

Navsarjan Ecosan Pilot Projects in Gujarat State, India



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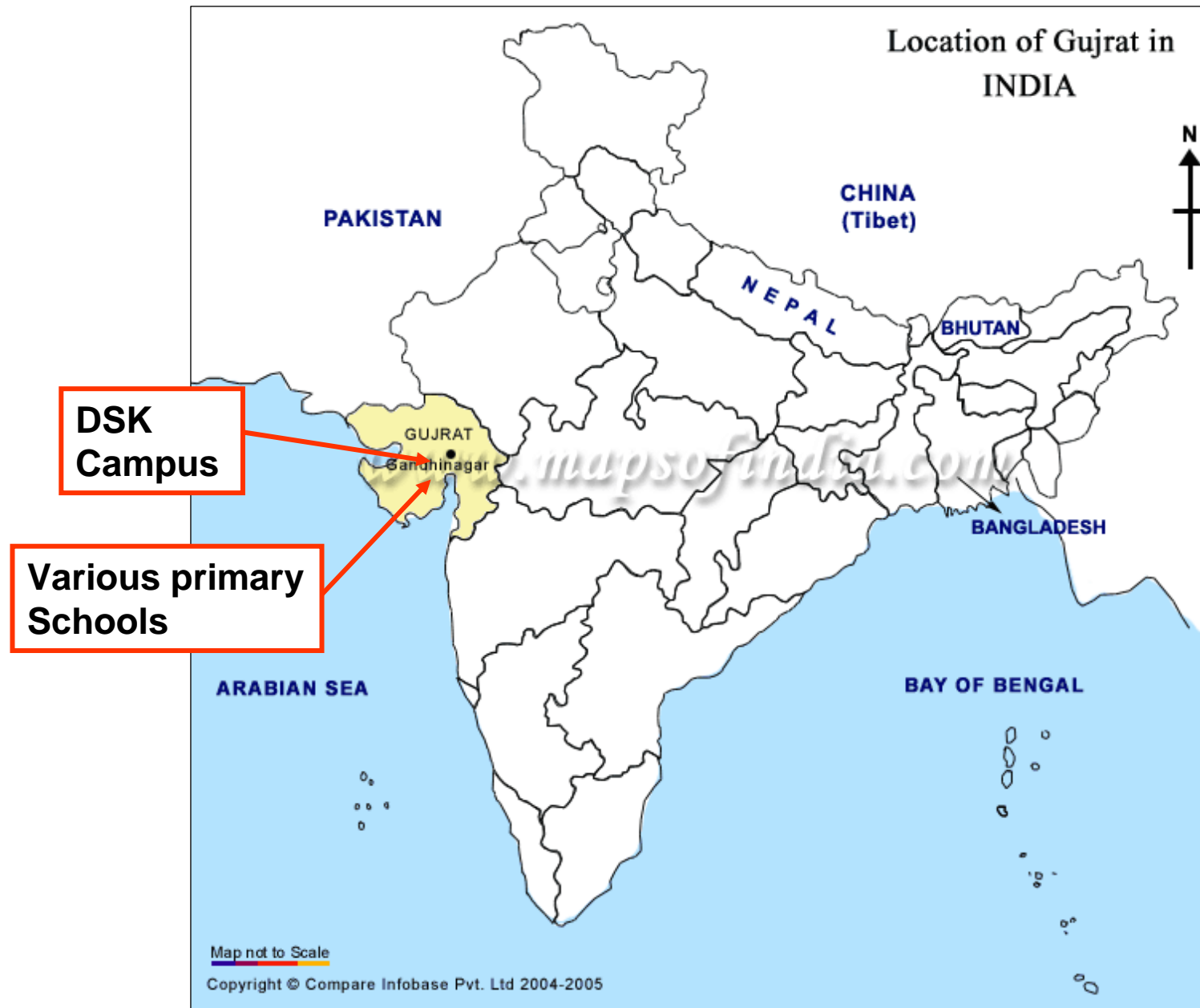


DEZA
DDC
DSC
SDC
COSUDE



gtz | ecosan program
recycling oriented
wastewater management
and sanitation systems

Location of ecosan project: Gujarat, India



Navsarjan

- Is a Gujarati NGO that is run by, and works for Dalits (since 1989)
- Has 150+ social workers
- Fights injustice against Dalits and tries to ensure the equality of Dalits before the law by:
 - Legal Assistance
 - Social Mobilisation (Campaigns)
 - Women and Community Empowerment
 - Education:
 - Primary Schools
 - **Vocational Education (DSK Programme)**



Navsarjan's DSK Programme

Dalit Empowerment and Vocational Training Programme (DSK):

Main Objective:

- Economic Empowerment of Dalits by providing marketable **vocational training** for Dalit youth that break through the caste system and its division of occupations.
- **Social Empowerment** by raising self-confidence, self-respect, discipline and social awareness.

