

PRESENTATION FOR  
THE CHARLES COOPER ANNUAL MEMORIAL LECTURE

Playing in invisible markets:  
Innovating to harness the economic  
power of the poor

A celebration of the ideas of Charles Cooper

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Playing in invisible markets: Innovating to harness the economic power of the poor

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## The story of toilets for the poor

1. Setting the Background
2. Presenting the Toilet knights
3. The demand side story
4. What's been the role of the government?
5. Other actors
6. Success stories
7. Recommendations

# 1. Background : (1.1) Why invest in the bottom of the income pyramid?



Income Pyramid

Those earning less than 2\$ per day

Recent works by thinkers from various disciplines show that both 'income' and 'welfare' can increase for all by developing the economic capabilities of the BOP group.

- Prahalad (2006)
- Sachs (2005)
- Bornstein (2005)

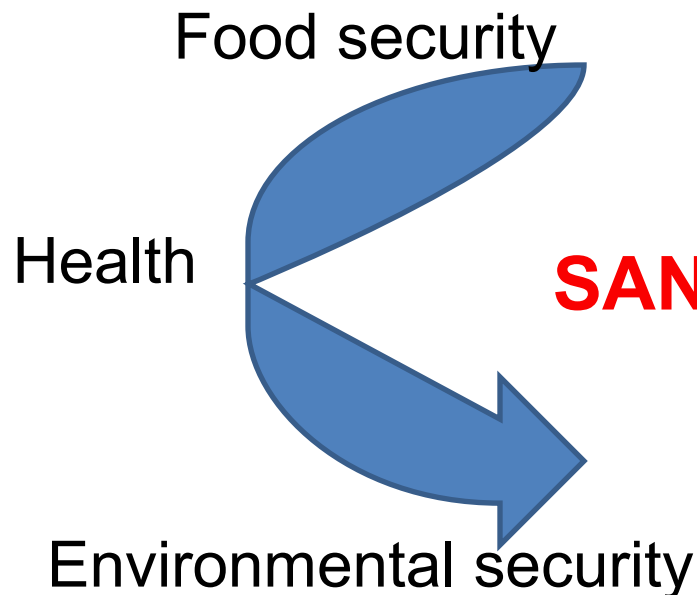
This hypothesis has also been accepted by the most Heads of State = The Millennium Development Goals (MDG)

What is a BOP innovation for us? Something that helps the MDG.

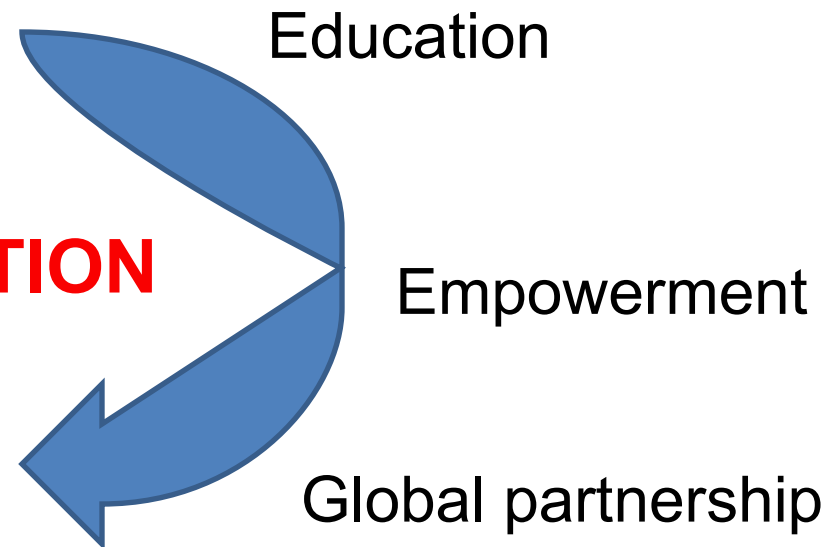
## 1.2 Why toilets?

