

Decentralized waste resource management: Nisargruna experience

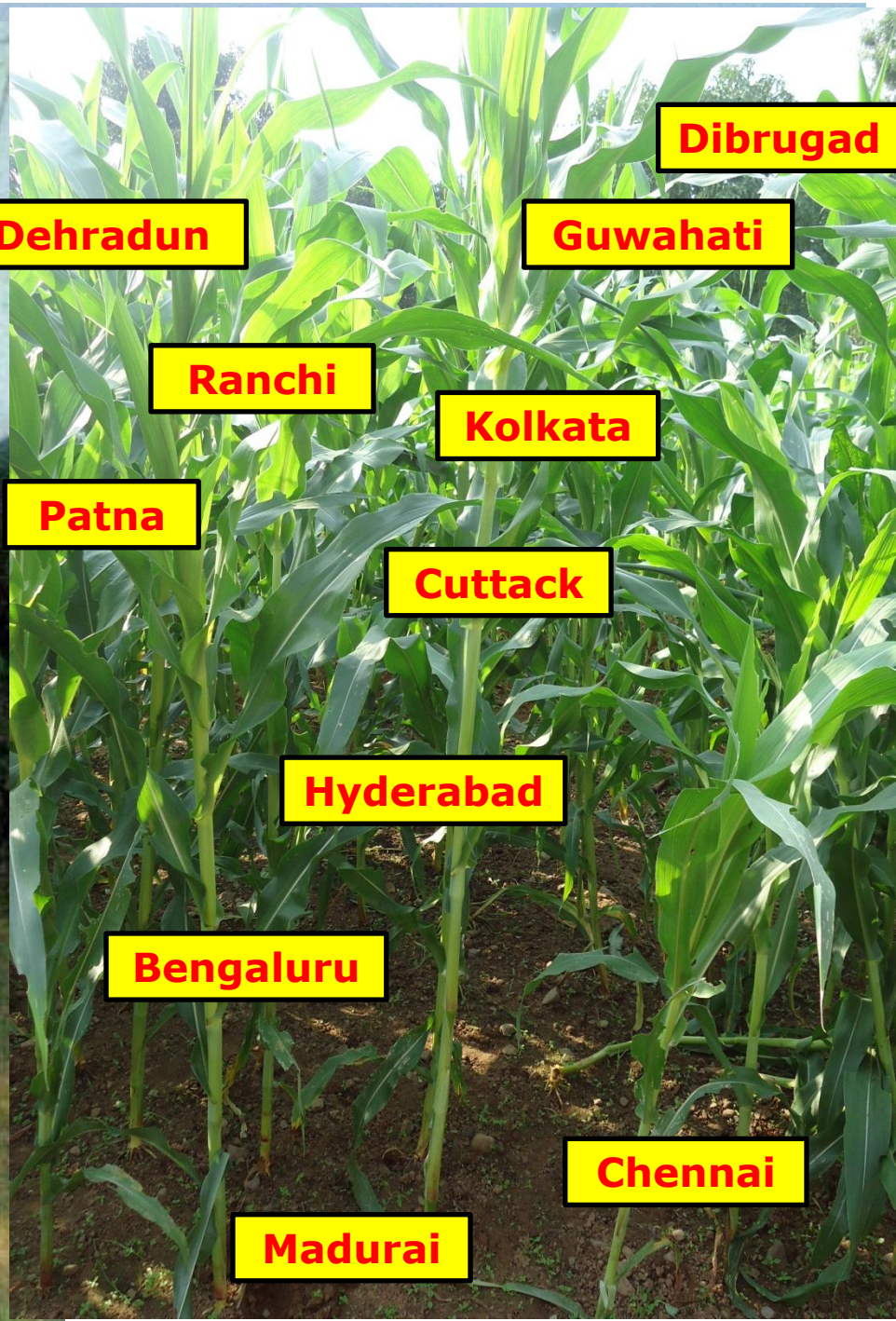
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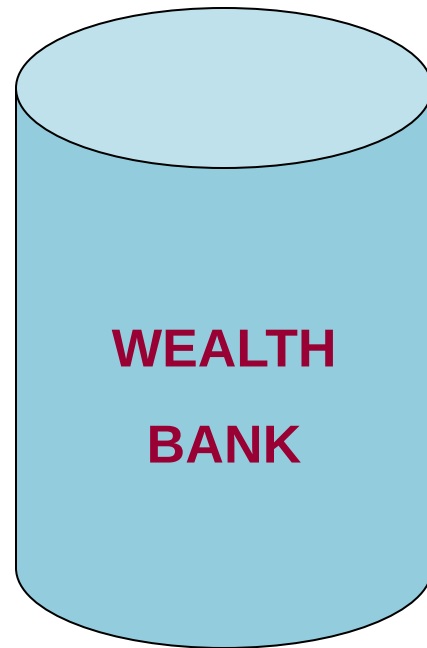




