कृषि एवं किसान कल्याण मंत्रालय
MINISTRY OF AGRICULTURE AND FARMERS WELFARE

NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT
NABARD

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AGRISURE GREENATHON

Team Details

- Team Name: InnoQuest
- Team Leader Name: Saishree Priyadarshini
- Problem Statement: India is grappling with a severe waste management crisis characterized by overflowing landfills, environmental pollution, and escalating greenhouse gas emissions. The country's heavy reliance on fossil fuels for energy is accelerating climate change and leading to energy insecurity. For this our solution “Ecofuel” is the best solution possible.

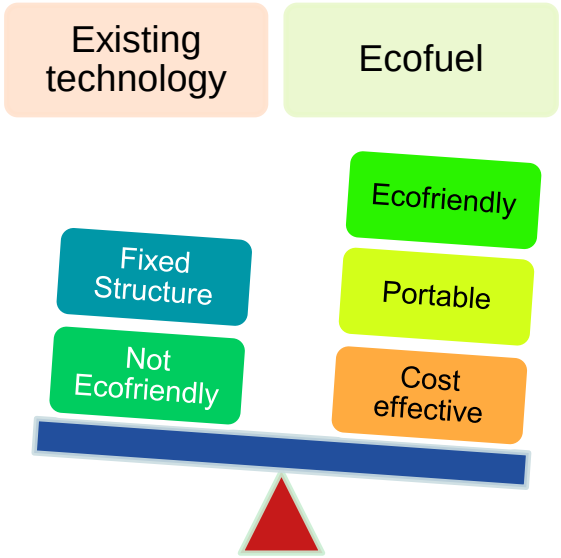
Brief about the idea

India is a country where urbanisation is much rapid. Number of municipalities is increasing and many gram panchayats are likely to be upgraded to municipalities in the near future. The main problem faced by them is waste disposal itself. Incorporation of portable biogas plants will help them to reduce the waste management problem in a better way. Due to its effective design it would not be a burden for them. "EcoFuel" offers a promising solution to India's waste management challenges by converting organic waste into biogas, reducing dumping sites and environmental hazards, mitigating climate change, providing an affordable energy source, and promoting energy independence, thereby supporting environmental sustainability and a cleaner future

The main objectives of the product are

1. To address the problems caused by dumping sites to people residing in nearby areas.
2. To fight against climate change
3. To develop a suitable and affordable energy source.
4. To reduce the dependency on existing costlier and non renewable energy fuel.

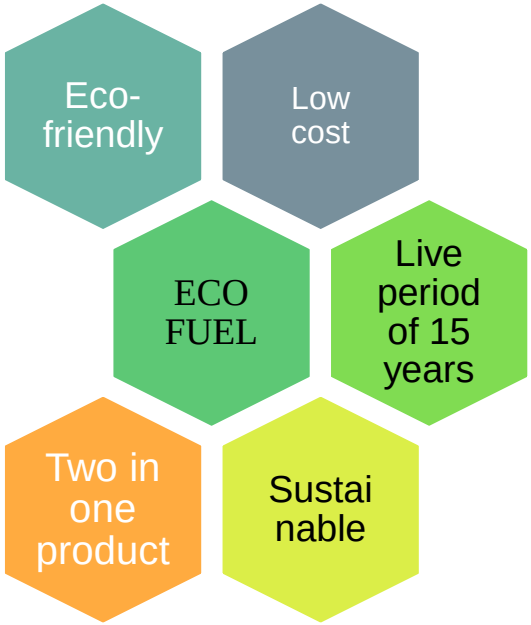
Opportunities



How will it be able to solve the problem?

EcoFuel is a pioneering solution that transforms cow dung into biogas through anaerobic digestion, offering a portable, eco-friendly, and cost-effective alternative to traditional fuels. It reduces greenhouse gas emissions, mitigates waste disposal issues, and promotes sustainable agriculture, while also improving indoor air quality and empowering local communities. By providing a renewable energy source and organic fertilizer, EcoFuel contributes to a healthier environment and a more sustainable future.

