

Vivekananda Kendra



- ✓ - a spiritually oriented service mission to translate into action the vision of Swami Vivekananda of a Glorious India.
- ✓ - is centered on the noble thought that **Service to Man is Worship of God** and serves the nation through 230 branch centers throughout the nation.





Vivekananda Kendra : Activities

- ✓ Character building EDUCATION
- ✓ Culture-based Service-oriented RURAL DEVELOPMENT
- ✓ YOGA as a Socially relevant way of life
- ✓ Invigorating PUBLICATIONS
- ✓ nardep for Sustainable Development





VK - nardep : THRUST AREAS



'SHAKTI SURABHI'

Energy Plant

(Waste to Energy, Waste to Wealth)



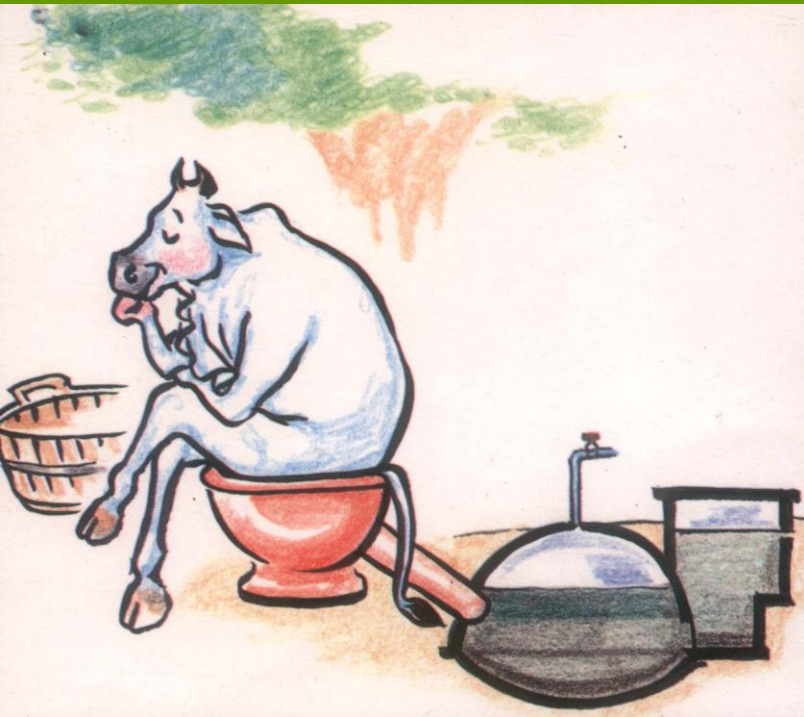
Presentation by

VIVEKANANDA KENDRA –NARDEP

KANYAKUMARI

Biogas Plant

TO



Kitchen waste plant

Many Problems - One Solution Shakti Surabhi



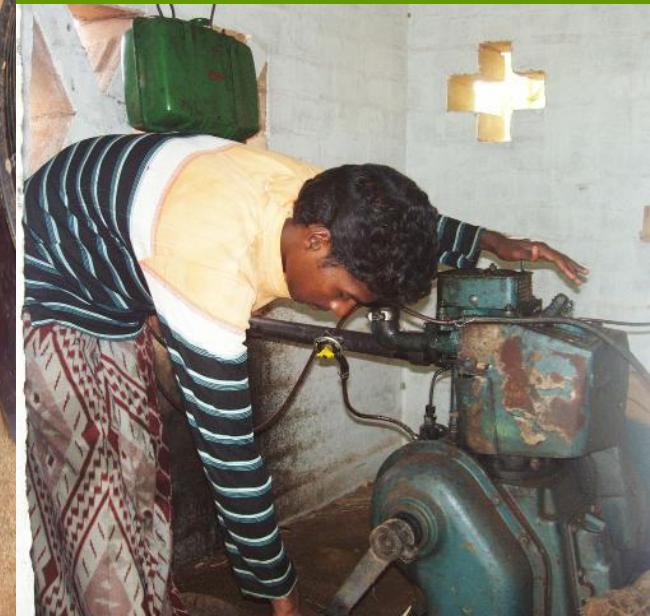
Disposal of waste is a problem
Burning of wastes adds to global warming
Organic waste accumulation
is a health Hazard!



