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AGRICULTURE IN MODERN LANDSCAPES: A FACTOR HINDERING OR FACILITATING DEVELOPMENT?

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Suburbanization at the expense of farmland: the example of the Ljubljana Marsh.

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Agriculture in modern landscapes: A factor hindering or facilitating development?

ABSTRACT: Agriculture plays an important role in both protecting and developing farmland. In Slovenia, the main reasons for this loss are urbanization and the implementation of large development projects that require the destruction of fertile farmland. About 3000 ha of farmland has been lost each year since Slovenia's independence. The importance of agriculture and farmland is touched upon in this special issue of *Acta geographica Slovenica*. The authors focus on management of farmland, analyse the development potential for agriculture, observe the changes in the landscape by remote sensing, soil quality and its pollution, and land cover as an element of biodiversity. They draw attention to the lack of participation in spatial planning procedures and the question of the importance of agriculture and jobs in this sector in national economy. This introductory paper brings a short analysis of how the issue of farms' spatial constraints and moving farm structures to new locations is perceived by municipal offices, nature parks, and the Slovenian Chamber of Agriculture and Forestry and its regional offices.

KEY WORDS: agriculture, urbanization, spatial planning, less-favorable areas, limiting factors, karst, Slovenia, European Union

Kmetijstvo v sodobni pokrajini: zaviralec ali pospeševalec razvoja?

POVZETEK: Kmetijstvo ima pomembno vlogo pri varovanju in razvoju kmetijskih zemljišč. Od osamosvojitve dalje je Slovenije vsako leto izgubila približno 3000 ha kmetijskih zemljišč. Glavni razlogi za njihovo izgubo so urbanizacija in izvajanje velikih razvojnih projektov, ki zahtevajo uničenje plodnih kmetijskih zemljišč. Pomena kmetijstva in kmetijskih zemljišč smo se dotaknili tudi v tej posebni izdaji revije Acta geographica Slovenica. Avtorji se osredotočajo na upravljanje kmetijskih zemljišč, analizirajo razvojni potencial kmetijstva, opazujejo spremembe v pokrajini z daljinskim zaznavanjem, obravnavajo kakovost in onesnaževanje prsti ter rabo zemljišč kot element biotske raznovrstnosti. Opozarjajo na pomanjkljivo sodelovanje pri prostorskem načrtovanju in na vprašanje pomena kmetijstva oziroma delovnih mest v tem sektorju za nacionalno gospodarstvo. Uvodni članek prinaša kratko analizo o tem, kako občine, naravni parki in Kmetijsko-gozdarska zbornica Slovenije ter njeni regionalni uradi zaznavajo vprašanje prostorskih omejitev kmetij in premikanje struktur kmetij na nove lokacije.

KLJUČNE BESEDE: kmetijstvo, urbanizacija, prostorsko planiranje, območja z omejenimi dejavniki za kmetijstvo, omejitveni dejavniki, kras, Slovenija, Evropska unija

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1 Introduction

The importance of farmland and protecting has been a widely debated issue in Slovenia in recent months. The main reason for this is the planning of certain business development projects, the siting of which will destroy high-quality farmland. According to agricultural experts, this will cause irreparable damage to Slovenian agriculture and food security. Let us mention only two such development projects. The first is the construction of an auto paint shop in the Municipality of Hoče–Slivnica, where a large number of new jobs supposedly justifies the destruction of over 80 ha of high-quality and highly fertile farmland. The second is the planned construction of the Third Development Axis, the aim of which is to strengthen the economy of secondary urban centers (Nared and Razpotnik Visković 2016). Its northern section from Velenje to Šentrupert is planned to cross 110 ha of Slovenia's highest-quality farmland.

Both cases have certain points in common: they are both development projects of national and regional importance, the implementation of which requires the destruction of fertile farmland. This is also the main reason for the strong opposition from local civil initiatives, environmental organizations, and individuals. They all draw attention to the lack of participation in spatial planning procedures for siting such projects (Nared et al. 2015) and the insufficient assessment of alternative solutions. The issue of insufficient inclusion of individuals and local initiatives in preparing municipal planning documents (which is even more apparent with national spatial plans) was also highlighted by the Court of Auditors in its recent audit of spatial planning in Slovenia (Revizijsko … 2017).

