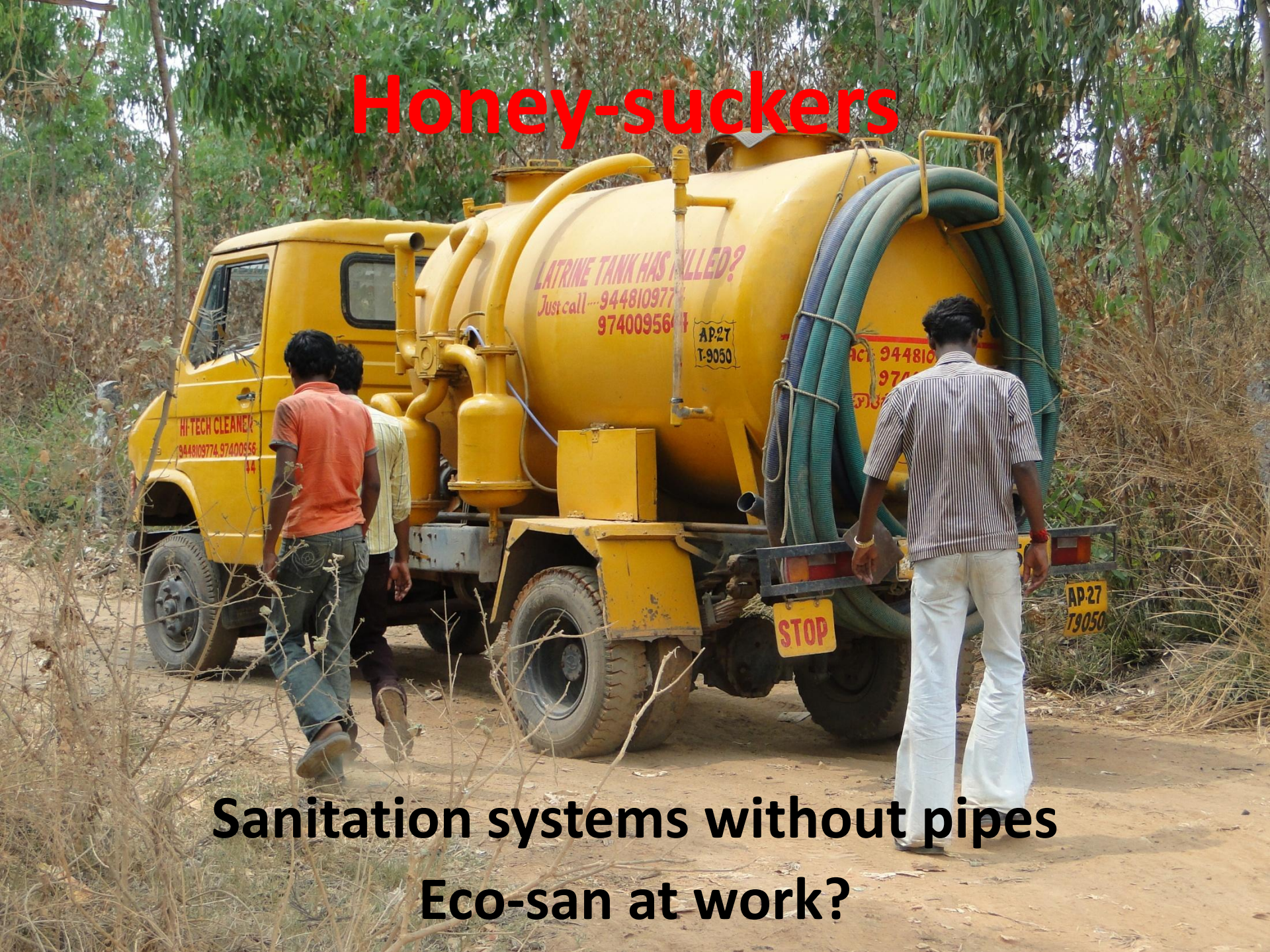
Honey-suckers



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 P_2O_5 and 1.2 lakh tons of K_2O 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 vacum 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 honeysucker