Bio-Methanation plant Shakti Surabi is a solution to this grave environment and health problems arising from organic and domestic wastes.

Usage of Kitchen Waste Plant

- Cooking
- Running the Engine
- Lighting the lamp
- Good Organic Manure





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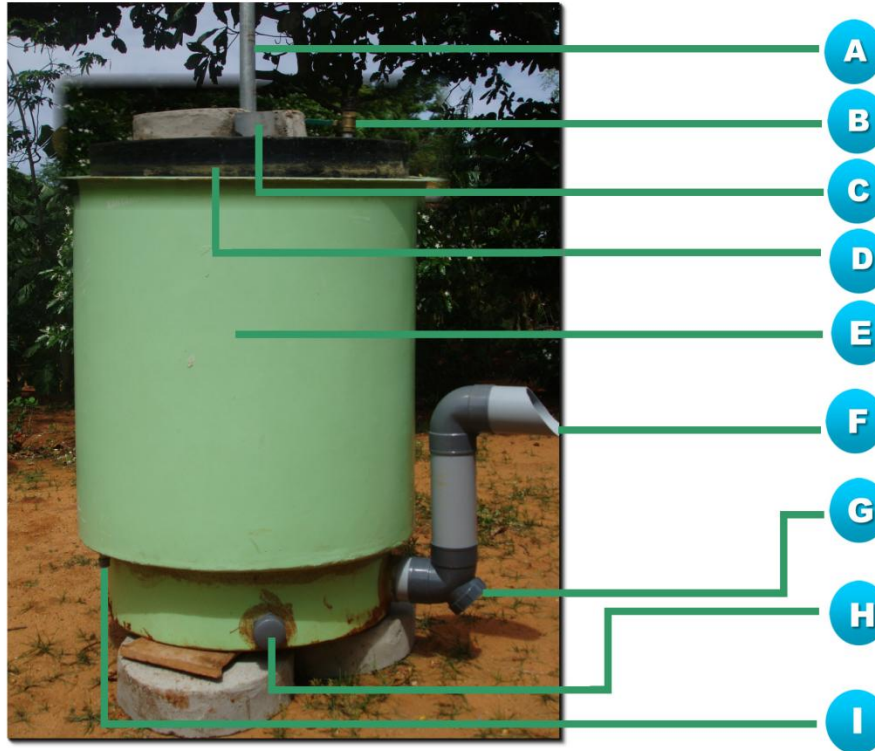
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- A** Guide Pipe
- B** Gas Outlet
- C** Inlet Pipe
- D** Gas Holder

- E** Digester
- F** Outlet Pipe
- G** Emergency Slurry Drain
- H** Substrate Drain
- I** Water Drain

Advantages of Shakti Surabhi[®] Bio-Methanation Plant



Apart from the obvious ecological and health advantages the plant has the following additional advantages:

