ECOLOGICAL RECONSTRUCTION POLLUTED INDUSTRIAL SITES

Habilitation Thesis

Summary

The current habilitation thesis, entitled "Ecological reconstruction POLLUTED INDUSTRIAL SITES" includes, in summary, the results of the activities regarding teaching, training and research of the author, since obtaining a PhD in Forestry, with the thesis: "Cercetări privind influenţa condiţiilor geomorfologice şi meteorologice asupra proceselor poluante în depresiunea Baia Mare"/"Research Regarding the Influence of the Geomorphologic and Meteorological Conditions on the Pollutant Processes in the Baia Mare Depression", within the University "Transilvania" of Brasov, awarded by the Ministry of Education and Research Order no. 4802 / 15.08.2005.

The relevance and originality of the habilitation thesis consists in combining multidisciplinary research conducted in the field of ecological restoration of polluted industrial sites. These researches are well anchored in the concept of sustainable development, a concept understood as a necessity for the future socio-economic crisis.

A. Among the educational activities of the author, the following are being presented: holder of five specialty courses (General and Applied Ecology, Technology and equipment for soil remediation, environmental management and license-level protection and soil remediation, environmental compartments Management master level) in Technical University of Cluj-Napoca, Faculty of Engineering; responsible for a postgraduate course; upgrading laboratory for research on soil protection and pollution; organizing symposions, workshops, student contests; research organization with students and master; coordinating students / master-level students in drafting license / dissertation; writing and publishing specialized books, textbooks, laboratory etc.; collaboration in implementation and coordination of the site results of student activity.

B. The achievements regarding both research and professional activities of the author are reflected in the patents, international research projects, contracts with various partners in the socio-economic organization of scientifc events (conferences, workshops), articles published in journals, scientific papers in international and national conferences indexed in ISI or BDI databases, books and chapters in books, membership of the national and international professional associations (SNRSS, AGIR, RSR), reviewer, scientific coordinator, editor- chief of journals indexed in international databases (Scientific Bulletin of North University Centre of Baia Mare, Series D Mining Mineral Processing Non-ferrous Metallurgy, Geology and Environmental Engineering).

The current thesis of habilitation presents thematic, multidisciplinary directions, developed by the author, actualized and in perspective within the scope of protection and enhancement of the natural environment in general, namely the ecological restoration of polluted sites industry in particular, the aim being the fact that these sites can be safely introduced in an economic ecological circuit. These thematic research directions were grouped as follows:

1. Research on the application of phitoremediation for the remediation of sites contaminated with heavy metals. In the research conducted, applicability of phitoremediation to rehabilitate contaminated mining sites in Romania was investigated from two perspectives: as technology and the socio-politico-economic impact. Research results so far suggest, for instance, that the lake Bozânta - pond which has undergone ecological accident on 30 January 2000 and had a significant negative impact on human communities nationwide and international is recommended plantation- six woody species, four of which are spontaneous local flora. Starting from the working process and the technology implemented on this site, technologically detailed phases had been designed for the implementation process of phitoremediation, so as to be a low risk that heavy metals present in the tailings enter the food chains of nearby human communities . Other results of applied research on the evolution of heavy metal contaminated sites that have been decontaminated in a given context of knowledge, application possibilities and funds available include site "Meda dump" - dump ecologically rehabilitated in 2002-2004 and dumps within EM Herja currently under monitored natural attenuation process.

2. Research on the regenerative capacity of sites polluted by petroleum products. The purpose of this research Romania-Ukraine border, was to detailed knowledge of the evolution of sites contaminated with petroleum products held by the temperate climate zone. Deciphering how the interaction, and the method of aggregation of oil pollutants residual in the unsaturated soil at different depths, have steered us in deciphering the processes pedoevolutive of a polluted soil and application of modern methods, less aggressive environmental regeneration . I believe that these soils are important not only scientifically but also because in time, they are forming new habitats and can provide new conceptual models, as we know, behind the creation of technologies hitherto unsuspected. Research results to date have been included in a database specialist part of our data needed to design the most effective remediation techniques.

3. Research on the use of infrared radiation with higher wavelength in agriculture and health. Within these researches, several original research methods were developed, a significant result being to obtain a patent. Place of applied research were laboratories of the faculty and later greenhouses classical type "Prinz-Dokkum." The research covered the following areas: microclimate ambient, namely: air temperature and soil humidity and its load microbiological ventilation space culture; overall monitoring of greenhouse perceived as an ecosystem semiartificial, namely: exhibition from the sun, structural, water sources and techniques of watering, spontaneous flora, fauna specific soil pests ratings percentage of the number of seeds germinated and vigor seedlings, assessments phases of growth and development of plants; regular biometric measurements from the stage of seed germination to harvesting and dissolution culture. they have also been proposed and carried out a wide range of research in the laboratories of the faculty.

According to research made by the author, the work team formed laboratories developed strategic and institutional framework, candidate aims, as was pointed out above, further research directions as follows:

1. research on ecological rehabilitation of polluted industrial sites; Structural issues are concerned, physiological monitoring, integrated foundation for adequate implementation of modern technologies in agro-forestry, fertilization plans, etc.;
2. innovative research on soil remediation technologies, in line with current knowledge and taking full regional practice: way of Pouant residual behavior in the unsaturated zone of the mountain of earth, soil pedodevelopment of historically polluted sites, pedorhythms of soils, imported dumps and mining areas, integrated monitoring soil-vegetation-climate etc .;
3. advanced research on the behavior of some plant species of spontaneous environments polluted industrial sites in conservation, rehabilitation sites etc. to deciphering response mechanisms still poorly understood but necessary for the development of sustainable technologies of rehabilitation in the context of dynamic planetary climate change and socio-economic.

These evolution plans and development are based on a detailed knowledge, long-term framework physical-geographical and vegetation Depression Baia Mare, respectively Baia Mare's Mining Basin as a whole territorial extremely complex, with peculiarities and problems environmental conditions.

Future concerns regarding research and professional development would therefore be a natural continuation of those so far, opening to new research themes and researchers. For the full realization of the development plans proposed will be implemented effectively doctoral school requirements without neglecting the requirements of doctoral students that I want so much to introduce them into the secrets of advanced scientific research.

The mode of action by which the candidate seeks professional development, academic and scientific relies on a set of values that have been passed down over time by his professors trainers, and team work, family, people who accompanied her over the lifetime by example of labor discipline, professional excellence, consistency, openness to new communication, feedback, teamwork, thanks the people who in this way.