

S-DSS TOOLS FOR POLICY & PRACTICE

MY MUNICIPALITY: A SUPPORT FOR SUSTAINABLE MANAGEMENT AND PLANNING

SUMMARY

A mayor's challenges; what is necessary for sustainable management and planning of the municipal territory?

The growing recognition of the environmental and landscape relevance (soil consumption, territorial safety, conservation of biodiversity), as well as citizens' attention to the influence the quality of the environment has on health and the demand for access to green spaces and outdoor living, has reinforced the role of planning in territorial government and the need to give an appropriate dimension to the demand for this use of space.

For administrative bodies (for example, where the staff and tools available to the Technical Department are inadequate to deal with the complexity involved in managing the territory), it is important to obtain a tool which helps in the managing of both ordinary and extraordinary activity such as town planning, implementation plans, the programming and projecting of work on public services and facilities.



KEY MESSAGES

- ◆ Land Take
- ◆ Land degradation
- ◆ Ecosystem services
- ◆ Sustainable planning and management of territories
- ◆ Support systems for geospatial decisions (S-DSS)
- ◆ Instruments available to decision makers

LAND TAKE MONITORING

Land take by bad urban expansion is the most serious threat of soil degradation in Europe in so much as it eliminates all of the soil ecosystem services.

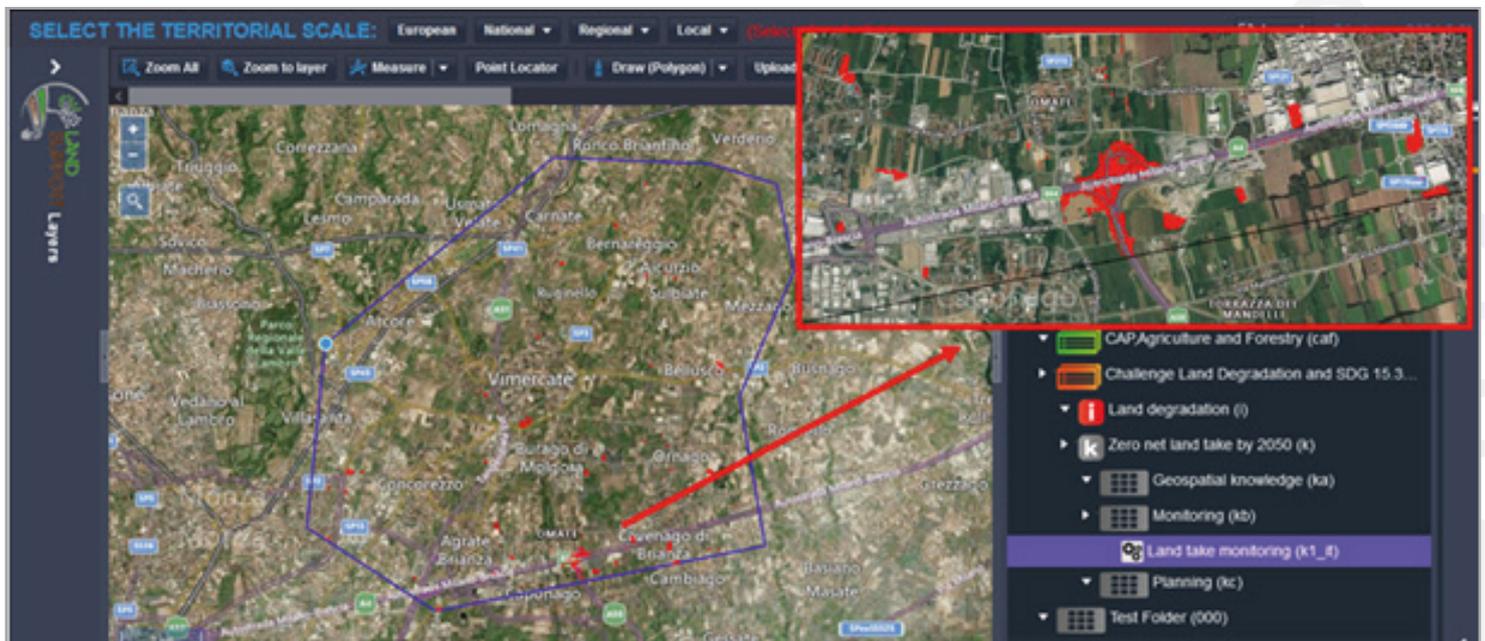
The European Commission’s “No net land take by 2050” document has set the ambitious goal of achieving zero net soil consumption by 2050 (Environmental Action Programme).

