

Extended Abstract

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Paper/Poster Title	Investigation of the sustainability and environmental protection ambitions of the irrigation development measure in Hungary
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Abstract	200 words max
<p>In Hungary, the share of irrigated land is low compared to developed EU countries and to regions with a strong agricultural tradition. As the increasing droughts of recent years and decades have led to a growing need for irrigation development of agricultural production. In the current Rural Development Programme, there is a special measure for the development of the water management sector, which provides sufficient funds to apply for and will continue to do so in the coming period. Document analysis of the current call for proposals and analysis of the business plans for tenders are carried out using a text mining method. Text mining, as part of data mining, is a field of computer science dealing with the processing and analysis of electronic text documents, which allows for the quantitative analysis of qualitative content (Tikk, 2007). The analysis shows that little attention is paid to sustainability and the preference for environmentally sound solutions. Our results suggest that policy makers should change the irrigation development measures accordingly.</p>	
Keywords	Irrigation development, Sustainable water economy, Rural Development Programme
JEL Code	Q01, Q25, Q18
Introduction	100 – 250 words
<p>Agriculture accounts for more than 40% of total freshwater use in the EU, although in some regions the freshwater use attains 80%. Most of the freshwater abstraction in Greece, Spain and Cyprus goes to agriculture (Rossi, 2019). In Hungarian agriculture, water abstraction for irrigation has decreased with significant fluctuations in the period 2012-2020 (EEA, 2021), while the national annual precipitation totals have varied between 407-740 mm (Figure 2), thus the necessity of irrigation has increased in recent years (OMSZ, 2021). The irrigated agricultural area in Hungary was only 1.62% in 2018, when the irrigated area varies between 2.71% and 33.7% the developed European countries with agricultural traditions (Worldbank, 2022). The agricultural area affected by drought and feasible for agricultural production with irrigation is about 800 thousand ha, but the existing water supply allows potentially to have only 320 thousand ha irrigable land and the existing irrigated land is below 100 thousand ha (AKI, 2021). There is a strong need to increase the uptake and efficiency of irrigation in Hungary, and at the same time to avoid causing environmental and ecological problems when developing the existing and new irrigation facilities. In the Hungarian Rural Development Programme there is a special measure to support development of water management and irrigation in agriculture. The aim of this paper is to</p>	

investigate the objectives of supported farmers if they have any environmental and ecological ambitions when developing their irrigation facilities.

Methodology

100 – 250 words

Data mining methods were applied to extract the commitments and actions undertaken in the business plan of grant application of the beneficiary holdings. Data mining aims at extracting latent information from imperfectly structured databases (Mészáros-Sebők, 2018). As part of data mining, text mining is a field of computer science dealing with the processing and analysis the electronic textual documents, in which qualitative content can be analysed quantitatively (Tikk, 2007). The databases available for the evaluation of the investigated rural development measure include financial data on applicants, the amounts of funding awarded, the focus areas of the RDP, payment claims, payments made and other relevant data. However, most of the documents submitted in the application process are available in text format, e.g. business plans, construction plans, technical data, etc.

The assessment of environmental and ecological ambitions of the identified activities related to irrigation investment can be found in the business plans and construction lots. For word sets compiled using the most common key words (descriptions of technical and construction data, technology, water use in the business plans), tokenised text was used to count the number of occurrences and the number of beneficiaries who wrote them in their application documentation.

Results

100 – 250 words

In the investigated measure of the Rural Development Programme 2014-2020 farmers are entitled to apply individually and in cooperation with other farmers, but only few joint application were submitted instead of the fact that irrigation development necessitate territorial coordination among farmers to access the water supply. The efficient and ecological use of the available water resources can be achieved if farmers wishing to irrigate use irrigation infrastructure jointly, in cooperation. According to the aim of the call for proposals of the development of the agricultural water management sector, the granted application should address one or more objectives as to promote water retention, sustainable management of water resources, the dissemination of efficient irrigation technologies, climate-resilient production methods and sustainable land use, support measures to restore and/or maintain surface and groundwater bodies to good quantitative status in order to ensure the security of agricultural production and adapt to climate change (VP, 2021; Irrigation Strategy, 2017). Economic policy measures have been taken to meet irrigation development needs and objectives, but such significant irrigation development objectives has to be implemented in a sustainable and environmentally responsible manner. Our data mining investigation reveals that these objectives are not explored, addressed and implemented in the granted applications.

Discussion and Conclusion

100 – 250 words

The measure for the development of the water management sector of the Rural Development Programme provides sufficient funds to apply for irrigation development individually and in cooperation, and it will continue in the next programming period. The more efficient use of the available water resources and a better return on investment can be achieved if farmers wishing to irrigate are applying cutting age irrigation technologies and use irrigation infrastructure jointly, in cooperation. The call pays little attention to sustainability and to the promotion of environmentally sound solutions. By feeding the results of this research back to decision-makers, greater account could be taken of sustainability objectives and environmental protection.