



तेजपुर विश्वविद्यालय / TEZPUR UNIVERSITY

(केंद्रीय विश्वविद्यालय / A Central University)

ऊर्जा विभाग / DEPARTMENT OF ENERGY

तेजपुर-784028 :: असम / TEZPUR-784028 :: ASSAM

कुलाध्यक्ष का सर्वोत्तम विश्वविद्यालय पुरस्कार, 2016, एनआईआरएफ़ भारत रैंकिंग 05 :2016 और नाक द्वारा ए ग्रेड प्राप्त  
Visitor's Best University Award, 2016, NIRF India Rankings 2016: 05 and accredited with NAAC 'A' grade

### A REPORT ON

## International Research Collaborative activity between Indo-Hungarian Strategic Research Fund (IHSRF) of Department of Science and Technology of India and National Research, Development and Innovation Office (NRDIO) of Hungary.

1. **Name of the Collaborative Activity:** International Joint Research Collaboration between India and Hungary on the topic 'Biochemicals and biofuels from lignocellulosic biomass by Green catalytic processes.
2. Nature of Activity: Research Project mode, Exchange visit of students and faculty members from both countries.
3. Name of the Collaborating Agency/ Individual with affiliation, and contact details:

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#### 4. Summary of collaboration:

This collaboration was aimed to pave the way for exchange of expertise, knowledge, technologies between the two counterparts, promote a multi-disciplinary research approach in the conversion of lignocelulosic biomass into biofuels and chemicals.

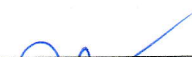
Globally, the current roadblock with biofuels is the lack of economical conversion technologies. In India also, we have such feedstocks unutilized. Therefore, it is not only, India and Hungary's concern in particular, but, in general a global issue to be addressed. So, economically viable processes involving heterogeneous catalysis offer immense potential in helping to make lignocellulosic biofuels a commercial reality.

Hungarian partner used cheaper oxide-supported transition metal catalysts as heterogeneous catalysis for study the consecutive hydrogenation and dehydration reactions of levulinic acid to high value-added molecules, such as cyclic compound gamma-valerolactone (GVL), 2-methyl tetrahydrofuran (2-MTHF) and pentatonic acid (PA).



Indian partner developed multifunctional mesoporous solid acids catalyst prepared by the sulfonation of chemically activated carbonized waste biomass or waste de-oiled seed waste cake for synthesis of renewable heterogeneous catalyst which were employed against conversion of lignocellulosic biomass to oligomers to fermentable sugar and furfural.

#### 5. List of year-wise activities under the collaboration:

Year	Activity
2016-17	.Skype meeting on 02.11.2016 at 3.30pm Indian time with our Hungarian counterpart PI: Prof. Valyon, József, Institute of Materials and Environmental Chemistry, Hungarian Academy of Science. We discussed regarding the implementation of the project as per proposal. Finalization of experimental design, Procurement of consumables, setting up of the necessary facilities and optimization, staff recruitment, Trial experiments and preliminary evaluation of results. Project staff appointment.



2017-18	Conducted of objectives specific experiments and analysis of the result in Tezpur University and other Indian partner Institutes. Dr. Dhanapati Deka, PI and Dr. Utpal Bora, Co-PI of the project visited Department of Environmental Chemistry and catalysis, Institute of Materials and Environmental Chemistry, Research Centre for Natural Sciences, Hungary Academy of Science, Budapest, Hungary during June 10-20, 2017. They took part in a common seminar at mta ttk followed by project progress discussion and laboratory exposure during the period of visit. Three research papers with Hungarian Counterpart are published. Hungarian Scientist, . Dr. Robert Barthos, Mr. Gyula Novodarzski visited Tezpur University during 21-11-2017 to 30-11-2017.
2018-19	Hungarian Scientists 1. Dr. Robert Barthos , 2. Dr. Agnes Szegedi and 3. Ms. Blanka Szado, Ph.D.student visited Tezpur University during December 18-22, 2018. Objective specific Experiment works were continued.
2019-20	Renewable heterogeneous Catalysts were prepared and employed against the conversion of lignocellulosic biomass to Platform chemical and biofuel. Two research papers were published with Hungarian Counterpart.
2020-21	Research works continued in Tezpur University for achieving the project objectives finally.

Signature of Faculty	Signature and Seal of Head of Department/ Centre/ Cell
 <p><b>Name:</b> Prof. Dhanapati Deka <b>Designation:</b> Principal Investigator Department of Energy Tezpur University Tezpur, Assam, India</p>	 <p><b>Name:</b> <b>Designation:</b> Head Department of Energy Tezpur University</p>