

Sustainable engineering: environmental and health studies

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Esteemed readers,

We are pleased to present in this issue of the Revista Brasileira de Ciência, Tecnologia e Inovação (RBCTI) a selection of innovative studies from the Graduate Program in Sanitary and Environmental Engineering at the State University of the Midwest (Unicentro), Irati, Paraná, Brazil. The articles address crucial issues related to the quality of life of recyclable material collectors, the potability of water in alternative supply sources, the impact of sidewalk afforestation, models for estimating water infiltration in the soil, the effects of using sewage treatment plant waste in soybean cultivation, ecotoxicological evaluation of wood industry effluents and analysis of the quality of water in springs recovered using the soil-cement technique.

The article by Almeida *et al.* (2023) "**Analysis of quality of life of recyclable-material scavengers during the COVID-19 pandemic**" provides data on the quality of life of waste pickers in Ponta Grossa-PR during the COVID-19 pandemic and highlights the importance of understanding the challenges faced by these professionals. Working conditions, combined with physical and psychosocial risks, have a significant impact on the quality of life of these workers. The results indicate that, even during adversity, overall quality of life was moderately positive, with specific areas, such as the environment and social relationships, deserving attention for the implementation of more targeted interventions and psychosocial treatments.

The research by Manzatto *et al.* (2023) "**Water from alternative supply sources in Paraná State: potability and map of vulnerable groups**" deals with the potability of water in alternative supply sources in the 4th Health Region of Paraná, bringing to light significant challenges. Among the municipalities evaluated, the occurrence of errors in registration and the variation in water quality are highlighted. The cluster analysis reveals that rural areas and traditional communities are more vulnerable, highlighting the need for specific interventions to guarantee safe water for these populations.

The study by Francisco *et al.* (2023) "**Changes in the provision of ecosystem services based on sidewalk tree-composition scenarios**" shows that the ecosystem services offered by sidewalk tree planting in Irati and Curitiba is a valuable contribution to sustainable urban planning. By testing different floristic composition scenarios, the researchers identified that the choice of tree species plays a crucial role in maximizing ecosystem services, highlighting the importance of conscious decisions in urban afforestation.

The research by Florentino *et al.* (2023) "**Assessing Horton and Kostiaikov models focused on estimating soil water infiltration**" seeks to estimate soil water infiltration provides valuable information for soil and water conservation. The results highlight the need to consider the specific characteristics of the soil and the limitations of the models when interpreting infiltration data. An interdisciplinary approach between soil hydrology and modeling is essential to properly understand and manage this vital process.

The research by Kummer *et al.* (2023) "**Waste from sewage treatment plants used in soybean cultivation: its influence on crop development**" presents the use of composted sewage sludge (CSW) and treated sewage effluent in soybean cultivation offers an innovative perspective on sustainable agricultural practices. The results indicate that replacing conventional nitrogen fertilization with LEC can be a viable strategy, saving on inputs while maintaining the healthy development of the crop. Irrigation with treated sewage effluent also showed significant improvements in soybean growth parameters.

The article by Gavlav, Vidal and Souza (2023) "**Ecotoxicological assessment of timber-industry wastewater based on bioassays conducted with lettuce seeds (*Lactuca sativa L.*)**" focuses on the ecotoxicological evaluation of wood industry effluent and highlights the importance of understanding the environmental impacts associated with this activity. Using bioassays with lettuce seeds, the results indicate a significant inhibition in seed germination and a marked increase in radicle growth at higher concentrations of the effluent. This innovative approach offers an effective and affordable way of assessing environmental impacts.

Finally, the study by Mallet *et al.* (2023) "**Water quality analysis based on the presence of aquatic macroinvertebrates applied to water springs covered with soil-cement technique**" highlights the water quality of springs recovered with the soil-cement technique highlights the effectiveness of this approach for the conservation of aquatic ecosystems. The analysis of aquatic macroinvertebrates reveals the differentiated response of these organisms to environmental factors, emphasizing the importance of sustainable and preventive practices in the preservation of water resources.

These studies represent a collective effort by researchers committed to addressing complex and urgent issues related to sanitary and environmental engineering. By uniting different disciplines, this research contributes not only to the advancement of scientific knowledge, but also to the search for practical and sustainable solutions to the challenges faced by communities and ecosystems. We thank the researchers for their significant contributions and hope that these studies will inspire future research and actions that promote a healthier and more sustainable environment.

Regards

The Editors

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