For instance, in the course of just one year (2019-2020 monitoring), 57 km² were consumed in Italy, which is equal to 17 hectares a day or almost 2 sq. metres a second (ISPRA).

Higher-level territorial planning gives great attention to soil consumption and its monitoring

But what can a policy-maker do to quantify and monitor land take?

Help is provided by LANDSUPPORT (www.land-support.eu) in the form of the “Land Take monitoring” tool, which allows the evolution and trend of soil consumption within a given territory of interest (a region, a province, a municipality or an area chosen by the user) to be calculated and visualised directly on the map for a selected period, also in relation to soil productivity classes.



The map shows where land take has effectively taken place, while the report includes quantitative information on the total number of hectares lost (or gained) and how these can be broken down

into three classes of aggregate soil use, that is cropland, forest and pasture. For each of these three classes, we also obtain details about the productivity classes of the soils that have been lost.

RESULTS

Rural territory lost (soil consumption)

	Area
Rural territory lost (soil consumption)	48.46 Ha
Rural territory gained (de-sealing)	0

LOSS OF SOIL IN HECTARES BY PRODUCTIVITY CLASS (increasing from 1 to 10)

	1	2	3	4	5	6	7	8	9	10
Cropland	0	0	0	0	8.89	0	0	34.29	0	0
Forest	0	0	0	0	0	0	0	0	0	0
Pasture	0	0	0	0	0	0	0	0	0	0

All results were processed on the Copernicus layer imperviousness HRL up to a 10-metre resolution.

CONDITION OF THE ENVIRONMENT BETWEEN CONSERVATION AND DEGRADATION

The European territory is subject to intense soil degradation. Through the Sustainable Development Goal 15.3 (Land Degradation Neutrality - LDN), the United Nations require us to neutralise soil degradation by 2030. But what does LDN mean? It is the “state in which the quality and quantity of the territorial resources necessary to support the ecosystem functions and services and improve food security remain stable or increase within specific temporal and spatial scales and ecosystems”. The UNCCD (2017) proposed a methodology for evaluation which foresees the combined use of three sub-indicators (soil cover and weather changes, soil productivity and the organic carbon content), leaving the possibility to add other indicators which may be considered important at the individual country level.

But how can I obtain all this information for the territory of my municipality?

Through just one click, the LANDSUPPORT LDN tool makes a report available which includes information on soil degradation at municipal level, both in aggregate (LDN) form or with variations for the principal soil uses (CLC level 1).

LDN indicator variations in the selected area			
Degraded territory	Stable territory	Recovered territory	Area with no data
267.4 Ha	11171.9 Ha	272.4 Ha	0 Ha
2.28 %	95.39 %	2.33 %	0%

Each of the three previously mentioned sub-indicators is rendered clear spatially and generated onto a raster map that is then integrated into a final SDG 15.3.1 indicator map which presents all of the information of the state of the soil, i.e. whether it is stable or shows increasing or decreasing levels of degradation.

