

Project title
Community based bioenergy research

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Funded by: University of Nottingham

Duration: 1 year

Total amount sanctioned: £31,500

Background:

India is recognized as one of fastest growing economies of the world; however, basic energy needs of thousands of millions of its citizens are yet to be fulfilled. However, there is a serious energy supply-demand imbalance in the country. Growing energy demand coupled with limited conventional fuel options and environmental concern has compelled India to search for renewable and sustainable energy options. This proposal builds on the concept of developing a new community-scale energy solution for the production, management and utilisation of locally-produced bioenergy focusing on one of the poorest regions of India – Assam in the northeast.

Bioenergy technologies offer potential community solutions through the use of anaerobic digestion (AD) technologies offering piped biogas for clean cooking, heating and lighting. Biogas offers clean fuel to improve health and welfare conditions and improves household economies through diminished use of liquefied petroleum gas (LPG) and firewood. In this project we seek to increase livelihood earnings from AD through (1) the use of solar PV to enhance thermal stability of the digesters and maximise gas yield and (2) designing a low cost, small-scale mechanism for bottling the biogas. This will improve the prosperity and welfare of the disadvantaged and marginalised off-grid households. Our aim is to identify locally-acceptable and environmentally sustainable solutions that will enhance clean energy access and lead directly to economic and welfare benefits for individuals and households, promoting economic and social development of the participating villages. This proposal seeks to focus on adding economic value to community bioenergy systems using additional technologies such as solar PV to maintain thermal environment and bottling systems to offer value-added income generation opportunities.

Objectives

The proposed project aims to deliver the decentralize energy at household level with the strength of locally available bio-wastes and thus address the major issues viz, energy, employment and economy. We will test anaerobic digesters within a real community setting to understand how different community stakeholders work together to ensure equitable benefits to all stakeholders. We seek to establish whether excess production of clean energy from anaerobic digestion systems can be bottled to deliver a cheap, affordable and safe added-value product to improve livelihood incomes. We will engage with off-grid, rural communities to combine low cost solar PV systems to existing biogas digesters and develop a method of pressuring biogas into LPG containers for sale and use off site. We will run user group training and feedback meetings throughout the project to maximise benefit of the energy services and ensure all groups of community. The project will integrate the locally available unused biomass resources, use them efficiently, provide energy services, and improve the livelihood through capacity building.

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"Michele Clarke" <Michele.Clarke@nottingham.ac.uk>
Biogas related invoices
Wed, March 15, 2017 2:12 pm
"baruahd@tezu.ernet.in" <baruahd@tezu.ernet.in>

To: Dean
For NIA
December
16/3/17

Dear, R&D: Could you please
do needful as suggested by VC

Through

Dean R&D

15/03/17

discussed I need two separate invoices from you as follows:

15317
(D. C. Baruah)

the attached GCRF project which you can use to demonstrate to your Dean the value of the
operation under project "Optimising clean community biogas energy systems for poverty alleviation in
India" please can you send me a formal invoice for £16500 for research costs and consumables (solar
maintenance of thermal environment & biogas bottling systems and associated consumables).

grant award closes at the end of this month & I have not managed to spend all of the travel costs but
between headings so the 16500 is the consumables plus some travel]

the HEFCE Newton Fund Project "Bioenergy from waste: exploring the multiplier benefits to poor
communities of medium-scale technology interventions" I was awarded £15,000 (not the full amount I
was awarded for).

you please therefore send me a separate invoice for £15,000 for the installation of medium
scale biogas systems in Jhawani village

I hope that with funds from both of these projects we can install a number of separate digesters in
the village as well as complete the digestate management/vermicompost units so that we can progress our
work there and give them some energy access. I am still keen on bottling as the research component
of the project. I appreciate it is very much research at the small-scale, so if we can progress that too it would be
helpful since otherwise it is hard to see how we can make a community scale system work!

I need to receive the invoices in the coming few days as the projects end at the end of this month.

