies both the territorial components which constitute the territory's structural identity, and, therefore, should not be transformed, and the elements that limit transformation.

This table presents the entities that correspond with, for example:

- Natural and agricultural resources;
- The historical and cultural landscape patrimony (MIBAC data-base)
- Natural and human risks (seismic risk, landslide risk, hydraulic risk, fire risk, etc)
- Infrastructure (electricity power lines, gas pipelines, rail network, road network etc)



Figure 7- Map of possible transformation of the Ptcp of Avellino

Problem 4: The law (L.132 / 2016) affirms the need for annual monitoring of land consumption. This is particularly difficult due to the way in which a municipality's ordinary technical activity is structured. It is not easy to activate a practice of combatting land consumption through the identifying of possible ecological corridors.

Landsupport solution: helps contrast land consumption on a provincial level – the ecological (green) network.

The primary objective of policies of establishing ecological networks is to combat the fragmentation of natural environments due to human action (primary objective of landscape and/or territorial plans), avoiding, amongst other things, a clear separation of those areas which enjoy protection regulation from the "rest" of the territory.

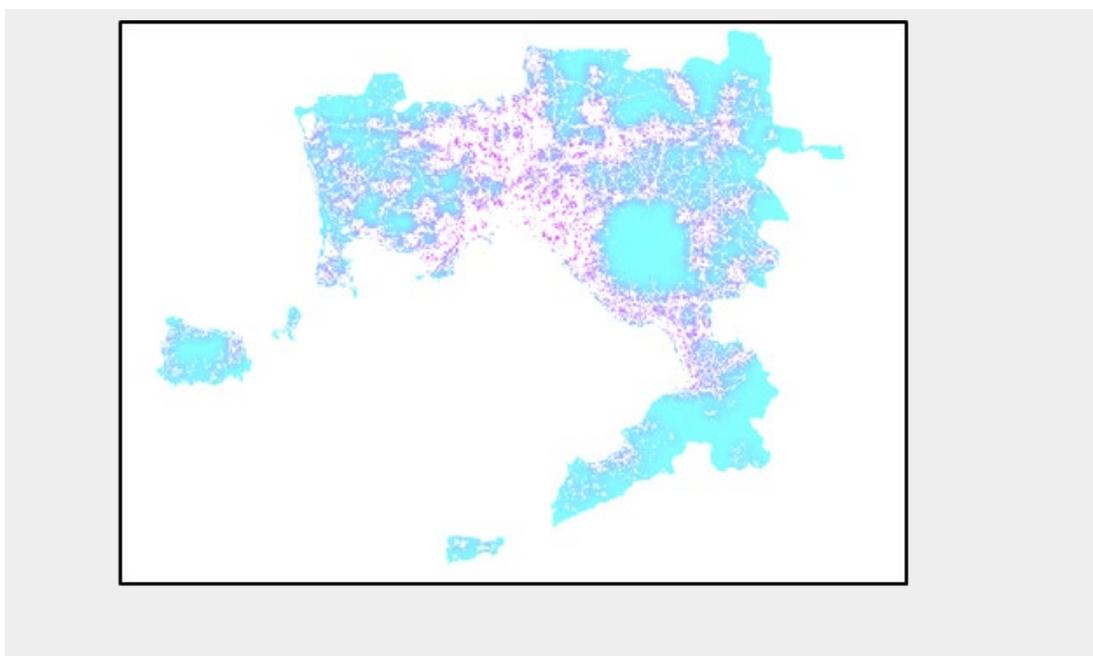


Figure 8- Land Fragmentation maps of the rural environment

Problem 5: Activation of practices to combat land take through the identifying of possible ecological corridors is not easy.

Landsupport solution: Helps to identify an ecological network on a provincial level.

For example, plans for a Metropolitan area that attribute a structural function to the sites of Rete Natura 2000 (Sic and Zps), the protected areas (Parks and Reserves), the agricultural origins of the territory, and the land which historically has, or potentially could, support high levels of biodiversity, contribute concretely to the definition of the structure of the ecological network.

