



Bioenergy, fertiliser and clean water from invasive aquatic macrophytes (BEFWAM)

PROJECT BRIEF

This project focusses on using invasive aquatic macrophytes (water hyacinth) and nutrient rich waste (manure, faecal sludge) in combination with immobilised microbial systems to facilitate the production of biogas, clean water and recovery of nutrients in developing countries.

Background

More than 625 million people have no access to modern energy services in Sub-Saharan Africa. The supply of clean affordable and reliable forms of energy is therefore a key priority (supporting SDG goal 7).

In addition to energy issues, water reserves are poorly managed and sanitation is a huge problem. The discharge of untreated sewage pollutes rivers and water sources, resulting in a critical environmental and health hazard.

Water Hyacinth grows in lakes, rivers and stagnant water and is a global problem which is causing considerable pressures on infrastructure, local economies and health.

It is normally associated with poor sanitation and discharge of sewage into the water body which often has a number of detrimental effects including:

- Restricting the movement of fishing boats
- Block agricultural irrigation channels
- Acts as a breeding ground for parasites and their vectors

Objectives

1. Optimise the use of pre-treatment, co-digestion and reactor configuration to maximise bio-methane yields
2. Investigate the integration of single and multi-stage anaerobic digestion for biomethane production
3. Develop the use of carbon additives (hydrochar, biochar, charcoal) for improving conversion and product quality.
4. Develop suitable approaches for upgrading biogas into high-quality methane to diversify its potential usage
5. Understand the environmental and socioeconomic impacts of using water hyacinth for biogas production
6. Demonstrate the innovation development beyond pilot scale in India and Uganda

Potential outcomes:

Solve this environmental issue, create a cleaner environment, improved health, employment opportunities and develop new sustainable routes for the production of bioenergy and biomaterials.

Researchers

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In-country partners

- Centre for research in energy and energy conservation (CREEC), Uganda
- The Institute of Chemical Technology (ICT), India
- Visva Bharati University (VBU), India

Funder



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