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The use of the concept of Smart Villages in the multifunctional development of rural areas on the example of the Mazowieckie Voivodeship

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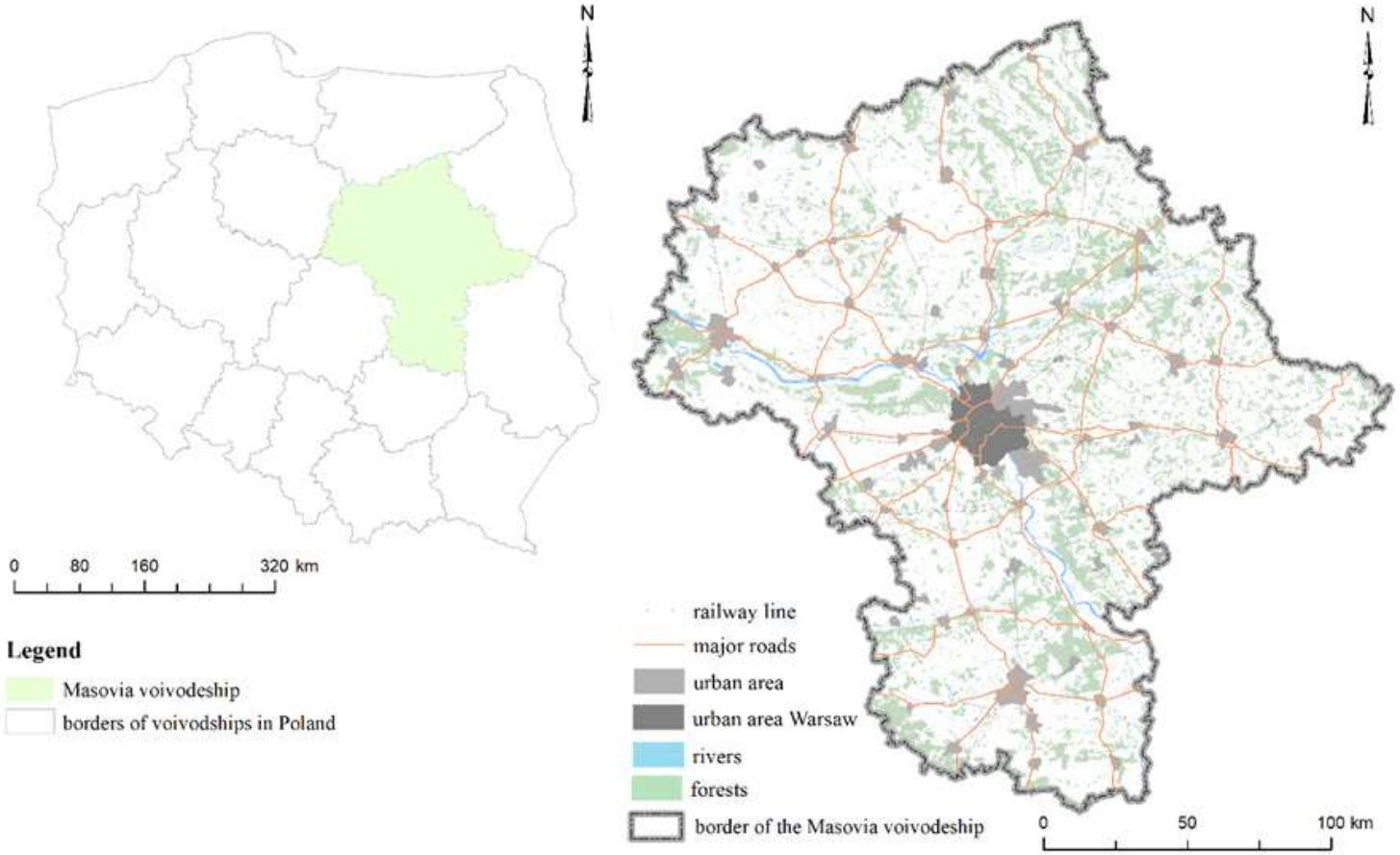
Main aims of the study

- To diagnose the main problems which result in spatial conflicts and to offer the possibility of mitigating them with the use of innovative digital technologies and public participation, in accordance with the Smart Villages concept
- To show the key barrier to multifunctional development of rural areas is the spatial structure of land plots and farms that is not adapted to the current needs, technologies, and potential land use.

Location of the study area



Detailed purpose of the research

To assess the spatial structure of rural areas in terms of the need for comprehensive changes and transformation of land development.

The spatial structure of the registered plots was considered, especially their:

- area,
- width,
- extension,
- and number on the farm.

It was found that these parameters significantly affect the possibilities of development of the areas. Moreover, they should transform in the event of a change in the function and manner of use.

