ACHIEVING CIRCULARITY THROUGH MANURE MANAGEMNT

National Dairy Development Board

Strategy Towards Sustainability through Circularity

Interventions for a small holder dairying system appropriately **incentivizing Dairy farmers** and other stakeholders in dairy value chain **to adopt circular dairy practices** ensuring sustainability

Examples of Circular Economy Initiatives in Indian Dairy reducing Carbon Footprint

Feed Management

(Reducing input cost while increasing milk yield)

- Ration Balancing Programme
- Crop residue management
- Total Mixed Ration
- Feed additives

Converting F&V waste into animal feed

- Utilization of pea pod and other vegetable waste for animal feeding
- Address the environmental impact of waste disposal

Manure Management

(Producing clean energy and organic fertilizer)

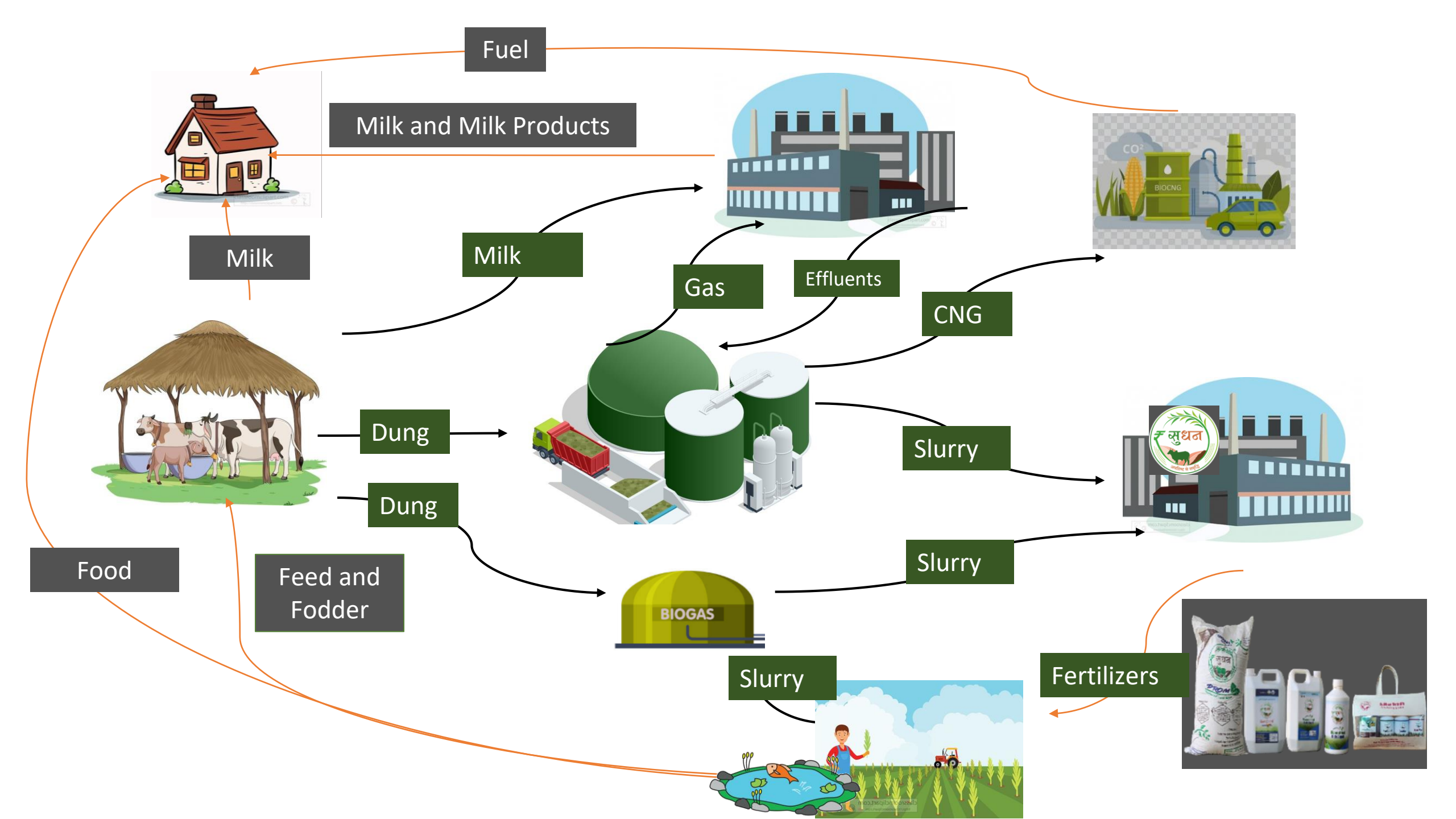
- Zakariyapura Model
- Banas Model
- Varanasi Model

