NATIONAL SCIENCE, TECHNOLOGY, AND INNOVATION COUNCIL (NSTIC)

Project Theme:

Promotion of Innovative Energy Solutions

Project Title

Development of a Biogas Plant for Conversion of Solid Waste to Gas for Cooking and Heating in Kenema

-A Demonstration Project-

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1 Monitoring and Evaluation Strategy

The monitoring and evaluation strategy for the proposed project adopts a comprehensive approach to ensure effective progress tracking and impact assessment. Regular monitoring will involve the installation of data collection devices to capture real-time information on energy consumption, bio-digestion efficiency, and gas cooking stove performance. The research Team will conduct frequent site visits to assess the physical implementation of the biogas plant and its integration with home cooking infrastructure. Continuous optimization will be informed by the collected data, ensuring the system's efficiency, and addressing any emerging challenges. Evaluation activities will include a robust data analysis process, utilizing statistical methods and modeling techniques to measure the correlation between biogas plant performance and cooking stove use. Feedback mechanisms will be established to engage stakeholders in reporting issues and observations, providing valuable insights for ongoing improvements. This strategy ensures that the project's objectives are met and that its impact on energy use in Sierra Leone is understood and continuously optimized.

Table 1: Monitoring and Evaluation Strategy

Indicator	Description of the indicator	How the indicator will be tracked over the duration of the project to show impact
Scheduling	Timelines for implementation, dissemination, and reporting	• Targets for each phase of the implementation and demonstration met and reported on timeously.
Awareness	Understanding of the value and benefit of the biogas plant and cooking stove by the locals in the implementation region	• Number of sensitization events held. • Number of varied locations for events. • Number of community members participating in each event.
Solid waste collection	Improvement in environmental sanitation from effective collection of solid waste in the implementation region	• Reduction in harmful effect of decaying solid waste in the demonstration region. • Cleanliness of the street drainages of the city of Kenema. • Reduction in air pollution from burning solid waste.
Biogas generation	Collection and storage of biogas from the plant	• Quantity of biogas collected and stored in large tanks, as reported by the installed gas flow meters. • Regularity of maintenance and servicing of the gas plant. • Review of tank capacity informed by quantity of gas generated by the plant.

Indicator	Description of the indicator	How the indicator will be tracked over the duration of the project to show impact
Gas cooking stove	Generated gas used in the gas stove for cooking and heating	• Number of households replacing cooking mechanism with gas cooking stove. • Level of reduction in deforestation in Kenema district over 5 years from date of introduction of gas cooking stove.
Environmental impact assessment	Air, land and water pollution from solid waste	• Regular report of solid waste collection volume. • Air quality from reduction in burning of solid waste. • Land and water free of decaying solid waste.