Greatest spillovers to other MDG a targets

### OUTCOMES



### MEANS

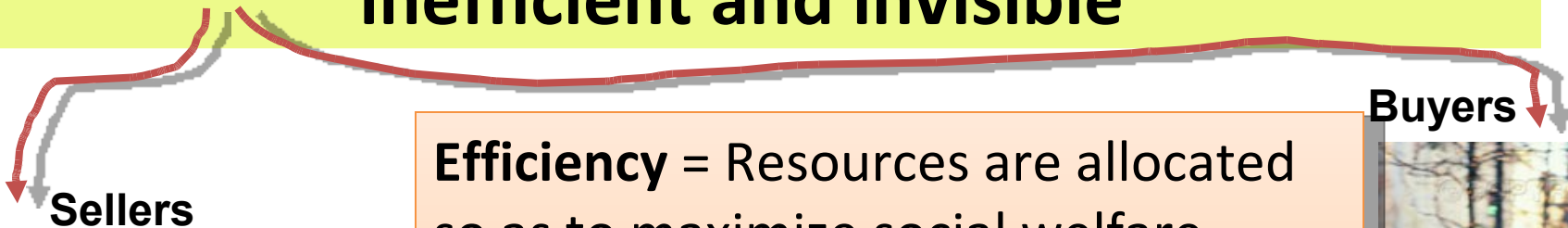


**SANITATION**

## 1.2 Why toilets?

- 41% of the world population = 2.6 billion people don't have access to a toilet.
- 42,000 people die every week around the world due to drinking water contaminated with faecal matter.
- In India, China and most of Africa access to toilets varies between 25%-50%.
- In these countries, in rural areas, girls drop out of school after puberty due to lack of toilets.
- **For India: complete sanitation coverage could save at least 100 million € every year.**
- **Positive Externalities for all : Less incidence of diseases spread by flies, less contamination of water and soil.**

# 1.3 What's wrong with the market : inefficient and invisible



Street dentist in India

**Efficiency** = Resources are allocated so as to maximize social welfare.

**But this doesn't happen if :**

- there are problems of information;
- there are externalities;
- if the commodity has public good features;
- If the market is not competitive.



Noble Laureates this year examined second-best allocation mechanisms.

**Roth** : Targets for market design : Markets should be **thick, safe and uncongested.**

# 1.4 The technology :

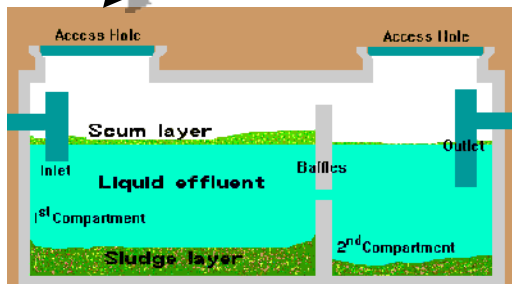
## Brief toilet history in India : Inherited Models

- Indus Valley Civilization (around 2500 BC)
- Dry toilets cleaned manually by scavengers.



- Two innovations introduced by the British: Mohenjo-Daro 2500 BC
  - London first city a sewer system in 1850, New York in 1860, and Calcutta in 1870.

The septic tank developed in London in 1596 introduced in India after 1850



But open defecation most practised norm.

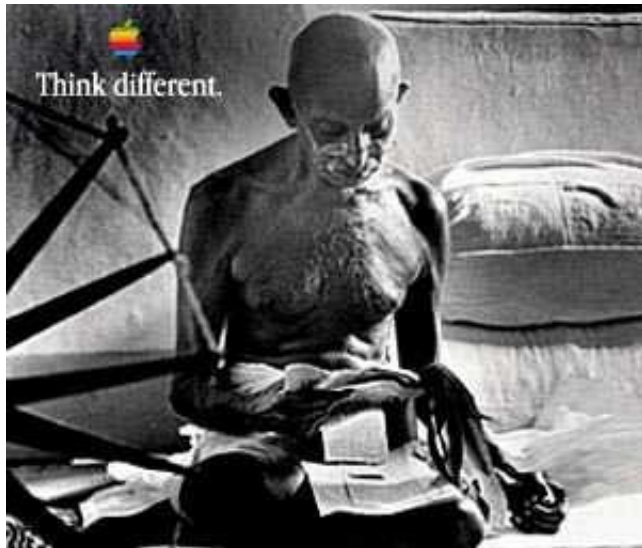
## 1.4 Toilets today.....

