

  
ICUP2022

International  
Conference on  
Urban Planning



ICUP2022

PROCEEDINGS

Serbia, Niš, November 9-10, 2022



urban planning cluster niš





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## PERI-URBAN AGRICULTURE AND LAND USE CHANGE UNDER GLOBAL CHALLENGES FOR FOOD SECURITY: URBAN PLANNING PERSPECTIVE

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### ABSTRACT

*Policies addressing food security issues are becoming an increasingly important agenda globe wide. The preservation of agricultural land and contribution of urban agriculture to food security is widely recognized as a need. The main treat to agricultural land use change (ALUC) is due to urban sprawl and land take, and the first under attack is the land in peri-urban areas. The current growth of ALUC is contrary to the principles of sustainability. The prevention of agricultural land loss and permanent land use change, i.e., land take is seen as the necessity and there is no dilemma on that issue (“no net land take”).*

*Agricultural land within functional urban area (FUA) of Novi Sad face with strong land use change pressures. Starting from the broadly adopted theses that spatial and urban planning affect ALUC, the author analyses the experiences in urban planning practice regarding ALUC within part of Novi Sad FUA and analyses the effects of regulatory land policy instruments. The purpose of this approach is to contribute with such perspective to very modest domestic research practice on those issues. As a result, the extension of ALUC, which inevitably has implications on peri-urban agriculture in the context of food security, is perceived. With the reference to some international experiences on related issues, the author draws a parallel and concludes that binding legal framework providing protection of urban agriculture through land use planning practice is a key for the protection of agricultural land, especially high quality land within peri-urban area of Novi Sad.*

**Keywords:** agricultural land; urban planning; land use change; peri-urban agriculture, food security

### INTRODUCTION

The phenomenon of agricultural land use change (ALUC) due to urbanization processes, that mainly occur in form of urban sprawl in Europe, is on the focus of a numerous research. It specifically describes the scattered development of settlements in the peri-urban area (Wandl, Magoni, 2017) and it is related to the physical pattern of low-density unplanned expansion of large urban areas, mainly into the surrounding agricultural areas (EEA, 2016). Impacts of urban sprawl are often quantified by monitoring of land take (Tardieu et al., 2021), that is the loss of agricultural, forest and other semi-natural and natural land to urban and other artificial land development (EEA, 2006). Still, land take does not always coincide with urban sprawl, since it can occur outside of urban or peri-urban areas, but the role of land use planning in reduction of land take is fully recognized (Colsaet et al. 2018: 349).

The concept of providing food security through the protection of agricultural land and especially high-quality peri-urban land has been promoted only recently (e.g. Verburg et al., 2013; Horst et al., 2017; Zróbek-Różanska, Zielinska-Szczepkowska, 2019). Gardi et al. (2015) proposed a methodology to quantify the impact of land take on food security at the European level and demonstrated that land take could be an important threat to food security in a long term perspective (e.g. 100 years). In EU, it is recommended to stop the process of land take of agricultural land and other natural areas by 2050 (“no net land take”) (EC, 2011). In the other hand, that goal is expected to be achieved globally by 2030 in accordance with Sustainable Development Goals (SDG), as well as substantial increase in food security to achieve zero hunger and promote sustainable agriculture (UN, 2015).



In order to meet global demands for food security, urban planners and municipalities in numerous European countries developed tools to protect urban and peri-urban agriculture within the metropolitan areas by some forms of controlled urbanization and zoning (e.g. Jansma et al., 2022; Olsson et al., 2016). It has to be stressed that urban agriculture is usually considered as micro- to small-scale agriculture practiced on non-agricultural land within the build-up city and oriented to short supply chains, while peri-urban agriculture is small- to large-scale, which is performed by professional farmers on agricultural land, often with the zoning status and distributed by a wider range of channels (Opitz, 2016). However, although researchers insist on differences between (intra-) urban and peri-urban agriculture, these are not separated from each other by rigid borders.

Traditional planning instruments, as zoning regulations, urban growth boundaries and green belts, as well as other tools for land use control (development fees, infrastructure financing, financial incentives etc.) represent the main planning instruments for urban agriculture preservation (Zasada, 2011; La Rosa et al., 2014). Policy makers must combine regulatory protection with positive reinforcement of farming activity to support the agricultural land use (Eagle et al., 2015), although land use planning occasionally failed to encourage farmers to continue their agricultural activities near urban areas and resulted in the abandonment of agricultural activities (Darly, Torre, 2013).