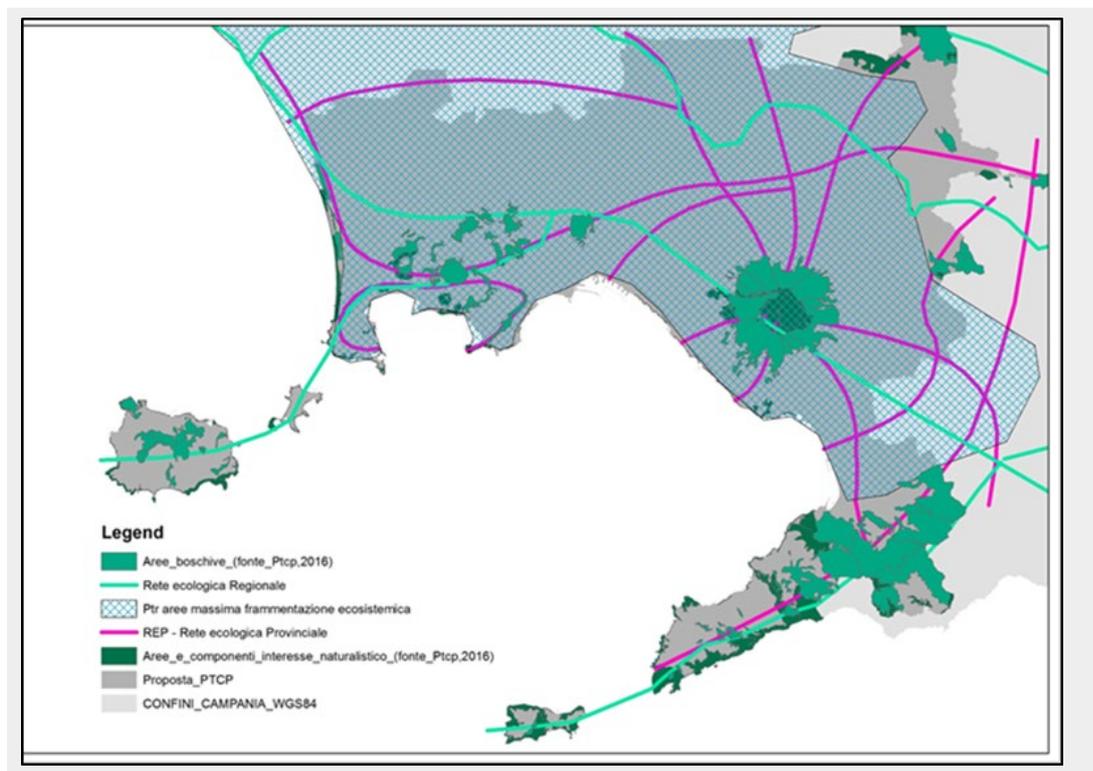


Figure 9- Ecological network. (Source: Coppola, Grimaldi, Langella - 2017)

Problem 6: Climate change is one of the most significant challenges that governments, territorial bodies, international institutions and populations have to face.

Landsupport solution: Helps in organising plans for adapting to climatic changes.

Landsupport can also be of assistance in the national, regional and local planning the European Union has, on several occasions, urgently asked for with regard the integration of the various decisional phases of public policy and territorial planning for adaptation to climate change.

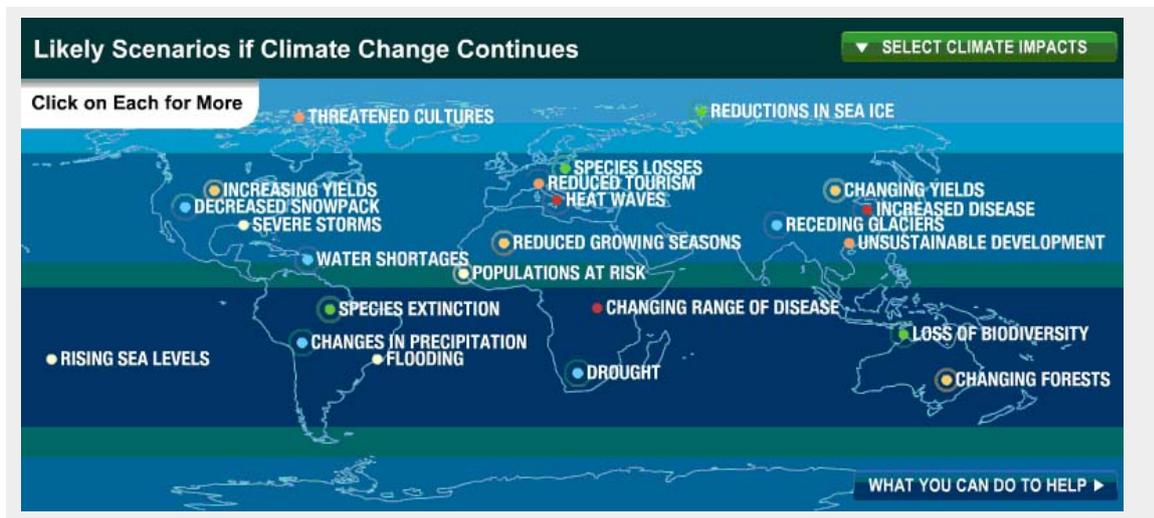


Figure 10- Intergovernmental Panel on Climate Change (IPCC)

