

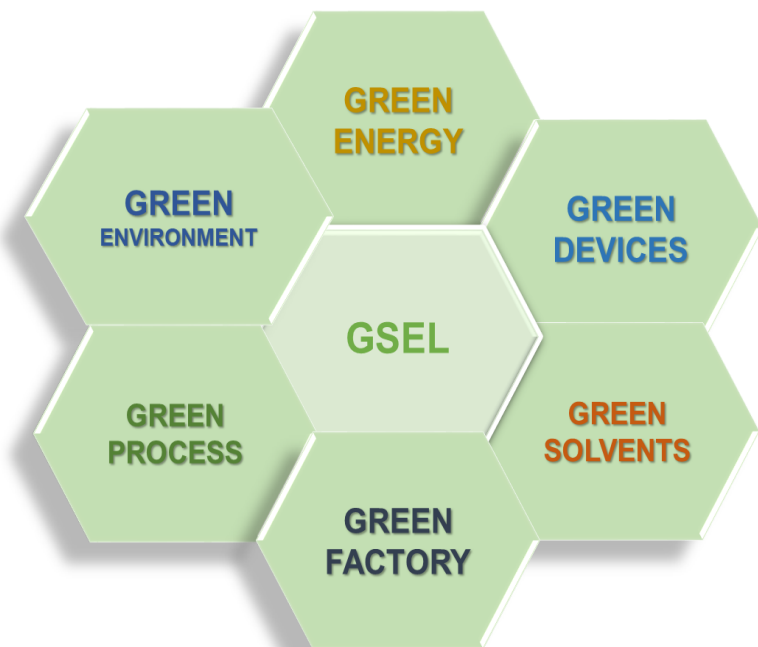


# GREEN SEPERATION ENGINEERING LAB [GSEL]

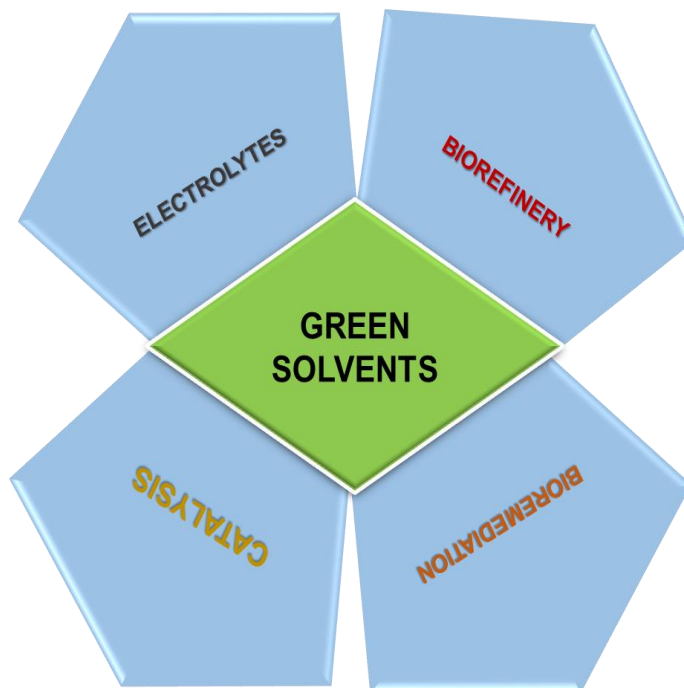


## THE GREEN WHEEL – The Elixir of modern planet :-

Green Planet has been the mantra of contemporary world owing to its ethical value. Recent global awareness on sustainability has led to establishment of agencies that are stringent in executing green principles. Beyond protecting the environment, these practices guarantee replenishment of Mother Nature acting as essential part of futuristic technologies. The green wheel also grants facility to accomplish critical missions with minimal risks and enhanced efficiency. Our research entity, GSEL acts as a crowning establishment that provides extensive facilities in executing these projects of great societal importance



Designer green practices have versatile applications that extend from acting as critical part of biological process like Bioremediation, Extraction and Benign catalysts till as universal substituents of electrolytes in batteries, conducting elements in biosensors and diodes in organic LED displays, which make them inevitable in contemporary world