The planning perspectives to peri-urban agriculture issues have very modest research practice in Serbia. Starting from the fact that agricultural land within peri-urban areas is under huge land take pressure, the author presents the example of ALUC process within part of Novi Sad peri-urban area. In the same time, that area belongs to functional urban area (FUA) of Novi Sad. Urban and peri-urban agriculture have very important role in the economy of Novi Sad FUA, primary because of the fertile agricultural land, plenty of water, accessibility and vicinity to large urban markets of Novi Sad and Belgrade (Figure 1). Relying on recent research (Živanović Miljković et al., 2022a) of which is a part, this paper shows case study on peri-urban agriculture and ALUC in lenses of urban planning practice, as urban and peri-urban agriculture and farmers are facing strong land take pressures throughout the FUA. By analysing primary sources (urban planning documentation and urban strategies), the extension of ALUC, which inevitably has implications on peri-urban agriculture in the context of food security, is perceived. The main objective of this review is to identify the effects of ALUC on peri-urban agriculture in the context of urban land use planning and land policy. This perspective resulted with some recommendations for future planning practice concerning agricultural land, especially regarding the upcoming new planning cycle, that will occur after new Spatial Plan of the Republic of Serbia (SPRS) adoption.

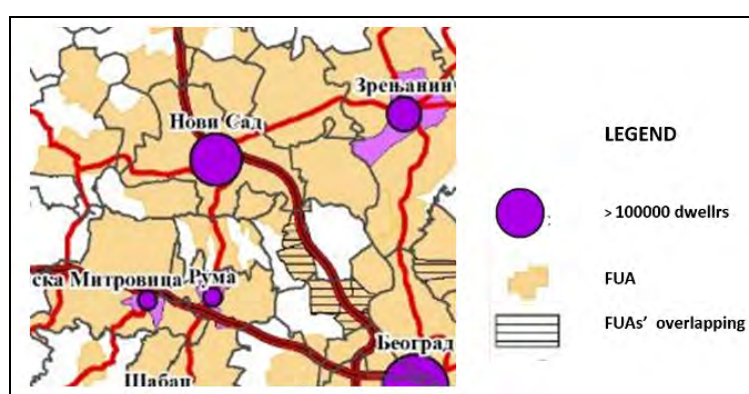


Figure 1: Novi Sad FUA position in the nearest environment (Source: adapted from SPRS Draft, 2021)

## REGULATORY LAND POLICY CONTEXT ON AGRICULTURAL LAND USE CHANGE IN SERBIA – A BRIEF PREVIEW

The protection of agricultural land as a basic natural resource for food production, along with controlling ALUC, is a priority in Serbia, as declared through national strategic documents. According to the Law on agricultural land (2009), it is forbidden to use arable agricultural land up to the fifth cadastral class for non-agricultural purposes, except in cases where the public interest is determined by law and with compensation for the land use change (LAL, 2009). Still, the practice of spatial and urban planning is faced with permanent spatial conflict related to agricultural land, because agricultural land is very attractive for investors. The previous Spatial plans of the Republic of Serbia (SPRS) (1996, 2010) promoted the mandatory protection of

agricultural land and the preservation of its quality and natural fertility for food production. Going further in protection of agricultural land than previous ones, the draft of the newest SPRS (2021) encourages the use of existing construction funds for new developments instead of greenfield investments. Also, it recognizes that urban plans may contribute to the excessive expansion of urban settlements by unrealistic consideration of future needs for construction land (SPRS, 2021). However, in previous planning cycle, within the planning determinants that have significantly affected the spatial development of municipalities and cities, the use and protection of agricultural land is most often marginalized (Ibid.).

In the local planning context of Serbia, the instrument of land use change in plans can enable land take and ALUC (Živanović Miljković et al., 2022a; Živanović Miljković et al., 2022b). Recent quantitative research on spatial and urban land use plans and policies at the local level (Živanović Miljković, Čolić, 2020; Živanović Miljković et al., 2022a; Živanović Miljković et al., 2022b) indicated long-term tendencies of ALUC, which is mostly for other- ie. non-public - purposes (e.g. housing, industrial, commercial).

### 3. THE CASE STUDY ANALYSES ON PERI-URBAN AGRICULTURE IN NOVI SAD F U A

Novi Sad FUA covers an area of 1892 km<sup>2</sup>, larger than administrative area of the City of Novi Sad. According to 2018 data on land cover (CLMS, 2022), agricultural land accounted for 1,377 km<sup>2</sup>, with 73% of total area, respectively. Arable land dominates, with share 88% of total agricultural land (Figure 2). Based on Corine Land cover data, in the period 2000-2018, ALUC is occurred on 34 ha.