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 load

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

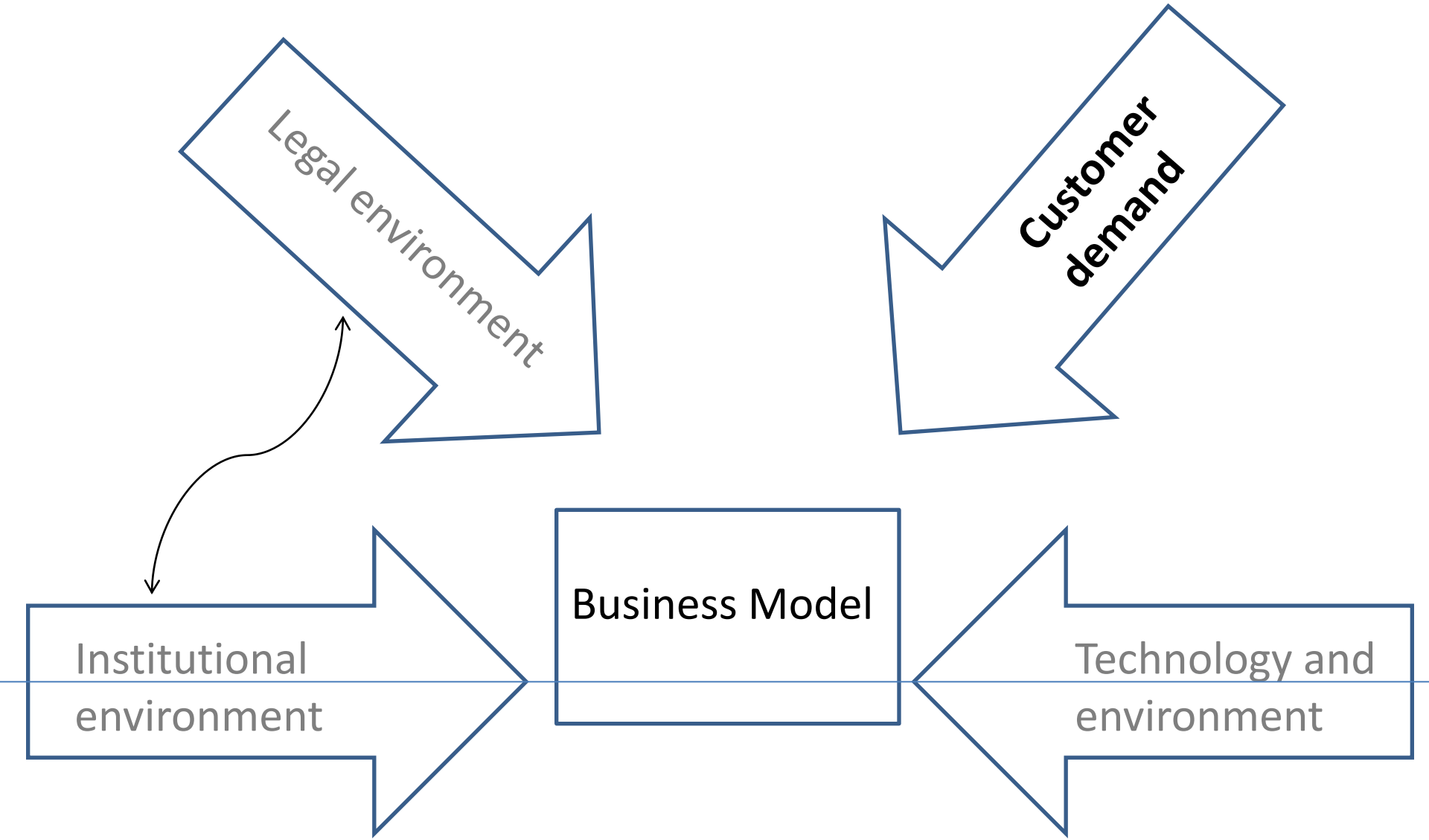
- A Honeysucker costs Rs 13.50 lakhs
- Charges Rs 1500 / per trip
- Can do 5 trips in a day
- Income Rs 7500 a day Rs 2.25 Lakhs a month
- Income in a year Rs 27 lakhs
- Expenditure for O and M - Rs 4.0 lakhs
- **One truck can service a population of 20,000 assuming a 2 year pit emptying cycle**

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 frame-work 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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