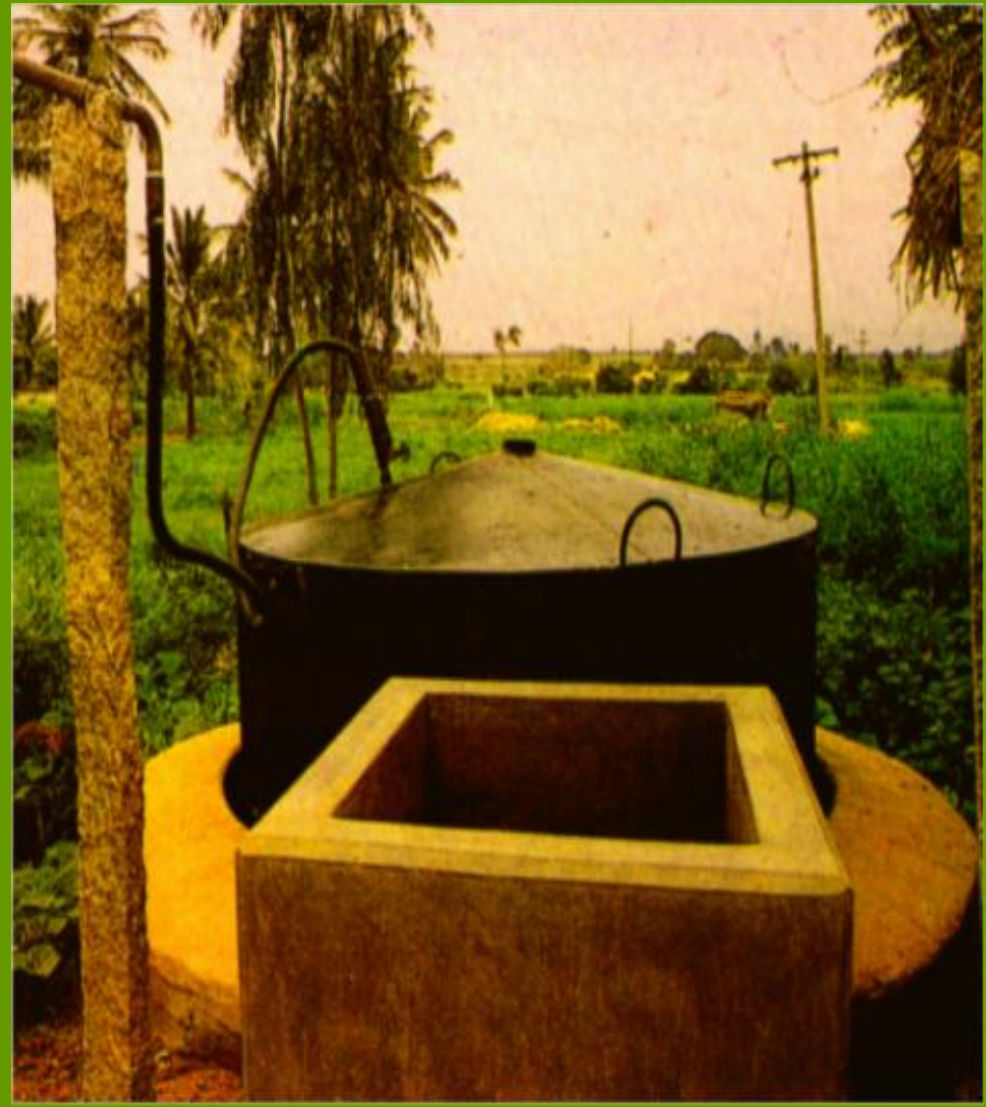
- They are suitable for rural and urban settings
- They are portable
- They have aesthetic looks
- They are easy to transport - assemble and de-assemble
- They are easy to maintain and handle
- They come in different capacities and designs

All these make the plant
"Your plant"
for the rural and urban
middle class.

Types of Kitchen Waste Plants

➤ Portable Model

➤ Fixed Model



SS plant in Terrace





Water jacket model



Portable models

Range- 0.5 cum to 6 cum



❖ **Patented**



❖ **Approved by MNRE**

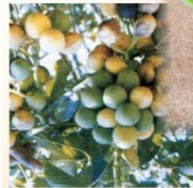
❖ **Installed More than 300 units in All Over India**

Different wastes as Feed material



- Cooked waste (Rice, Chapathi, Dhal etc)
- Non-vegetable waste (Fish, meat etc)
- Vegetable waste (Wastage from vegetable market)
- Flour mill waste (Wheat, rice etc.)
- Starchy material (Tapioca, Maize etc.)

Non-Edible Oil Seed Cakes as Feed Material



Neem
Pungam
Jatropha
Mahua
Rubber and
Cotton seed cake
and others

■ Non edible oil can be used as bio-fuel.

■ These oil cakes can be used as feed material for Shakti Surabhi plants.

■ The slurry can be used as bio-pesticides and growth promoters.





Water Hyacinth, Ipomoea and sea weed as input material

Advantages:

- ❖ Cleaning of water bodies
- ❖ Production of biogas from waste
- ❖ Less green house gases as methane is 23 times more dangerous than CO_2
- ❖ Output slurry can be used for composting
- ❖ Improved cooking facilities and so better hygienic conditions.



Different Material and Quantity Requirement for 1cum plant

Sl.No	Feeding Material	Quantity Kgs.
1.	Cooked waste	5.0
2.	Vegetable Waste	7.0 - 8.0
3.	Tubers	1.0 -1.5
4.	Non –Edible cake	1.0-2.0
5.	Grains	1.0-1.3

Note: Tea leaves, Azolla, organic waste, Kanchi etc., also can be used.