8/23/2013

Earth needs your help

PERSPECTIVE METTERS



SEGREGATION IS THE



Glass



Metal



Green



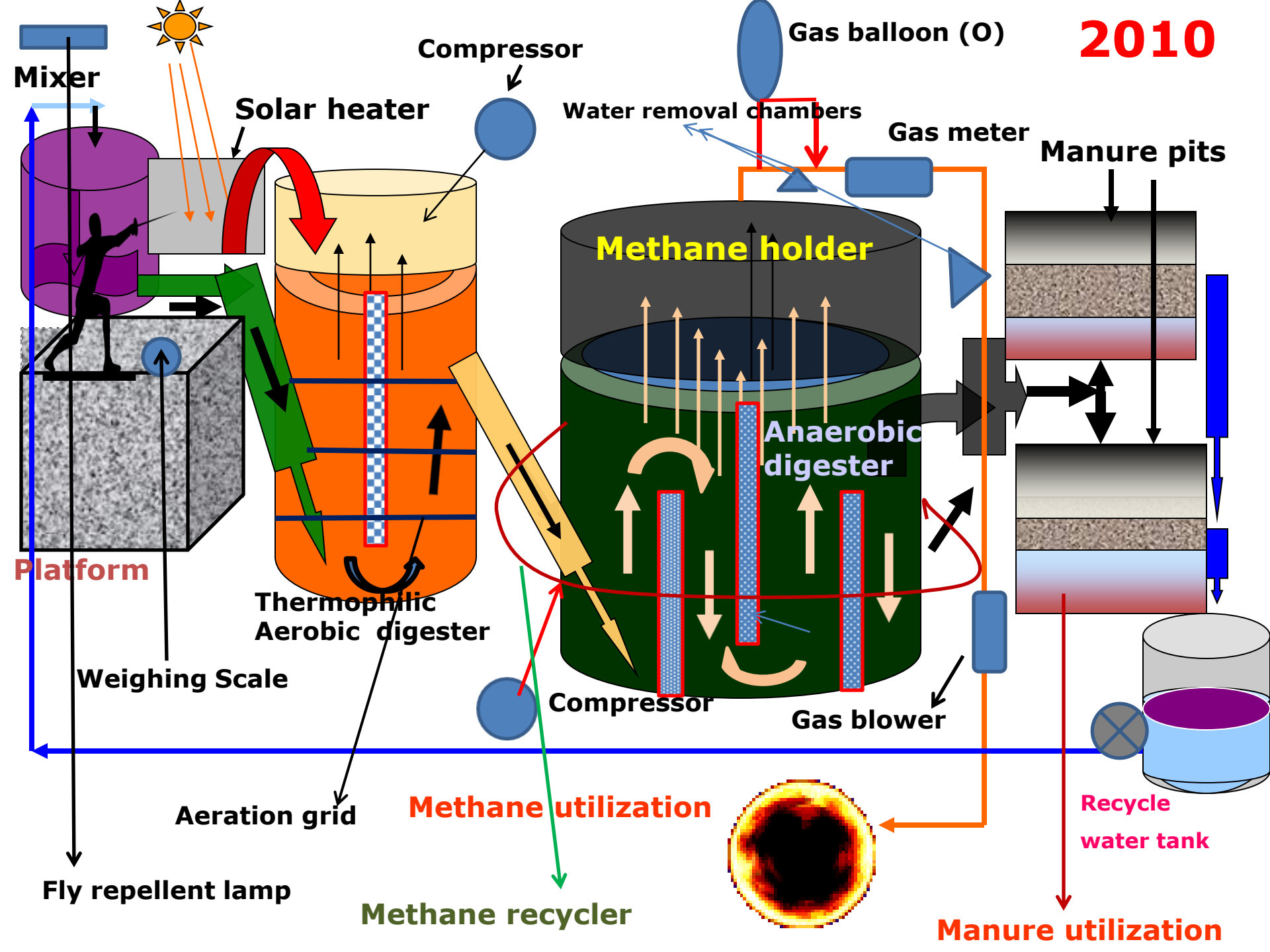
Plastic

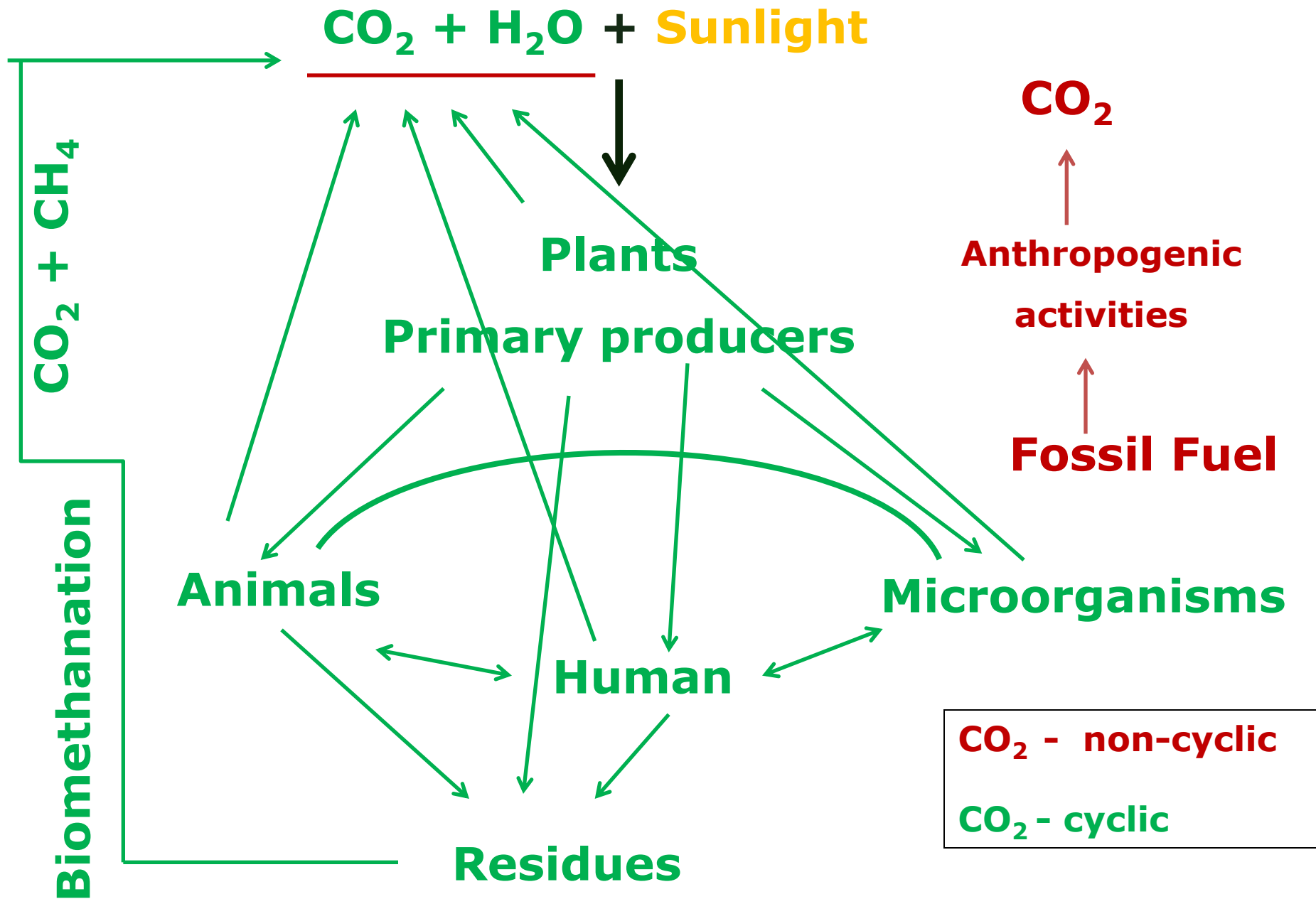


landfill



2010





ENVIRONMENTAL SUSTAINABILITY AND ECONOMICS

- **1 MT biodegradable waste is going to be 1 to 2 MT food for tomorrow.**
- **Decentralized plants can substantially reduce transportation costs and associated hazards.**
- **1 MT biodegradable waste resource processing through Nisargruna generates**
 - **employment for 1 person**
 - **15-30 Kg fuel (Methane gas)**
 - **50-90 Kg manure**

Average installation cost for

- 1. 1-5 MT/day plants would be Rs. 17-20
Lakhs per tonne**
- 2. 10 to 25 MT/day plants would be Rs. 15
Lakhs/MT**

Average O&M cost per annum for

- 1. 1-5 MT/day plants would be Rs. 1 Lakhs per tonne**
- 2. 10 to 25 MT/day plants would be Rs. 0.8 Lakhs/MT**