Peri-urban agriculture of Novi Sad FUA is very specific. Here is presented the example of Futog settlement, due to its specificity of the production of Futog cabbage, vegetable with appellations of origin, a special kind of geographical indication. According to WIPO (2022), a geographical indication is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin. Acknowledging that the land is substantial for the long-term success of the products with geographical indications, that fact encourage producers to adopt long-term strategies for land protection (Calboli, 2017) since that products are always related for certain area only.

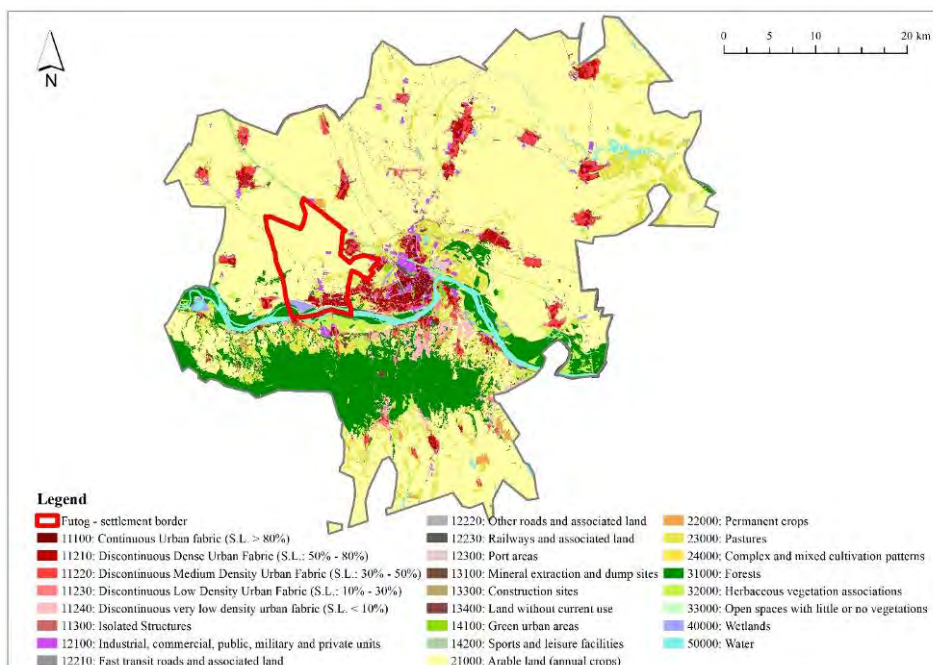


Figure 2. Land cover for Novi Sad FUA (2018)  
(Source: Živanović Miljković et al., 2022a)

#### 3.1. Land use planning issues

Plan of the General Regulation for the Futog Settlement (PGR, 2015) and its subsequent amendments (Amendments, 2017-2021) are in implementation in the period 2015-2022 (Figure 3). The basic concept of spatial development within the settlement creates the conditions for arranging two main land use: Futog “atar”, the area of rural settlement with primarily function of agricultural production, and Building zone.

Agriculture is considered as a primary activity, and, therefore, “atar” land use includes about 87% of total area covered by PGR (Table 1). At the entrance directions to the settlement and within the individual housing plots, working zones are placed. For the purpose of communal equipping, it is planned to expand the building land over „atar“, within the area planned for the business on entrance directions to the settlement. Also, the area between Futog and Novi Sad, which is not designated for the construction, has been taken over by illegal building for housing purposes for a long time. That is in collision with the earlier conception according to which the area between the city and the closest settlements should have been preserved as agricultural land (Spatial plan of the City of Novi Sad, 2012).