Use of Solar Energy

- Powering Milk Collection, Dairy processing, transport, and irrigation with incentive from grid connectivity
- Solar Thermal for Milk Processing

A Case of Manure Value Chain Initiative

Harnessing the potential of dung as source of clean energy and fertiliser


Fuel
Milk and Milk Products
Milk
Milk
Gas
Effluents
CNG
Dung
Dung
Slurry
Slurry
Food
Feed and Fodder
BIOGAS
Slurry
Fertilizers
BIOCNG
सुधन

Innovative Manure Value Chain Models

Household level biogas based Manure Value Chain model sufficing cooking energy and organic fertilizer needs of farmers

Zakariyapura Model

Dung based large capacity biogas plant to produce Bio-CBG and Organic Fertilizer

Banaskantha Model

Dung based large capacity biogas plant to suffice Steam and Power needs of Dairy Plant and produce Organic Fertilizer

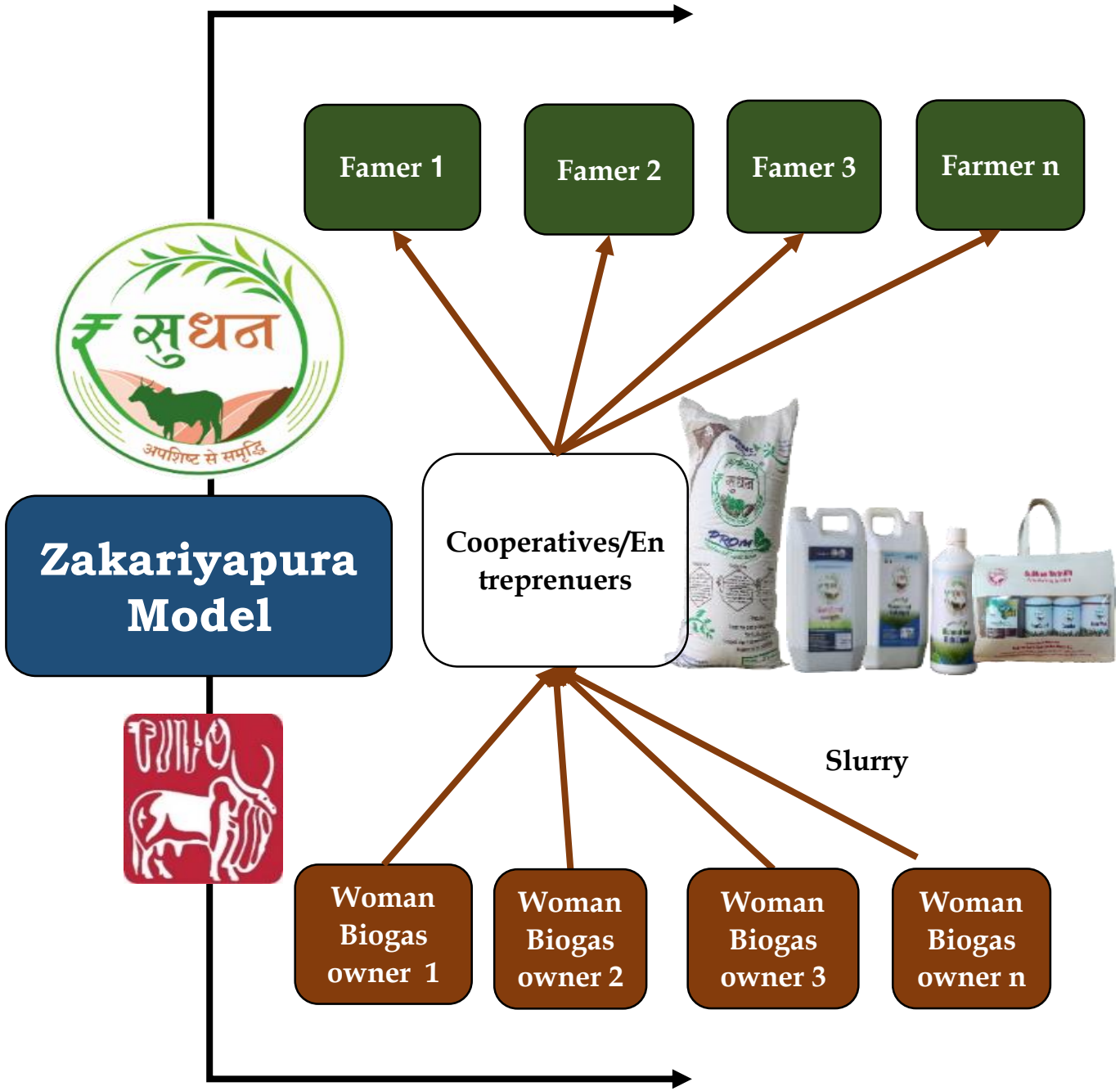
Varanasi Model

Zakariyapura Model

- The model of household level biogas coupled with a slurry processing unit replicated in Assam, Sikkim, West Bengal, Jharkhand, Bihar, Uttar Pradesh, Rajasthan, Gujarat, Maharashtra

