

## Submitted Abstract

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## Abstract

Green areas have a key role to deliver ecosystem services and preserve life quality. They contribute to mitigate and adapt to the effects of climate change, by cooling, reducing runoff and limiting energy consumptions for air conditioning.

In recent years, a phenomenon of increasing urbanization and land take has been observed in Trento and its Province, an alpine region in the north of Italy, leading to the reduction of open spaces. Moreover, according to a recent analysis conducted in Trento, the number of abandoned or underused buildings have been growing. In this framework, spatial planning tools are envisaged to protect not only the rich natural areas of the hillsides but also corridors and green spaces in the densely populated areas, especially in the valley floors.

The study is developed within the framework of the Trento Urban Transformation (TUT) research project, which aims to propose innovative, adaptive and incremental planning tools to allow flexibility, preparedness to extreme events, and capacity to learn from the past. The proposed plan draws on a new vision, namely “Trento Leaf Plan”, which has an important communicative role by clearly setting out the ecological transition on future development and by highlighting the important role of open spaces. It defines a strategic vision to cope with urban challenges and to manage the diversity of territory within the Municipality.

The paper focuses on two tools that have been experimented: a spatially explicit vegetation assessment model, and the integration of environmental criteria in planning tools to limit land consumption.

The former constitutes a simple and replicable model to map permeability and canopy cover from high spatial resolution aerial imagery and Digital Elevation Models. The tool can be introduced in the policy cycle, for example to manage and monitor through time green infrastructure, to map ecosystem services and to plan land-use transformations.

The latter consists of a method to manage sustainable land-use transformations and to integrate green infrastructure management in the planning process, by introducing specific requirements for urban transformations that guarantee no land take or the exploitation of specific ecosystem services.

The use of the presented tools can be valuable for policy makers to manage land-use transformations and to integrate green conservation strategies in planning practices. In conclusion, the contribution provides a case study to enrich the debate about management and implementation of green open spaces in the alpine areas and to give scientific support for sustainable urban planning.