Soil Sealing and Urban Growth in Italy

Mariangela Soraci ISPRA and Padua University (TESAF)

M. Soraci[1], F. Assennato[2], R. Bruno[3], L. Congedo[4], P. De Fioravante[5], M. Di Leginio[6], I. Marinosci[7], M. Munafò[8], S. Pranzo[9], A. Strollo[10]
[1]ISPRA and Padua University (TESAF), [2,4,6,7,8,10] ISPRA, [3]IUSS Pavia, [5]Tuscia University

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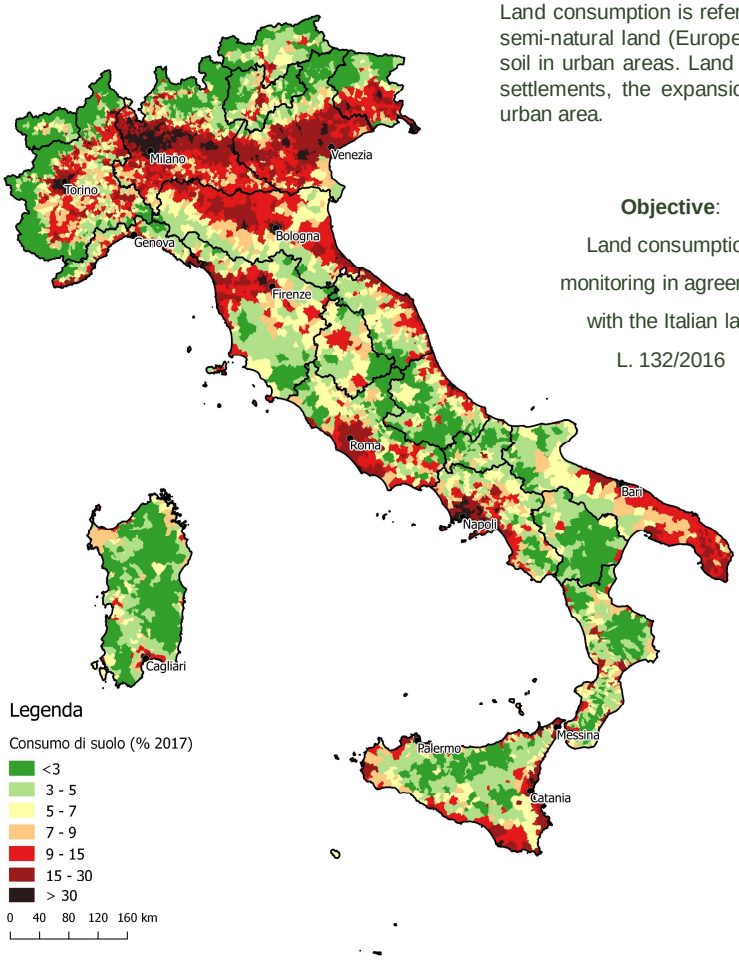


Land consumption is referred to artificial land cover growth at the expense of natural and semi-natural land (European Environmental Agency, 1997), therefore including unsealed soil in urban areas. Land consumption is linked to the construction of new buildings and settlements, the expansion of cities, the densification or conversion of land within an urban area.

Objective:
Land consumption monitoring in agreement with the Italian law L. 132/2016

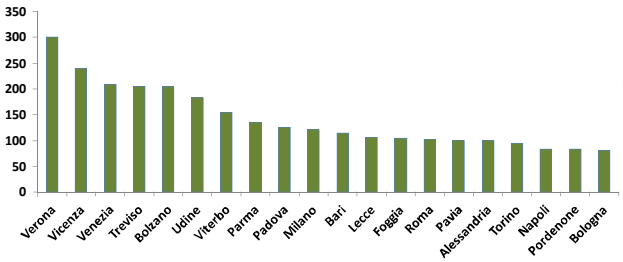
ISPRA and the Italian National System for the Protection of the Environment (SNPA) perform the National map of land consumption integrated with Copernicus High Resolution Layers (HRL) and the Corine Land Cover (CLC) based on a system , which distinguishes artificial from natural soil.

