

₹80/-

APRIL 2024

AGRICULTURE The National Agriculture Magazine TODAY

VOLUME XXVII | ISSUE 4

www.agriculturetoday.in



BUILDING WATER POSITIVE AGRICULTURE

Special Feature

DCM Shriram Agwater Challenge

BIOGAS SLURRY FOR SUSTAINABLE AGRICULTURE



Organic farming is gaining momentum globally, and India stands at the forefront with the highest number of organic producers. To sustainably meet the demands of the global organic market, India must transition to organic practices while adopting renewable energy sources like biogas.

Indian Scenario

The adoption of Biogas has the potential to provide dual benefits of energy and bio-product. Biogas slurry is fermented to form Fermented Organic Manure (FOM), which is also known as Fermented Organic Fertilizer. India has the world's largest livestock population, generating substantial quantities of animal waste. For example, bovine dung alone (cow and buffalo dung) contributes 256.2 MT to the annual production of 730 MT of dung by animals, resulting in an estimated annual production of 76.8 MT of BGS (assuming 1 kg of cattle dung produces approximately 0.4 kg of BGS). These figures highlight the availability of biogas slurry from biogas plants, which can

Biogas

Biogas production is a process that converts organic waste into energy through anaerobic digestion (AD). This process is facilitated by microorganisms that break down organic matter, generating biogas. Biodegradable materials such as cow dung and agricultural residues are broken down in an oxygen-free environment during the AD process, resulting in the production of biogas - a versatile energy source that can be used for various applications. The by-product of anaerobic digestion, known as digestate or biogas slurry (BGS), exists in either a solid or liquid form. The slurry enriched with a diverse range of microorganisms and secondary metabolites is a rich source of macro and micronutrients. Recent studies have confirmed that biogas slurry (BGS) derived from cow dung is nutrient-rich.

About the AUTHORS

Dr. Deepti Rai
Senior Research Fellow,
and
Dr. Bhagyashree
Kesherwani
Project Associate, Mobius
Foundation, New Delhi



be used as bio slurry to supply agriculture.

GOBARdhan Initiative

The Galvanizing Organic Bio-Agro Resources Dhan (GOBARdhan) initiative launched by Ministry of Jal Shakti, includes various schemes and programs from different ministries and departments. The government has launched initiatives under the GOBARdhan umbrella to promote sustainable agriculture and a circular economy by leveraging biogas-generated residual fermented organic manure (FOM) and liquid fermented organic manure (LFOM). The GOBARdhan initiative serves the purpose of fulfilling the need for cleaner energy sources, promoting responsible resource management, reducing greenhouse gas emissions, improving health outcomes, and supporting environmental sustainability. Furthermore, GOBARdhan aims to promote environmental sanitation, prevent vector-borne diseases, and empower rural communities through entrepreneurship and income generation.

The objectives of the GOBARdhan initiative include establishing 500 "waste to wealth" plants, comprising 200 compressed biogas (CBG) plants, 75 plants in urban areas, and 300 community or cluster-based plants at a total investment of Rs.10,000 crore. This initiative aligns with



By promoting the use of BGS in crop production, India can enhance agricultural productivity while minimizing environmental impact.

Sustainable Development Goals (SDGs), specifically contributing to SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action).

Initiatives like GOBARdhan underscore the government's commitment to addressing waste management challenges while promoting agricultural sustainability.

Applications in Agriculture

Fermented organic manure (FOM) and liquid fermented organic manure (LFOM) derived from BGS offer several advantages for Indian agriculture. They enrich soil health, reduce reliance on chemical fertilizers, and facilitate waste management. By promoting the use of BGS in crop production, India can enhance agricultural productivity while minimizing environmental impact.

Case Studies and Research

International examples, particularly from China, demonstrate the efficacy of biogas slurry in improving crop yields and soil fertility. Studies indicate its potential as a foliar fertilizer, reducing the need for pesticides and enhancing chlorophyll levels. Moreover, BGS application has shown superior results compared to chemical fertilizers, highlighting its promise for sustainable agriculture.

For Food Security

The integration of biogas production and the utilization of its by-products present a promising pathway for India's sustainable development journey. Initiatives like GOBARdhan underscore the government's commitment to addressing waste management challenges while promoting agricultural sustainability. By embracing biogas technology and its applications, India can achieve food security, environmental conservation, and rural development goals, ensuring a prosperous future for generations to come.



Other initiative taken by government was Waste to Energy Scheme by the Ministry of New and Renewable Energy, the SATAT (Sustainable Alternative Towards Affordable Transportation) scheme by the Ministry of Petroleum and Natural Gas, the Swachh Bharat Mission Grameen (SBM(G) Phase II program by the Department of Drinking Water and Sanitation (DDWS), the Agri Infrastructure Fund (AIF) of the Department of Agriculture Cooperation & Farmers Welfare, and the Animal Husbandry Infrastructure Development Fund (AHIDF) by the Department of Animal Husbandry & Dairy.