Shakthi Surabhi[©] Bio-Methanation Plant (Fixed Model)



Plants constructed above the ground level
Cost-Effective
Easy to construct
Adaptable for rural and semi-urban areas



Users Share their Delight...



No more smoke from fuel wood. My kitchen is clean.



I can save more on LPG and my kitchen garden also has grown green.



Even after 2 months vacation tour, when I returned, the plant was fully functional.



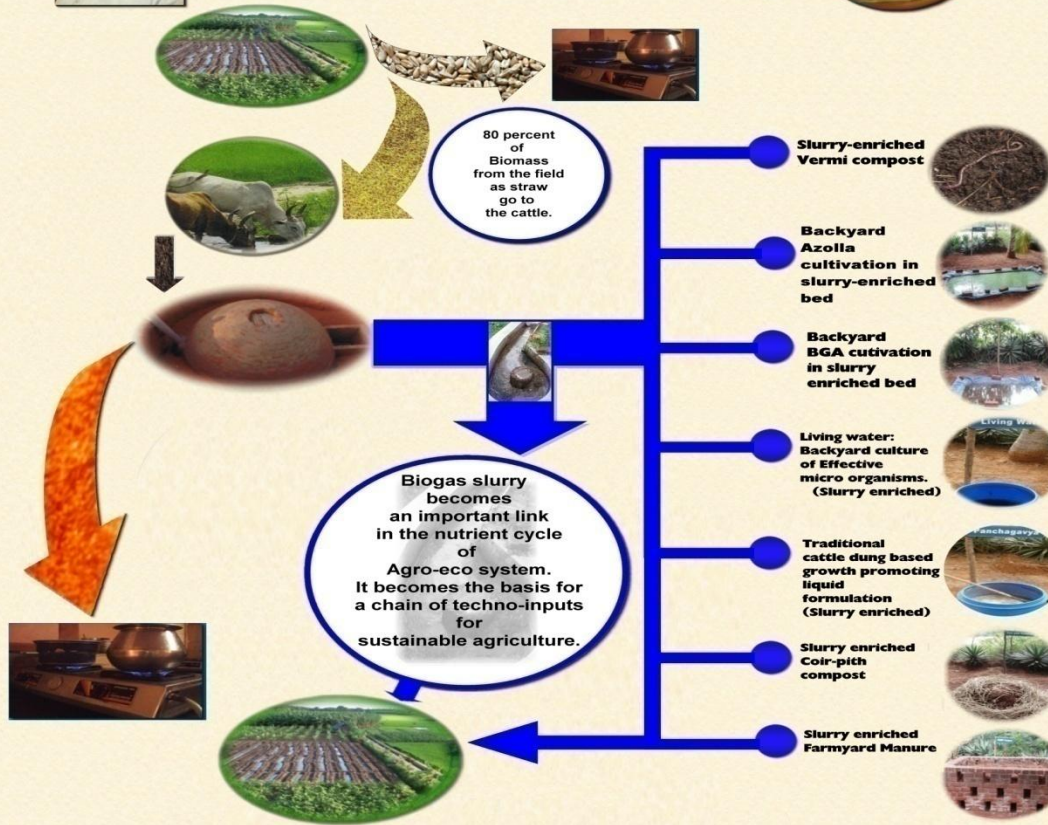
This plant saves my time and has improved my family's health

Biogas-Slurry

The Tao of Energy and Nutrient managements for the farmers of the developing world



Dr.J.C.Kumarappa - eminent Gandhian Economist was the first to propound the Tao of Biogas technology : for Energy and Nutrient Management : He saw Biogas plant as backyard fertilizer plant for marginal farmer.