- Household level Biogas plants installed in above states and additionally in Karnataka, Odisha, Tamil Nadu, Haryana, Punjab, Chhattisgarh, Madhya Pradesh, Telangana, Kerala

More than 25000 biogas plants installed across the country



Different Centralized Biogas Models

- A **Banas Model** Producing Bio CNG and Fertilizer
  - Five more CBG plants in Banaskantha with Suzuki and Banas Dairy
  - Four more plants in Mehsana, Amul, Jaipur Sabarkantha
  - A CBG plant in Cow Sanctuary at Muzzaffarnagar

- A **Varanasi Model** satisfying energy needs of Dairy Processing Plant and Producing Fertilizer
  - Biogas plants in Barauni with support of ONGC

Household Biogas installed	
State	State Wise Total
Assam	292
Bihar	528
Chattisgarh	54
Gujarat	12297
Haryana	196
Jharkhand	113
Karnataka	26
Kerala	20
Madhya Pradesh	233
Maharashtra	9399
Odisha	216
Punjab	117
Rajasthan	1849
Sikkim	121
Tamil Nadu	206
Telangana	50
Uttar Pradesh	959
Uttarakhand	1
West Bengal	331
19 states	**27008**

Large capacity plants operational till date		
Banas Dairy	1 Dung based CNG plant	**40 MT/day**
Varanasi Dairy	1 Dung based biogas for steam Generation	100 MT/day

Large capacity plants under setting up		
Banas Dairy	4 Dung based CNG plant	**100 MT/day**
Barauni Dairy	1 Dung based biogas for steam Generation	100 MT/day
Cow Sanctuary	1 Dung based CNG plant	100 MT/day

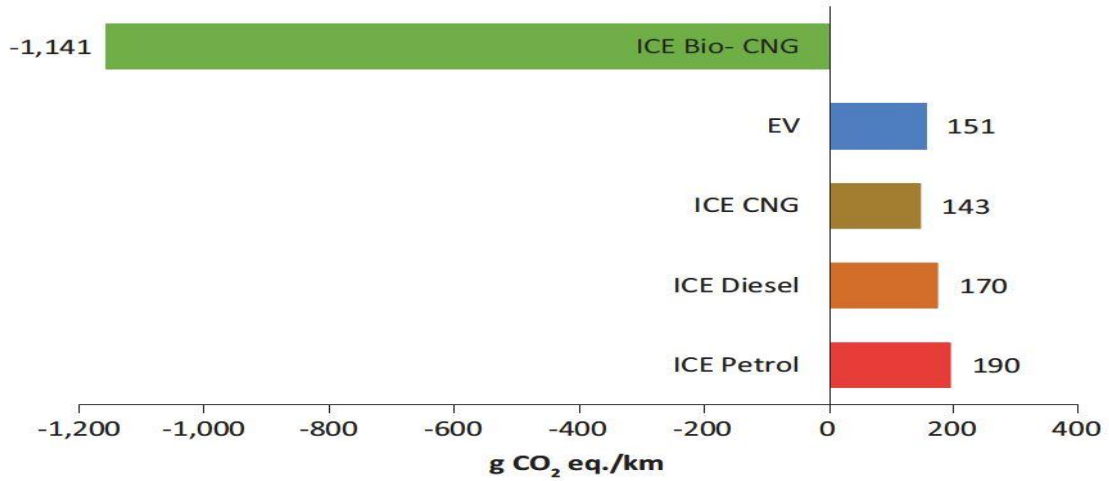
Large capacity plants being taken up		
Banas Dairy	1 Dung based CNG plant	**75 MT/day**
Sabar Dairy	1 Dung based CNG plant	**75 MT/day**
Amul Dairy	1 Dung based CNG plant	**75 MT/day**
Jaipur Dairy	1 Dung based CNG plant	**75 MT/day**
Mehsana Dairy	1 Dung based CNG plant	**75 MT/day**

