



## PROTECTIVE SHELTERBELTS AS A MEASURE TO MITIGATE THE EFFECTS OF CLIMATE CHANGE IN PERI-URBAN AREAS

**HUNOR VASS<sup>1</sup>, TEODOR MATEOC-SÎRB<sup>2</sup>, NICOLETA MATEOC-SÎRB<sup>2,3\*</sup>**

<sup>1</sup> University of Life Sciences "King Mihai I" from Timișoara, Doctoral School "Engineering of Vegetable and Animal Resources"

<sup>2</sup> University of Life Sciences "King Mihai I" from Timișoara, Faculty of Management and Rural Tourism, Department Management and Rural Development

<sup>3</sup> Romanian Academy - Branch of Timisoara, Research Center for Sustainable Rural Development of Romania

**Abstract:** Climate change and pollution represent major challenges of contemporary society, manifested by increasing temperatures, changing precipitation patterns and intensifying extreme weather phenomena. The main sources of pollution identified are road traffic, residential heating and industrial and agricultural activities, with significant impact on air, soil and water quality. In this context, planting protective curtains is proposed as an effective measure to mitigate climate effects and reduce pollution, contributing to stabilizing the microclimate, reducing erosion and increasing the ecological resilience of the Timișoara periurban space.

### • Introduction

Climate change represents one of the greatest challenges facing contemporary society, manifesting itself through rising temperatures, changes in precipitation patterns, and the intensification of extreme weather phenomena, such as droughts, storms, and heat waves.

Planting protective curtains in peri-urban areas is an essential measure for increasing climate resilience, protecting ecosystems and promoting sustainable development of rural and urban environments.

Through these multiple benefits, they become an important tool in adapting to climate change and promoting sustainable agriculture.

### • Material and method

This study adopts a mixed, quantitative and qualitative approach to analyze the dynamics of climate change and pollution in the periurban area of Timișoara, as well as to evaluate the role of protective curtains as a measure to mitigate climate effects.

Pentru evaluarea presiunilor antropice, au fost analizate date privind evoluția demografică, extinderea suprafețelor construite și intensificarea traficului rutier în localitățile periurbane ale Timișoarei

### • Results and discussions

The periurban area of Timișoara is one of the most dynamic urban regions in western Romania. Analysis of climate data from the last three decades highlights a constant increase in average annual temperatures in the Timișoara area. The periurban area of Timișoara has become an important logistics and industrial center. The platforms in: Freidorf, Calea Șagului, Ghiroda, Calea Buziașului, Airport generate heavy traffic and additional emissions of air pollutants. European studies show that long-term exposure to PM10, PM2.5 and NO<sub>x</sub> is associated with: increased cardiovascular risk; chronic respiratory diseases; asthma; increased premature mortality. An important measure of adaptation to climate change in the periurban area of Timișoara is the implementation of forest protection curtains.

### • Conclusions

To reduce the impact of climate change and pollution in the peri-urban area of Timișoara, integrated measures are necessary such as: expanding metropolitan public transport, developing bicycle infrastructure, creating peri-urban green belts, limiting uncontrolled urban expansion, continuous monitoring of air quality; energy efficiency of buildings, use of renewable energy sources.