



Indo –UK Workshop On

“Valorisation of agri-waste for energy and nutrient recovery”

Sponsored by Global Challenge Research Fund, UK

January 15 – 17, 2020



Organised by:

Faculty of Science and Engineering
Anglia Ruskin University, UK
&
Mechanical Engineering Department
Indian Institute of Technology
(Banaras Hindu University)

Venue:

CERD, Department of Mechanical Engineering
IIT (BHU), Varanasi-221005

Introduction:

As per the latest available data from the World Bank, approximately 1.1 billion people (~15% of world population) across the globe lacked access to electricity, with over 95% in sub-Saharan Africa and developing countries in Asia. However, the United Nations (UN) set-out an ambitious but achievable sustainable development plan to ensure universal access to affordable, reliable and energy services by 2030. Global population rose from 2.5 billion in 1950 to 7.3 billion in 2015. The UN has estimated that it will further increase to 9.0 billion by 2050 and worldwide energy consumption of marketable energy will increase by 48%. To achieve the UN’s sustainable development plan-2030, decentralised energy system could play a significant role in power supply and bringing people out of energy poverty.

In India, about 960 million tonnes of solid waste is being generated annually. Of this ~350 million tonnes are organic wastes from agricultural sources. In-situ burning of *Parali*(agricultural waste) after crop harvesting season in the field causes smoke and creates a curtain of smokes in nearby areas including Delhi and other metro cities of India. Therefore, it is imperative to develop innovative technologies that are designed to maximise resource recovery from agri feedstock while promoting a circular bio-economy concepts.

The workshop is aimed to cover the clean conversion technology of agricultural waste. This project (a) contributes towards the UK and India’s clean growth strategy (b) provides whole-energy system integration (c) enables assessment of the decarbonisation potential of the agriculture sector (d) provides energy security and benefits across the environmental, societal and economic domains, particularly in rural communities (e) develop technologies that effectively convert organic wastes into clean fuel.

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Guest Speakers

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Prof.M.P.Maiya, IIT Madras
Prof. D.P. Mishra, IIT Kanpur
Prof.Sunil Pandey, IIT Delhi
Prof.Diwakar rakshit, CES, IIT Delhi
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About the City and Institute:

The holy city Varanasi is the oldest living city in the world which is also known as the capital of the spiritualistic world. It is a place of great historical and cultural importance. This religious capital of India is situated on the bank of the holy river Ganges and is famous for temples of Lord Shiva, Buddha (at Sarnath) and Sankat Mochan etc. The Institute of Technology, BHU was established in 1968 and converted into Indian Institute of Technology (Banaras Hindu University) on 29 June 2012. Presently, the institute comprises of 14 Departments and three interdisciplinary schools. Varanasi and its adjoining areas is production hub of food grains and fruits and vegetables. A Centre equipped with state of the art post-harvest agri-waste conversion technology can improve the farmer’s income and can off-set chemical fertiliser use (organic forming).

About the Project

In India, about **960 million tonnes** of solid waste is being generated annually. Of this ~350 million tonnes are organic wastes from agricultural sources. In-situ burning of *Parali* (agricultural waste) after crop harvesting season in the field causes smoke and creates a curtain of smokes in nearby areas including Delhi and other metro cities of India. Therefore, it is imperative to develop innovative technologies that are designed to maximise resource recovery from agri feedstock while promoting a circular bio-economy concepts. Gasification process is regarded as a clean conversion technology. However, the scalability, optimisation, uncertainties in process parameters, feasibility analyses as well as potential implications for the environment (carbon footprint) of the processes have not as yet been addressed in detail due to technical, economic and organisational factors.

This project (a) contribute towards **the UK and India's clean growth strategy** (b) provides whole-energy system integration (c) enable assessment of the decarbonisation potential of the agriculture sector (d) provides energy security and benefits across the environmental, societal and economic domains, particularly in rural communities (e) develops technologies that effectively convert organic wastes into clean fuel. In addition, increased phosphorous recovery and its reuse will reduce the dependency of phosphorous rock import from geo-politically sensitive countries as the recovered products are easy to store, handle and can be used by farmers (sustainable farming). For the nutrient value chain of by product (biochar and ash), lab-based incubation methods will be used for a short duration to assess the quality, carbon and nutrient uptake capability of plants. Similarly, soil quality and fertiliser value will be assessed in pot-trials under local conditions. It is envisaged that this QR GCRF funding will act as a catalyst to develop long-term collaboration and possible MoU between ARU and IIT (BHU).

Who should attend?

- **Students of IIT (BHU), Researchers, faculty members from engineering colleges and scientist/staff from R&D**

- **Rural population near Varanasi**

Call for Registration

There is no registration fee for students from IIT (BHU) & BHU and Innovators/ villagers/farmers nearby Varanasi. Limited seats are available on first come first serve basis. However, total no. of available seats is limited to 50 only. Registration fee ₹3000 can be paid at registration counter only for outside participants.

Participants willing to attend the workshop are requested to submit the completed registration form to the following emails:

skshukla.mec@gmail.com

jvtirkey@gmail.com

CHAIRPERSON

Prof. S.K..Shukla, Dept of Mechanical Engineering, IIT(BHU)

Dr. D.S. Pandey, Ruskin Fellow and Senior Lecturer, ARU, UK

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REGISTRATION FORM

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on**

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1. Name

2. a) Age b) Sex: M/F

3. Present Position

4. Address for correspondence

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E-mail:.....

Phone/Mobile.....

5. Area(s) of interest

6.a) Date and Time of arrival

.....

b) Date and Time of departure

.....

Date.....

Place

Signature of the Applicant