USP of the proposed solution

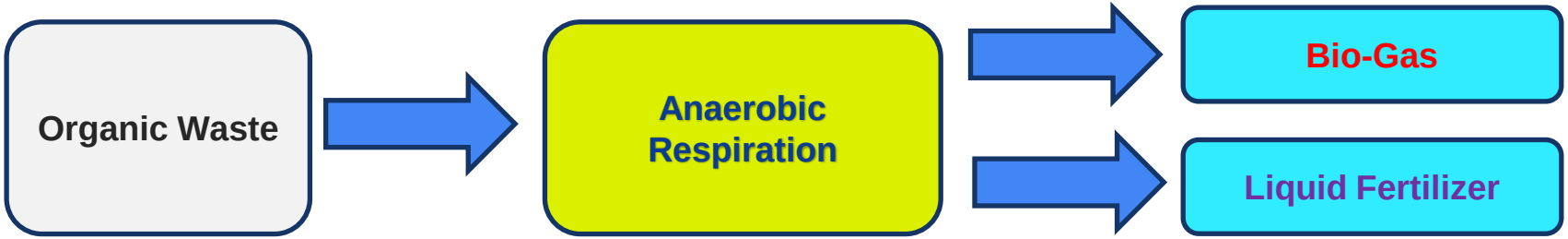


List of features offered by the solution

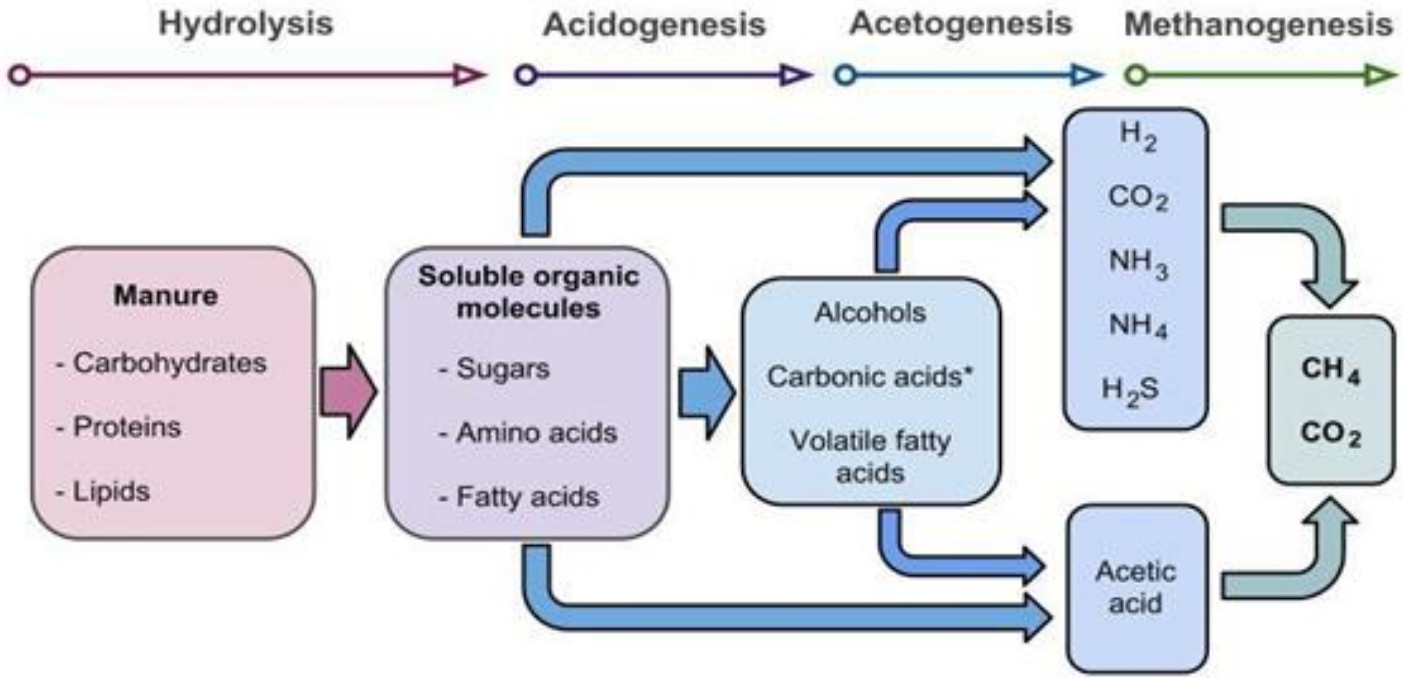
"EcoFuel": A unique solution that addresses multiple challenges while promoting sustainability and community empowerment, offers an innovative solution to waste management and energy production challenges through:-