Land monitoring is based on:

- Satellite Remote sensing (Optical and SAR);
- Photointerpretation of aerial orthophotos;
- Integration of geographical and topographic data;
- GIS modelling for elaboration and computation of environmental and territorial indices.

Fig.1 Land consumption at municipality level (% 2017). Source: ISPRA's processing on SNPA map.

Increase of land consumption between 2106 and 2017 in hectares (first 20 provinces)



Land cover and consumption data allow to develop useful indicators for the evaluation of phenomena such as: urban sprawl, dispersion and settlement diffusion, fragmentation.
Analysis of the urban transformation is very important in the evaluation of urban sprawl. For this assessment, several indicators are used in the report, such as the Edge Density (ED), which describes the fragmentation of the landscape through the density of the margins of the built and two diffusion indicators, the Largest Class Patch Index (LCPI) and the Remaining Mean Patch Size (RMPS), thus assessing the diffusion of cities around the central core. The fragmentation of the territory is the process of transformation of large non-artificial patches into parts of territory that are smaller and more isolated, the result of phenomena of building and urban expansion and of the development of the infrastructural network. The evaluation of the fragmentation is carried out through an innovative method that allows to analyze every square kilometer through the degree of fragmentation due to the presence of artificial areas and infrastructures. At the national level, 38% of the territory results in a high or very high fragmentation class (Figure 2).

38%

PERCENTAGE OF THE ITALIAN TERRITORY WITH HIGH FRAGMENTATION

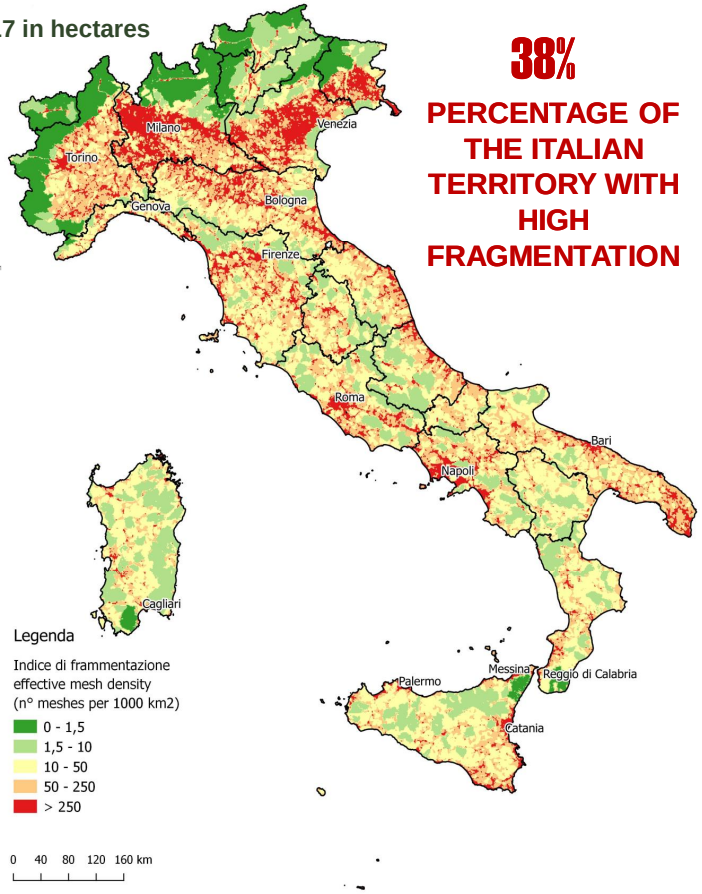


Fig.2 Effective mesh density Index on a regular grid at 1 km in 2017. Lower values of the index identify lower fragmentation levels. Source: ISPRA's processing on SNPA data.