MAGYAR AGRÁR- ÉS ÉLETTUDOMÁNYI EGYETEM

THESIS

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SUMMARY OF THESIS

Thesis Title: Exploratory Land Use Suitability and Vulnerability for Eco-Scheme Participation with GIS

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The latest reforms in the European Union's Common Agricultural Policy (CAP) are instrumental to the European Green Deal (EGD) and Sustainable Development Goals (SDG). A novel aspect includes measures to incentivise farmers to implement environmentally friendly practices outlined in Eco-Schemes. Eco-Schemes are uniquely designed by Member States (MS) and contained in their National Strategic Plan (NSP). The Hungarian Ministry of Agriculture (NAK) designed their Eco-Scheme called Agro-Ökológiai Program (AÖP) around agricultural land use categories, namely, arable land, grasslands, and permanent crops. Hungarian farmers can choose from a list of practices to voluntary implement on their farm. The Hungarian Ministry of Agriculture (NAK), in collaboration with the National Land Centre (NLC) further designed a recommendation layout for farmers to choose which options of the Eco-Scheme practices are most suitable on their land based on three categories: Areas that are most vulnerable to soil, water and biodiversity degradation.

This study aimed to explore farmers' perception on the changes in the new CAP (2023-2027) and their decision making to select Eco-Scheme practice options. The area of research included three settlements in proximity of the Hungarian University of Agriculture and Life Sciences. Land suitability analysis for agricultural usage was incorporated into the study as a factor that farmers consider when selecting an Eco-Scheme option. Farmers must consider multiple factors when deciding how to participate in Eco - Schemes. GIS was used to aggregating the information available for consideration to select implementation practices of the Eco-Scheme. Then, two structured interviews with farmers in the sample area were conducted to obtain their feedback and perception. A list of interview questions together with the agricultural land use suitability classification, vulnerability categories and land use areas were presented to two

farmers in a structured interview. Their feedback was discussed in comparison with each other as well as compared to the literature findings. This exploratory study cannot demand firm conclusions from the results obtained. Therefore, important factors noticed during the study area highlighted and could possibly guide themes to consider for future research endeavours.

The suitability analysis was performed considering climate, topography, and soil factors with a weighted overlay technique in QGIS. The weights were determined using the Analytical Hierarchy Process (AHP). Soil has the highest weight, followed by slope and precipitation. The results of the land suitability analysis for agricultural use indicate that most of the study area is suitable or moderately suitable for agricultural land use. Results of the aggregated information to consider for Eco-Scheme consideration is depicted in cartographic format. Farmers' feedback was positive about the results of the suitability analysis, but they highlighted the importance of precipitation for the study area.

There were common themes echoed in the interviews that were reflected in the literature. The support provided by the CAP are important for the viability of farmers' operation. However, it is possible that a complexity in the CAP could be difficult for farmers considering the administrative burden. The motivations and decision process for participation in Eco-Schemes are likely very diverse among farmers. Furthermore, it is important to calibrate agricultural suitability analysis to the area investigated. There is an indication that land management challenges are different in proximity to urban areas. Environmental challenges are important in the literature and for the farmers interviewed with special reference to decreased precipitation and fluctuating temperatures.

Limitations to the study include the small number of farmers interviewed and few input factors for the suitability analysis. The findings of the respective research proved the usefulness of GIS for aggregating information and decision-making for farmers, governmental institutions, policy makers or any person involved in agriculture or land management. Additionally, the cartographic result of GIS is a useful prompt for in-depth discussions with individuals that have expert knowledge on an area investigated.

The findings of the exploratory research could be helpful for considering future research themes or areas of investigation for scholars, policy makers or government institutions. Additionally, the farmers interviewed gained further understanding of the Hungarian Agro-Ökológiai Program (AÖP) and were directed to the NAK interface for participation information.