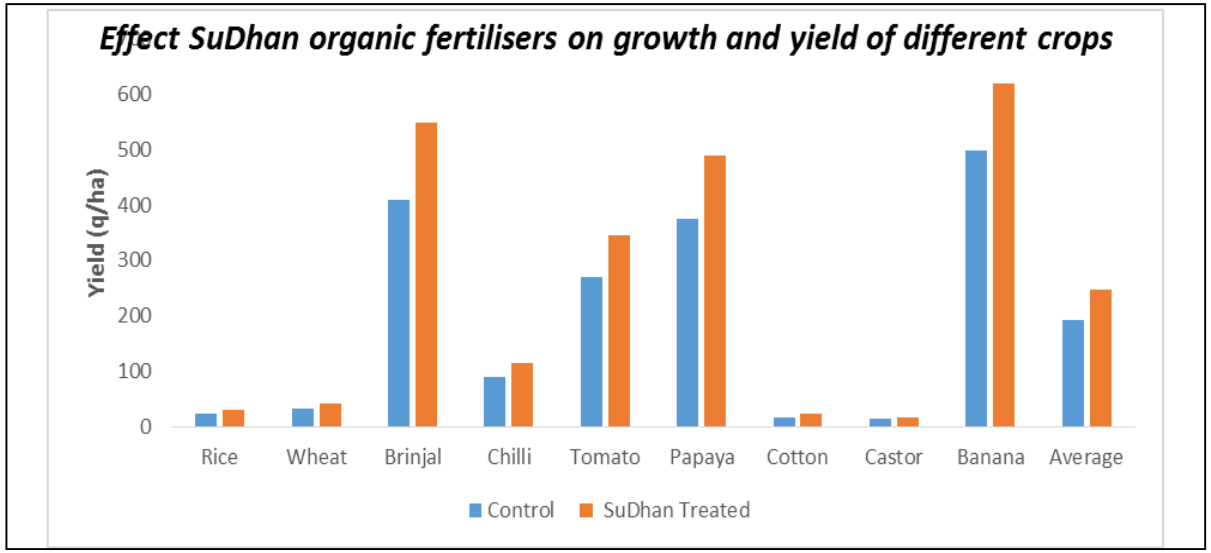
13 large plants in three states

Importance of Biogas and Slurry based fertilizers

- Efficacy of Organic Fertilizers
  - by Anand Agricultural University, Gujarat and Banaras Hindu University
  - Positive impact on yield, Growth, Nutrient content Microbial count
  - Promising results at farmer field
- Positive impact of slurry on fish
- A Study by TERI on dung based CBG as the most attractive source to reduce automobile emissions

Crop	Wheat		Maize	
	Control (100% RDF)	Treated (75% RDF + Sudhan Products)	Control (100% RDF)	Treated (75% RDF + Sudhan Products)
Grain yield (kg/ha)	5533	6856	4050	5467
Protein in grain (%)	11.63	12.45	9.45	10.44
Microbial population in soil (CFU/g)	3.7×10^3	5.6×10^4	6.7×10^3	9.1×10^4
Growth parameters (height in cm)	86	90.2	211.5	213.5