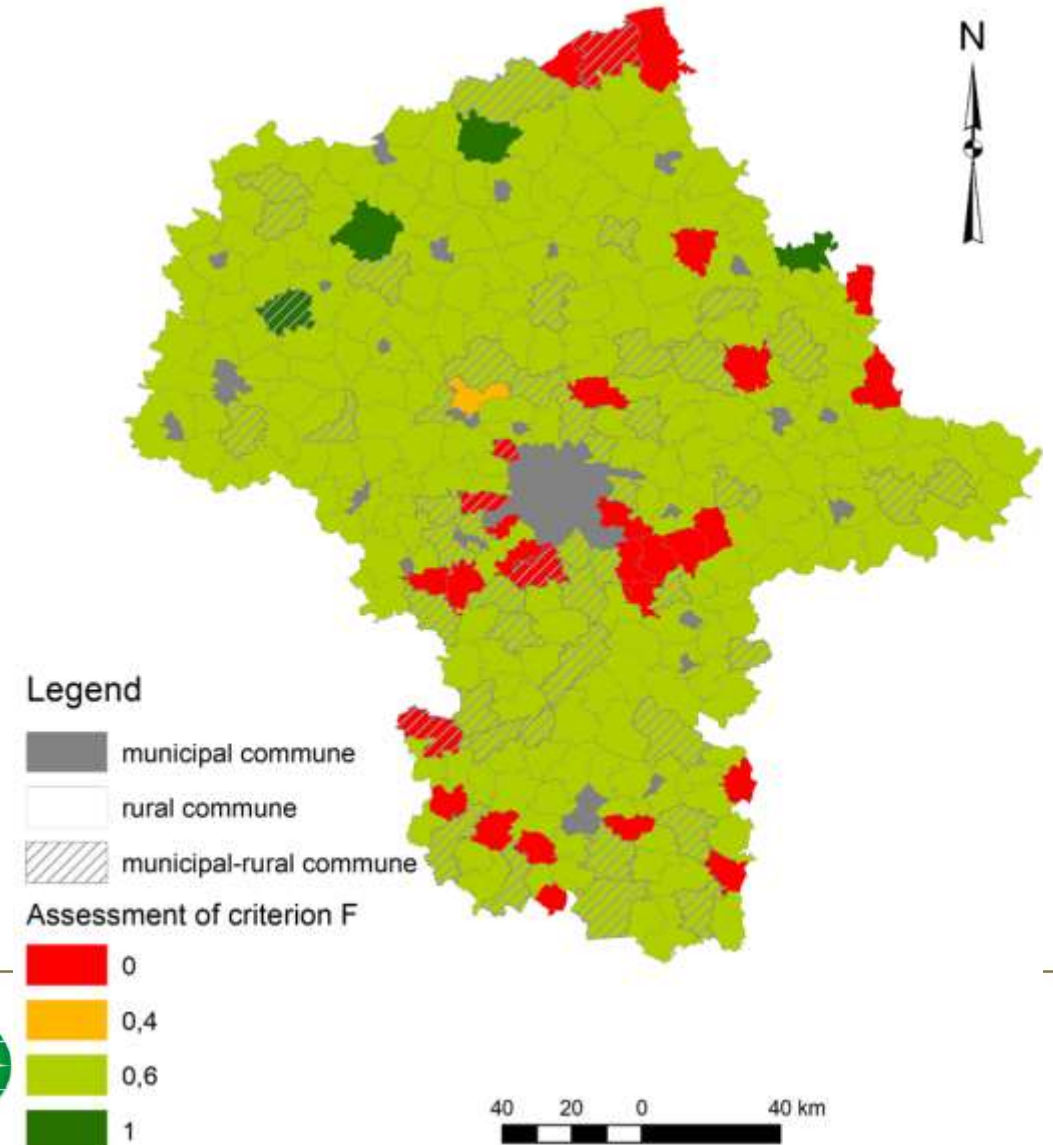
Criteria:

Used selected spatial parameters of farms and registered plots in the author's assessment of the transformation needs and complete changes in land development. On this basis, the transformation index "T" was calculated. Made the assessment based on the following simplified criteria:

