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MILANO 2015

Measuring agriculture and rural planning with advanced methods

Part II: Rural land management and planning: crosscutting and interdisciplinary issues

New tools for agricultural and forestry landscapes for an ecologically oriented planning

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INTRODUCTION

PLANNING LANDSCAPE GEOMATICS

- Techniques for the production and updating of territorial databases not only provide the planners useful **informative tools** but also allow **new spatial analyses** to be used for the planning of rural and protected areas.
- These spatial analyses are based on new cartographic products, based on DTM (Digital Terrain Model) and orthoimages databases can give.

INTRODUCTION

- **Examples on new cartographic representations useful for the landscape analysis and planning:**
 - Visual sensitivity analysis of a landmark
 - Visual sensitivity analysis of a linear system
 - Visual sensitivity analysis of a territory (terroir)
 - Potential of energy exploitation of a region (PV)
- **Why are they crosscutting?** Geomatics and Landscape planning, combine physical aspects with social, quantitative with qualitative
- **How much interdisciplinary?** Energy sciences (technology, planning, etc.), perceptive psychology

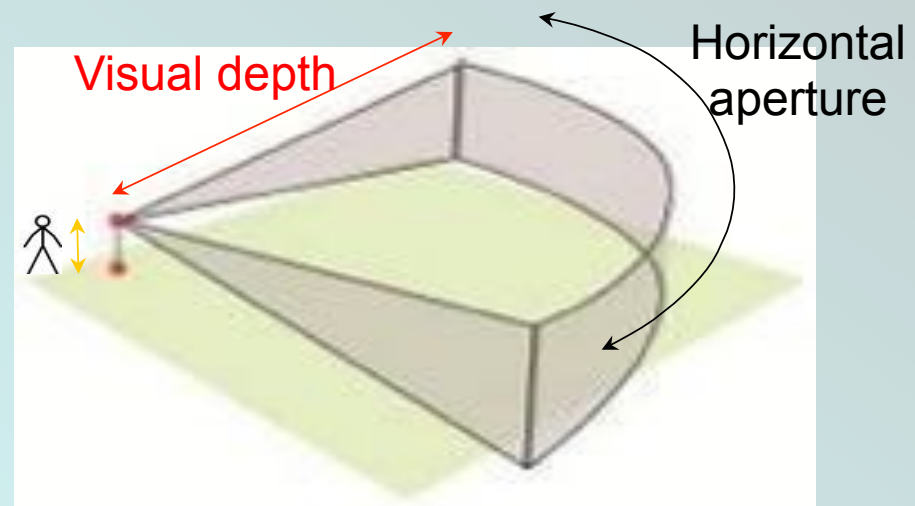
REPRESENTATION OF A VISUAL SENSITIVITY

Areas of rural landscape that can be seen from a view point and how these are seen, can be computed in an automated procedure by means of *Viewshed Analyses (VA)*.

VA simulates the complex relationships between the topography, the landscape and the vantage points. They use the *lines of sight* method to determine the visibility of each land unit of the case study area from a certain view point (or a sequence of viewpoints).