3.2. THE CASE OF MUNICIPAL PLANNING

Problem 1: The increasing recognition of the relevance of environmental and landscape issues (territorial safety, conservation of biodiversity, safeguarding the landscape), also within the context of ordinary municipal urban planning both through the growing demand for environmental analysis and with the need for environmental monitoring as imposed by the Strategic Environmental Assesments.

Moreover, the personnel and instruments in the technical offices of many small and medium-sized municipalities are not adequate for an effective administration of the territory.

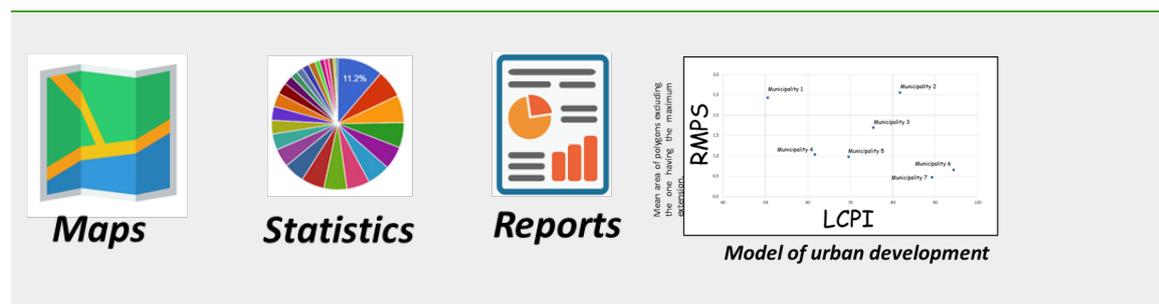
Landsupport solution: helps in the drafting of territorial analysis on a municipal level

Landsupport could be a practical tool to help the management of both ordinary and extraordinary activities (support in the editing of PUC, the implementation and monitoring of VAS).

Specifically, Landsupport could play a fundamental role in the policies and actions to contrast land take, as well as contribute to land development through, for example, the setting up of schemes to implement a green urban network and the promotion of agricultural values.

It is, for example, useful not only in demographic analysis, but also in the analysis of land use and the changes in that use over time:

Example of statistical, demographic and spatial analysis



Problem 2: The definition of a map of possible transformations is one of the most complex and responsible operations for a planner at municipal level.

Landsupport solution: Can also assist in the drafting of a table of possible transformation at municipal level.

This table is compiled:

- the possible admissible transformations in the various parts of the territory can be found through the identifying of different territorial elements;
- bearing in mind the need to safeguard the natural, landscape-environmental and agro-woodland-pastoral resources; the areas that are not susceptible to transformation and those that can only be transformed within the limits or conditions dictated by criteria of landscape – environmental protection and prevention or mitigation of natural or human risks, particularly in terms of the geological and geomorphological aspect of the municipal territory.