- Technological Innovation: Anaerobic Digestion of cow dung to produce biogas
- Portability: Easy transport and installation
- Economic Benefits: Cost savings, cheaper than LPG, and job creation
- Environmental Impact: Renewable energy, reduces fossil fuel reliance, and organic fertilizer
- Social Advantages: Improves health, reduces indoor air pollution, and empowers local communities

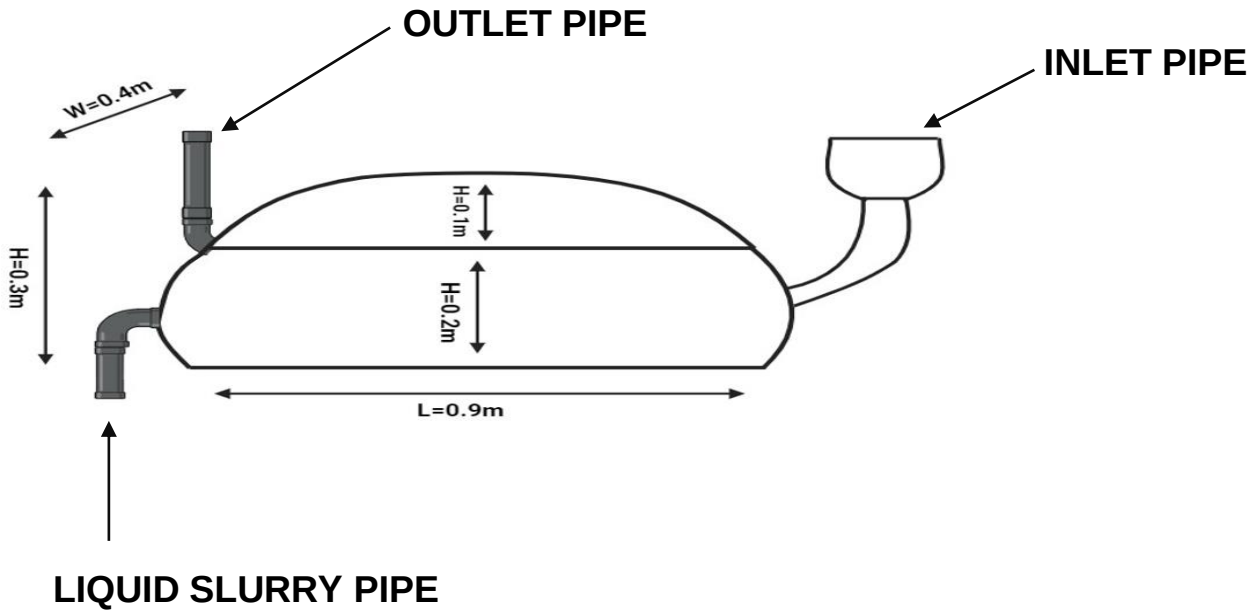
Process flow diagram or Use-case diagram



Wireframes/Mock diagrams of the proposed solution



Architecture diagram of the proposed solution



Technologies to be used in the solution

Anaerobic Digestion Process:

Hydrolysis ,Acidogenesis ,Acetogenesis , Methanogenesis

Enhanced Efficiency:

- **Bacterial Optimization**: Utilizes specially cultivated bacteria to enhance the efficiency and speed of biogas production.
- **Odor Control**: Advanced filtration systems prevent foul odours, making the system suitable for urban and residential use.

Eco-Friendly Components:

- **Sustainable Materials**: Uses durable, eco-friendly materials such as reinforced polythene for the biogas storage bag.
- **Integrated Fertilizer Production**: Produces nutrient-rich organic fertilizer as a by-product, supporting sustainable agriculture.

User-Friendly Design:

- **Simple Installation**: Designed for easy setup with minimal technical knowledge required.
- **Low Maintenance**: Requires minimal maintenance, ensuring long-term usability and reliability.