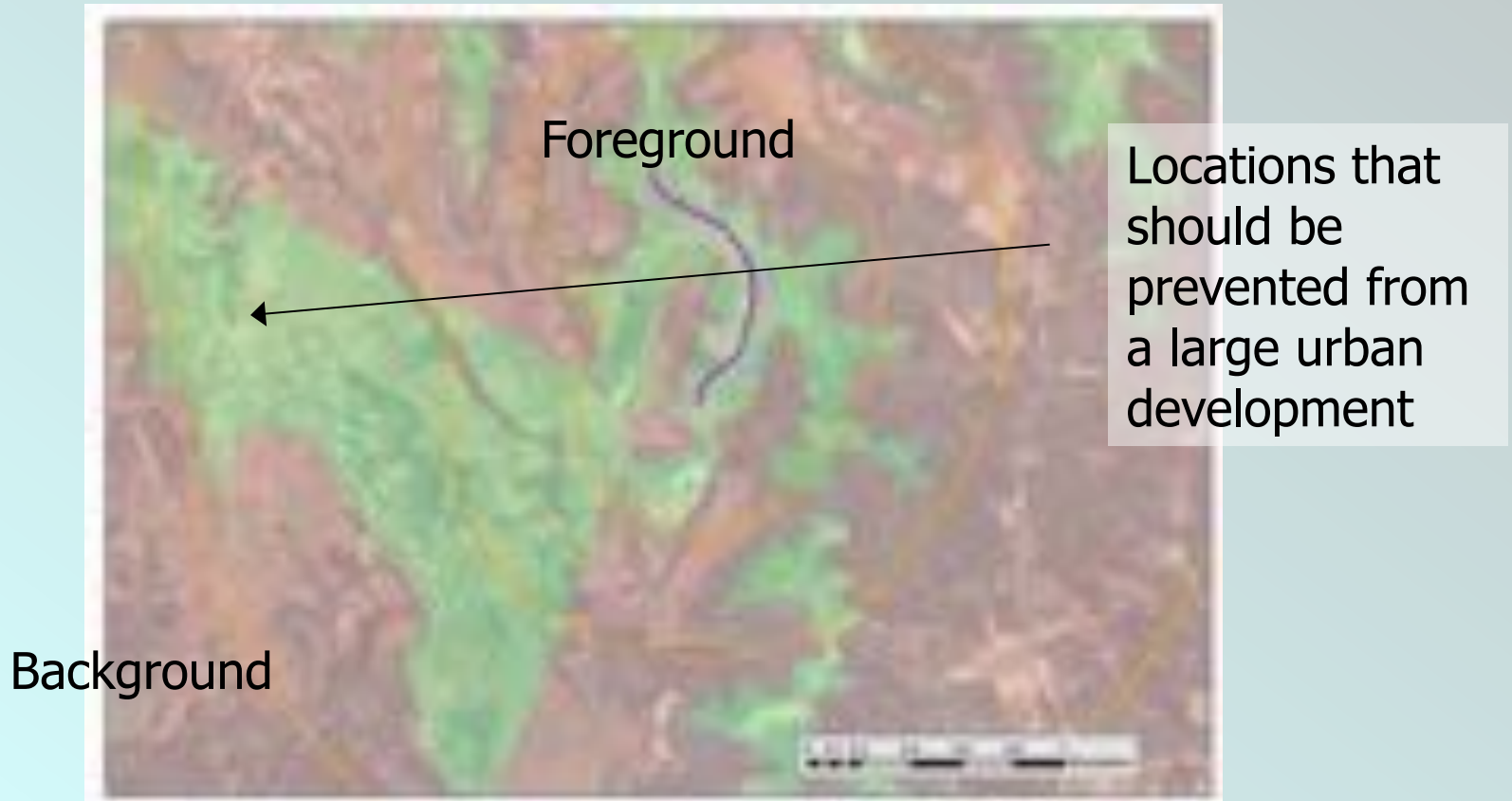
Other aspects that affect the visibility can be considered:

- Visual acuity limit
- Atmospheric extinction
- Colour contrast, shape,...



REPRESENTATION OF A VISUAL SENSITIVITY

The result of such analyses are raster images (each point is a land unit) and its content depends on the visibility model that is adopted (*binary viewshed*, *cumulative viewshed*, *identifying viewshed*, ecc.).



VISUAL SENSITIVITY AND LANDSCAPE PLANNING GUIDELINES



VISUAL SENSITIVITY OF A LANDMARK

- Two new skyscrapers of the city of Turin (DTM+buildings)