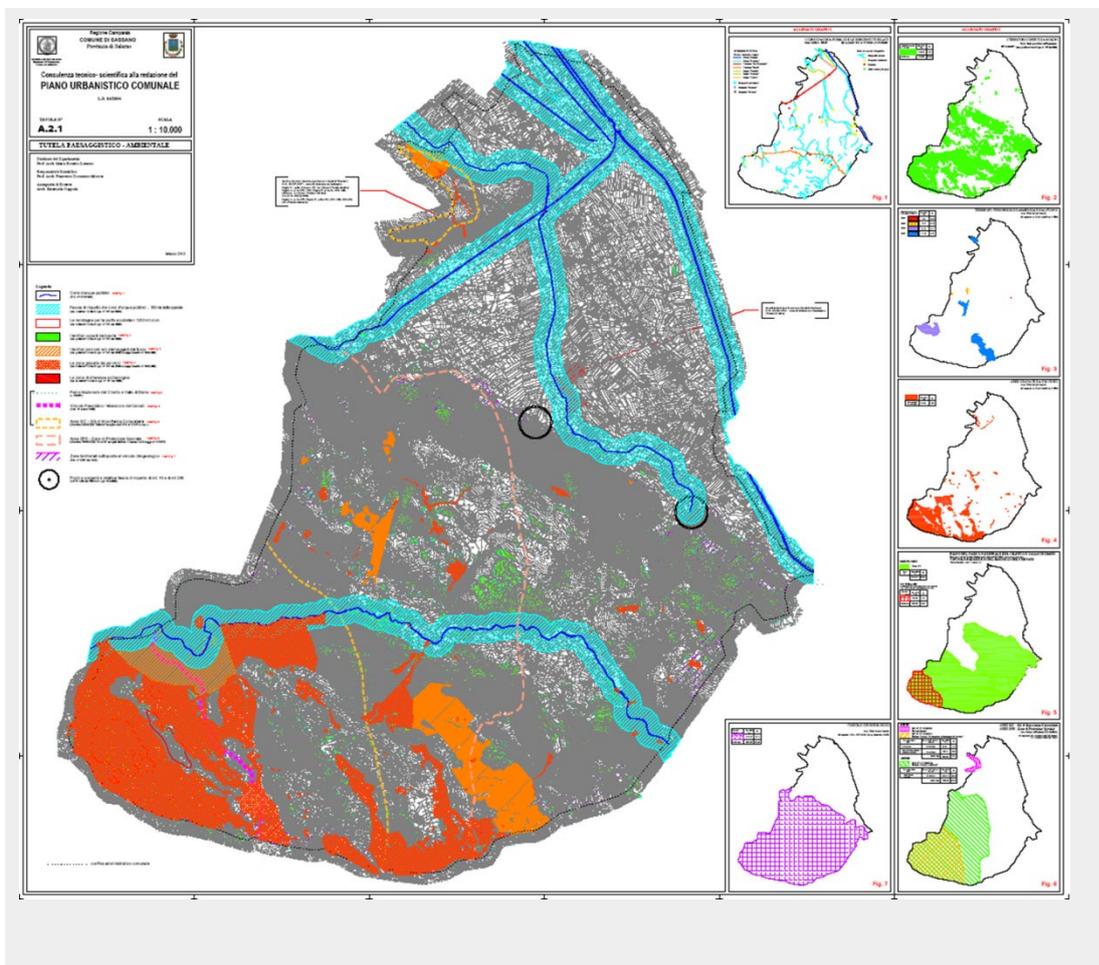


Figure 11- Preliminary Plan of PUC – Sassano (SA) Municipality

In achieving a historical-cultural analysis (old towns, archaeological areas, buildings of historical-cultural interest), a survey of the possibility for transformation within a territory would be almost complete (unless there were some particular conditions of territorial fragility).

Problem 3: The law (L.132 / 2016) declares the need for annual monitoring of land consumption. This is particularly difficult because of how the ordinary technical activity of a municipality is structured. The very action of contrasting land consumption through the identifying of a possible green urban structure to bring nature into the city is not easy to perform.

Landsupport solution: Helps to contrast land take on a municipal level too.

Green infrastructure is a concrete action to mitigate the effects of soil sealing which is also referred to in *Sealing Guidelines*, produced by the *European Commission* in 2012.

The principle is the following: *through the reinforcing of green infrastructure, landscapes of value could be maintained or created. These would constitute the basis of ecosystem services on a wider landscape level, such as the provision of drinking water, productive land, attractive recreational areas and mitigation of and adaptation to climatic changes* (European Commission, 2011).