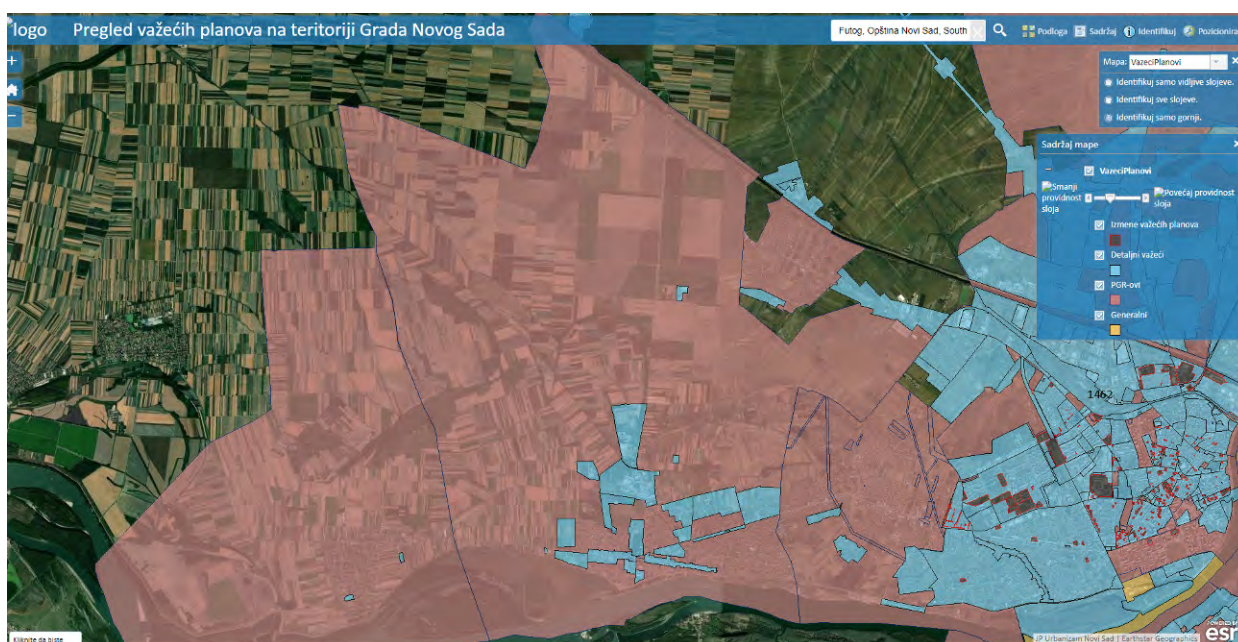


Figure 3: Coverage by plans for Futog settlement  
(Source: <https://vgis.nsurbanizam.rs/gis/planovi/>)

Table 1: A comparative land use balance for Futog in the period 2015-2021

Land use	Area (ha)	%
PGR	8280.85	100
-Building zone	1087.62	13.13
Public land use	463.37	42.67
Other land use	624.25	57.33
Futog „atar“	7183.23	86.87

(Source: author’s elaboration based on PGR, 2015, Amendments on PGR 2017-2021)

### 3.2. The effects of regulatory land policy instruments on peri-urban agriculture

Strategy for the Development of Agriculture and Rural Development of the City of Novi Sad for the period 2018-2022 (SDARD NS) promotes multifunctional agriculture and responsible resource management, maintenance of different production systems and types of agricultural holdings within urban agriculture.

However, local level, i.e. urban plans promote ALUC and new land take (Živanović Miljković et al., 2022a), even if that implies land use change of land designated for production with geographical indications within “atar” (e.g. Amendments, 2015). Also, an initiative for additional expansion of construction land in Futog was submitted again in 2021 (Amendments, 2021), with planned land take more than 15 ha of ‘atar’, where commercial facilities – non- public purposes, thus. In the covered area, currently there is no built traffic infrastructure except agricultural roads. It’s about, therefore, new land take of high quality agricultural land belonging to “atar”, including land registered for appeal of origin for cabbage production.

Consequently, with ALUC into construction land, farmers in Futog are faced with increase in property tax. The market value of construction land is 125 times higher than the price of agricultural land (Decision on the construction land development program for 2021). As a result of public investment in infrastructure capitalization of construction land’s increased value (SIUDS, 2019).

#### 4. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE PLANNING PRACTICE

The results of this review stand by an international consensus on the required, and sometimes mandatory protection of agricultural land from permanent loss due land use change, and its rational use, because that are very important issues from the aspect of food security. Searching for and balancing realistic needs with development and investment interests remain major task and challenge for planners.

The example of peri-urban agriculture in Futog specificity indicate necessity of scientific and expert-based solutions for conflict between the profit-oriented ALUC (e.g. for commercial, industrial, housing purposes) and the preservation of agricultural land for unique production with geographical indications. Special attention had to be drawn due to attachment of products with geographical indications to the land on certain area only.

Taking into account ALUC issues within study area, some principal recommendations for land use planning practice, especially within the forthcoming new planning cycle, have been identified as follows:

- *To identify areas with high quality agricultural land (protected agricultural areas) and include them into planning documents as areas with constraints in terms of new ALUC.*
- *To allocate resource in order to better protect agricultural land.* All new ALUC should be directed to the land of marginal importance for agriculture. Greenfields should be avoided.
- *To stop ALUC for economic and socio-cultural needs (private interests), except for national interests of high priority (public interests).* Any potential new ALUC should be evaluated from the perspective of food security issues as a public interest.

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