GLOBAL INDICATOR OF LAND DEGRADATION NEUTRALITY (LDN) SDG 15.3

**Percentage of selected area which is degraded:
2.28 %**

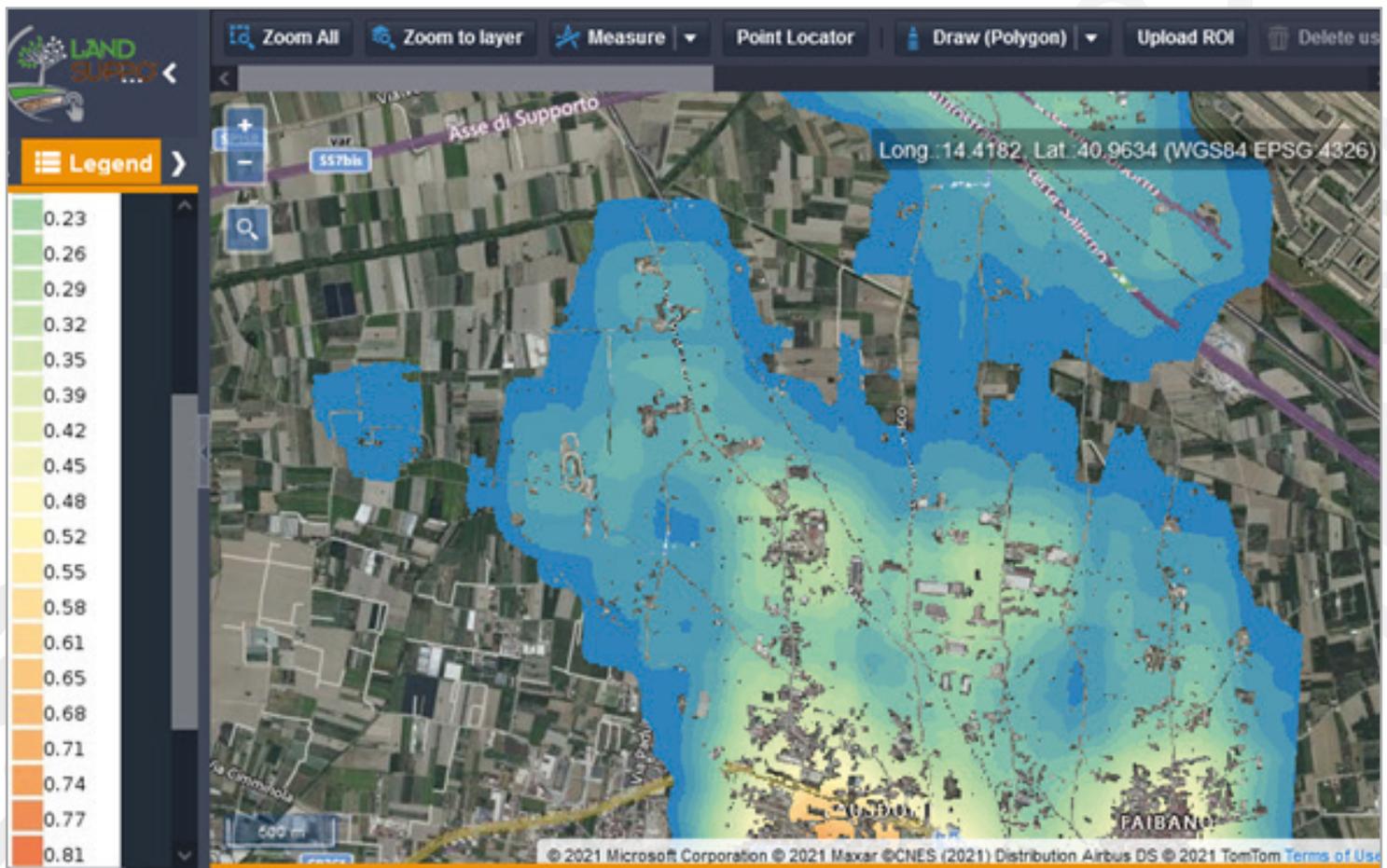
PLAN AT THE SCALE OF MUNICIPALITY (MUNICIPALITY URBAN PLAN)

The plan for municipal urban development - (e.g. in Italy PUC) – is the municipality’s general town planning tool and regulates environmental protection and urban and construction development for the entire municipal territory. Nowadays, all PUCs have to reduce soil consumption as is required by regional, provincial and metropolitan planning. However, a PUC also requires knowledge of the dynamics of urban development in the territory and the indicators which it would be useful to subject to state-of-the-art analysis, as well as the ability to foresee the potential consequences of the various actions to be planned.

But how can a municipal decision maker (eg. the mayor) obtain help in reducing soil consumption?

In just a few clicks, the decision maker can ask questions of the LANDSUPPORT platform and obtain indications regarding certain indices of urban dispersion (Urban SPRAWL and Edge Density) and the degree to which the urban area is compact (LCPI and RMPS).

However, what is most important is that LANDSUPPORT has the instrument known as “Fragmentation”, which allows the degree of urban and rural fragmentation in the selected area to be visualised directly on the map (exploring a circle of between 1 and 1,500 metres in radius), so providing an immediate picture of the areas more or less affected by serious processes of degradation of the rural territory.



Thanks to this map it is possible to identify compromised areas, areas that are susceptible to re-connection ecology and areas to preserve. This is all key information within sustainable planning. The importance of planning at a municipal level of the construction of the ecological network and the achieving of goals regarding landscape quality

is also underlined, given that it is at this level that local actors become involved in the identifying and recognition of landscape values and a complete incorporation of the landscape planning within the planning tools and territorial government can be guaranteed.

