CARE 4BIO

Horizon Europe Brokerage Event
Cluster 6 Calls 2024

Brussels , 26 September 2023

Advanced green technologies in decentralised water and wastewater treatment (AdvWat)

Prof. PhD. Claudia-Maria SIMONESCU

National University of Science and Technology
POLITEHNICA Bucharest, ROMANIA

This project has received funding from the European Union's Horizon Europe research and innovation programme, under Grant Agreement No 101059839

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the granting authority can be held responsible for them.

Topic addressed :

- **HORIZON-CL6-2024-CircBio-02-4-two-stage: New circular solutions and decentralised approaches for water and wastewater management**

Other topic of interest:

- HORIZON-CL6-2024-ZEROPOLLUTION-01-2: Best available techniques to recovering or recycle fertilising products from secondary raw materials

Project idea

- To demonstrate the benefits of decentralised approaches and to propose new circular solutions for water and wastewater treatment in Central and South-East Europe in order to achieve sustainable and circular management of water resources, as well as prevention and removal of pollution.

- Integrated technological and management solutions for wastewater treatment, treated wastewater reuse for irrigation, and to produce compost that can be used as fertilizer will be developed.

Project idea

- Advanced green technologies (AGTs) based on vermifiltration coupled with aquatic macrophyte will be used to **provide high -end products (compost)** without compromising environmental sustainability.

- **POLITEHNICA Bucharest** will be involved in lab scale development of the innovative technologies for wastewater treatment and use them in real systems; the development of guidelines for decentralized wastewater treatment systems and for reuse of treated substances

Economically viable
The setup requires minimum energy only for pumping of wastewater and does not involve any other mechanical devices. It incorporates locally available raw materials as.

Decentralized
It combines the primary and secondary treatment units into one unit and is well established for the on-site treatment of various kinds of wastewater.

Socially acceptable
Earthworms are being used for sustainable agricultural practices since ages and their effectiveness helps in the improvement of soil conditions and crop productivity.

High value end products
Vermiwash and vermicompost are rich in nutrients to make it bioavailable to plants and thus indicates its potential to be used for irrigation and agricultural purposes.

Ecologically sustainable
Vermifiltration strives to meet society's needs of treated water and decentralised wastewater management. It is a zero waste technology which promotes circular economy and SDG 6.3.

Odor free
No odor is produced during the treatment as it is an aerobic technology and no sludge formation takes place. Therefore this emits the need of excess sludge treatment and its disposal costs.

No clogging
Due to the continuous burrowing action of earthworms, no clogging is observed which results in the smooth working of the vermifilter.

Adapted after S. Arora, S. Saraswat, Vermifiltration as a natural, sustainable and green technology for environmental remediation: A new paradigm for wastewater treatment process, Curr. Res. Green Sustain. Chem. 4 (2021) 100061.

Main expertise offered

- The research team is a research group of UPB4H POLITEHNICA Orizont Support Center developed in the project "POLITEHNICA Orizont Support Center – activities and expenses Export Component 12020", acronym UPB4H, MySMIS 108792 (http://upb4h.upb.ro/en/).

- They are also academic staff from Faculty of Chemical Engineering and Biotechnologies with achievements and international reputation in engineering, environmental protection and engineering, water and wastewater treatment and management, biogas production, composting, sustainable development. (https://chimie.upb.ro/en/departamente/chimie-analitica-si-ingineria-mediului/).

Main expertise sought

- Role in project: partner

- The requirements for additional partner(s):

- ❑ To apply advanced green technologies for the treatment of wastewater at pilot and demo sites in different environments and local conditions in Central and South-East Europe;
- ❑ To establish the conditions to improve the treatment efficiency, and to provide high-end products;
- ❑ To test these technologies for domestic and industrial applications;
- ❑ To perform Life cycle sustainability assessment of advanced treatment techniques to identify the sustainable solutions for sustainable and circular management of water resources

Contact details

- Claudia-Maria SIMONESCU (claudia.simonescu@upb.ro)
- upb4h@upb.ro
- National University of Science and Technology POLITEHNICA Bucharest
- Academic institution
- Romania