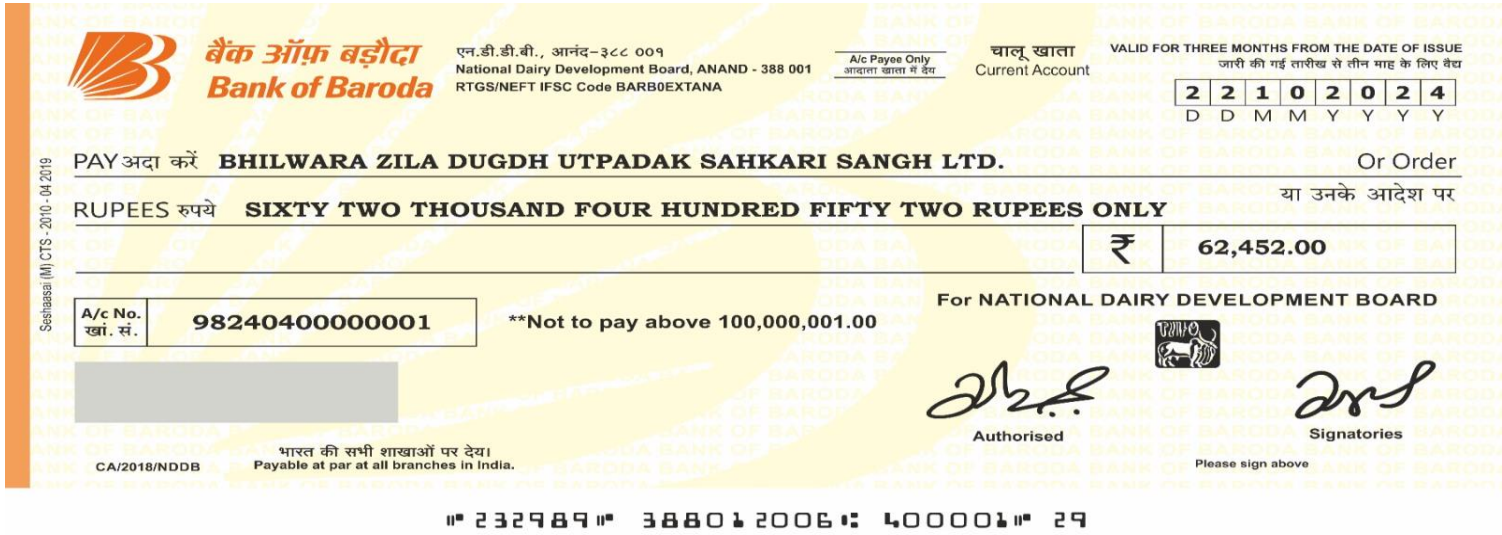




Monetising environmental benefits under the initiative

- Registering Household level biogas projects to avail carbon credits and passing on the benefits to farmers
- Carbon Financed Programs to upfront subsidise the biogas plants for dairy farmers
- Registering large capacity biogas plants for availing carbon credits

Developing Methodologies to account impact of Slurry based organic fertilisers and in turn carbon sequestration



Support available for Household level biogas plants

- MNRE Biogas program
- Gobardhan scheme (Rs.50 Lakh per district)
- CSR fund support
- Various foundation's initiative
- Carbon Finance

GOBARdhan

(Galvanizing Organic Bio-Agro Resources)

SUSTAIN+

FOUNDING PARTNERS

CInI

SOCIAL alpha

SELCO FOUNDATION

A credit support may be required for farmers to contribute their share.

SISTEMA.bio

CREATING VALUE FROM WASTE

Support for large scale Biogas plants

- Suitable credit support can be availed under AHIDF
- Assurance of Gas offtake
- Minimal grant available for Biogas plant
- compulsory blending of CBG with CNG
- CSR support
- Collaboration with Automobile or related industry

पशुपालन और डेयरी विभाग
DEPARTMENT OF ANIMAL HUSBANDRY AND DAIRYING

सत्यमेव जयते

ओएनजीसी
ONGC

SUZUKI

Support for Organic Fertilisers

- Market Development Assistance of Rs.1.5/kg by Department of Fertilisers
- Linking with Organic Farming missions of Centre/State
- NDDB's expertise in product formulation, process formulation, compliances etc
- Collaboration with Fertiliser Industry

सत्यमेव जयते
Department of Fertilizers
Ministry of Chemicals & Fertilizers

₹ सुधन
अपशिष्ट से समृद्धि

GUJARAT STATE FERTILIZERS & CHEMICALS LIMITED
GUJARAT STATE FERTILIZERS & CHEMICALS LTD.
Integrated Management System Certified Company

Taking forward the initiative in Focussed manner

- Managing Dung as a COMMODITY
- Addressing localised needs and keeping Farmer at CORE
- Developed expertise in Operations and Management of plants
- Development of Fertiliers products and Marketing
- Channelizing Funding Supports
- Works on Carbon Credits as source of income and offsets
- Collaborations with Fuel and Fertilizer Industry
- Focused research and Innovation

MRIDA can offer the support Dairy Cooperatives in Executing, Managing projects under the Manure Value chain initiative across the country

With Government of India's mandate, NDDB Established a Fully Owned Subsidiary NDDB MRIDA Ltd for scaling up and to establish commercially sustainable 'Manure Value Chain' across the country

Mrida is an unlisted Public Limited Company under the Companies Act, 2013, a wholly owned subsidiary of NDDB.

Manure Value Chain Contribution towards GOI initiatives and SDGs

आत्मनिर्भर भारत

MAKE IN INDIA

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Additional Income Job creation Reduced Imports

Reduced GHG Emissions

Public Private partnerships

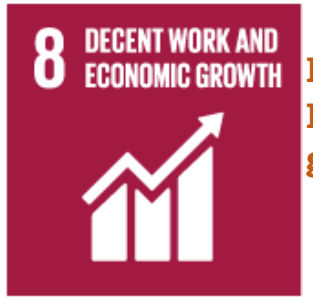
Food Security Improved Human Health and nutrition

Swachh Bharat Improved Soil Health Crop Residue Reuse

Access to Clean and sustainable energy

Women Participation

Investment in Sustainable Energy Infrastructure



Employment/ Entrepreneurship generation

Thank You