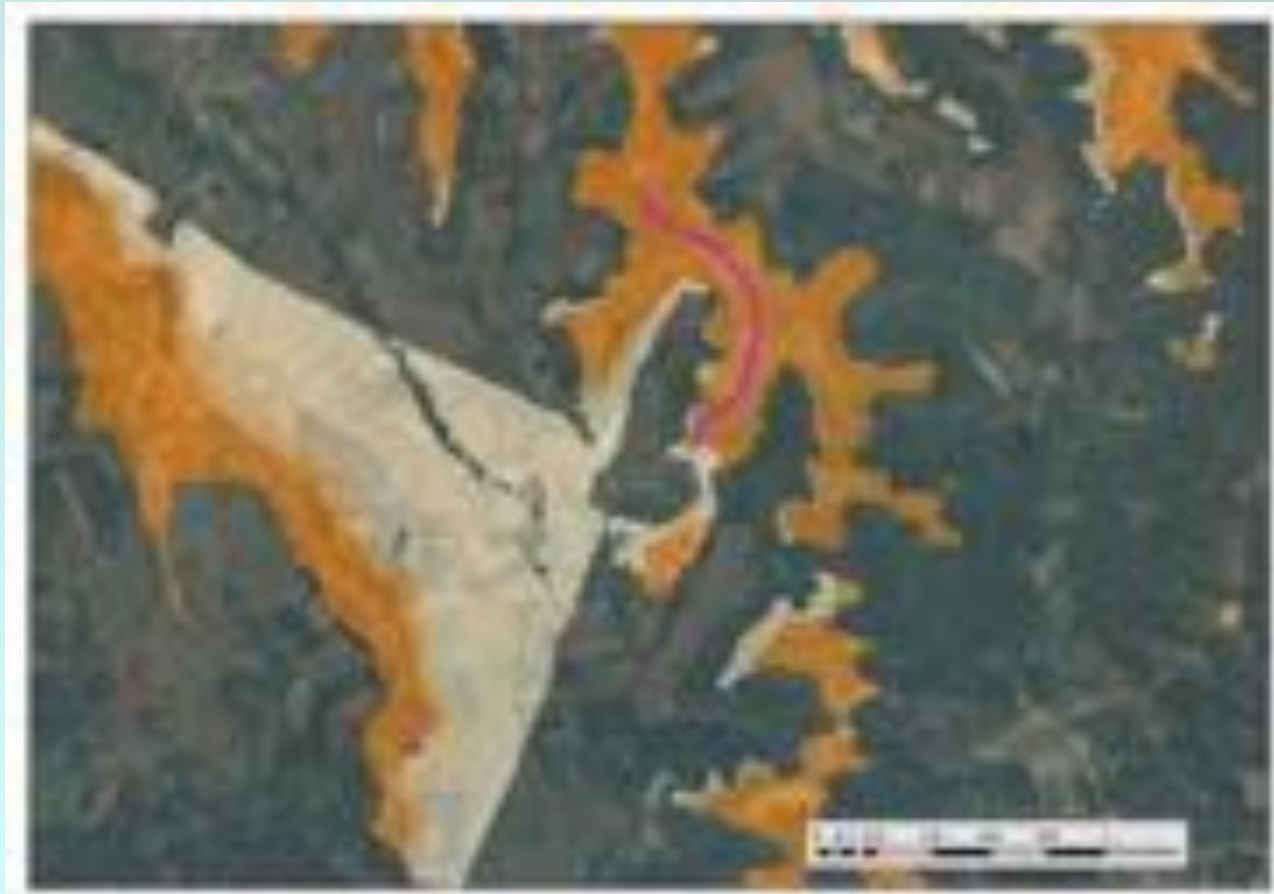
VISUAL SENSITIVITY OF A LINEAR SYSTEM

- A path of 14 stages that connects the house of Don Bosco to the house of S. Domenico Savio in the province of Asti



