

Special Issue on

**Food Waste Biorefinery: A Window for Circular Economy and Advanced Energy**

## CALL FOR PAPERS

Food waste (FW) is among the top bio-wastes generated around the globe. Food and Agriculture Organisation (FAO) suggested food waste as losses in edible food mass throughout the supply chain from cultivation to final product. As per an estimate, more than one-third of the total global food production goes in vain as wasted and costs around \$750 billion (INR 47 trillion) to the economy. Russian Federation is at the top while India is at seventh rank in overall food wastage. The issue is not only limited to food loss but also reflected in several environmental and health concerns, including greenhouse gases (GHGs) emissions, microbial (pathogen) load in the environment, and foul odour. Ultimately, food waste impacts the biotic and abiotic factors of the environment. Food waste can be categorised into edible and non-edible portions and hence need special precautions before discarding and proper waste management.

The food waste is a rich source of several biomolecules, including carbohydrates, proteins, lipids, vitamins, and minerals (depending upon source and preparation methods). Moreover, such waste material contains a significant number of bioactive compounds, such as polyphenols. These biomolecules can be used as feed for microorganisms and support their selective metabolic activity to generate several commercial productions including fuel, food, nutraceuticals, and biopolymers. The conventional approach suggested the inclusion of food waste as animal feed and substrate for biogas production. Production of commodity chemicals, biofuels, pharmaceutical ingredients, bio-based materials, etc., not only reduces the huge environmental burden along with providing sustainable and cost-effective raw materials for other industries but also improves the economy. Upstreaming of food waste has the potential to contribute to the transition of a linear based economy to the circular economy. However, the major challenge with food waste is collection, and stability during transport to the site of use. Earlier, researchers have shown the successful process development for the production of a variety of chemicals, biomaterials, and animal feed from food waste by the integrated biorefinery with other commercial process that improved the bioeconomy of process and made process eco-friendly, greener, and sustainable.

Food waste is mainly generated from different food processing practices that can be upstreamed and recycled. Food waste can be considered a zero-value and non-consumable resource but also hold significant value in terms of biomolecules available. As per the 12.3 Sustainable Development Goals (SDG) of the United Nations, half the food loss at the production stage and waste at the consuming stages must be reduced by 2030 through 3R (reduce, reuse, recycle) practices. The Special Issue will consider the waste generated in any form irrespective of source and its possible use in commercial processes. Counter the global energy crisis and environmental pollution with the production of biohydrogen, bio-oil, methane, etc. This Special Issue mainly aims to invite high-quality manuscripts for the production of commercially viable and high valued products with conventional as well as advanced approaches with detailed feasibility studies. We invite original research and review articles from researchers, scientists, and policymakers regarding possible opportunities associated with food waste for a sustainable food and environmental system.

Potential topics include but are not limited to the following:

- ▶ Food waste global status and scenario, collection and strategies to reduce the spoilage
- ▶ Block chain monitoring for waste transport
- ▶ Mining of microbes (bacterial, fungi, and algae) for novel metabolic pathways for bio-transformation waste
- ▶ Metabolic engineering and genetic modification for bio-fuel production
- ▶ Waste pre-treatment methods and comparative analysis for waste transformation
- ▶ Process designing, optimisation and upgradation for high titre and conversion rate
- ▶ Process carbon footprint reduction and gaseous discharge sequestration
- ▶ Downstream processing methods and advanced techniques for product characterisation
- ▶ Conventional fuels from food waste e.g., biogas, ethanol, biodiesel, heat generation by burning
- ▶ Advanced biofuels e.g., methane (high purity), butanol, hydrogen, aviation fuel
- ▶ Application assessment of biofuel from food waste
- ▶ Catalyst recycling and process waste reutilization
- ▶ Challenges and opportunities in industrial scale up and commercialization of biofuel
- ▶ Technoeconomic analysis and cost assessment for fuel production

Authors can submit their manuscripts through the Manuscript Tracking System at <https://review.wiley.com/submit?specialIssue=475510>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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