This raises the question of the importance of agriculture and jobs in this sector in the current national economic strategy. Slovenia's Development Strategy (Strategija … 2005) does not even mention the word *agriculture*, even though there were 69,902 farms in Slovenia in 2016 (Kmetijska … 2016); something similar applies to the 2050 Vision of Slovenia (Slovenija … 2017). Such developments have a long-term effect on the overall national economy because, among other things, they also affect biodiversity and forest and water resources. Moreover, the new jobs and economic development promised by the planned projects mentioned above indirectly threaten not only the production of food and national food security, but also jobs in agriculture that are tied to cultivating the farmland that is now threatened.

The Alumni Club of the Department of Agronomy at University of Ljubljana's Biotechnical Faculty responded to these recent events with the roundtable Protecting Agricultural Land (Kako prenesti varovanje … 2017), which was held in early May 2017. At this roundtable, participants discussed the farmland protection system over time, presented future changes including the new methodology for defining farmland of the highest quality, highlighted the importance of urbanization as the main reason for the loss of farmland, and examined the role of agriculture in this.

The importance of agriculture and farmland is also touched upon in this special issue of *Acta geographica Slovenica*. The authors emphasize that high-quality management of farmland involves more than just defining the regulations and the ratio between areas allocated for urban growth and those allocated for rural development (Markuszewska 2017). It is vital to first evaluate the development potential for agriculture in various areas and develop tools that make this possible (Pažek et al. 2017). In this as well as in observing changes in the landscape, land use, and land cover, extensive databases such as NDVI, Corine Land Cover, and the Slovenian Register of Current Agricultural and Forest Land Use have proven helpful for over a decade, but they need to be used with caution, taking into account the pitfalls hidden in the methodological changes in capturing data over time (Foški 2017; Jovanović, Milanović and Zorn 2017). In terms of protecting high-quality farmland, usually only data on area are used, while neglecting two other aspects: first, soil quality and the impact of its pollution on other landscape elements, especially water (Ilić and Panjan 2017), and, second, land cover, which is a vital element of biodiversity, nature conservation, and protection against natural disasters (Polenšek and Pirnat 2017).

2 Agriculture and farmland

Agriculture plays an important role in both protecting and developing farmland, considering that there have been constant spatial tensions between agricultural and rural activities in recent decades, usually resulting in a more or less permanent loss of farmland. Urbanization is the main reason for this loss in Slovenia. Since Slovenia's independence, 70,000 ha of farmland (or 3.45% of the country's territory) has been built

up, and the current municipal planning documents envisage another 57,000 ha to be earmarked for the construction of housing, business and commercial districts, and transport infrastructure (Kako prenesti varovanje … 2017). In addition, farms also have increasing spatial needs for expanding and modernizing their activities (Razpotnik Visković 2017). Today's farmyards and the structures in them are unable to meet modern technological needs and regulations (Knific and Bojnec 2015). Farms inside settlements are becoming increasingly spatially constrained, with areas for relocation or mere expansion usually only available on the edges of the settlement (i.e., on farmland; Razpotnik Visković 2015), where urbanization is also spreading.

The target research project Selecting Farm Structure Sites and Solving Spatial Conflicts (Internet 1) revealed how the issue of farms' spatial constraints and moving farm structures to new locations is perceived by municipal offices, nature parks, and the Slovenian Chamber of Agriculture and Forestry and its regional offices. A full 192 municipalities – or 90% of all Slovenian municipalities, accounting for 90% of Slovenian territory and 90% of the total Slovenian population – responded to the online questionnaire prepared as part of this project. Such a wide response already indicates that the spatial constraints on Slovenian farms are a very relevant topic (Polajnar Horvat and Smrekar 2015). A full 85% of the responding municipalities confirmed that their farmers were dealing with spatial constraints and that this was a serious development issue. In twenty-eight municipalities, this problem was not indicated. These were mainly hilly municipalities with an exceptionally low share of developmentally promising farms.