Space economy in Nisargruna plants

Capacity MT	Space M ²	Quantity processed in 30 years (MT)
1	60	9900
2	100	19800
5	400	49500
10	1000	99000
25	2000	247500
50	4000	495000

Average life of a Nisargruna plant will be 30 years

- **Paying back Nature's loan**
- **Improving the environment**
- **Maintaining the resource recycling in equilibrium**
- **Improving the health aspects of city and country**
- **Reducing carbon emissions through**
 - **Vehicular transportation check**
 - **Using biogas to replace fossil fuels**
 - **Stopping the emission of methane at dumps**
 - **Using manure replacing urea**

NISARGRUNA PLANT: RAW MATERIALS

Type of material	No. of plants	Locations
Kitchen discards	> 100	Most of the existing plants
Vegetable market	> 30	Some plants receive mix materials
Abattoir discards	4	Deonar, Solapur, Kalyan
Bone protein factory discards	3	Chandrapur
Cattle dung	10	Nasik, Chiplun, Pali, Anjangaon, Vasai, Tara

APPROXIMATE QUANTITY OF MATERIAL PROCESSED AT MAJOR LOCATIONS

Location	Material processed (MT)	Location	Material processed (MT)
Anushaktinagar	6000	Pandharpur	1000
Govandi	6000	Kaiga	1000
Matheran	6000	Cochin refinery	800
Kalameshwar	1500	Nasik	1200
Katol	1000	Symbiosis	1000
TIFR	1000	Symbiosis _2	800
INS Kunjali	1500	TCS, Thane	600
Pune (Model Colony)	2000	Alibag	600
Baramati	1000	Roha	1000
Nasik	1000	Pune	1000
Anjangaon	500	Kerala	1500
Chiplun	500	Thane	2000
Pali	500	Ankaleshwar	4000

JUNE 2002

4 MT/day

**GAS IS USED IN
HOSTEL KITCHEN**

TRAINING SCHOOL HOSTEL, ANUSHAKTINAGAR

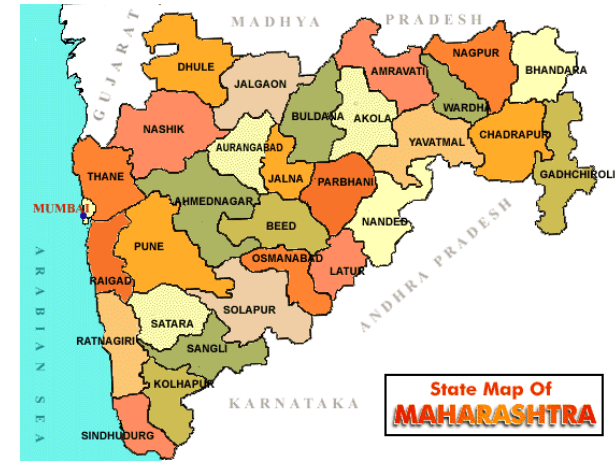
HIRANANDANI ESTATE, THANE



- **5MT/day hotel and vegetable market material**
- **Area 300 m²**
- **Biogas for electricity**
- **December 2005**