- Central sewage system: In 2007, out of 5000 towns in India, only parts of 232 towns are connected to a central sewage system;
- The septic tank model
  - “Institutional inefficiency” dump sewage sludge on the next street or even better near the slum.
- Millions of dry toilets cleaned manually by scavengers.
  - About 7 million of scavenger community still clean manually in “illegal markets”
  - Main staff of municipalities in sewage clearance.
- Pit latrine: worst polluter during rainy season and in areas with high water table.
- Open defecation most practised norm. Terrible for cities.
- **Toilet Innovations introduced by the toilet knights !**

## 2. Presenting the Toilet Knights



# The First Toilet Knight of India



- Mahatma Gandhi, **social entrepreneur par excellence.**
- first to address problem....in political rallies.....in his journal.....The Harijan
- Wanted toilet to be a national objective
- Experimented with toilet models in his retreat - Sewagram
- Experimented with maintenance routines
- Contribution : **Highlighting the need for an ecologically friendly toilet model that could be AUTONOMOUSLY maintained.**



# The Second Toilet Knight

## *Sulabh – the dream of a scavenger free India*



- Created **in 1970** by Bindeshwar Pathak, a young sociology student and follower of Mahatama Gandhi's ideals



***“To restore human rights and dignity to scavengers by stopping the practice of manually handling human excreta”***

- Sulabh technology → the first one to ***target the poor population***

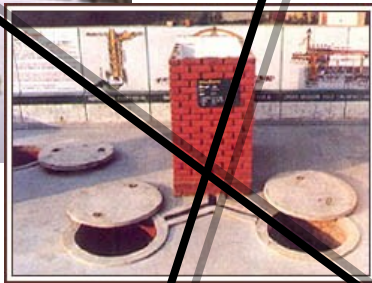
### **Contributions:**

- **A toilet model that permits autonomous maintenance;**
- **A toilet model that is ecologically friendly;**
- **Fighting against the idea of “toilets as a merit good” and emphasizing the need for “robust business models” to sustain toilet complexes.**

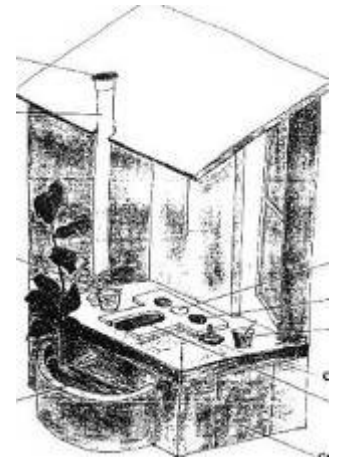


# The Third Toilet Knight

***Paul Calvert – British Engineer, Social Entrepreneur  
First to create and introduce urine diversion toilet model  
in India***



**High water  
table area**



**Calvert's 2 in 1  
EcoSan model**

## **Contributions:**

- **A toilet model that permits autonomous maintenance in coastal areas;**
- **Technical innovations = ecopan, vent pipe, raised platforms**
- **A toilet technology that is far more efficient in recuperation and recycling of human waste.**

## Result 1: Determinants of innovation in BOP toilet market

*The market for BOP toilets is invisible from the supply side, because the evolution of technology in this market has been mainly driven by a few NPOs motivated by organization-specific managerial vision, rather than by incentives provided by the market. Innovations have been generated through 'learning by doing' routines rather than by 'investment in learning'.*

# 3. A case study of the demand side.....

**The demand :**  
**Kameshwaram**  
**case study**



## Physical

- Isolated village (10 kms from Velankanni)
- High-water table area
- Heavy rain during the 3 months of the monsoon
- Tsunami hit area