BIOGAS SLURRY BASED AGRO-INPUTS

- REDUCE CHEMICAL FERTILIZERS
- REDUCE CHEMICAL PESTICIDES
- REDUCE GREEN HOUSE GAS EMISSIONS
- REDUCE OVERALL POLLUTION

BIOGAS SLURRY BASED AGRO-INPUTS

- INCREASE NUTRIENT CYCLE EFFICIENCY
- INCREASE SOIL HEALTH
- INCREASE CROP HEALTH (ORGANIC GROWTH PROMOTERS)
- INCREASE FIELD-SOIL BIO-DIVERSITY



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Construction of Bigger Size Shakti Surabhi Energy Plant

Cow dung based Biogas plant -
100 cum for CNG



Shakti Surabhi
Kitchen waste Biogas plant- 100cum



Construction Stages SS Plant



Bigger size SS plants transports



25Cum. Shakti Surabhi Kitchen waste Plant TVS, Pondicherry



100 Cum . S.S Plant - PSG Tech. Coimbatore



100 Cum. Shakti Surabhi Plant at Mammallapuram





Budget for 100 cum. Plant (500kgs.waste)

Sl.No	Description of Items	Amount Rs.
1.	Digesters – 60 cum capacity	5,75,000/-
2.	Gas Holders in F.R.P – 55cum capacity	3,65,000/-
3.	Inlet tank, Outlet tank Hydrolysis Tank – 4 nos	90.000/-
4.	Crusher	1,10,000-
5.	Sludge Pump	50,000/-
6.	Pipeline connections (10m distance)	50,000/-
7.	Commissioning of the plant	85,000/-
8.	Monitoring of the plant for one month	10,000/-
9.	Transport Expenditure	25,000/-
	Total Amount	13,60,000/ -