Integrated Monitoring:

- **Digital Sensors**: Optional integration of digital sensors to monitor biogas production levels, system health, and efficiency in real-time.
- **Mobile App Connectivity**: Potential for a mobile app interface to track performance, provide maintenance alerts, and optimize usage.

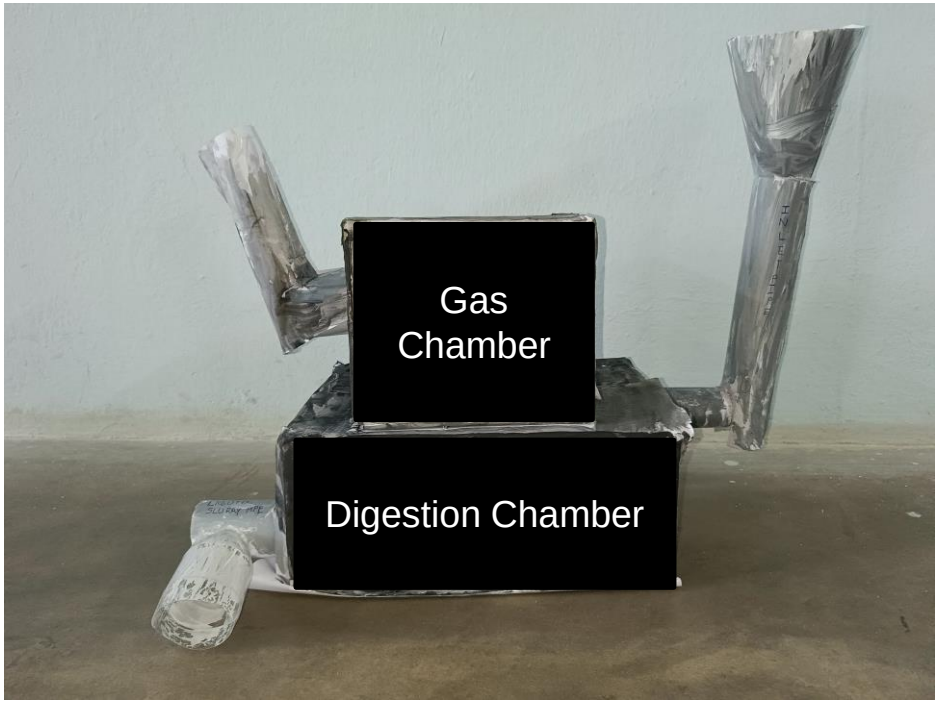
Estimated implementation cost

Particulars	Budget
Research and Development	₹ 70,000
Production Costs	₹1,60,000 (for 16 units)
Marketing and Outreach	₹30,000
Training and Workshops	₹20,000
Total Budget	₹2,80,000

Snapshots of the prototype

Cow dung

Vegetable Waste



Prototype

Prototype Performance report/benchmarking

EcoFuel's Groundbreaking Performance will include

- Cutting-Edge Technology: It is aiming to yield 0.25m^3 biogas per kg cow dung
- Unmatched Portability: it has its unique feature of Plug-and-play solution for any location
- Economic Powerhouse: we are targeting to make it cheaper than LPG, and in creating local jobs
- Environmental Champion: Slashes emissions, produces organic fertilizer
- Social Impact Leader: Improves health, empowers communities

Additional Details/Future Developments

Given India's rapid urbanization, “EcoFuel” has significant potential for scaling up. Future development will focus on:

- **Technology Enhancement:** Increasing biogas yield, improving energy conversion efficiency, and developing advanced features.
- **Market Expansion:** Targeting larger municipalities and exploring opportunities in rural electrification.
- **Policy Support:** Advocating for supportive policies and incentives to promote biogas adoption.
- **Business Model Innovation:** Exploring different business models, such as biogas-as-a-service or partnerships with waste management companies.
- **Community Engagement:** Strengthening collaborations with local communities to ensure sustainable and equitable benefits.

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GitHub Public Repository Link & Demo Video Link

https://github.com/dibyandu/INNOQUEST.git

https://github.com/user-attachments/assets/126a1cc9-40c7-4067-b8b7-65bd59f70ebb

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