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Applications of technology and innovation for a sustainable future

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Applications of technology and innovation for a sustainable future



Sustainable future depends on ways in which we keep upgrading our living style. The goals and targets set by Sustainable Development Goals will definitely help us to protect all types of ecosystems and their biodiversity. Still, much more complementary advances in technology and innovation and their applications are essential in realizing a sustainable future. The aims and scope of Environmental Technology & Innovation is well geared to contribute to such ambition. Thus, this virtual special issue (VSI) contains 23 articles from the presentations made at the international conference on the Challenges in Environmental Science and Engineering, CESE-2021. A brief description of the topics and the articles in this VSI are given below.

There are seven articles which discuss about innovative technologies to recover resources and treat pollutants. Three articles are related to the utilization of alginate in adsorption leading to treatment and recovery of various chemical species. One article describes the rapid adsorption of per- and poly-fluoroalkyl substances (PFAS) by *Moringa oleifera* seed powder encapsulated in alginate beads (Militao et al., 2022). Another article explores the application of polyethyleneimine functionalized alginate composite fiber for fast recovery of gold from acidic aqueous solutions (Dangi et al., 2022). The third article investigates the poly(vinyl alcohol) and alginate cross-linked hydrogels for cesium adsorption from water (Chang et al., 2022a). The fourth article investigates the reuse of aluminum-based water treatment sludge for phosphorus adsorption (Nguyen et al., 2022). Three articles investigate resource recovery under different circumstances. One article investigates the recovery of biomethane from a submerged anaerobic membrane bioreactor treating domestic wastewater blended with semi-solid organic wastes discharged from residential establishments (Gautam et al., 2022); another explores the possibility of recovering potash from potassium rich wastewater and biomethanated distillery effluent using tartaric acid as a recyclable precipitant (Khatri and Garg, 2022) and the third article explores the recovery of water and valuable metals using low pressure nanofiltration and sequential adsorption from acid mine drainage (Fonseka et al., 2022). The eighth and the ninth articles also can be included in this group as they discuss about the production of 5-hydroxymethylfurfural (primarily being used in the food industry) from glucose by recyclable heteropolyacid catalyst in ionic liquid (Chang et al., 2022b) and drip fertigation with treated municipal wastewater and soil amendment with composted sewage sludge for sustainable protein-rich rice cultivation (Ouoba et al., 2022).

Three articles explore the role of biochar for sustainable environmental systems. One of those investigates the impact of biochar along with fertilizers and cultivation type on environmentally persistent free radicals in agricultural soil (Baltreinaite-Gediene et al., 2022). Other two are exploring different types of biochar that are used to treat various chemical species. One article uses a novel chitosan modified magnesium impregnated corn straw biochar for ammonium and phosphate removal from simulated livestock wastewater (Li et al., 2022) and the other investigates the use of industrially manufactured sawdust and paddy husk derived biochar for the removal of Cu, Pb and Zn from stormwater (Wijeyawardana et al., 2022).

Six articles are on various treatment of different pollutants. They are: (i) Oxidative treatment of bisphenol A by Fe(VI) and Fe(VI)/H₂O₂ (Widhiastuti et al., 2022); (ii) Denitrification by a mesh rotating biological reactor treating municipal wastewater (Maheepala et al., 2022); (iii) Iron oxide-modified pervious concrete filter for lead removal from wastewater (Krishnan et al., 2022); (iv) Flowform cascade with constructed wetland to enhance domestic wastewater treatment (Ung et al., 2022); (v) Formation of phosphine and its effect on phosphorus retention in constructed wetlands (Wang et al., 2022) and (vi) Investigation of sludge dewatering efficiency in the thermal-hydrolysis reactor at various physical operational factors (Im et al., 2022).

Three more articles investigate carbon nanotube production from waste biodegradable plastic catalytic pyrolysis (Prabu and Chiang, 2022), nanofiltration membrane with functionalized MoS₂ nanosheets (Mallya et al., 2022) and in-situ radical graft modification of nanofiltration membrane (NF270) (Lin et al., 2022). Impacts of highly active Ni-Mg-Al Ni-Mg-Al catalyst, enhancing the membrane performance/fouling resistance, effects of water salinity and fouling types are investigated respectively in those articles.

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Two more articles are on utilizing the construction of a spatial–temporal metabolic path for hazardous waste management (Zhan et al., 2022) and comparing spatial interpolation methods for distribution map of an unmanned surface vehicle data for chlorophyll-a monitoring in the stream (Kim et al., 2022). Thus, the articles provide variety of topics relevant to the scope and aims of the journal.

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