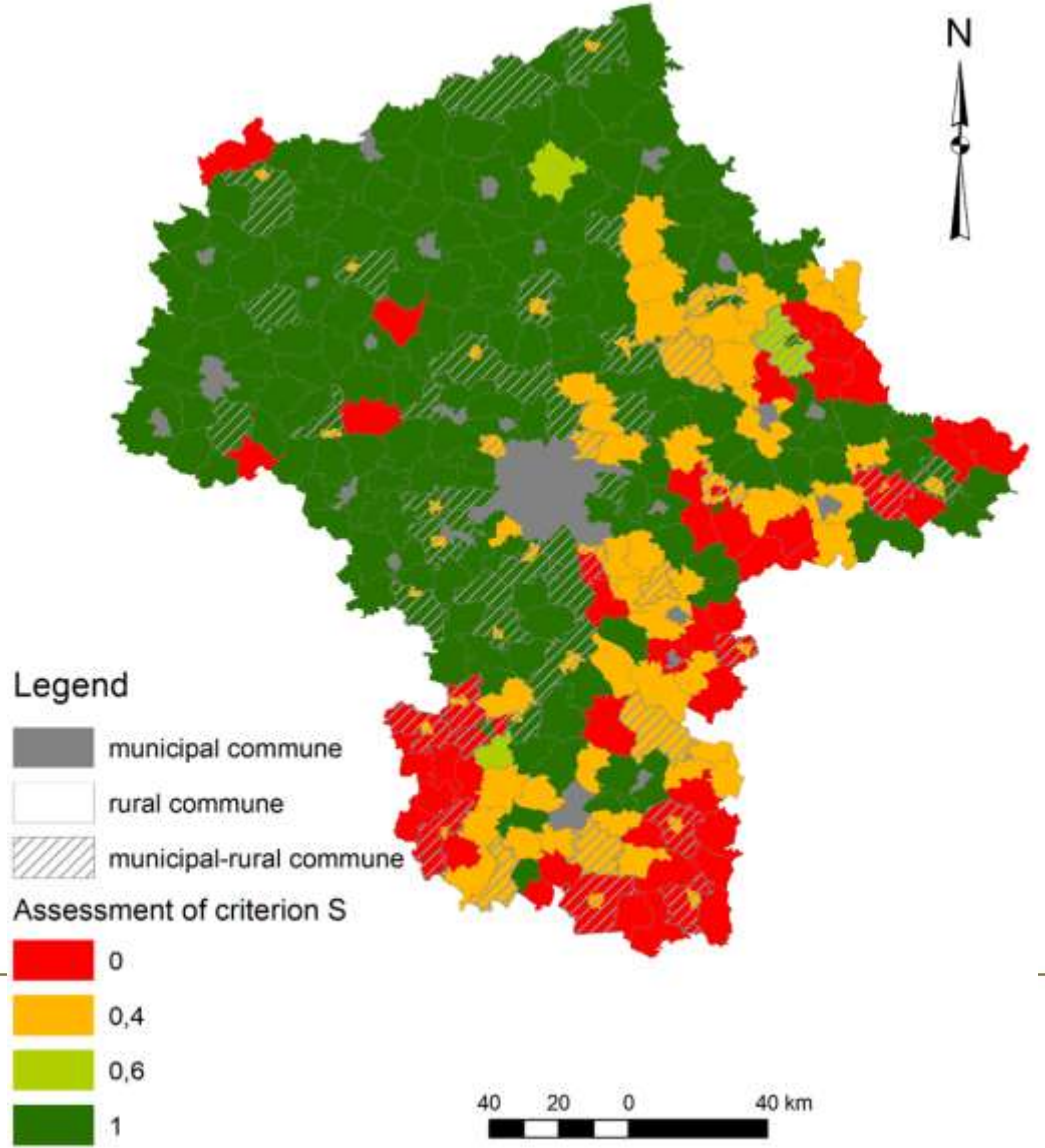
- 1. Spatial structure of farms (F):
- a. The average area of a farm above 1 ha in a commune (Fa)
- b. Number of plots on the farm (Fn)
- 2. The shape of the small records (S):
- a. Plot width (Sw)
- b. Parcel extension (Se)

