



MAZHAPOLIMA IN THRISSUR DISTRICT KERALA

Water security – Sanitation Nexus: Key to sustainable future – Lessons from Mazhapolima in Kerala, India

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Supporting water sanitation
and hygiene services for life

Rain Rich – Water Poor

Area Context -

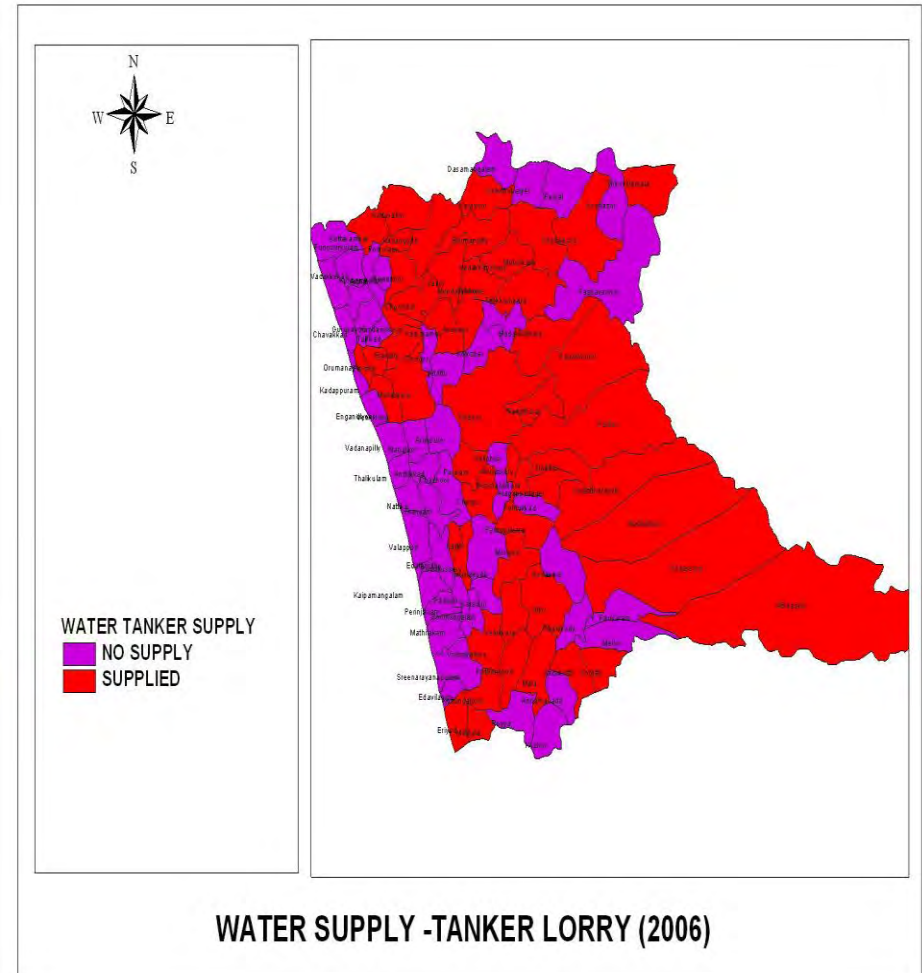
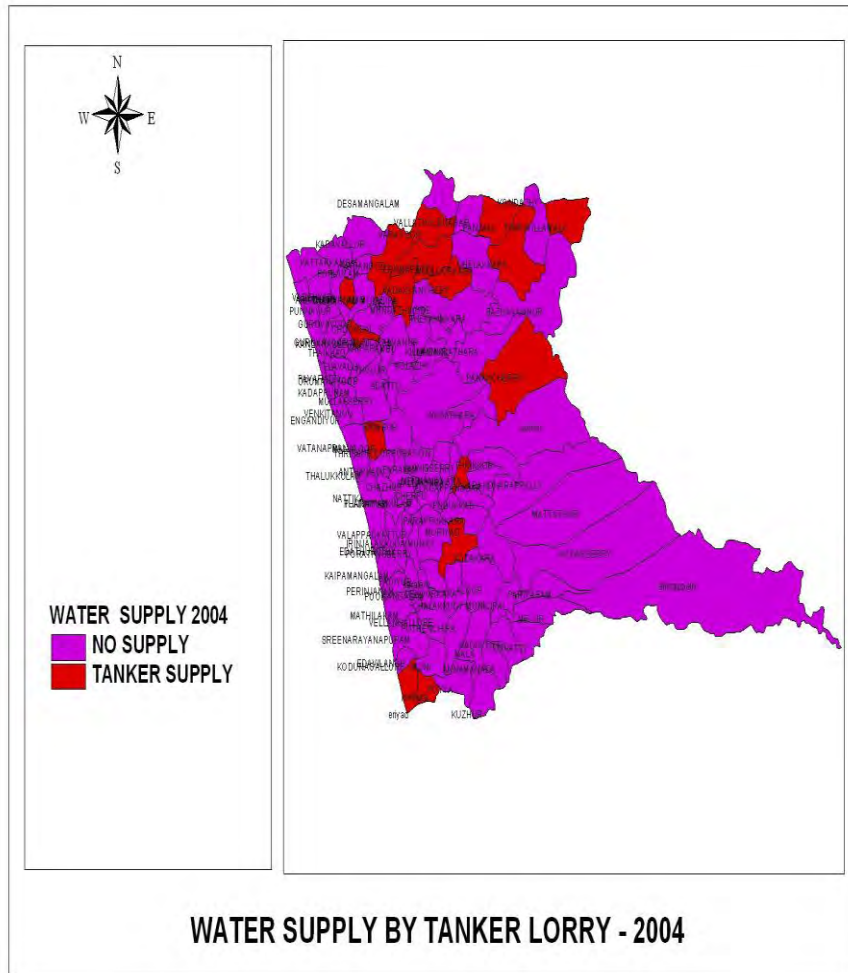
- Thrissur District has high rainfall (3130 mm) coexist with drought conditions
- Tanker lorry supply is increasing every year at a huge cost
- Salinity increasing in coastal areas and ground water falling