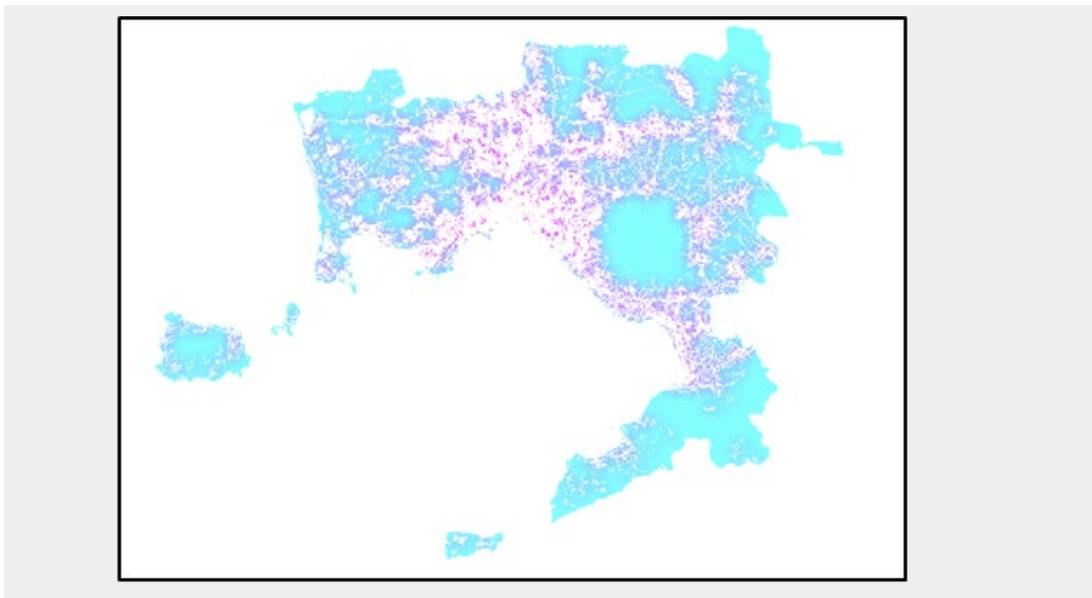


Figure 12- Land Fragmentation maps of the rural environment

In his sense, the task of planning is to find the strategical points and reconstruct the links, especially given the importance that the urban infrastructure, i.e. the roads, equipment and permeable, or potentially permeable, spaces, has in the management of the increasingly frequent, intense precipitation caused by climate change.

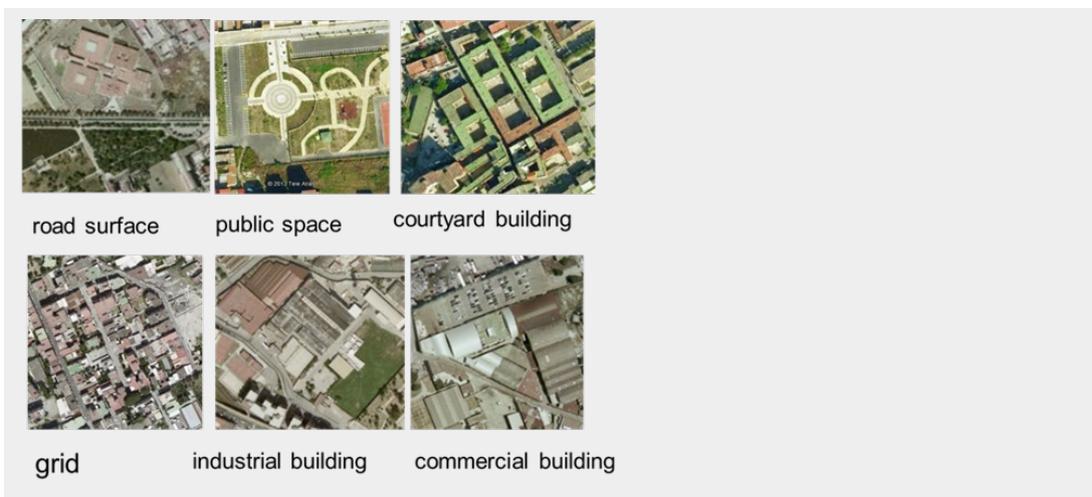


Figure 13- Strategical urban infrastructures for green network (Source: Berruti Coppola Moccia 2014)

4. ADDENDUM: GREEN URBAN INFRASTRUCTURE

In general, green infrastructure uses the land and vegetation for the infiltration, evapotranspiration and/or recycling of the water from the first rains. The management of green infrastructure by the US Environmental Protection Agency foresees approaches and technologies of infiltration, evapotranspiration and collection and reuse of rain water in order to maintain or reactivate the territory's natural hydrology.