On the other hand, only 37% of municipalities had allocated areas for relocating or expanding promising farms in their spatial plans. Considering that as many as 85% of the municipalities acknowledged a spatial constraint problem, this share was modest and lower than expected. The areas envisaged for relocating or expanding promising farms are important not only from the viewpoint of these farms' economic progress, but also in terms of reducing social tensions within settlements. Lower quality of life due to agricultural activity (noise, odors, mud on the roads, and so on) in (sub)urban settlements (Tiran 2016) is one of the main reasons for disagreements among residents (Guštin and Potočnik Slavič 2015). The majority of municipalities considered suitable adjustments to their spatial plans to be the primary method for resolving such disputes. By adopting suitable planning documents, development can be directed to more suitable areas, thus preserving the highest-quality farmland.

An important measure in terms of developing farmland is not only the relocation of farms and the construction of large farm buildings, but also the construction of auxiliary farm structures. The Agricultural Land Act (Zakon o kmetijskih … 2011) provides that in their planning documents local communities may allow the construction of simple farm and forestry outbuildings and other structures on farmland for which a building permit is not required (e.g., hayracks, sheds, greenhouses, or barns). Municipalities assess the suitability of selecting sites for auxiliary farm structures very differently. The main problems observed include inappropriate dimensions and location, inappropriate designs, and disproportionate visual impact. A major problem highlighted by the municipalities is the fact that these structures are not being used for agriculture, but as vacation houses, workshops, camper garages, or even housing. It is surprising that farmers were the main developers in only 55% of municipalities; elsewhere, non-farmers predominated or the ratio was half-and-half. The current situation primarily results from a lack of inspection and inadequate activity by inspection services.

In their interviews, the representatives of agriculture and forestry institutes highlighted another issue: municipalities provide very different support for the construction of farms and the development of agricultural activity on farmland. They believe this is not fair because the same law applies to all of Slovenia.

Seventy-eight per cent of municipalities reported that they strategically support the construction of farm structures on farmland, whereas the rest were against it. Reservation toward construction on farmland was expressed in four urban municipalities (Maribor, Nova Gorica, Murska Sobota, and Ptuj) and many municipalities with well-developed tourism (Ankaran, Bled, Bohinj, Brda, Rogaška Slatina, Šmarješke Toplice, Tolmin, and Zreče). In contrast, municipalities with a high share of developmentally promising farms (Cerklje na Gorenjskem, Mozirje, Sveti Jurij ob Ščavnici, and Vrhnika) were in favor of such construction. Here it must be added that the lack of support for farm construction on farmland does not mean that these municipalities are against agricultural activity or that they hinder its development; such a standpoint can merely contribute to more long-term protection of farmland, which is also called for by agricultural experts themselves.

3 Papers in the special issue

This special issue begins with a paper on the conflicts between legal policy and rural area management in Poland (Markuszewska 2017), which describes the consequences of rural transformation as witnessed in central and eastern Europe and reflected in many adverse effects that have an impact on the environment and activities in it, and hence also long-term economic development. Spatial management is encumbered due to a lack of strategies and legal documents acknowledging the importance of the development of rural areas, especially where they come in contact with urban areas or in areas of infrastructure use. This is where conflicts arise, the most common consequence of which is a continuous decrease in high-quality land suitable for agriculture. The author proposes a mechanism for coordinated spatial planning and planning of agricultural activities that would reduce the probability of conflicts.

In her paper »The (Non)usefulness of the Register of Current Agricultural and Forest Land Use for Monitoring Processes in Urban Areas,« Mojca Foški (2017) discusses changes in urban land use as a key indicator of spatial processes in Slovenia. She reports that in Slovenia it is only possible to monitor this phenomenon by using the agricultural and forest land use register, and that the methodology for capturing these types of data has changed so much that the register does not reflect the actual changes in urban areas. This means there is no systemic and up-to-date data source available to monitor actual changes in urban areas, where extensive use (undeveloped islands within settlements) often occurs, degraded areas form in settlements, and various conflicts arise, especially on the edges of urban and suburban settlements, where they adjoin agricultural and forest land.

