

# BEFWAM: Bioenergy, Fertiliser and Clean Water from Invasive Aquatic Macrophytes

University of Leeds, UK; ICT-Mumbai, India; Visva Bharati University, India; Defiant Renewables, India, CREEC, Uganda

## ANAEROBIC DIGESTION

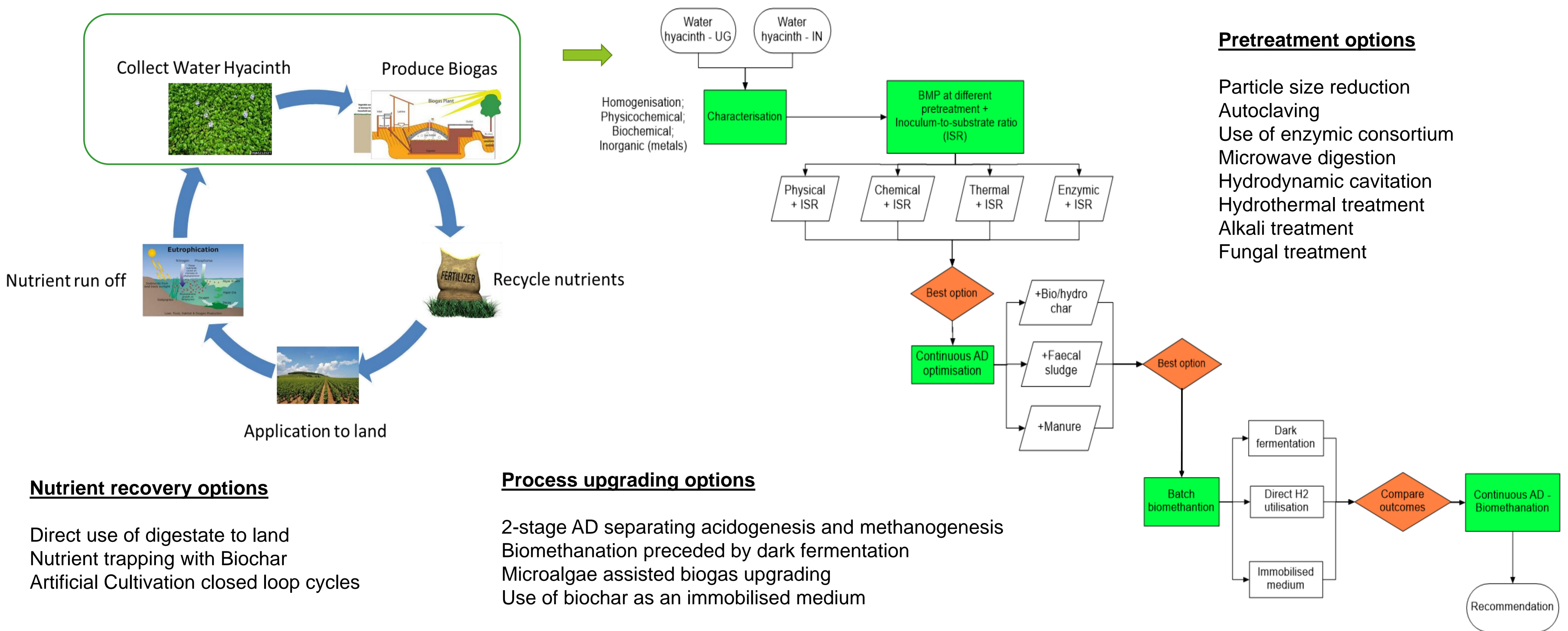
Water Hyacinth cultivated directly from invasive growth and from artificial cultivation trails will be assessed as a potential feedstock for anaerobic digestion in combination with other nutrient rich feedstocks such as manure and food waste.

Assessment of pre-treatment and single stage anaerobic digestion will be performed in **WP1 (Anaerobic conversion of invasive macrophytes)** using a range of inoculant and reactor configurations including laboratory and full scale anaerobic digestion facilities.