Training:

- **Short-term** (2-3 month) vocational training courses
- Focus on local **unorganised market**
- Special attention on **self-employment**
- Training campus was largely financed by the **SDC**



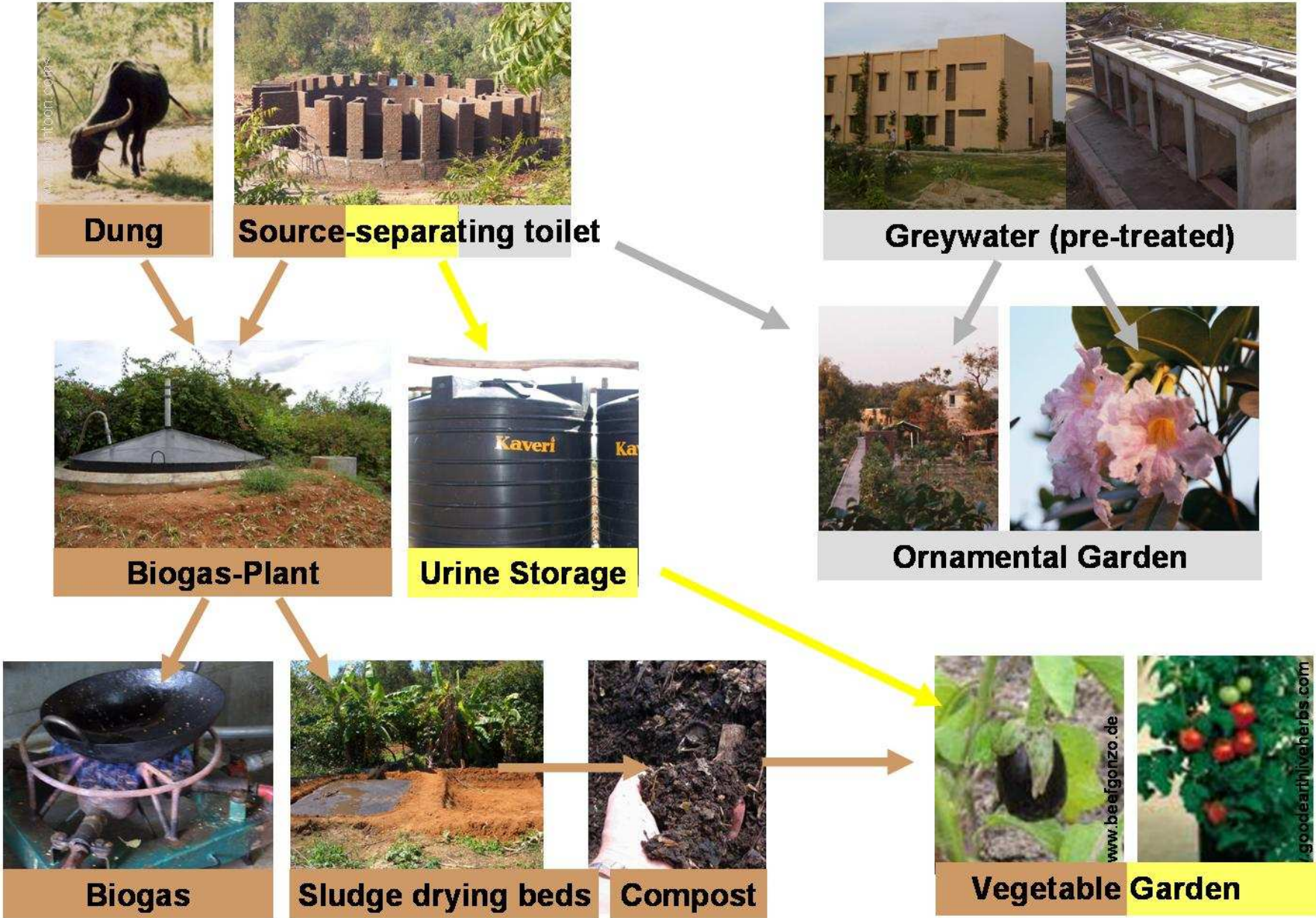
Setting: DSK Campus



Dalit Shakti Kendra (Vocational Training Institute for Dalits)

- 240 resident students + staff (+ guests attending meetings & workshops)
- No source-separation
- current wastewater is directed into a soak pit → unpleasant smells & mosquito breeding ground
- Agricultural land close by (vegetable garden)

Proposed System for the DSK Campus



Primary Schools



5th Grade Class



New School Toilet

Situation:

- 4 newly built primary schools for Dalit children in rural Gujarat
- Boarding school: students stay over-night
- Remote location:
 - water scarce area, no public water connection
 - own garden cuts down on food costs

- Ecosan systems implemented from the beginning

Ecosan Systems at Navsarjan Primary Schools

Total construction costs: 5'000 – 5'500 €



Urine Separating Dehydration Toilet (2 chambers) with showering facilities

Rainwater collection tanks planned



Vertical Flow Filter

Storage



Composting



Ornamental & Vegetable Garden

Impact on Capacity Building



Navsarjan's DSK Campus:

- **Demonstration and “live presentation”** of ecosan technologies:
 - ⇒ Delicate subject: seeing that it works is very important
- **Demonstration** of ecosan technologies to a large audience (students & field workers)
 - ⇒ Students & fieldworkers transfer knowledge to local villages
- **Human Dignity:** ecosan as a technological solution to scavenging & untouchability. This concept is spread through the building of a demonstration ground at the DSK.