Economics of the Bio-Methanation plant

1 cum. of biogas = 0.43 kgs. of LPG

100 cum. of biogas = 43 kgs. of LPG./day

say 40kgs. LPG

Commercial Rate

LPG = 40 kgs. @ Rs.72/- = 2,880.00

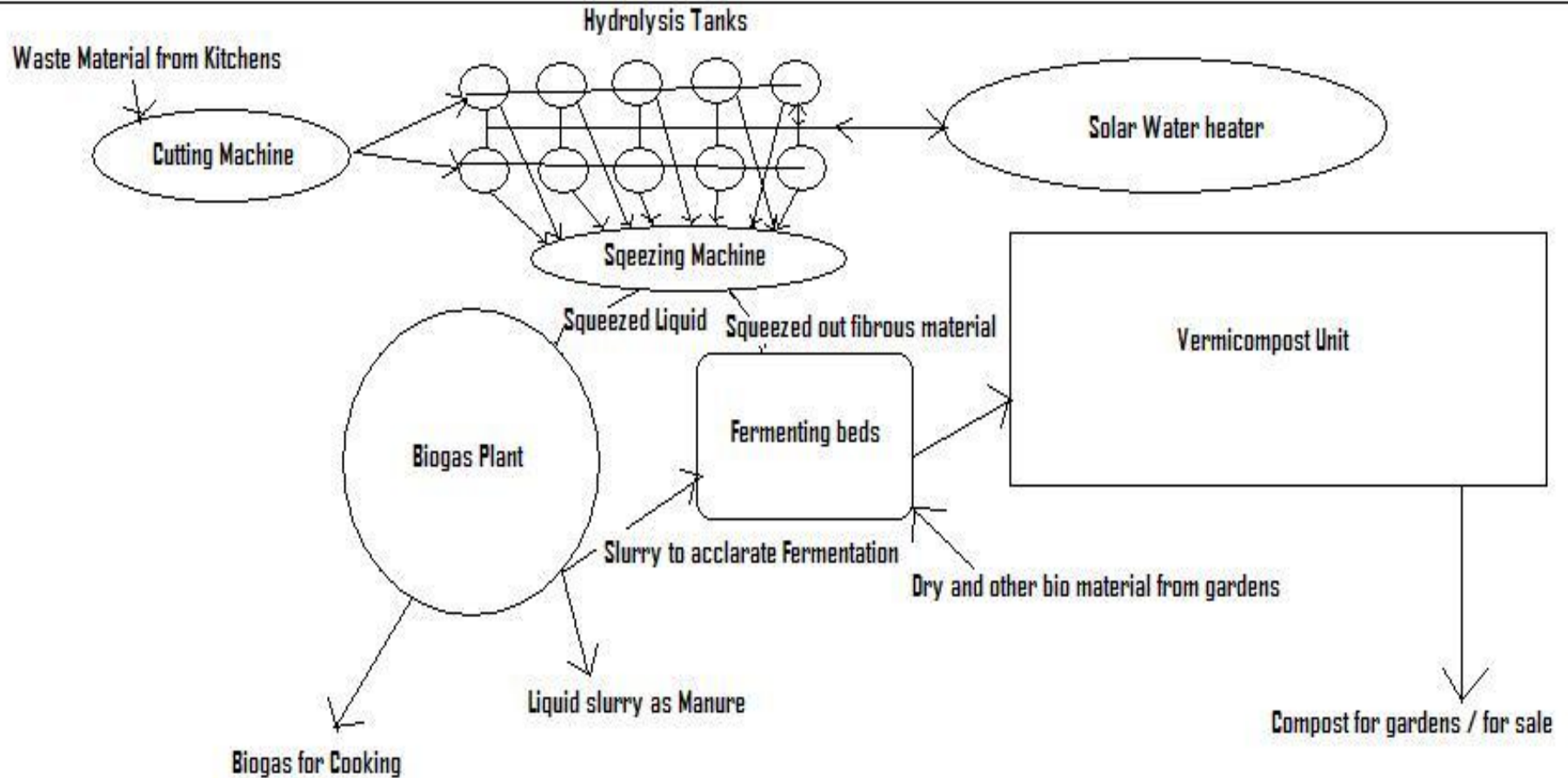
Slurry = 1000lits @ Rs.0.20/- = 200.00


Total -----
3,080/ day


Per Annum = 350 days @ Rs.3000/day =
Rs.10,50,000/-


Thus pay back period is 1 year 6 months

Schematic Diagram –method -1



Biogas  **Electricity**

Biogas  **CBG**

Biogas  **Carbon Credit**

Biogas



Electricity




If power requirement is 5 K Watts then

Power of the engine = 10kW or next available Generator

A diesel engine converted to biogas engine will give assured 50% Power.

Biogas plant capacity does not have any bearing on engine.

The gas consumption is one cubic metre (cum) per kilowatt hour i.e. the consumption will be 5 cum per hour.

- A plant of 100 cum  5 kW power for 20 hours/ day.
- A plant of 60 cum  5 kW power for 12 hours / day.
- A plant of 90 cum  5 kW power for 18 hours /day.



**Compressed Biogas (CBG)
System at Sevayur in Virudhunagar Dist.**



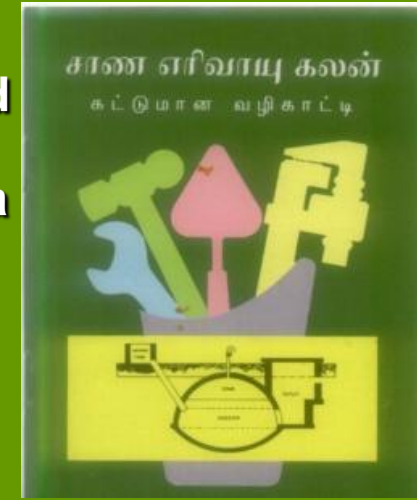
**VPSA System with 2 stage compressor,
Control Panel & CBG Cylinders**

Cow with Methane gas



Guillermo Berra, a researcher at the National Institute of Agricultural Technology, Argentina, says that “Every cow produces between 800 to 1,000 litres of methane (23 times more dangerous than CO₂) emission every day.

Work in Bio gas field



- ❖ One of the leading Organisations in India working in the field of Biogas since 1986.
- ❖ Constructed more than 2000 Biogas plants through out India
- ❖ Developed cost-effective model VINCAP – using bamboo instead of bricks
- ❖ Published half a dozen books on Biogas Technology – supported by Ministry of Non-Conventional Energy Sources - MNES, New Delhi.
- ❖ The book titles are as follows:
 1. Repair and Maintenance of Biogas plant
 2. Biogas a boon
 3. Masons Manual
 4. Biogas Users Guide
 5. Biogas Manure Users Guide
- ❖ Most of the books are in all the three languages – English, Tamil and Hindi



