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Recovery of Phosphorus from Wastewater Using Raw Materials

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Abstract

"Recovery of phosphorus from wastewater using raw materials involves extracting this vital nutrient from wastewater streams through sustainable, cost-effective methods. By utilizing natural materials like biochar, industrial by-products, or algae, phosphorus can be efficiently captured and recycled. This process helps reduce environmental pollution, prevent nutrient imbalances in water bodies, and create a valuable resource for agricultural fertilizers. It supports the circular economy by reusing resources and mitigating the depletion of phosphorus, a finite and essential element for plant growth. Thus, the study focused on the Recovery of Phosphorus from Wastewater using raw materials, holds immense significance in the realm of agricultural and environmental sustainability. The recovery process of phosphorus from wastewater, employing raw materials, is vital due to phosphorus being an indispensable macronutrient crucial for plant growth. Given that phosphorus is irreplaceable and a finite resource, the current trend towards recycling the phosphorus present in wastewater is gaining momentum. This initiative involves the extraction and separation of phosphates from potentially harmful substances, aiming to contribute to resource efficiency and environmental protection. Notably, approximately 80 percent of the world's phosphorus reserves are derived from phosphate rock, mainly consumed in the agricultural sector for fertilizer production—a sector integral to the economy, especially in developing countries like Ethiopia. As natural phosphorus deposits deplete, the exploration of alternative sources such as biological waste becomes imperative for sustainable phosphorus management.

Keywords: *Phosphorus removal, Raw materials, Wastewater*

Recent Publications: Minimum 3 publications to be included (Not mandatory)

1. Jatani Bonaya Godana, Sisay Demeku Derib (Phd), 2024, Evaluation of Traditional Water Lifting and Modern Water Lifting Technology: A Case of Tula Sallan of Borana, Southern Ethiopia, INTERNATIONAL JOURNAL OF ENGINEERING RESEARCH & TECHNOLOGY (IJERT) Volume 13, Issue 12 (December 2024),
2. Godana, J. B., and S. D. Derib. "Traditional groundwater exploration method for pastoralist community water supply system in semi-arid region of Ethiopia: case of Tula Sallan Borana, Southern Ethiopia." *International Journal of Environmental Science and Technology* (2022): 1-12.
3. Godana JB, Derib SD. Assessment of Indigenous Water Management System: A Case Study of Borana Community, Southern Ethiopia. Journal of Civil E Environmental Engineering. 2021; 11(1).

Biography

This Jatani Bonaya. Jatani is the Founder and Executive Director of Daayyaa Generation Network (DGN) and an instructor at Dilla University, Ethiopia. With degrees in Water Supply and Sanitary Engineering and Project Management, Jatani is deeply committed to climate advocacy and sustainable development. As a member of YOUNGO and Global Youth Advisor for the Global Agenda for Sustainable Livestock (GASL), he champions youth inclusion and environmental defense. A Borana indigenous community member, Jatani has over 10 years of voluntary service in pastoralist communities, focusing on peace-building and human rights. He has authored three books addressing social issues and driving change. Recognized with an award from IGAD for his impactful work, Jatani has participated in global forums and summits, from Ethiopia to Turkey, South Africa, UAE, Indonesia, Russia, Germany and Poland advocating for WASH, Education, Renewable Energy and climate solutions. He is currently a UNESCO/Poland Engineering Fellow at AGH University of Science and Technology, Krakow, Poland.

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