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## CONTENT

Tulbure I., Berca M., 2020 Assessing environmental impacts of energy supply systems. *Ecoterra* 17(2):1-11.

Robin, Supriyono E., Nirmala K., Jusadi D., 2020 The effectivity of using humic acid and fulvic acid from quickstick (*Gliricidia sepium*) compost to slow down lead (Pb) accumulation in red tilapia (*Oreochromis* sp.) cultivated in ex-tin mine waters. *Ecoterra* 17(2):12-26.

Chinasho A., Balcha D., 2020 Controversial on biodiversity and carbon sequestration: implication for biodiversity conservation. *Ecoterra* 17(2):27-34.

Jackovics P., 2020 Deployability of international medical teams for disaster response. *Ecoterra* 17(2):35-39.



## EDITORIAL FOREWARD

ECOTERRA Journal of Environmental Research and Protection was developed with the aim of responding to the growing needs of environmental specialists, now widely recognized in the scientific media. It is a quarterly journal, edited since 2004, with the clearly stated mission of fostering the communication and dissemination of interesting results among researchers and practitioners from a wide range of scientific areas, such as earth sciences, environmental protection, risk assessment, disaster management and so on.

ECOTERRA Journal of Environmental Research and Protection includes high-quality researches in the fields of engineering sciences, earth sciences, biotechnologies, environmental protection, notes on national and international scientific events, books or articles reviews and synthesis papers in the specific fields of the journal.

This issue of ECOTERRA journal is published under the aegis of The National Society of Environmental Science and Engineering (SNSIM), together with S.C. I.C.P.E. BISTRIȚA S.A. (Institute for Research and Development in Technologies and Equipments for Environmental Protection Bistrița), and the Faculty of Environmental Sciences and Engineering, University „Babeș-Bolyai” of Cluj-Napoca. SNSIM is a professional association of experts from academic and research institutes having specific activities in the field of environmental science and engineering. Its mission is to develop and promote the professional interests of their members, within a national and international context and to contribute to the development of the environmental science and engineering field in science and research.

Given the high interest of scientists and the variety of submissions, ECOTERRA has taken an initiative to become a peer-reviewed journal, having the articles published on its webpage. Thus, the research results will be accessible via the Internet for immediate worldwide, serving the best interests of the scientific community.

This new issue comprises diverse and original research from a broad spectrum of areas as varied as best available technology, natural gas extraction, atmospheric risks, waste management, energy efficiency, water purification, integrated environmental marketing, risk communication and equipments for environmental protection.

We are very thankful to the scientists and institutions that have contributed to the past history and, we hope, to the future development of this journal. This issue would not have been possible without the support of the editorial board members and the authors. We continue to welcome article submission in all fields of environmental science and engineering that will further stimulate research in these areas.

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