

Honey-suckers



Sanitation systems without
pipes

Eco-san at work?

Based on an ongoing research Sludge Reuse from Mega-Cities – A Southern India Case



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·India - 17.9 million cubic meters of sewage and 4 million tons of sludge each year



·Combined nutrient contribution of 2.4 lakh tons of N, 1.3 lakh tons of P₂O₅ and 1.2 lakh tons of K₂O besides 12 lakh tons of organic carbon most of which are being wasted leading to pollution of soil and water bodies

·To exploit the huge potentiality of anthropogenic wastes as a supplement to fertilizers, many changes in policies and practices of civic bodies are needed besides a thorough research on use of anthropogenic wastes in agriculture

·The only alternative to address these problems is to go for scientific use of Anthropogenic wastes in agriculture

Septic tanks and Pit Latrines

- India has 102 million septic tanks and pit latrines (World Bank, 2006)
- India has more than 68 million single pit or double pit toilets in rural areas (ddws.nic.in)

Present Agriculture Scenario in India

- The fertilizer cost has escalated enormously the demand for fertilizer use is increasing.
- Indiscriminate use of fertilizer has deteriorated soil health.
- The availability of organic manures is limited and organic carbon content of semi arid tropical soils is very low.
- The multi-micronutrients deficiency in soils is wide spread.



We are in the midst of problems

- Shortage and escalating cost of fertilizers
- Growing demand for fertilizers
- Nutrient deficiencies in soils
- Declined yield of crops
- Decreased availability of good quality water
- Increased production of highly polluting industrial wastes, posing disposal problems



Bangalore –Sanitation

Sanitation deficiency is largely prevalent in the conurbation and green belt of Bangalore. In conurbation areas, only 47% of households have toilets, 19% share toilets and a significant 35% defecate in the open.

But the state of sanitation is worse in green belt areas where only 26% households have toilets while 4% share toilets and a staggering 70% defecate in the open. This shows that there is a high disparity in access to sanitation facilities across the core area and suburban and rural areas. The absence of a sewage network in conurbation areas, the green belt and rural areas is the main shortcoming.

Survey of the Environment report - 2008 , Govt. of Karnataka

Foam rivers

Untreated sewage primary cause



From untreated sewage



The informal sector in urban sanitation



Pre-cast concrete rings



In informal vacant sites



Pit toilets are common in the urban periphery



The Honeysucker vacuum sucks a pit toilet



Mechanization eliminates manual scavenging



Trucks are now indigenously developed



They have a water jetting and
vaccum sucking pump
(upto 30 H.P.)