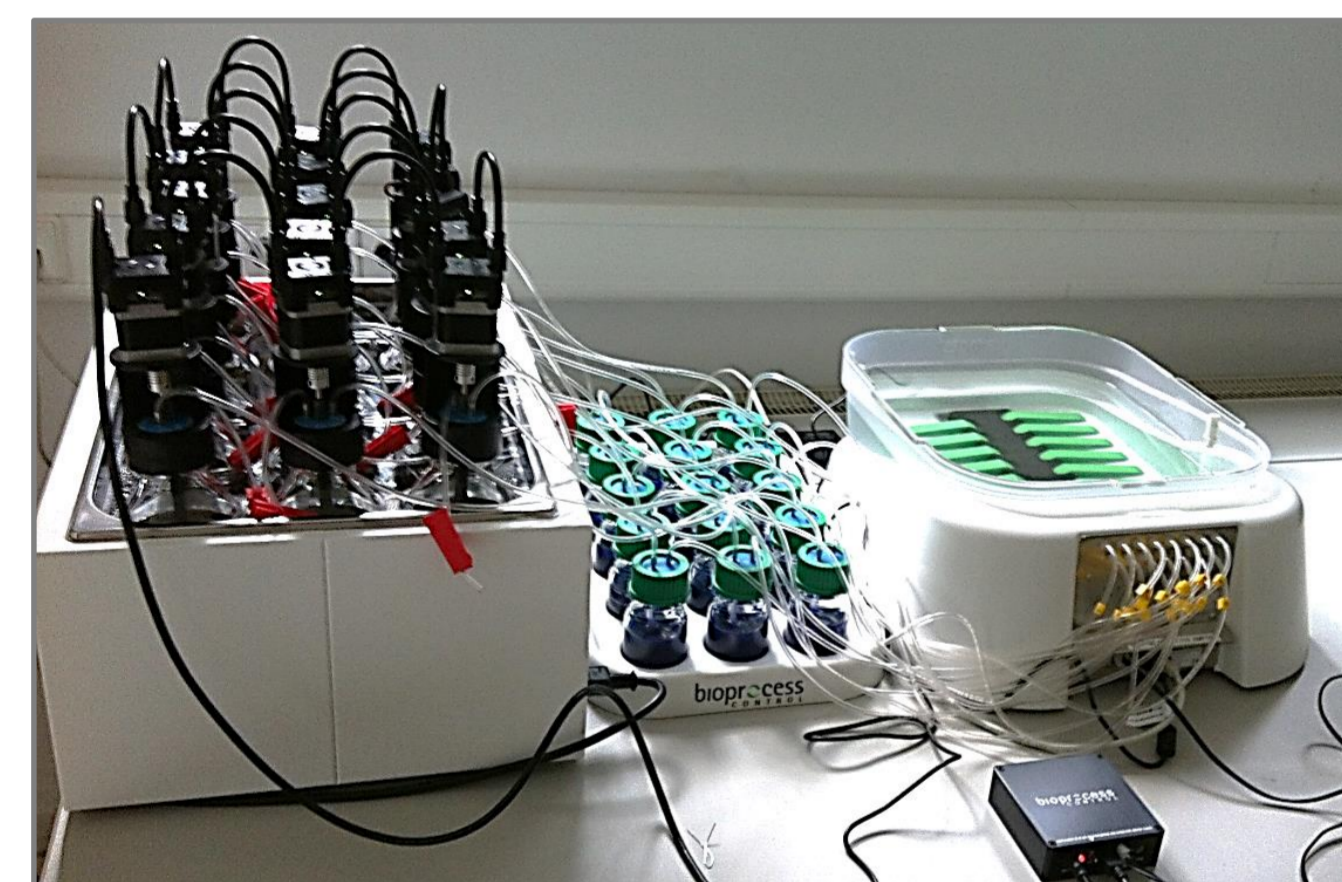
Two stage anaerobic digestion, dark fermentation and in-situ biomethanation will be investigated in **WP2 (Investigating routes to enhance methane yields and biogas quality)** to improve biogas quality.

The influence of biochar augmentation on anaerobic digestion will be investigated in **WP3 (Development of immobilized bioreactors systems)**.

## ANAEROBIC DIGESTION INTEGRATION OPTIONS



## LABORATORY SCALE FACILITIES



Protocols will be developed for laboratory testing including:

- Batch BMP testing
- Continuous reactor operation
- Inoculum type/storage
- Biochar type/usage
- Gas measurement
- Nutrient/micronutrients



Standardisation of methods will allow comparison between different laboratories in UK, India and Uganda.

Minimum requirements for analytical measurements will be developed e.g. COD removal, C/N ratio, pH etc

## DEMONSTRATION FACILITIES

Larger scale anaerobic digesters (25m<sup>3</sup>) operated by VBU, India.

Experience working with water hyacinth as a feedstock.

Operated in collaboration with local communities as a training facility



Medium scale anaerobic digesters available (Fixed dome and flexible balloon-type) installed by Green Heat, Uganda.

Biogas applications will include usage directly for cooking and for use in refrigeration & energy generation.

Small scale anaerobic digestion for household cooking used extensively in India will be investigated due to low cost.