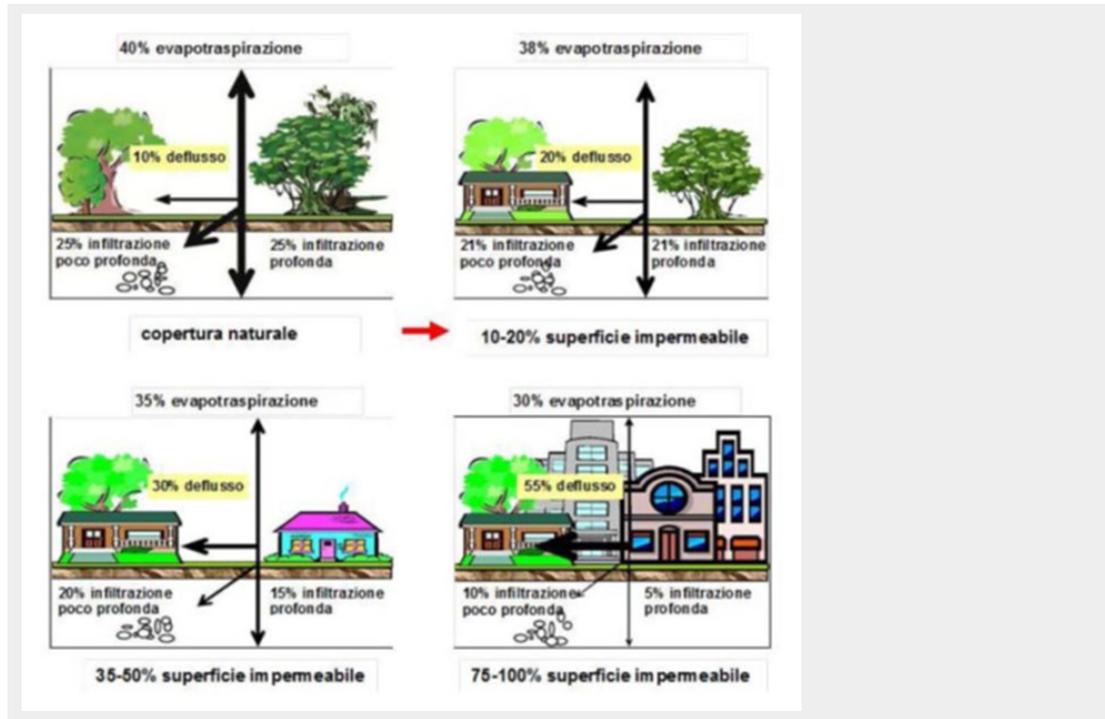


Figure 14- Infiltration, evapotranspiration and imperviousness (Source: U.S. EPA 2010)

The aim of this approach is that of planning and managing the networks of natural and cultural landscapes through the use of strategic open spaces so as to conserve the functions of the ecosystem and provide a series of advantages for citizens (Coppola 2016).

The creation of a network of public spaces could be set in motion by the recognition and coordination of green spaces which might have very different environmental qualities, but that are of the necessary dimensions for the construction of a green-grey continuum as defined in the Green Infrastructure Planning Guide of the University of Newcastle.

The definition of Green Infrastructures that the Guide provides includes not only a rather wide range of green space typologies, but also of grey spaces: Green infrastructure is the physical environment within and between our cities, towns and villages. It is a network of multi-functional open spaces, including formal parks, gardens, woodlands, green corridors, waterways, street trees and open countryside. It comprises all environmental resources, and thus a green infrastructure approach also contributes towards sustainable resource management (see figure above).

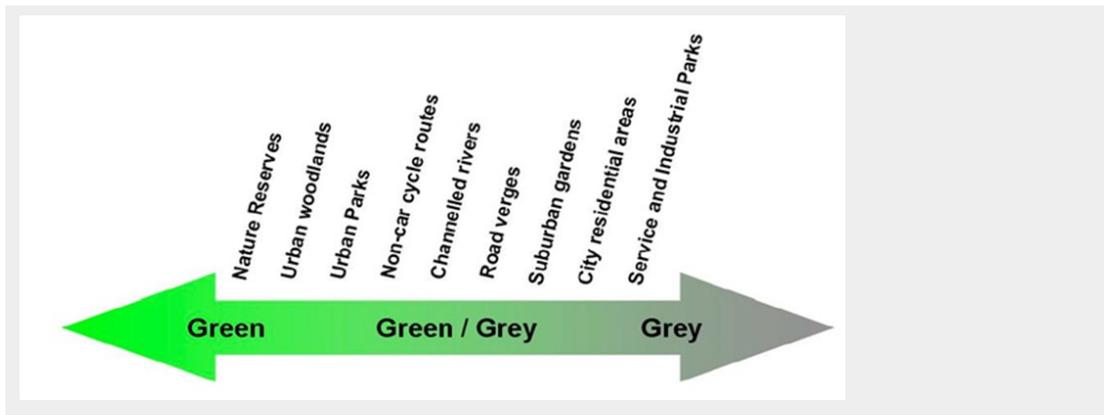


Figure 15- . Green-Grey continuum (Source: Green Infrastructure Planning Guide)

The idea of a grey-green continuum defines the potential elements that could rebuild the green network, starting from the most natural territories and moving towards those that are most urbanized.

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