Impact on Capacity Building



Navsarjan's Primary Schools:

- Socially acceptable, hygienic & safe solution
- Elimination of manual scavenging through education
- Education of children
- Ecosan technologies demonstrate at a school level that manual scavengers are redundant
 - ⇒ Dropout rate of scavenger's children/Dalits in general can be reduced
- Students transfer knowledge to local villages
- Demonstration of viable sanitation options in water scarce areas

Relevance for ecosan

- Focus not only on environmental aspects, but a “**scientific approach to remove caste-based occupation**”
- New aspect in the Dalit movement: → technological solution to a social problem
- Special focus on gender issues (scavenging mainly done by women)
- Gujarat: Navsarjan is a large organisation already known to and trusted by Dalits and other oppressed people
 - Promotion of sanitation under the aspect of dignity
- **Demonstration grounds** are a must: People have to see that these technologies work , that they are clean, safe, hygienic and dignified (Dalit Shakti Kendra Campus)
- Future plans: build demonstration toilets (like the primary school toilets) in all villages where Navsarjan is working to spread this technology

Projected Economics of Navsarjan Projects

ANNUALIZED INVESTMENT COST WITHOUT INTEREST	
Construction of toilet Centre (24 seats)	1'200 – 1'500 €
Biogas plant & urine storage tanks	210 – 230 €
RECURRING COST per year	
Maintenance & Electricity for toilet	290 – 370 €
Vegetable Seeds	50 – 80 €
TOTAL COSTS	1'750 – 2'180 €
Savings through biogas production*	720 – 1'100 €
Savings through production of vegetables*	420 – 1'130 €
Fertilizer Savings	~ 50 €
Value of additional urine fertilizer	~ 60 €
Compost, 20% sold	110 – 1'270 €
TOTAL INCOME	1'340 – 3'600 €
% of return to ANNUALIZED costs:	61% - 205%

Projected Economics of Navsarjan Projects

ANNUALIZED INVESTMENT COST WITH INTEREST	
Construction of toilet Centre (24 seats)	2'640 – 3'750 €
Biogas plant & urine storage tanks	360 – 440 €
RECURRING COST per year	
Maintenance & Electricity for toilet	290 – 370 €
Vegetable Seeds	50 – 80 €
TOTAL COSTS	
Savings through biogas production	720 – 1'100 €
Savings through production of vegetables	420 – 1'130 €
Fertilizer Savings	~ 50 €
Value of additional urine fertilizer	~ 60 €
Compost, 20 % sold	110 – 1'270 €
TOTAL INCOME	
% of return to ANNUALIZED COSTS + INTEREST:	28 – 107 %

Projected Economics of Navsarjan Projects

TOTAL INVESTMENT COST WITHOUT INTEREST	
Construction of toilet Centre (24 seats)	18'000 – 22'500 €
Biogas plant & urine storage tanks	2'720 – 3'090 €
RECURRING COST per year	
Maintenance & Electricity for toilet	290 – 370 €
Vegetable Seeds	50 – 80 €
TOTAL COSTS	21'060 – 26'040 €
Savings through biogas production	720 – 1'100 €
Savings through production of vegetables	420 – 1'130 €
Fertilizer Savings	~ 50 €
Value of additional urine fertilizer	~ 60 €
Compost, 20% sold	110 – 1'270 €
TOTAL INCOME	1'340 – 3'600 €
% of return to TOTAL COSTS W/O INTEREST:	5 – 17%

Projected Economics of Navsarjan Projects

TOTAL INVESTMENT COST WITH INTEREST	
Construction of toilet Centre (24 seats)	39'610 – 56'260 €
Biogas plant & urine storage tanks	5'650 – 7'320 €
RECURRING COST per year	
Maintenance & Electricity for toilet	290 – 370 €
Vegetable Seeds	50 – 80 €
TOTAL COSTS	45'600 – 64'030€
Savings through biogas production	720 – 1'100 €
Savings through production of vegetables	420 – 1'130 €
Fertilizer Savings	~ 50 €
Value of additional urine fertilizer	~ 60 €
Compost, 20% sold	110 – 1'270 €
TOTAL INCOME	1'340 – 3'600 €
Percentage of return to TOTAL costs:	2 – 8 %