Development of a Multifunctional Flow Reactor System for Water Treatment

Natural water reservoirs are contaminated due to the growing population, urban migration, inappropriate city planning, industrialization, intensive use of fertilizers and pesticides in agriculture etc and, hence world lack access to quality water. Suitable water for drinking, agriculture, industries and other functions are declining through the years. The need for an efficient wastewater purification system is a global momentous and the existing conventional methods suffer from both high cost and inadequate decontaminating performance. Thus, there is a need for an efficient, low-cost, ecofriendly and convenient treatment method. The motivation behind this project is based on the fact that natural materials are abundantly available in Sri Lanka which could be promising candidates for wastewater purification after physical and/or chemical modifications. We are interested in fabricating a flow reactor which is a combination of adsorption and photocatalysis. All the adsorbents and the photocatalysts will be produced by chemically modified naturally available low cost materials. Moreover, as Sri Lanka is a tropical country which is located just north to the equator with hot and humid weather throughout the year sunlight will be used as the energy source for the photocatalysis. Therefore, the whole flow reactor system would be fabricated for a low cost and hence would be applied to both urban and rural areas worldwide.

Team Leader – Dr. T.C. Jayaruk, *PhD in Material Chemistry, The University of Alabama, USA*

Team

Name	Qualification	Expert Areas	Role of the Member
Dr. T. Charitha Jayaruk (SLIIT, SL) ***Team Leader***	PhD (UA, USA), BSc (UOC, SL)	Materials Chemistry (carbon, silica, metal nanoparticle-porous composites) Nanotechnology	Fabrication of Adsorbents and Photocatalysts Development of the Flow reactor
Dr. Mudith Karunaratne (SLIIT, SL)	PhD (U Cambridge, UK) BSc (UOM, SL)	Materials Engineering	Development of the flow reactor Photocatalysis experiments
Prof. R. D. Wijesekera (UOC, SL)	PhD (ANU, AUS) BSc (UOC, SL)	Inorganic chemistry	Adsorbance related experiments and data analysis

Dr. Murthi S. Kandanapitiye (GJRTI, SL)	PhD (Kent state U, USA) BSc (UOC, SL)	Material Chemistry Biochemistry	Photocatalysis experiments
Prof. M. G. Bakker (UA, USA)	PhD (U Canterbury, NZ) BSc (U Canterbury, NZ)	Materials Chemistry (Carbon, silica, metal oxide porous composites, Flow reactors) Nanotechnology	Development of the Flow reactor, Fabrication of adsorbents
Prof. Shanlin Pan (UA, USA)	PhD (U Rochester, USA) MSc (Lanzhou U, China) BSc (Lanzhou U, China)	Photocatalysis Solar energy conversion Nanotechnology	Fabrication of Photocatalysts, Photocatalytic activities
Ms. Himasha Gunathilaka (SLIIT, SL)	BSc (UOC, SL)	Organic chemistry, Nanotechnology	Batch study on Adsorbance, Record Keeping
Mr. Shanitha Mirihana (SLIIT, SL)	BSc (Northumbria U, UK)	Biotechnology, Nanotechnology	Batch Study on photocatalysis , Record keeping

Grant amount and Type

Rs. 10,000,000.00

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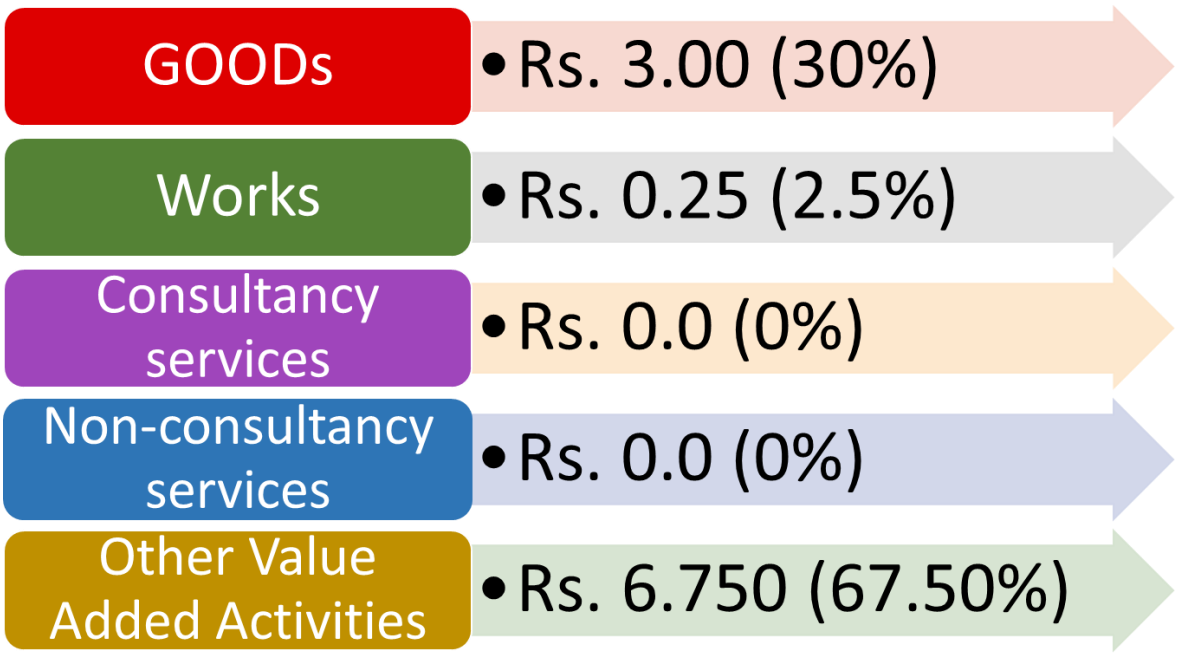

Key contributions expected

- International Journal publications
- International conference publications
- Patent
- MPhil/PhD Student