VISUAL SENSITIVITY OF A LINEAR SYSTEM

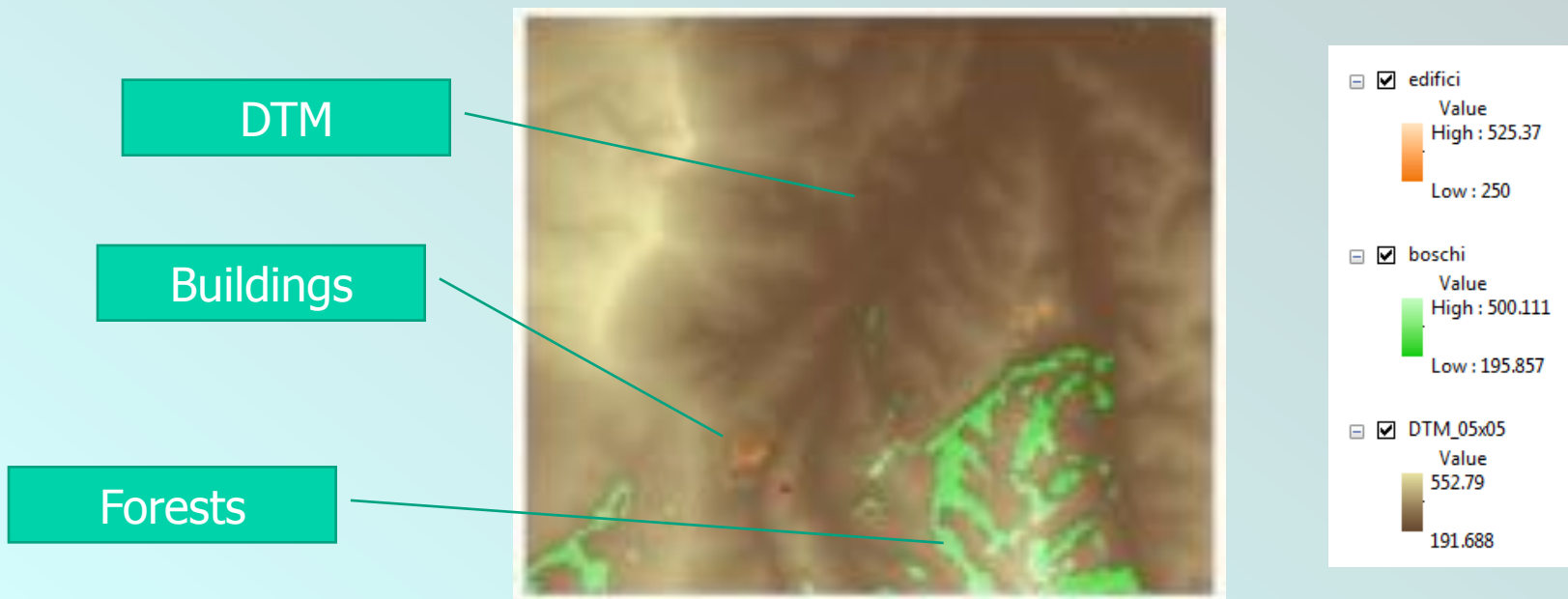
Landscape sensitivity map : each LU is classified as a function of the occurrence of the visibility from the various points of the path (LS is maximal if the LU sees all the points of the path)



VISUAL SENSITIVITY OF A TERRITORY

The Barolo Terroir (Barolo, La Morra, Castiglione Falletto)

- DTM from the regional DTM obtained with LiDAR techniques – Level 4 IntesaGIS/CISIS
- Buildings from fotogrammetry, CRT
- Forests: height obtained through analysis of the LiDAR original data for the forest areas (060101), estimate done by the *canopy*



VISUAL SENSITIVITY OF A TERRITORY

The Barolo Terroir (Barolo, La Morra, Castiglione Falletto)