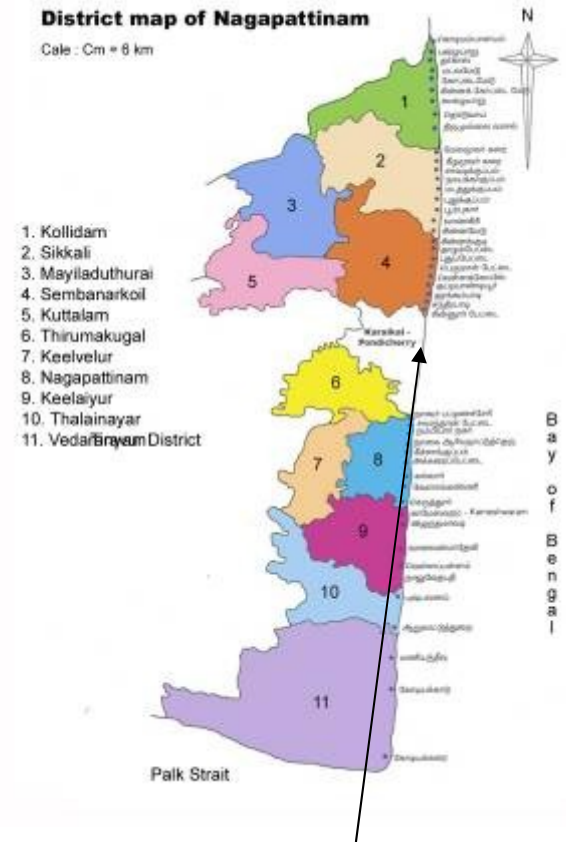
## Socio-economic

- 5300 inhabitants
- Farmers and small fishermen community
- Farming and fishing based economy



**District map of Nagapattinam**

Scale : Cm = 6 km



**Kameshwaram**

## 3.1 Spending patterns.....

An ecosan toilet with brick walls and the standard pan, costs about Rs. 7000 (or about 120 €)



Average income per family (exclusive of self-consumption) is between Rs2000- Rs 4000 per month.

2. Almost all have TV = Rs 5000;
3. Dowry + wedding for bride = Rs 100,000 to Rs 300,000.
4. Expenditures for a bridegroom = Rs 50,000.
  - Monthly expenditure on alcohol = ? Rs 500?
  - Spending on festivals & family functions per year : Rs 5000-10,000
  - **Willingness of spend a toilet : Will accept if 80%-90% of cost is paid by others.**

## 3.2 The rationality of the invisible market.....

Battle of the sexes : The need for toilets is **gender biased**...so diversion of toilets to be used as a store room or a goat room !

Marginal utility of goods that offer immediate escape (TV, cinema, alcohol) > marginal utility from many essential goods.



**Insurance to tide risk = social networks based on extended family and caste identities.**

**Minimum critical mass of adoption needed to ensure long term benefits.**



## 3.2 Result on the demand side.....

*The market for BOP toilets is an invisible one from the demand side because there is a **higher preference** for **commodities and services** that **strengthen social networks** providing socio-economic security or for commodities that yield immediate utility in the form of **entertainment** than for toilets.*

## 4. The Role of the government

Phase 1 : Focus on infrastructure and industrialization  
(1947-1986)

Phase 2 : Toilets a “merit good” to be supplied by the State  
(1986-1991)



Government as a direct supplier phased out after  
adoption of liberalisation in 1991

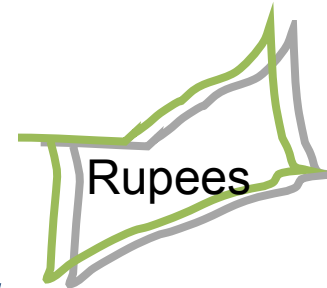
# 4.1 Change of role of State : From supplier to financier

Phase 3 : Total Sanitation Campaign (TSC) 1999  
(Years after the Chinese)

Change  
in role of  
State

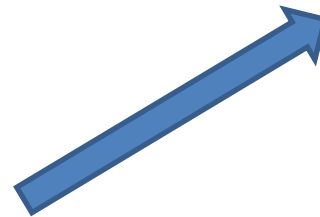
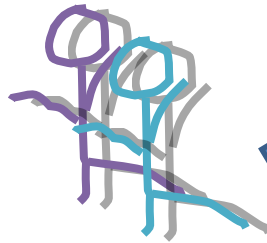


Major supplier



Major Financier

Entry of green  
multinational  
NGOs



- Individual toilets
- Sanitary Marts
- Production centres
- Toilet complexes

Creation of business opportunities = Market for NPOs

\*\*\*\*Education, Motivation, Construction, Monitoring

## 4.2 Change of role of State : And Great Success



- 1999-2003 Ministry of Rural development spent Rs 2.92 billion (US\$ 62 million)
- Sanitary Tournaments: Nirmal Gram Puraskar to villages, organizations and individuals....