Assembling a honey-sucker



The barrels – informal sector body building works



We estimate nearly 300 honey-suckers in Bangalore



Protocol for safe disposal needs to be evolved



The sewage is nutrient rich but also pathogenic



Cost to building Rs 1200/- to Rs
3000/-



Soil as a nutrient recipient rather than water



Mobile technology



In many apartments a daily visit



The composting pit



Compost after 3 months- sells for
Rs 1500/- to Rs 2000/- a tractor



Compost sample being collected for testing



Application on banana



The crop



The fruits



The soil – alive with alive with earthworms and ants



The Economics - For the truck

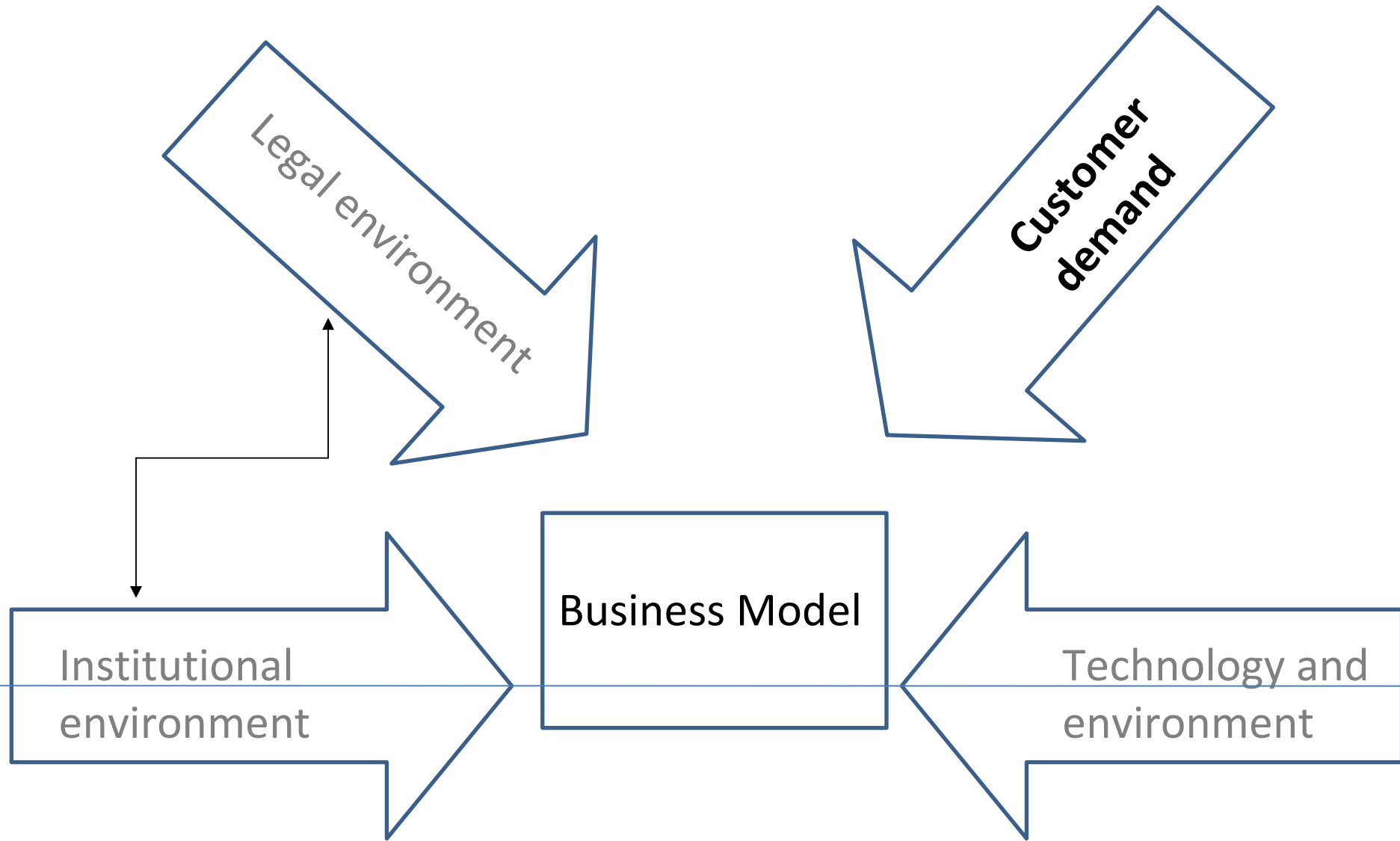
- A Honeysucker costs Rs 13.50 lakhs
- Charges Rs 1500 / per trip
- Can do 5 trips in a day
- Income Rs 7500 a day Rs 2.25 Lakhs a month
- Income in a year Rs 27 lakhs
- Expenditure for O and M - Rs 4.0 lakhs
- **One truck can service a population of 20,000 assuming a 2 year pit emptying cycle**

The Economics for the household

- Rs 1500 / every 2 years
- Rs 60 / a month

The Economics for a farmer

- Free compost
- On labour - expenditure Rs 5000 /
- Savings per acre Rs 20,000 to Rs 50,000 /- on manure alone (10 to 25 tractor load per acre per year)



Legal environment

Customer demand

Business Model

Institutional environment

Technology and environment

Way forward...

- Better understanding, from a business and sanitation perspective, of existing practices around the country
- Embedding of current practices as an officially accepted option to sanitation service delivery for all urban dwellers



Way forward

- Developing a protocol for the inclusion of non-sewerage based or on-plot sanitation systems in India
- Developing a protocol and a legal framework for handling, transportation, composting and application of nutrients from septage and on-plot systems
- Research on understanding nutrient – pathogens and safe application for nutrient reuse

Way forward

- Civic authorities to incorporate sewage disposal systems in building plan approvals
- Land use plans to earmark space for solid and liquid waste composting
- Separate systems for toilets and grey-water
- Understanding the pit / groundwater interface and designing systems for non-pollution

Thank you!

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