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SUSTAINABLE USE OF NATURAL RESOURCES

ON THE EXAMPLES OF **MUNICIPALITIES OF BILJE** AND **ANTUNOVAC**

INTRODUCTION

Unsustainable and **over exploitative use** of natural and environmental resources imposes preparation of expert bases which would analyze environmental and natural resources from the local to the regional level.

Such documents can **help local communities sustainably manage** their space.

The **consequent possibility of their application** is in various sectoral tools (as a basis for further development of strategic documents as expert bases for amendments to spatial plans, environmental and nature protection, green infrastructure strategies), or to **raise awareness of the importance of sustainable use of space**.

METHODOLOGY

In the examples of studies for the Municipalities of Bilje and Antunovac, an **analysis of natural**, **cultural-historical**, **socio-economic** and **landscape characteristics** was made.

These characteristics were **evaluated by a multi-criteria analysis**, enabling the **assessment of the condition and sensitivity** of the area, as well as **identification of potential development pressures** that could have negative impact on it and endanger it.

Existing **resources** were **evaluated**, as well as its **potentials - indication of future** area **development**. Finally, **proposal of guidelines for protection**, **future development** and **sustainable management** of Municipalities was given.

Intensive spatial analysis of all relevant data was made (geology, geomorphologyl, climate, pedology, hydrology, vegetation, land use, anthropogenic and landscape characteristics, spatial planning, etc.) within the geographic information system (GIS).
This vast **database** was prepared **for further use in spatial planning activities**, as well as a **basis for development** of other professional documents.

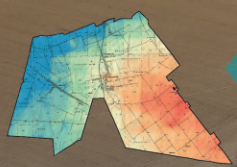
*Partly located in **Nature Park Kopački rit** and **Regional Park Mura-Drava**.*

Analysis of area characteristics, sensitivity and pressures

*Predominant **agricultural character** of the Municipality with small leftover natural areas (forests and forest land)*

Analysis of area characteristics, sensitivity and pressures

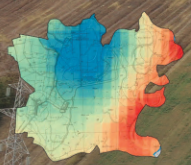
Small, leftover natural areas of forests/forest land, with significant common beneficial function value



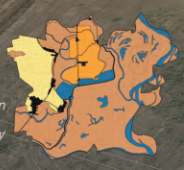
Sun energy potential slightly varies

High production capability of the land

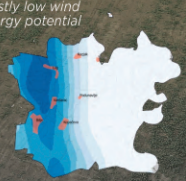
Significant common beneficial function value of forests, emphasized by their protected nature



Sun energy potential slightly varies



According to the production capability of the land, dominant category are other agricultural soils, forests and forest land



Mostly low wind energy potential

Watersources energy potential higher in larger rivers (Danube, Drava)

The Municipality of Antunovac was evaluated for its **resources**, ie their potential. This included **forestry resources**, **renewable sources of energy** (**Sun** energy, **wind** energy, **biomass** energy, **geotermal** energy, **water**courses energy), agricultural resources.

Due to the terrain morphology and characteristics of the area, most of the **renewable sources of energy have low potential**, aside from the geothermal energy which has a significant potential due to the location of the Municipality in the Pannonian sediment pool (large values of geothermal gradient and thermal flow).

Since its significant agricultural character and **high production capability of the land**, this Municipality **doesn't have many leftover forests and forest land.** This makes their common beneficial function value even more significant for the aforementioned area, as well as proposes the need to strengthen their existing value.

By evaluating existing resources of the Municipality of Bilje, it was concluded that by the **production capability of the land**, the dominant category is other agricultural soil, forests and forest land. The common beneficial function values of forests are significant, further emphasized by the fact that these **forests are located in the protected area** (Nature Park Kopački rit, Regional Park Mura-Drava).

Due to the terrain morphology and characteristics of the area, most of the **renewable sources of energy have low potential**, aside from the geothermal energy which has a significant potential due to the location of the Municipality in the Pannonian sediment pool (large values of geothermal gradient and thermal flow), as well as watersources energy (most water bodies have low values of gross power/energy potential; the greatest potential is in large rivers - Danube and Drava, which have significant amounts of water/flow).

The study of environmental and natural resources of **Municipality of Antunovac** served as a **basis for the development of the Green Infrastructure Strategy**

Each area has a certain **potential for green infrastructure development** - the main task of planning green infrastructure is identification, **preservation** and **recovering, improving** and creating new functions, forming new areas and elements, as well as connecting existing green/open space into a coherent green network that will be well managed.

CONCLUSION

The inventory studies of the Municipalities of Bilje and Antunovac characteristics and resources served as starting points for their **sustainable development** - directing their growth while **preserving, emphasizing** and **giving value** to their potential.

Analysis of environmental and natural resources of **Municipality of Bilje** was later used to **assess the suitability** of the aforementioned area for **growing spice peppers**

Through the consideration of spatial possibilities, technology of growing spice peppers and its ecological requirements, **optimal land use** was obtained by that document.

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