RESULTS

Assessment of the spatial structure of farms



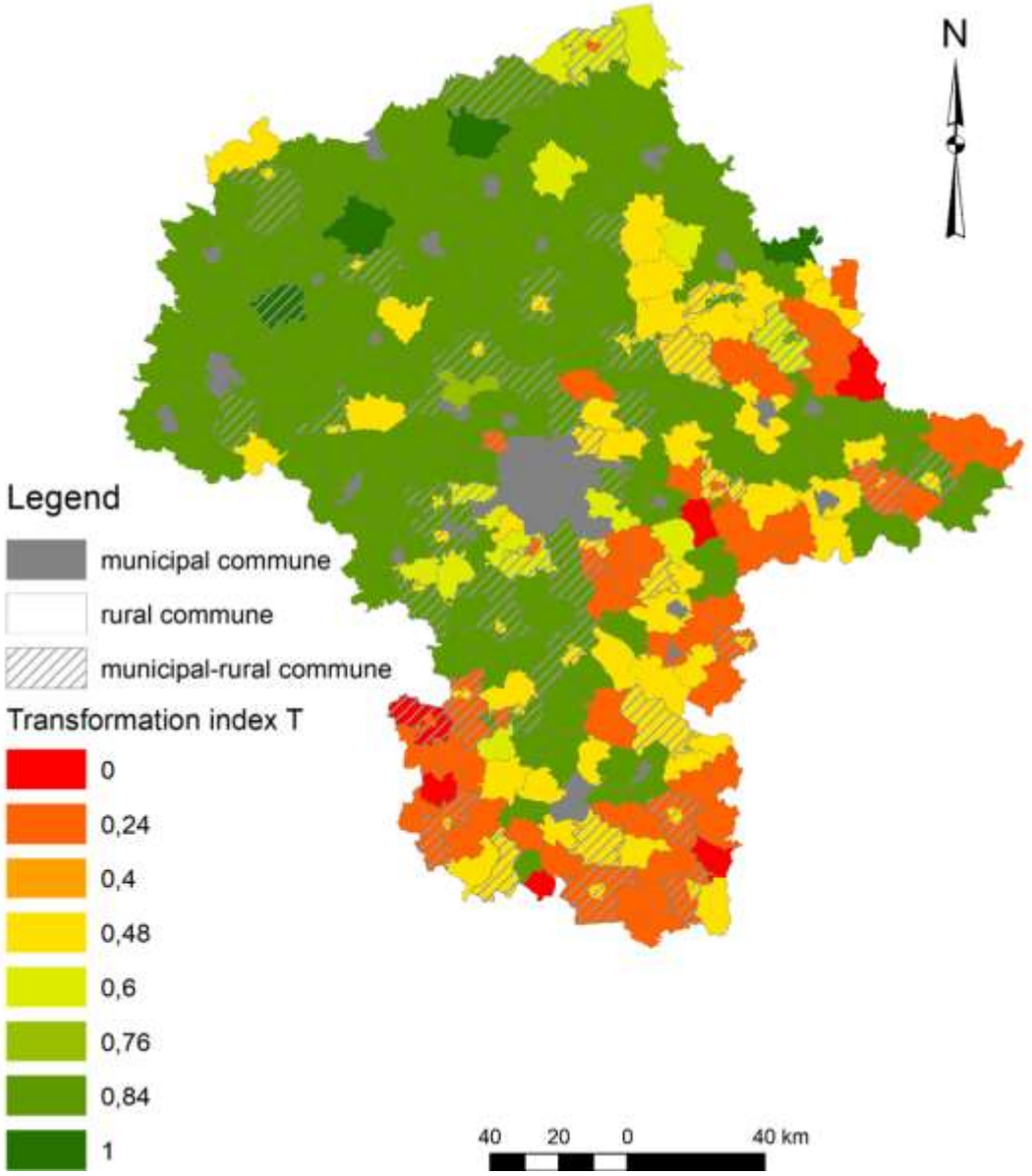
Assessment of the shape of registration plots



RESULTS

Assessment of the needs of comprehensive transformations in rural areas with the use of the transformation index (T)

The research aimed at identifying areas requiring changes towards multifunctional rural development has shown that communes located in the southern and south-eastern part of the Mazowieckie voivodship need the most urgent changes and transformation of land development (transformation index T ranging from 0 - 0.48).



CONCLUSIONS

- An essential factor slowing down the multifunctional development of rural areas in the Mazowieckie Voivodeship is the spatial structure of registered plots and farms.
- The areas of agricultural production located in these areas require land consolidation, increasing the area of plots.
- In the areas surrounding cities that are well-connected it is important to adjust the spatial structure of plots to the new residential or other functions related to the development of land for non-agricultural purposes. The main activity in this respect is the real estate division procedure. However, in the case of narrow and long agricultural plots, it is necessary to consolidate and divide the real estate.

CONCLUSIONS

- The use of intelligent technologies as part of the Smart Villages concept is crucial for strengthening the processes of transformation of the spatial structure of plots and farms. The possibilities of multifunctional sustainable development of rural areas depend on reconstructing their spatial structure. Intelligent digital technologies that technically support land consolidation, as well as consolidation and division of the real estate, will provide a reasonable basis for shaping non-agricultural economic activity.
- Adapting the shape of plots and their area to new functions will eliminate spatial conflicts resulting from the changement in use.

CONCLUSIONS

- The possibilities and directions for implementing the Smart Villages concept depend primarily on local conditions.
- Both in communes where farms will develop towards intensive agricultural production and where other management functions will enter, the ongoing changes require adaptation of the spatial structure to the current needs. Innovative technologies and intelligent spatial planning can significantly accelerate these processes and thus strengthen the development of the rural regions towards their multi-functional development.

Sources of funding

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