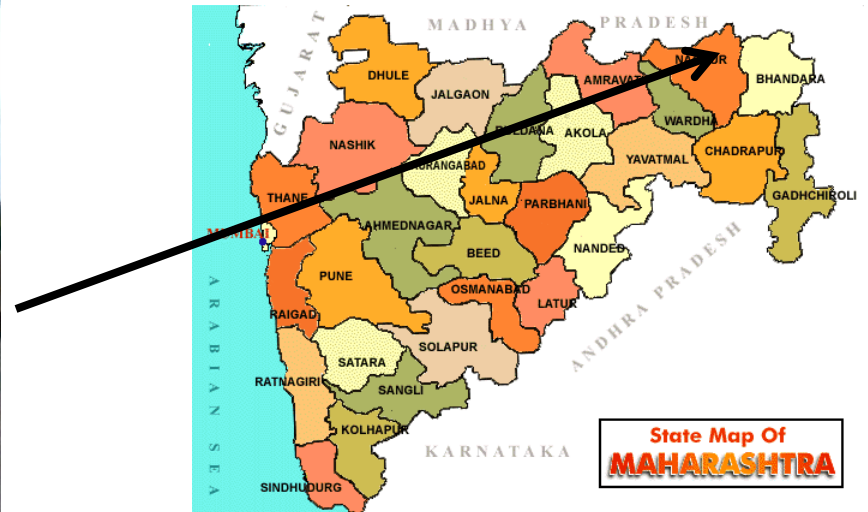
TCS, THANE

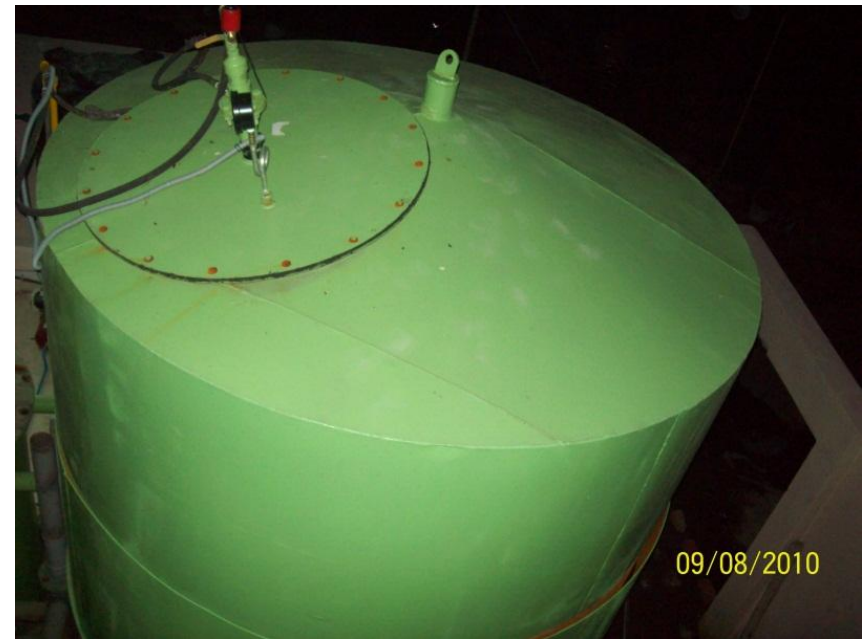


- **1MT/day Food resource from TCS canteen**
- **Area 40 m²**
- **Biogas for Kitchen**
- **June 2009**

KALAMESHWAR MUNICIPAL COUNCIL

- 2MT/day hotel and vegetable market material
- Area 300 m²
- Biogas for electricity (street lights)
- June 2007





Delhi Secretariat

0.5 MT/day Food based

June 2010

Fabricated in steel

Area 30m²

Biogas use in kitchen





Delhi Secretariat Nisargruna plant was inaugurated on August 20, 2010 by Honorable Chief Minister Smt. Sheila Dixit