While I hope you and your family are having a happy Holi

Vice Chancellor, TU : Permission is

H&D, Energy

Requested to forward to VC, TU

requested to obtain a total fund
of £ 31,500/- from Prof M. Clarke,
my research collaborator from
University of Nottingham, UK
to carry out the community
based Bio-energy research
activities as per set
programme (enclosed)

Michele Clarke PhD, FHEA, FRGS, FGS, MRSC
Pro Vice Chancellor (Global Engagement) Asia-Pacific
School of Environmental Change
Geography
University of Nottingham
Park
NG7 2RD, UK
0115 951 5446
0115 951 5249
michele.clarke@nottingham.ac.uk

Forwarded
15/03/17

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15-3-17

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D.C. Baruah
(D. C. Baruah)
Professor, Dept of Energy
15-3-17



Newton Fund Extension Award

(Please attach original submission statement to this form)

PI: Professor Michèle Clarke
Name: Professor Michèle Clarke

School: Geography

Position: Associate Pro Vice Chancellor & Professor of Environmental Change

Title of Newton Fund application:

Bioenergy from waste: exploring the multiplier benefits to poor communities of medium-scale technology interventions

This project translates learning and impact from two existing funded Newton Fund projects of which I am PI and one of which I am co-I:

- (1) Newton Bhabha ES/P000517/1 SMART ciTIES Network for Sustainable Urban Futures
- (2) Newton BB/02914X/1, Implication of enhanced ecological intensification and resilience in the eastern Amazonia region
- (3) Newton EPSRC-DOST EP/P018513/1 Water - Energy - Nutrient Nexus in the Cities of the Future

Collaborating partners (name, position, Institution)

Professor DC Baruah, Dean, Centre for Energy, Tezpur University
Professor P Mahanta, Dean, Dept Mechanical Energy, IIT Guwahati
Dr Hema Ramakrishnan, Professor, Madras School of Economics
Dr Helen West, School of Biosciences, University of Nottingham

Proposal for allocation of Additional funding;

India remains a stratified country where the poorest citizens lack access to energy services. This proposal builds on existing projects to develop a new community-scale solution for the production, management and utilisation of locally-produced bioenergy focused on one of the poorest regions of India - Assam in the northeast. Funds are requested for consumables to enable the construction and installation of two community-scale biodigesters in an off-grid location with the purpose of generating sustainable energy. The location chosen is off-grid and holds feedstocks sufficient for the generation of sustainable energy yet to date no systems exist and Indian government schemes operate only at household level. This project seeks to deliver and test in a co-produced manner an up-scaled locally generated solution which offers the advantages of an affordable and sustainable system which, if successful, could be replicated across the region. Community engagement and contribution includes donation of the land to support the project and the setting up of a village steering group and management team. Researchers from partner organisations have to date surveyed bioenergy feedstocks and engaged in social survey to develop an economic model for sustainable generation of locally produced energy services.

What are the key activities that the funding will support?

We seek funding to establish and test at scale digesters within a real community setting (and one living in poverty) to understand and measure the multiplier benefits of such interventions on individual socioeconomic wellbeing. If funded digester construction works will start immediately and testing and community engagement will continue throughout 2017 to understand how different community stakeholders work together to ensure equitable benefits to all stakeholders. Despite Indian government energy schemes spanning decades, impacts have been limited because the needs and behaviours of communities have been ignored. We will run user group training and feedback meetings throughout the project to maximise benefit of the energy services and ensure all groups, including women and the disadvantaged benefit from the project.

Travel funds are not requested as travel is provided by the existing Newton Bhabha SMARTIES

Research and Graduate Services
University of Nottingham
King's Meadow Campus, Lenton Lane, Nottingham, NG7 2NR.



project

What are the key outputs which the additional funding will enable?

- access to clean, reliable & available biogas for a range of energy services (cooking, lighting, heating)
- transformation of unused wastes to valuable assets
- health benefits for women and children of clean cooking fuel
- a better understanding of how communities respond to and engage with energy interventions
- training and upskilling local stakeholders in the benefits of waste to energy systems

Do you plan to bring additional partners on to the project – if so, please provide, name, position and address of proposed additional collaborator (must be an eligible Newton Fund partner country/ Institution)

Allocation of Funding;

Travel Planned flights (dates & costs)

Subsistence

Please briefly indicate whether any other awards (internal or external) related to the outcomes of the project have been awarded.

Research related costs (consumables etc.)

£19,500 consumables for the installation of two 40m³ biodigesters (made locally in India with concrete, brick and fibreglass) including gas distribution and monitoring & feedstock mixer system. These systems to be installed on community donated land

Support of seminar or dissemination activity;

£500 User Group Training & Dissemination activities

Is there any financial contribution from the collaborating institution?