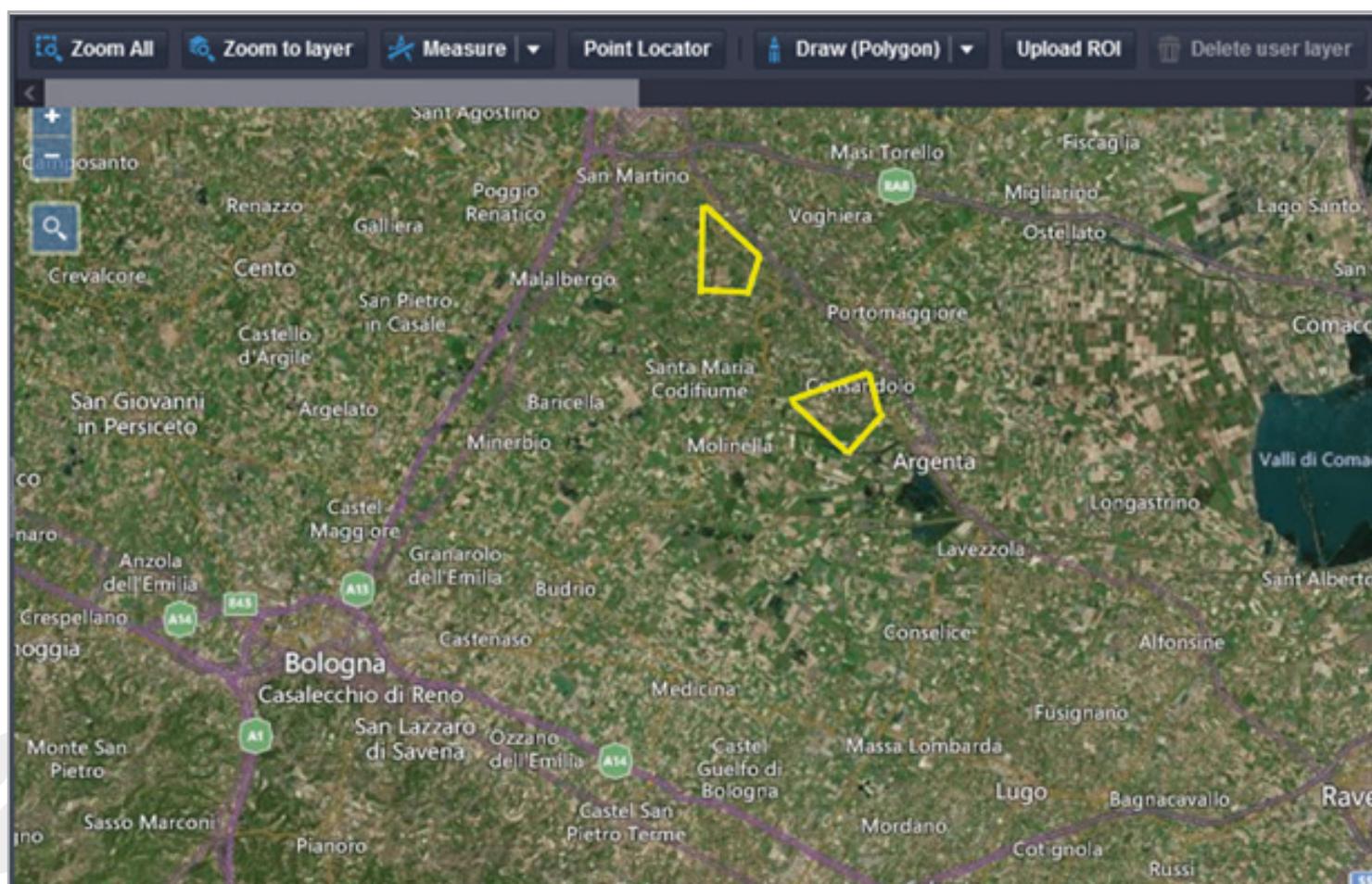
GREEN CORRIDORS OR AS OPPOSITE NEW URBAN EXPANSION

Once information on the state of sites has been obtained, it will be possible to think about where to locate possible infrastructure or where to intervene to reconnect green areas so as to create green corridors.

In deciding where to develop new construction projects and infrastructure or in modifying existing planning tools, other factors must be considered such as the impact on the soil and the possible loss of its ecosystem services and agricultural productivity.

But how to estimate these parameters and evaluate the effects on the ecosystem of different planning hypotheses?

When deciding on the rules of soil use in the case of a new urban expansion project for a large area, for example, infrastructure on an inter-municipality scale, LANDSUPPORT's "New Urban Development" instrument helps, through a report, to quantify the loss of ecosystem services due to the sealing of one or more areas defined by the user by comparing different options and showing which choice would have the least impact.



For each area designed, we will obtain the potential loss in agricultural and forest production and that in organic carbon expressed in tonnes. These parameters are calculated using the method elaborated by the EU project MAES.

An opposing argument can be made for the reconnecting of fragmented rural networks and the reconstruction of the ecological network and its structure based on recognition of core areas,

buffer zones and ecological corridors, also identified with the help of the tools previously referred to (eg. Fragmentation).

The "New Green Corridor" tool allows the area to be requalified to be drawn on the map and evaluation to be made of its benefits to the ecosystem services through the use of the indicators proposed by MAES.