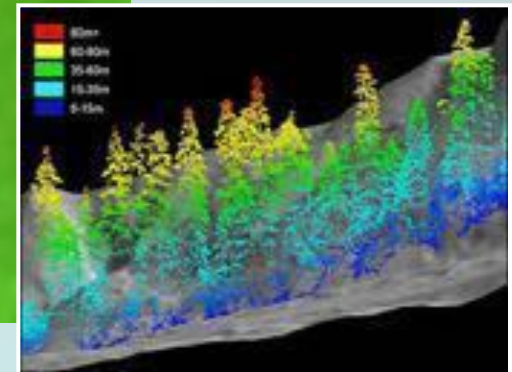
Modelling of the
buildings

VISUAL SENSITIVITY OF A TERRITORY

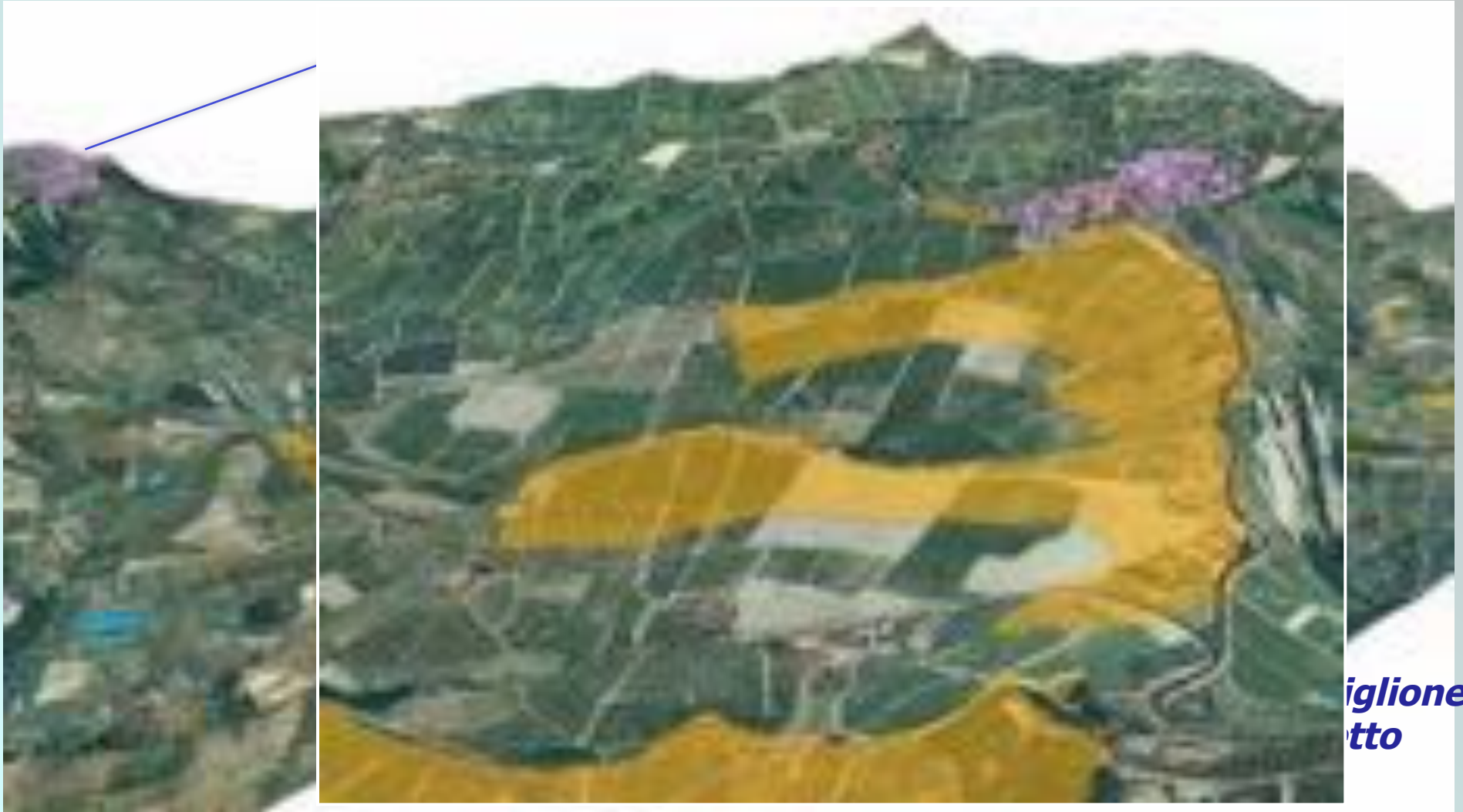
The Barolo Terroir (Barolo, La Morra, Castiglione Falletto)



Modelling of
the forests



VISUAL SENSITIVITY OF A TERRITORY



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VISUAL SENSITIVITY OF A TERRITORY

Virtual visibility (DTM only)