Head of School Support

Name of Head of School

Giles Foody

Statement of Support

This project builds on the foundations of earlier work to develop a new community-scale solution for the generation, management and use of locally-produced bioenergy in one of the poorest regions of India. This is a very worthy and topical research proposal from researchers with an excellent track record. The work fits closely to the School's newly launched research strategy and has the School's full support.

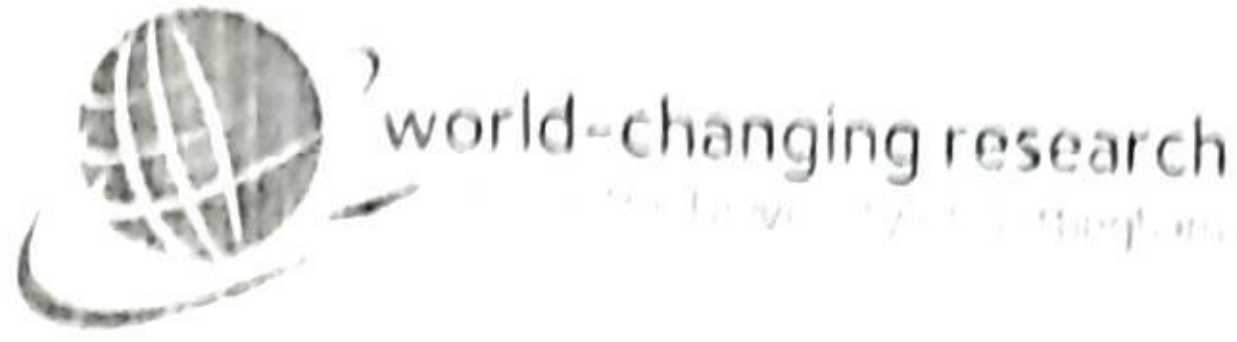
Signature

G. foody

Date

3 Feb 2017

Application Sign-off



The University of
Nottingham

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UNITED KINGDOM · CHINA · MALAYSIA

I understand that if awarded funding I will be required to write a brief report to account for expenditure and summarising the outcomes of the project.

I confirm that the funding applied for will be spent in accordance with Newton fund and ODA specifications.

Name and signature of the PI

Professor Michèle Clarke 

Date:

3 February 2017

Submission:

Please submit your application to maeve.fitzpatrick@nottingham.ac.uk

To Project Registration No: DORD / Bioenergy fr

From: Michele Clarke <Michele.Clarke@nottingham.ac>
Subject: Bioenergy from waste project
Date: Mon, July 8, 2019 3:16 pm
To: "baruahd@tezu.ernet.in" <baruahd@tezu.ernet.in>

Y / DCB / 20 - 324
ject

Serial No... ~~88~~ 833 ...
Date of Receipt 11/7/2019...
File No... Deah, R1D ...
Benefits to poor communities of

Sub: HEFCE Newton fund Project: Bioenergy from waste: exploring the multiple benefits to poor communities of medium scale technology innovations

Dear Prof. DC Baruah,

Thank you for your update on the current progress of the project "Community-based Bioenergy Research"

Work completed so far:

- Feedstock analysis, demand for feedstock for cooking energy, Biogas supply
- Demonstration and pilot scale production of vermi-compost and mushroom from digested slurry
- Active engagement of the community through workshops on Improved farming techniques (Lemon farming from Organic farming, Pisciculture)

Work to be completed:

Understand that a party for installation of AD plant is shortlisted. However, installation is delayed due to flooding and some other local issues beyond your control.

In this regard, I am pleased to grant a no-cost extension period of 12 months for the project to complete the remaining activities

With best wishes

Michele

Professor Michèle Clarke PhD. FHEA, FRGS, FGS, MRSC
University of Nottingham ODA Research Champion
Professor of Environmental Change
School of Geography
University of Nottingham
University Park
Nottingham NG7 2RD, UK
Tel: +44 (0)115 951 5446
Fax: +44 (0)115 951 5249
Email: michele.clarke@nottingham.ac.uk

Copy for Dean, R&D

DCB
(D. C. Baruah)
8/7/19

Please file &
do needful

DCB
10.7.19
i/c

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Attachments:
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