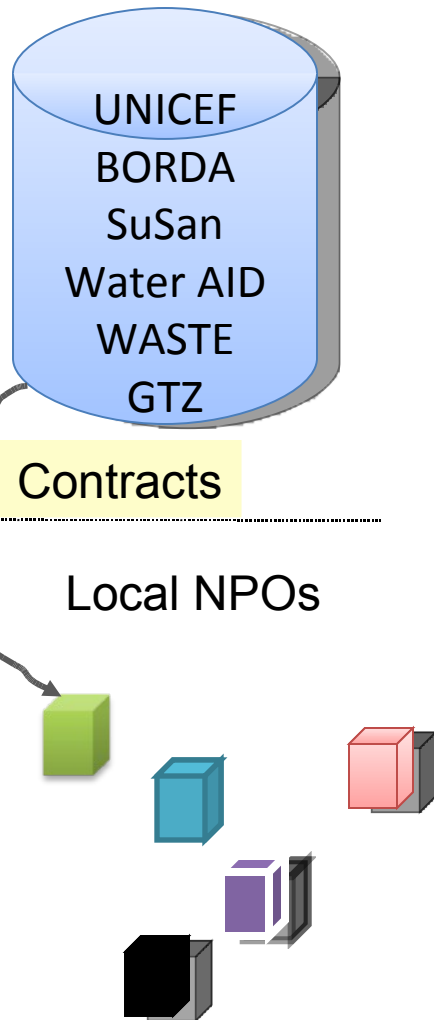
- 2003-04 : Rs 13.5 billion
- 2005-06: Rs 70 billion (**Killer Tsunami**)
- 1% rural households in 1981 to 30% in 2004
- 9.15% of public schools in 1993 to 45% in 2005.



## 4.3 Result on role of State

- *In the market for BOP toilets, the government is more effective as a financier than as a direct supplier and it enjoys higher returns to investment as a financier than as a direct supplier.*
- *Direct subsidies from government support the demand side of BOP toilet markets by lowering the price of toilets for individual families.*
- *Loans from government support the supply side of BOP toilet markets by providing business opportunities for NPOs.*
- *Sanitation tournaments provide incentives for local governments to improve the mode of governance of sanitation at the village level.*

## 4.4 NPOs large and small



- *In the BOP markets, NPOs are important service providers,*
- *Their survival and growth depends on their ability to generate contracts through their **technical expertise, knowledge of local contexts and marketing savvy.***
- *They are usually small and non-specialized.*
- *International NPOs, International and National foundations and private donors are the most important sources of contracts for small NPOs.*
- *Business opportunities for NPOs increasing greatly.*
- *It is a very grey market with severe informational problems.*

# 5. Success Stories to identify best practises

## 5.1 On Toilet beauty contests.....



1. Subsidization of toilets to the order of 80%
2. Reducing asymmetry of information through education
3. Adding value to the product, i.e. toilet through celebratory rituals
4. Involving the beneficiaries in the construction
5. Creating trust by reducing the 'us' and 'them' divide
6. And India's first toilet beauty contests!

*Result 5: The demand side of the market for BOP toilets can be made visible by :*

*(ii)reducing asymmetry of information through education;*

*(iii)changing 'beliefs' about the value (positive or nuisance value) of a commodity through strategic moves;*

- *providing financial incentives with random monitoring for usage*

# 5. Success Stories to identify best practises

## 5.2 On a public toilet which you get paid to use.....



- **Before : Badly functioning + horrible smelling public toilets.**
- **Grant from Dutch NGO WASTE.**
- **Building a set of communal ecosan toilets in its place.**
- **Users given a banana that is better than that from market from the complex garden!**
- **Created a market for compost and urea.**
- **Media attention = commitment from local governing body.**
- **Establishing: cleanliness of public toilet as indicator of efficiency of governance.**

*Result 6: Public toilets are an essential service in urban slums, where due to land constraints it is often not possible to build individual toilets. If through strategic moves a credible commitment for maintenance can be enforced on the local governing body, cleanliness of the toilets and its accessibility can be ensured as merit goods, but not otherwise.*

# 6. Back to supply and demand.....

## 6.1 The problems

### Adverse Selection

- Ignorance on demand side of consumers;
- Asymmetric information of public bodies = coordination problems.