VISUAL SENSITIVITY OF A TERRITORY

Visibility considering the buildings



VISUAL SENSITIVITY OF A TERRITORY

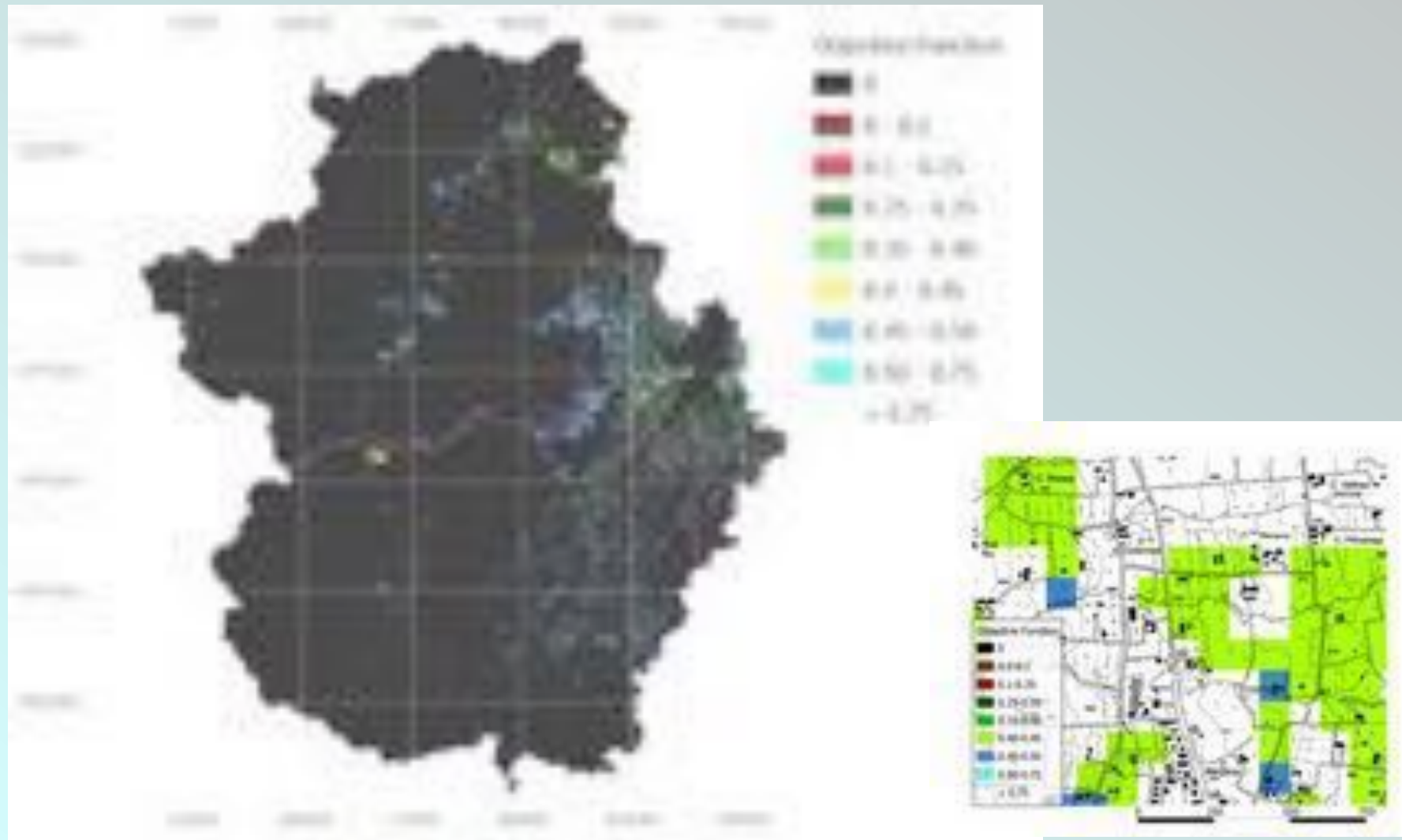
Visibility considering the buildings and the forests

- Vis. TERRENO+CASE+BOSCHI
VALUE
 Not Visible
 Visible
- Vis. TERRENO + CASE
VALUE
 Not Visible
 Visible
- Vis. TERRENO
VALUE
 Not Visible
 Visible