Actual Performance of Delhi Secretariat Project from August 2010 to July 2013

Parameter	Quantization
Quantity of resource processed	42000 Kg
Gas utilized in the kitchen	4150 m³
Utilizable gas generation per MT of resource	98.8 m³
Manure generated	3500 Kg

NISARGRUNA PLANT
CAPACITY 2 MT/day
BADDI (Himachal Pradesh)



AURO TEXTILES-BADDI (H.P.)
BIO GAS PLANT

GAS PRODUCED :- METHANE (80-85%)
GAS CAPACITY (MAX) :- 80Kg/DAY
WASTE PROCESSED :- 2000Kg/DAY
TECHNICAL :- BHABHA ATOMIC RESEARCH
PROVIDER CENTRE MUMBAI

Average Atmospheric Temperatures in Baddi for the Year 2010 - 2011 (April 2010 - March 2011)

S. No	Month	Maximum (°C)	Minimum (°C)
1 2 3	April May June	38 - 44	30 -34
4 5 6	July August Sept	36 - 40	26 - 32
7 8	October November	25 - 32	18 - 22
9 10 11	December January February	08 - 15.0	3.0 - 6.0
12	March	25 - 30	15 - 20

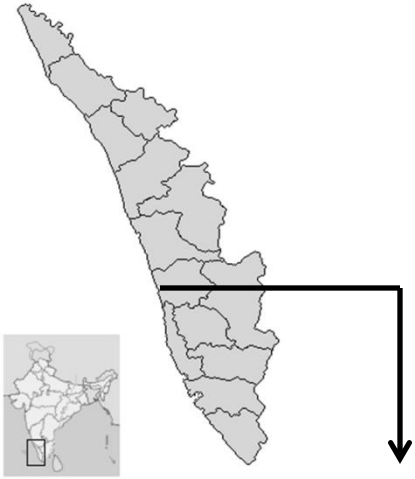
Data collected from Nisargruna plant at Baddi (Resource processed and biogas generation and utilization)

Month	Days	Resource processed (Kg)					Gas M³
		Kitchen	Cotton	Garden	Sludge	Total	
10-Oct	24	5000	0	0	23400	28400	336
10-Nov	29	5800	0	0	31600	37400	455
10-Dec	21	4782	0	0	26250	31032	230
11-Jan	31	5752	0	0	38750	44502	300
11-Feb	28	7193	109		35000	42302	445
11_Mar	31	7977	140	150	39706	47973	782
11_April	30	11800	780	465	41000	54045	1141
11-May	31	14849	485	125	45205	60664	2000
11-June	30	15120	410	150	42794	58474	3000
11_July	31	17253	240	0	54200	71693	3300
11-Aug	31	19625	0	0	51950	71575	3400
11-Sept	30	12085	0	0	60200	72285	1880
11-Oct	31	16680	0	0	49300	65980	2780
11-Nov	30	17388	0	0	52500	69888	3088
11-Dec	31	14693	0	0	54250	68943	3326
12-Jan	31	16474	0	0	47000	63474	2231
12-Feb	29	12123	0	0	38300	50423	426
12_Mar	31	1000	0	0	7300	8300	62
12_April	30	1837	0	0	15200	17037	154
12-May	31	12071	0	0	12000	24071	744
12-June	30	18835	0	0	34600	53435	1722
12_July	31	13062	0	0	19200	32262	1816
12-Aug	31	18583	0	0	37200	55783	2830
12-Sept	30	18182	0	0	36000	54182	2468
12-Oct	31	16360	0	0	33600	49960	2499
12-Nov	21	10516	0	0	22800	33316	1102
Total	765	315040	2164	890	949305	1267399	42517