Potential Externalities = **Risk**

### Moral Hazard

- Financing by public bodies = widespread petty corruption.
- Service provision by NPOs
- On usage by BOP consumers
- Compliance problems outside of the market

**Public good within the BOP family economy**

**Technology Lacuna:** A nanocar for 2000€ by Indian firm Tata but an ecological waste water treatment for public toilets for 3000 €- 6000 €

## 6.2 Recommendations

### To deal with adverse selection and moral hazard

- *Put an 'e-bay' type rating system on internet for maintenance of public toilets, efficiency of payments by local governing bodies and service provision by NPOs*
- *Create a user-friendly data base on NPOs*
- *Use local bodies to have a database on sanitation needs in villages*
- *Start applying the law on the use of traditional dry toilets*
- *Put fines for diversion of toilet use.*
- *Give a pricing policy on access to public toilets based on convenience offered and state of maintenance*

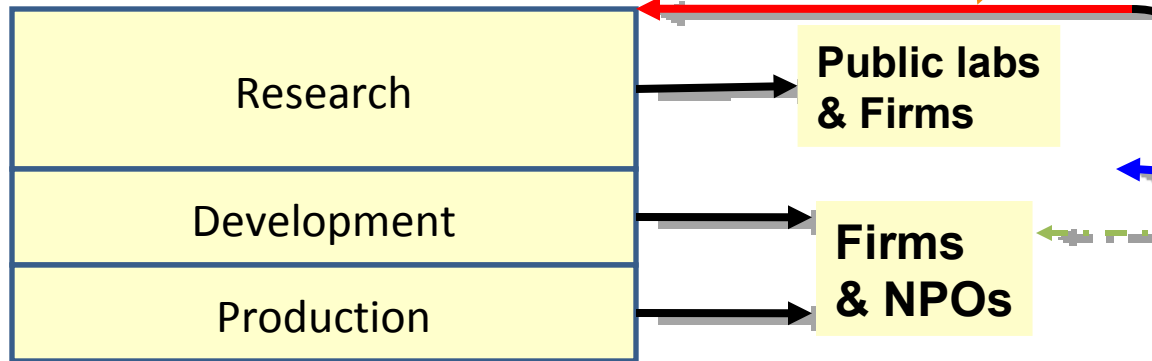
## 6.2 Recommendations

### To make markets 'thick'

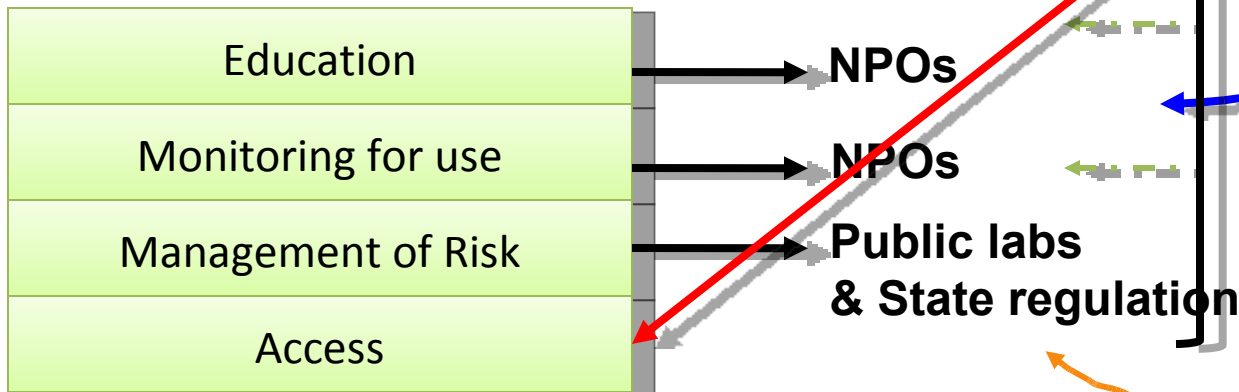
- *Create new technology : Give research contracts to public lab-NPO-firm consortiums*
- *Use tournaments on both demand and supply side to generate innovations at the grass roots level*
- *Create clearing houses for NPO services and real demand at the village level*
- *Create clearing houses for 'individual toilet finance donors' and 'recipients'*

