



Geographic Information System-Driven Decision Support System for Assessing Multiple Hazards in Post-Mining

Bouaziz Moncef^{1,#}, Haske Benjamin², Al Heib Marwan³, Benndorf Joerg¹

¹ Institute for Mine Surveying and Geodesy, Freiberg University of Technology, 09599 Freiberg, Germany, Moncef.bouaziz1@mabb.tu-freiberg.de

² Research Center of Post-Mining, Technische Hochschule Georg Agricola University, 44787 Bochum, Germany, Benjamin.Haske@thga.de

³ The French National Institute for Industrial Environment and Risks, Rue Jacques Taffanel, 60550 Verneuil-en-Halatte, France Marwan.ALHEIB@ineris.fr

Introduction

Mining regions face multiple post-mining, natural and technology hazards after closer mines. This paper presents a Geographical Information System (GIS)-based Decision Support System (DSS), as part of the European research project titled "POst-mining Multi-Hazards Multi-Assessment for Land-Planning (POMHAZ)". The objective of the GIS-DSS tool to help stakeholders to better manage the post-mining regions.

Data and Method

Utilizing predominantly open-source tools like PostgreSQL, Geoserver, Leaflet and Python-Libraries, the DSS aims to tackle the intricate challenges posed by post-mining hazards in European coal mining regions. Its primary objective is to furnish a functional web-based tool tailored for EU administrative units, ensuring a comprehensive evaluation of various hazards that impact their territories.

In the context of post-mining landscapes, conventional environmental policies often encounter challenges due to the lack of operational and accessible tools. The proposed DSS seeks to bridge this gap by catering to a diverse potential user base, including citizens, scholars, associations, and various decision makers.

Results

The DSS streamlines the acquisition, management, and processing of both static and dynamic data, providing web-accessible data visualization.

Customized for post-mining multi-hazards, this tool contributes to enhanced decision-making by generating data, statistics, reports, and maps for various EU areas of interest.

Conclusion

This paper showcases the practical application of a spatial GIS-DSS with sample data reflecting the potential threat posed by closed mining structures offering valuable insights to address the challenges associated with post-mining hazards.

Keywords

Multi-hazard, Post-mining, Assessment, DSS, GIS