SAAnA Reactor (Waste to Wealth)

Prelims: Current events of national and international importance | General issues on Environmental ecology, Bio-diversity & climate change

Why in news?

Researchers at BITS Pilani's Hyderabad campus have developed an innovation in organic waste management reactor.

- The Sandwich Aerobic-Anaerobic-Aerobic (SAAnA) Reactor is an innovative reactor to ***process organic waste***.
- It is a novel solution that provides a quicker and more effective substitute for traditional waste-to-energy systems.
- **Key Features –**
    - **Reduced Treatment time** – Unlike single-stage anaerobic digestion systems that take up to 60 days, the SAAnA reactor completes treatment in just 23 days.
    - **Diverse Waste Handling** - It is designed for treating diverse organic waste, including municipal solid waste, slaughterhouse waste, landfill leachate, and faecal sludge.
    - **Sustainable Biofertilizer** - It increases the biogas yield (up to 0.8 m^3 /kg of volatile solids) and a bio fertilizer that meets quality standards without further processing.
    - **Scalable and Energy-Efficient** - Its gravity-based design minimizes operational costs and makes it suitable for ***both urban and rural settings.***
    - **Patented Technology** - The SAAnA reactor is a patented innovation recognized under the ***Kapila Scheme*** for innovation.

The KAPILA (Kalam Program for IP Literacy and Awareness) Scheme *was launched in 2020 to promote Intellectual Property (IP) literacy and awareness, especially among students and faculty in Higher Education Institutions (HEIs).*

- **Three stages of working** – The reactor runs in three stages - anaerobic digestion, aerobic pre-treatment and aerobic post-treatment.
- **Benefits** –
    - It offers a promising solution for waste management challenges in urban and rural settings.
    - It is set to transform organic water processing, delivering environmental benefits and economic value through improved energy generation and fertilizer production.
    - It provides a quicker and more effective substitute for traditional waste-to-energy

systems.

- **Future potential** – From municipal waste treatment plants to industrial organic waste processors, it has the potential to reshape the future of waste management, making cities cleaner, greener, and more sustainable.
- **Significance** – It is a key step towards establishing a sustainable, circular economy model for waste management.

Quick Facts:

Waste to Wealth Mission
• It is an initiative under the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC). • It aims to promote sustainable waste management by identifying, validating, and deploying innovative technologies for converting waste into valuable resources

References

1. Deccan Herald | BITS Pilani’s SAAnA reactor

2. The Hindu | Innovation in organic waste management