# 6.3 Role of Firms, NGOs and the State

## CREATING SUPPLY OF BOP INNOVATIONS



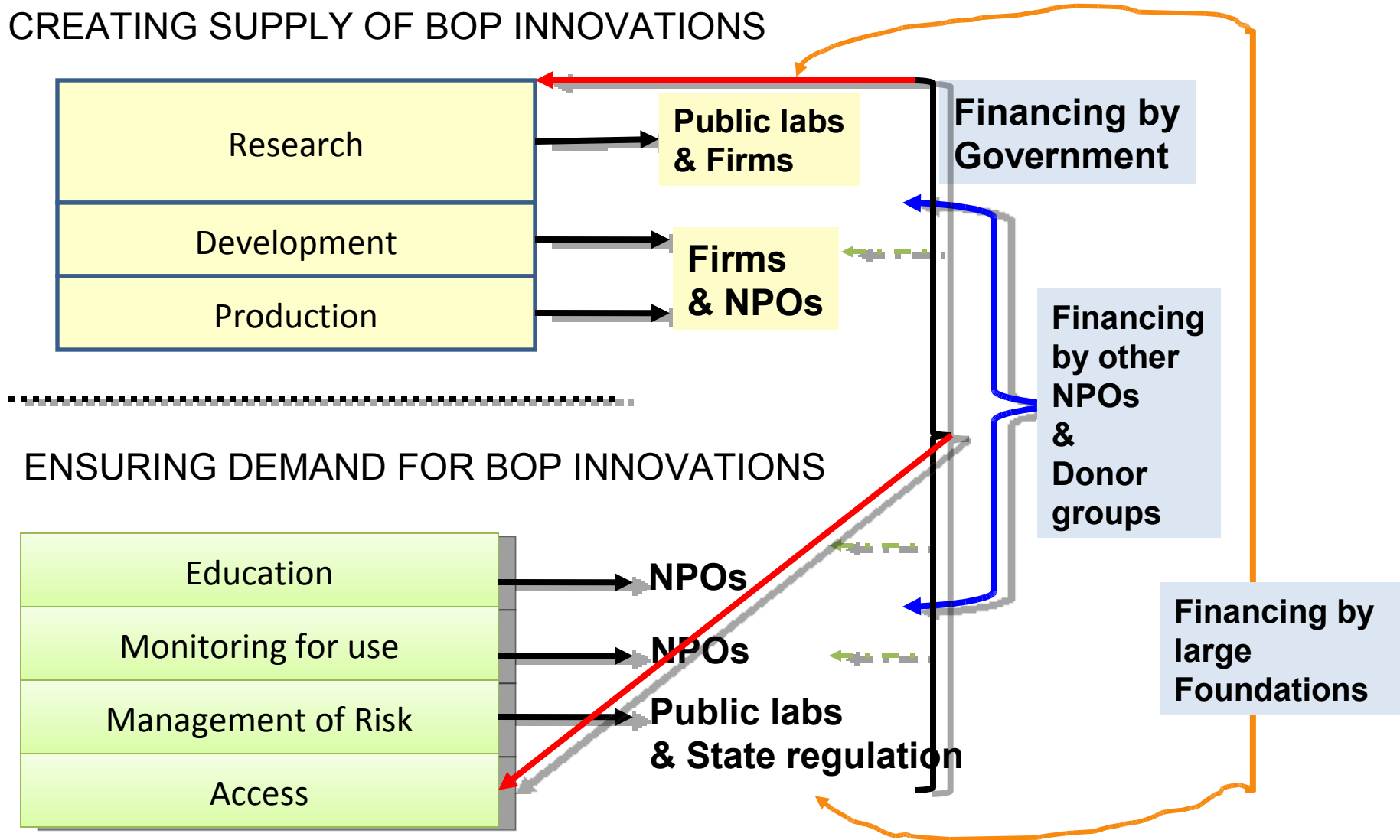
## ENSURING DEMAND FOR BOP INNOVATIONS



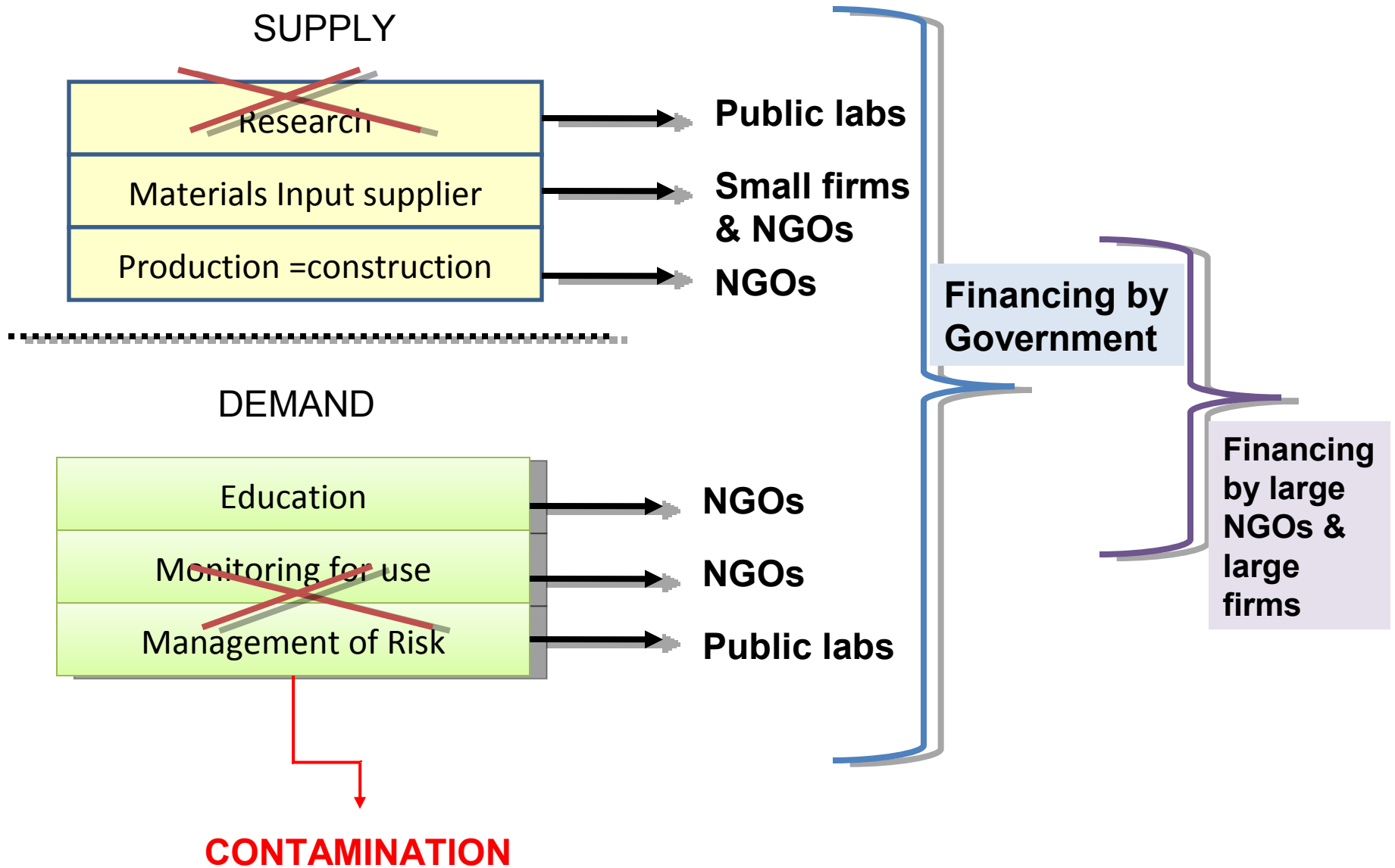
Financing by Government

Financing by other NPOs & Donor groups

Financing by large Foundations



# 6.3 Role of Firms, NGOs and the State : Actual



## 6.4 Extrapolation for international trade.....



+



Individual ecosan toilet

+



Clean ecosan public toilet

David Ricardo : Theory of comparative advantage

Thought for the day:

- India will be no. 1 in terms of population soon;
  - India will be no. 1 in terms of human waste production;
- Ricardo's theory = make use of comparative advantage;
  - Develop a market for human waste based compost and urea and export it!

## 6.5 So efficiency and thickness in the BOP toilet market can be improved to increase welfare.... So don't get the story wrong like this guy !

George W. Bush, appearing before a right-to-life rally in Tampa, Florida on June 17, stated: "We must always remember that all human beings begin life as a faeces. A faeces is a living being in the eyes of God, who has endowed that faeces with all of the rights and God-given blessings of any other human being."

Bush repeated his error at least a dozen times, before realizing that he had used the word "faeces" when he meant to say "fetus".

**Source:** Newsweek Magazine (uncorroborated) **When spoken:** June 17, 2004



*\*\*\* thanks to Lucas Dengel for this quote from his presentation on sanitation in Dec 2007*

Gandhi : "Be the change that you want to see"

