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## LAND USE IN BÉKÉS COUNTY

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### Abstract:

The study was inspired by the extreme drought in the Southern Great Plain region in 2022. There is a lot of research around this topic, both from academia and industry. Most research seeks to answer the question of extreme drought is a real phenomenon of climate change or the result of other local factors. In previous studies, we have reported on how our climate has changed and how this has affected our groundwater. The surface waters of Békés county are determined by the Körösök and Berettyó rivers. All these rivers are of downstream character and their catchment areas lie outside the borders of the Békés county. We therefore have no control over the quantity or quality of the water they deliver. For the water conservation and water management of Békés county, natural or man-made areas with good water retention and water retention capacity are essential. Natural forests, floodplains, reedbeds, meadows and pastures are good water retention areas. Man-made areas with good water retention capacity and high evapotranspiration, are plantations, gardens, orchards, vineyards, elderberry plantations, hop plantations. In my work I collect the results of the Agricultural Microcensus data series of the Central Statistical Office for the last 50 years. From the data I examine the quantitative changes of the above mentioned areas in Békés county. I will look at the proportion of areas that contribute to climate change (extreme drought), such as covered areas and built-up areas, that change over this period. The results of this change can be used to infer the extent to which land use change has contributed to the drying of the area. Sectors that promote low water-retentive land uses can be identified.

### • The history of drought in Békés County

Drought is a commonly known, complex concept. In Hungary, the consequences of this could be experienced in the southern areas of the Great Plain, in Békés county, in recent years, but mainly in 2022. In Hungary, the drought is not an unprecedented event. The XI. and the XIX century, 30 extreme droughts were recorded. At that time, the water level of our biggest rivers dropped significantly, famine hit its head, and most of the livestock died. There were also drought damages in Békés county in the years before the 2022 drought. Based on the damage claims submitted by agricultural producers (Table 1), it can be seen that drought has been playing an increasingly important role in Békés County in recent years (Rákóczi, 2022)

Table 1: Number and area of reported drought damage in Békés County

Drought damager	Number	Area
	Year/Number	Year/ha
2018	14	190
2019	499	18 041
2020	702	26 634
2021	2 181	68 549
2022	7 179	203 922

The landscape-forming factors (topography, hydrography, vegetation, soils, climate, human activity) are in close interaction with each other. If one changes, the others will change (Szilassi, 2015). Changes in land use can trigger significant impact mechanisms and complex chain reactions in the landscape. For example, the growth of artificial areas at the expense of natural areas reduces infiltration, increases runoff and significantly changes the hydrodynamics of the area (Centeri et al., 2012).

### • Major land use changes

In terms of land use changes, the interventions of the 19th and 20th centuries were the most significant. With the industrialization of agriculture, there was an increasing demand for land. Areas previously flooded (see Figure 1) have been "exempted". By cutting off bends and ensuring a straight bed, the water regulations ensured rapid flow and runoff.



1. Figure: Map of puddles 1938 (Hydrographic Institute of the Royal Hungarian Ministry of Agriculture 1:600,000)

The XX. the structural transformation of agriculture, which gained ground in the 19th century, means a change in the use of the Territory. At that time, the structures of small holdings, in addition to collectivization, are transformed into large-scale farming structures. Mechanization is characterized by the compaction of the soil structure and thus the further reduction of infiltration (Tímár, et al., 2024) The XX. in the second half of the 20th century, with the change in the system, the lands were once again privately owned. Farming sizes have decreased (Levente, 2006).

Table 2: Main territorial changes are in Békés County

Year	Arable	Garden	Fruit	Grapes	Lawn	Forest	Reeds	Fishpond	Excavated area
1990	409,0	2,2	1,2	0,1	45,8	24,0	-	-	80,5
2000	391,0	6,1	1,3	0,2	42,9	12,6	1,4	3,2	81,7
2005	391,8	6,1	1,0	0,1	43,4	24,4	1,3	2,8	69,9
2010	376,1	5,1	0,9	0,1	29,3	25,3	1,0	2,1	95,0
2015	383,0	5,1	1,0	0,1	30,7	26,0	0,9	1,1	93,8

Water regulations and the spread of industrialized arable farming caused the areas to dry out. Prior to this, the declaration of forests confirmed this process. The amount of areas (lawn, reed pond) that would contribute to water retention and optimal evaporation is minimal. Together, these factors led to the degradation of the soil and the reduction of water retention and evaporation capacity.