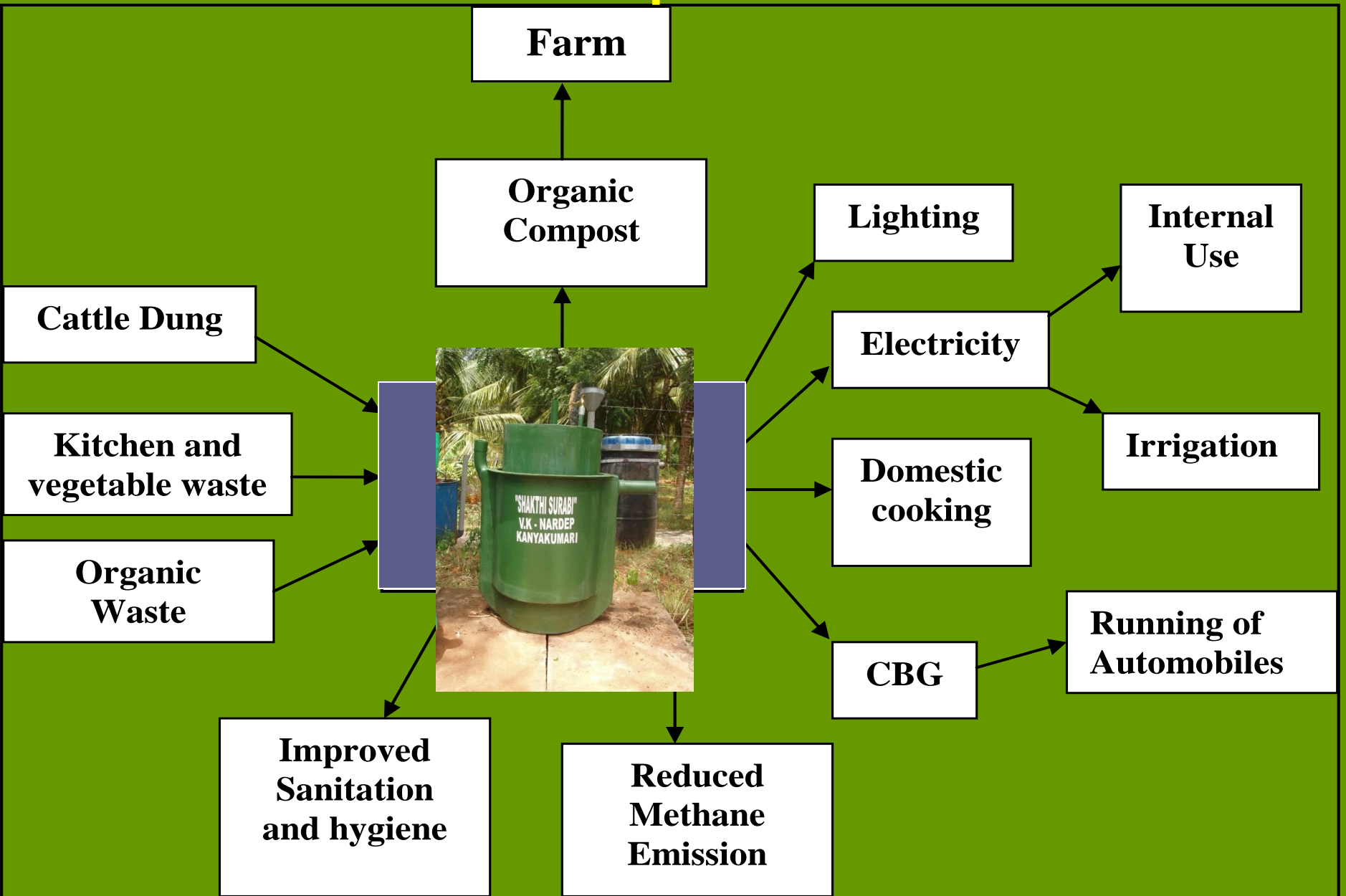
Work in Bio gas field

The highlights of our work in the field Biogas are as follows:

- ❖ VK-NARDEP is the member of International SNV Network on Biogas
- ❖ VK-NARDEP representative has attended International Seminar on Biogas technology at Beijing, China and read a paper.
- ❖ VK-NARDEP received the prestigious International Ashden Award (London) in the year 2006 for its work in the field of Biogas.
- ❖ VK-NARDEP has developed “Shakti-Surabhi” model for Bio-methanation of kitchen waste, which will help in the field of sanitation in the long way.
- ❖ VK-NARDEP is a turn key agent for construction and maintenance of Biogas plants in three districts of Tamilnadu viz. – Kanyakumari, Tirunelveli and Thoothukkudi



Recapitulation



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