ROMÂNIA
MINISTERUL EDUCAȚIEI ȘI CERCETĂRII
UNIVERSITATEA „VASILE ALECSANDRI" DIN BACĂU
Calea Mărăşeşti, Nr. 157, Bacău, 600115
Tel. +40-234-542411, fax +40-234-545753
www.ub.ro; e-mail:rector@ub.ro

A. SUMMARY

The habilitation thesis, titled "***STUDIES AND RESEARCH ON THE MONITORING OF ENVIRONMENTAL FACTORS***" provides an overview of my professional, scientific, and academic activities during the period following my doctoral internship, PhD thesis defense, and the attainment of the scientific title of Doctor (2008-2011-2024).

Structured into three parts, the thesis reflects both the accumulated experience and the primary scientific contributions, as well as the specific directions of my academic career. The content aligns with national and European priority research areas within the field of Environmental Engineering. This is evidenced by the publication of over 70 scientific articles: 35 papers indexed in the Scopus database and additional papers indexed in various databases associated with different journals. Furthermore, the work includes 11 articles published in ISI-listed proceedings, 22 scientific articles in BDI-listed journals, and multiple articles presented at international conferences and scientific events.

Another significant aspect of my research activity involves participation as a member in more than 30 research projects focusing on Environmental Engineering topics. These projects have addressed issues such as the classification of noxious and noise emissions from industrial activities, the determination of the composition of residual, biodegradable, and recyclable waste in Bacau County, environmental impact assessments of industrial activities, the treatment of municipal and industrial sludge, and wastewater treatment.

The knowledge and skills acquired during my doctoral internship served as a foundation for future research directions, which I developed after obtaining my PhD. In recent years, my research has taken an interdisciplinary approach, integrating various fields that I have explored throughout my teaching and research career.

The second part of the habilitation thesis focuses on a detailed analysis of the relevant results obtained in research activities, highlighting key aspects related to water, air, and soil pollution, as well as complementary studies in the field of environmental protection.

Regarding water pollution, extensive studies have been conducted on the quality of groundwater, surface water, and treated water to determine the presence of chemical and biological contaminants and their sources. Particular attention has been given to the influence of anthropogenic activities on aquatic ecosystems and the methods by which water quality can be improved. Additionally, modern filtration technologies have been investigated to optimize water treatment processes and ensure more efficient water resource management.

Research on air pollution has focused on assessing air quality parameters in different environments: indoor, urban, and industrial. In enclosed spaces, the impact of pollutants on human health has been analyzed, while in urban and industrial environments, emphasis has been placed on monitoring emissions from traffic and technological processes. The results obtained have helped shape strategies for reducing air pollution and improving air quality.

Another significant aspect of the research concerns soil pollution, where the sources and factors contributing to its degradation have been analyzed. The studies addressed pollution caused by agriculture and industry, as well as remediation solutions that can help protect ecosystems and maintain soil fertility.

Beyond these essential areas, other relevant studies have been conducted in the field of environmental protection. Research on urban mobility has examined the impact of transportation on the environment and ways to optimize it to reduce pollutant emissions. At the same time, studies on waste management have explored recycling strategies and sustainable management, laying the groundwork for effective solutions to reduce waste volume and promote material reuse.

This section of the thesis reflects the complexity and breadth of the research conducted, offering an integrated perspective on environmental challenges and the innovative solutions proposed to protect natural resources and improve quality of life.

The third section outlines my professional, scientific, and academic career development plan, which focuses on exploring new research directions of international interest, analyzing and assessing environmental vulnerability and adaptation to climate change, and developing environmental monitoring systems incorporating statistical and mathematical tools. Future

research efforts will build upon established results, with findings disseminated through publications in journals, scientific conferences, and academic events.

My university teaching career began immediately after completing my undergraduate studies in the Engineering and Environmental Protection in Industry program (2002-2007). From 2007 to 2009, I pursued a Master's degree in "Optimization of Equipment and Processes in the Food Industry" at the “Vasile Alecsandri” University of Bacau, Faculty of Engineering. In 2008, I commenced my PhD studies in Mechanical Engineering under the supervision of Prof. Ph.D. Eng. Valentin NEDEFF, including an external mobility internship at the Polytechnic University of Turin, Department of Environmental Engineering, Territory and Infrastructure, Italy, where I studied industrial noise monitoring and mitigation techniques.

My PhD research culminated in the public defense of my dissertation, " Studies and Research on the Possibilities of Improving Water Quality for Different Types of Requirements," at "Vasile Alecsandri" University of Bacau in 2011.

I began my academic career as a substitute university lecturer in the Department of Environmental and Mechanical Engineering and later progressed through the roles of lecturer, university assistant, senior lecturer, and currently, associate professor. My teaching activities have been supplemented by the publication of eight books and book chapters.

The impact of my scientific research is demonstrated by the publication of over 70 scientific articles in specialized journals and significant scientific event proceedings within the Environmental Engineering domain, showcasing my ability to synthesize and conduct research activities.

Future teaching activities will focus on integrating the latest developments in the field, continuously updating course content to enhance educational quality, and diversifying teaching methods through collaborative creativity. This will involve actively engaging students using discovery-based learning techniques.

My professional and scientific activities will aim to further advance Environmental Engineering, establish new collaborations with socio-economic partners, and enhance international recognition in the field.