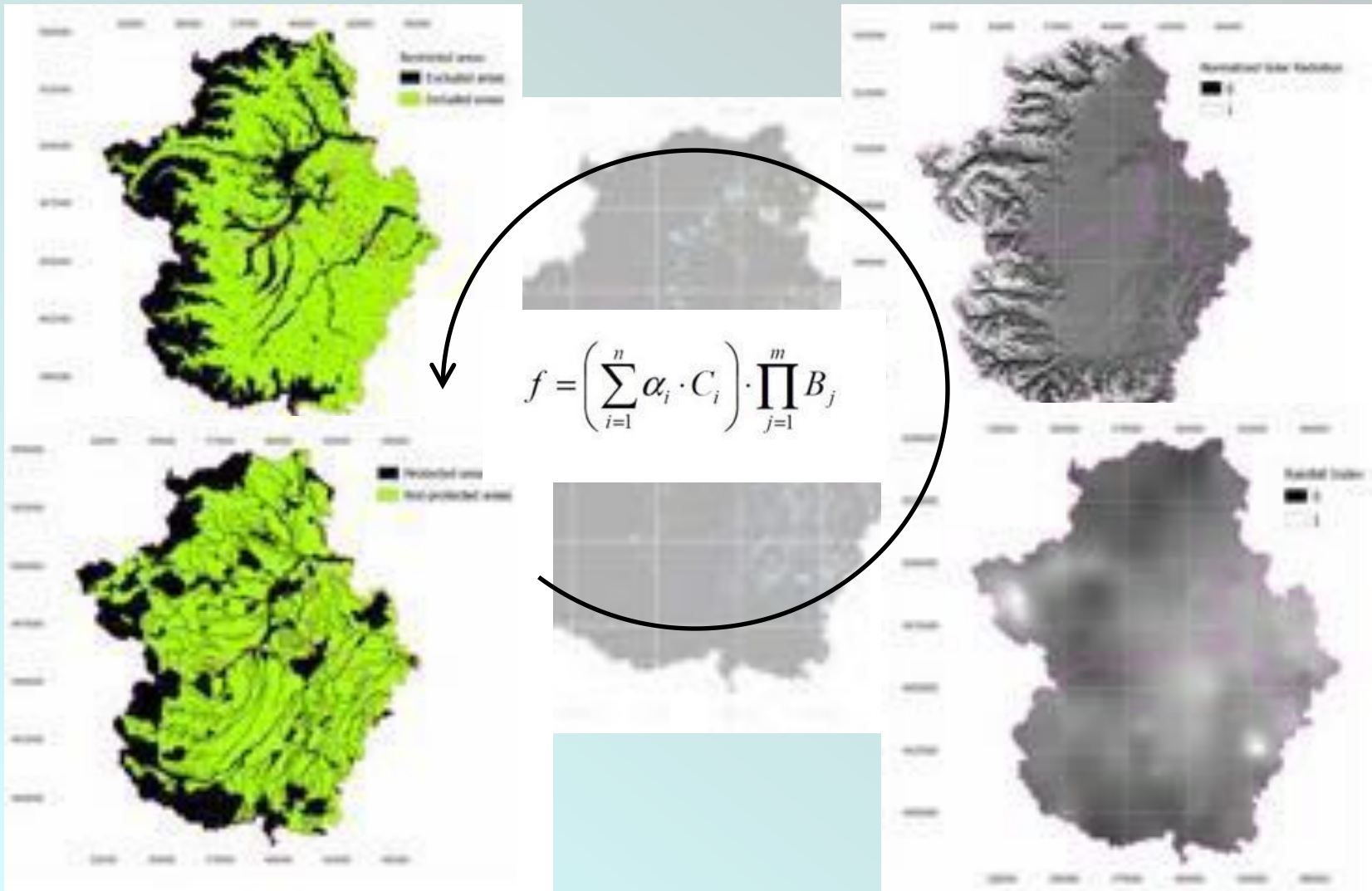
POTENTIAL OF ENERGY EXPLOITATION

Large ground mounted PV plants in 3 provinces of Piedmont



POTENTIAL OF ENERGY EXPLOITATION

Large ground mounted PV plants in 3 provinces of Piedmont



REFERENCES

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Thank you for
your attention

Food security
Agriculture



Sustainability
Agro-environment

Advanced methodologies
Rural planning

New challenges

Measuring agriculture and rural planning with advanced methods