KALYAN DOMBIVLI MUNICIPAL CORPORATION

Month	Waste processed	Efficiency of waste handling	Generator working hours	Units generated
	(Kg)	(%)		(KW)
Jun-10	2810	4.68	0	0
Jul-10	3600	6	0	0
Aug-10	12450	20.75	60	450
Sep-10	12840	21.4	110	825
Oct-10	25530	42.55	129	967.5
Nov-10	23260	38.77	21	157.5
Dec-10	45075	75.125	168	1260
Jan-11	42250	70.42	212	1590
Feb-11	33225	55.37	56	420
Mar-11	35365	58.94	49	367.5
Apr-11	44375	73.96	103	772.5
May-11	50600	84.33	135	1012.5
Jun-11	28690	47.82	71	532.5
Jul-11	42450	70.75	23	172.5
Aug-11	49140	81.90	0	0
Sep-11	44678	74.46	19.2	144
Oct-11	55428	92.38	54	405
Nov-11	52930	88.22	38.5	288.75
Dec-11	56981	94.97	0	0
Jan-12	55366	92.28	0	0
Feb-12		0.00	0	0
Mar-12	58020	96.70	0	0
Apr-12	55761	92.94	31	232.5
May-12	56879	94.80	196	1470
Total	887703	61.65	1475.7	9365.25

Cochin Refinery Nisargruna biogas plant



- **1MT/day hotel and vegetable market material**
- **Area 100 m²**
- **Biogas for kitchen**
- **March 2009**





WIPRO KOCHI



0.5 MT kitchen based

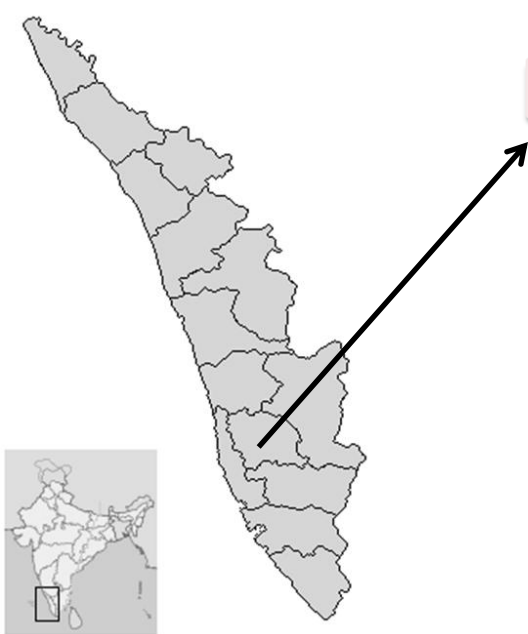
July 2009

Biogas use in kitchen

Area 100m²



KOTTAYAM MEDICAL COLLEGE



- **2MT/day hotel and vegetable market material**
- **Area 100 m²**
- **Biogas for electricity (street lights)**
- **June 2009**





TAJ KOVALAM



- **0.5MT/day hotel and vegetable market material**
- **Area 50 m²**
- **Biogas for kitchen**
- **December 2009**



TATA INSTITUTE OF SOCIAL SCIENCES, DEONAR MUMBAI

NISARGRUNA BIOGAS PLANT

CAPACITY 0.5MT/DAY

FOOD WASTE RESOURCE FROM INSTITUTE CANTEEN

INSTALLATION: JANUARY 2011

PROJECT COST: Rs. 12 LAKHS

UTILIZATION OF BIOGAS IN CANTEEN OF INSTITUTE

UTILIZATION OF MANURE IN GARDENS OF THE INSTITUTE





माथेरान गिरिस्थान नगरपरिषद

नागरी घनकचरा व्यवस्थापन विभाग
भाभा अणुसंशोधन केंद्र, मुंबई यांचे तंत्रज्ञानावर आधारित

निसर्गऋण बायोगॅस प्रकल्प

AN ISO-9001-2008 CERTIFIED













Major hurdles and difficulties

- **Mental attitude**
- **Public apathy for both segregation and understanding significance of waste resource**
- **ULBs have no designated funds for decentralized waste resource management**
- **Involvement of NGOs like Stree Mukti Sangahatana (Rag-picker's associations), though clearly directed by Hon'ble Supreme Court, is minimum.**

Policy decisions needed

Fund allocation has to be done



Our eyes can show us what is physical. Our brain tries to derive usable information from what we see. We must train our brain to think laterally. That way we can broaden our horizons of knowledge and scope of work.

~~Garbage~~

Resource Management

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