# MISSION & VISION OF THE LABORATORY:

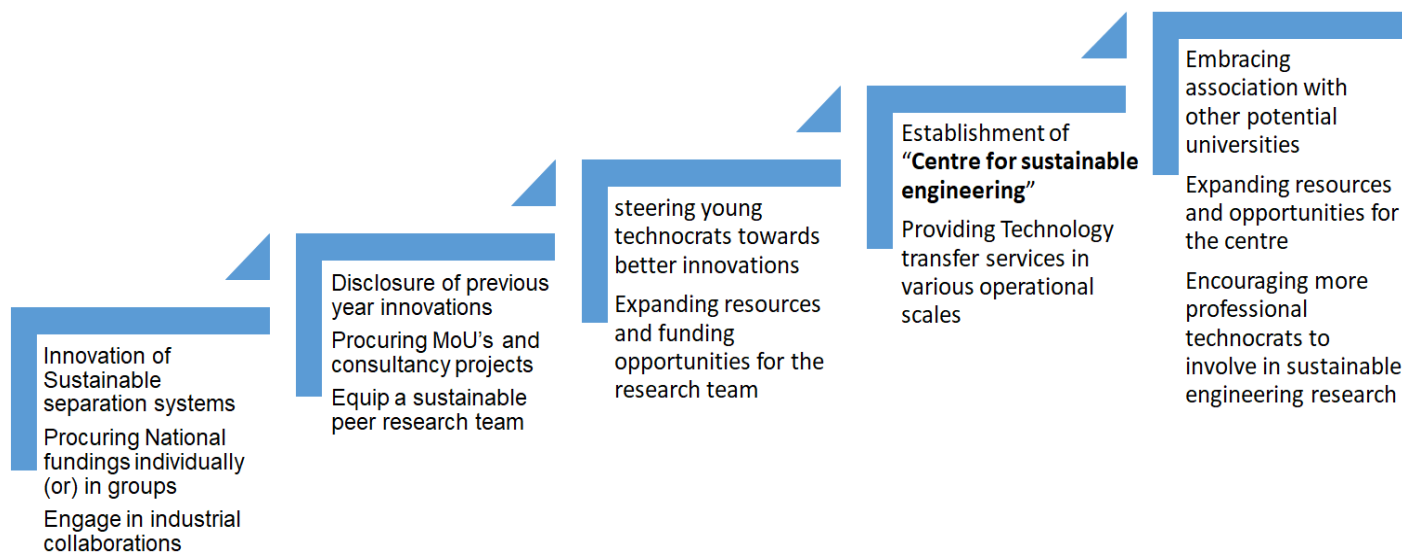
## MISSION STATEMENT

- To function effectively as a lead research entity with principles of integrity and excellence
- To encourage interdisciplinary applications without compromising sustainability values
- To inculcate R<sup>3</sup> concept among peer research groups and recognize opportunities to collaborate
- To reverse potential advancements in field of green engineering and aspire to meet global standards in research
- To implement and govern sustainable principles within the operational environment

## VISION STATEMENT

- To create a harmonic environment for budding technocrats in employing sustainable strategies over development
- To explore extensive opportunities for bridging industrial scale circular economy solutions (Technology Transfer, MoU)
- To establish green engineering platforms and procure national interest to develop technologies (core projects, research grants)
- To engage in unique inventions with intersectional interest of chemical engineering and biotechnology (Patents, International collaborations)

## ROAD MAP FOR THE UPCOMING DECADE (2020-2030)



### Lab members:

**Mr. Harishbabu Balaraman**  
CSIR - SRF, Mob no: 8807585221  
E-mail: [srivathsav92@sastra.ac.in](mailto:srivathsav92@sastra.ac.in)

**Mrs. Ramya Muniasamy**  
DST WOS-A, Mob no: 9787316668  
E-mail: [ramya\\_m@scbt.sastra.ac.in](mailto:ramya_m@scbt.sastra.ac.in)

### Project Teams:

#### Project GDev:

Design and fabrication of green devices and sensors for real-time application

#### Project GreeFac:

Establishing self-sustainable and energy efficient communities.

#### Project INTEX:

Design and development of integrated extraction process – process integration

#### Project NuEx

Design of task specific separation techniques for nutraceuticals

#### Project BIOSOL:

Design of selective protocols  
For bioremediation and environmental application

#### Project GrFenergy

Providing green & clean energy solutions in large scale

## Key publications:

1. Title: **Switchable deep eutectic solvent driven micellar extractive fermentation of ultrapure fibrin digesting enzyme from *Bacillus subtilis***, Authors: Ramya Munisamy, Bhavani Sowndarya Balamurugan, Devi Rajamahendran, Senthilkumar Rathnasamy, Year: 2022, Journal: Scientific Reports , Publisher: Springer Nature publications, DOI: 10.1038/s41598-022-04788-w
2. Title: **Sustainable and Green Engineering Insights on Deep Eutectic Solvents Towards the Extraction of Nutraceuticals**, Authors: Harishbabu Balaraman, Vivek Rangarajan, Rangabhashiyam Selvasembian, Senthilkumar Rathnasamy, Year: 2021, Journal: ACS Sustainable Chemistry & Engineering , Publisher: American Chemical Society, DOI: <https://doi.org/10.1021/acssuschemeng.1c03034>
3. Title: **Air assisted dispersive liquid phase microextraction coupled chromatography quantification for purification of therapeutic lectin from aloe vera – A potential COVID-19 immune booster**, Year: 2021, Authors: Senthilkumar Rathnasamy, Harishbabu Balaraman, Ramya Muniasamy Journal: Microchemical Journal, Publisher: Elsevier, DOI: <https://doi.org/10.1016/j.microc.2021.106187>
4. Title: **High selective purification of IgY from quail egg: Process design and quantification of deep eutectic solvent based ultrasound assisted liquid phase microextraction coupled with preparative chromatography**, Year 2020, Authors: Harishbabu Balaraman, Senthilkumar Rathnasamy, Journal: International journal of biological macromolecules, Publisher: Elsevier, DOI: <https://doi.org/10.1016/j.ijbiomac.2019.12.242>
5. Title: **Kinetics and microwave assisted extractive transesterification studies of high octane methyl esters (HOME) from karanja and chicken lard oil using protic deep eutectic solvent**, Year: 2020, Authors: Balaraman Harish Babu, Rathnasamy Senthil kumar, Journal: Fuel, Publisher: Elsevier, DOI: <https://doi.org/10.1016/j.fuel.2020.117299>
6. Title: **Kinetics and optimization of microwave-assisted lignin fractionation with Protic low transition temperature mixture of *Sesamum indicum* straw for enhanced bioethanol production**, Year: 2020 Authors: Harishbabu Balaraman, Senthilkumar Rathnasamy, Journal: Journal of molecular liquids, Publisher: Elsevier, DOI: <https://doi.org/10.1016/j.molliq.2020.112660>