The paper »Forest Patch Connectivity: The Case of the Kranj–Sora Basin, Slovenia« (Polenšek and Pirnat 2017) focuses on an important but often overlooked cultural landscape element: patches of forest, trees, and shrubs. These areas form an important agricultural landscape element in terms of biodiversity, nature conservation, and protection against natural disasters (e.g., wind). Urbanization and farming exert pressure on these parts of the landscape, resulting in reduction of their area and spatial connectivity. The authors argue that the connectivity of such areas is just as important for the functioning of a natural system as their area; this is especially true for minor agricultural land use types such as forests. This paper features an original methodological approach to studying this issue and proposes certain solutions useful for long-term planning of the use of agricultural landscapes.

The paper »Multi-Criteria Assessment of Less-Favored Areas: The National Level« deals with less-favored areas for agriculture (Pažek et al. 2017). These areas are highly relevant for agriculture in Europe because they account for as much as 65% of farmland. In Slovenia, this percentage is even higher (73%), covering mountainous areas (72.3% of Slovenia's total area), special vulnerable areas (10%), and other less-favorable areas with permanently infertile soil (4%), with karst land not taken into account (Ciglič et al. 2012). The authors present the complex multi-criteria decision-making model DEXi, which makes it possible to assess the most suitable farming method with an emphasis on sustainability. The model can be applied to the analysis of individual farms as well as regional analyses and agricultural policy. The agricultural landscape is a complex system, in which diverse agricultural activities are impacted by many other landscape processes, which creates conflicts and represents a constant management challenge. The use of models, such as the one presented in this paper, may help solve these issues.

The paper »The Use of NDVI and Corine Land Cover Databases for Forest Management in Serbia« (Jovanović, Milanović and Zorn 2017) also examines conflicts within the landscape, but from a different starting point. It presents the use of remote sensing and Corine land use data for managing forests in the Serbian municipalities of Kuršumlija and Topola. Because of the finding that the official data on the forest area in Serbia are deficient and differ from those in the Corine database, the authors present the use of a normalized vegetation index for calculating the forest area. This method is based on satellite vegetation data and provides fairly accurate results, which will facilitate the management of forest areas in this area, where illegal tree felling is common. This is most likely the reason for the calculated values being lower than the official ones. The authors recommend that the method be used for all geographically similar areas (e.g., in the Balkan Peninsula) or other areas that face illegal activities and where accurate official data sources are often unavailable.

Nitrogen and phosphorus pollution is common in agricultural landscapes and is especially alarming in protected areas. The paper »Nitrogen and Phosphorus Pollution in Goričko Nature Park« (Ilić and Panjan 2017) deals with the long-term impact of diffuse and point sources of pollution on the quality of

ecosystems. The authors carried out a comparative analysis by monitoring surface watercourses. They established elevated levels of nitrogen and phosphorus compounds in the water. Long-term pollution is indicated by the increasing levels of these pollutants, which is especially alarming due to the modest thermal and discharge potential of rivers. The results of the analysis have wider implications because this is not an isolated case, but a predominant situation in agricultural landscapes that should receive greater attention.

4 Conclusion

The papers in this special issue elucidate the topics described above, each in their own way. Examples from various countries show that spatial planning is a complex process in agricultural landscapes. A large number of stakeholders and diverse long-term impacts at various levels, from legislative to economic, make it difficult to manage these landscapes and cause frequent conflicts. Many of these could be solved through better land-use planning or by directing activities and, first and foremost, through better inclusion of stakeholders in all decision-making processes. This entails planning, preparing, and adopting strategic documents and municipal planning documents, and better harmonization of business, tourism, agricultural, and other strategies. The intensive development of farmland, which has been common in Slovenia since its independence, calls for more decisive protection of this land, reigning in urbanization tendencies, and efforts to raise awareness about the importance of farmland for the survival and secure future of communities. Or, in the words of Franklin D. Roosevelt: »The nation that destroys its soil destroys itself.«

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