Whereas -

- 4.5 lakh open wells for 5.24 lakh households – 70% depends well water for drinking
- 70% of wells drying up during summer – hence drinking water security need be WELL based

➤ **Mazhapolima (bounty of rain) was initiated - a participatory PRI centric well recharge programme**

Tanker supply at huge cost every year!

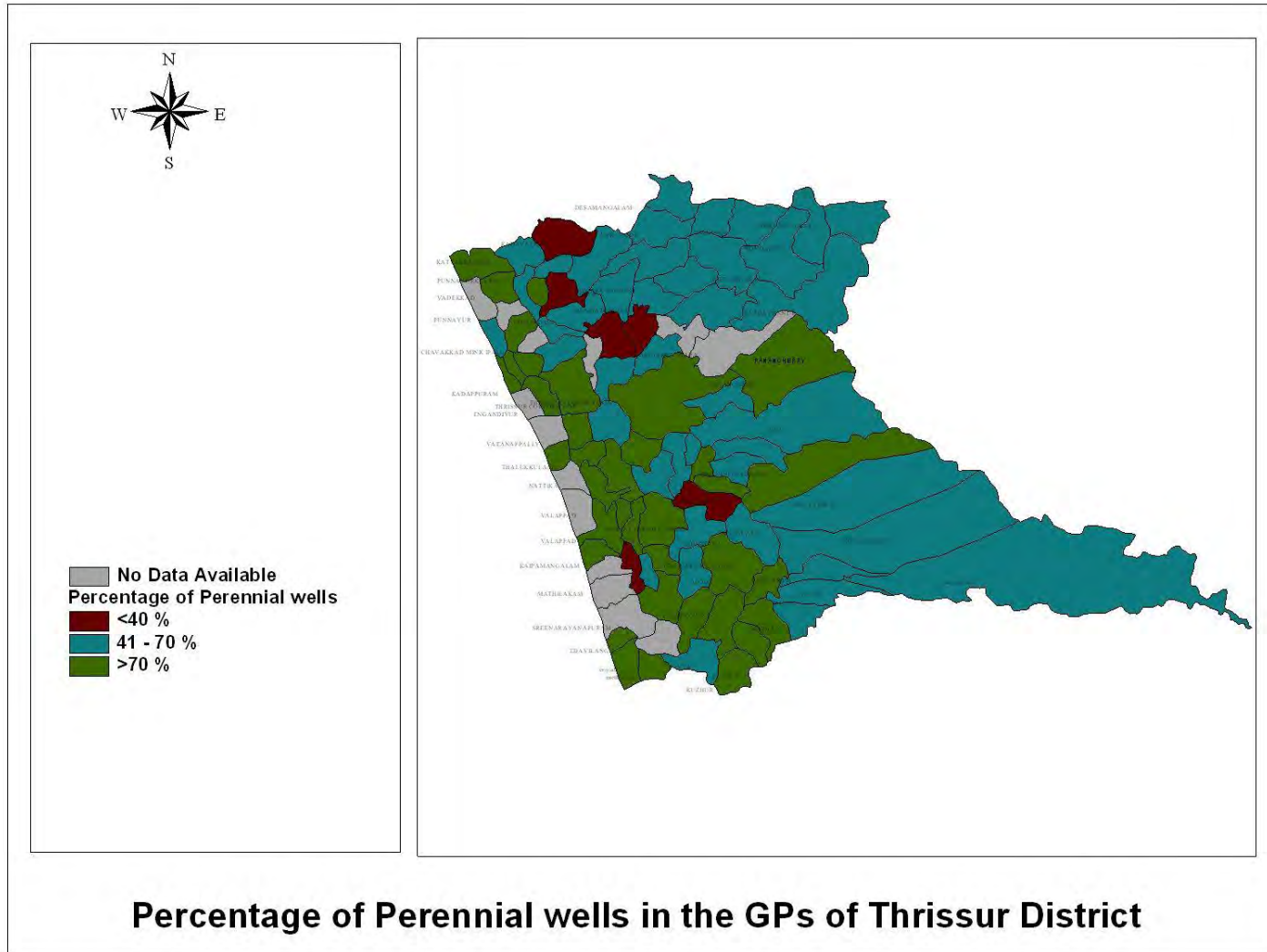


Salinity at Door Steps (2008)

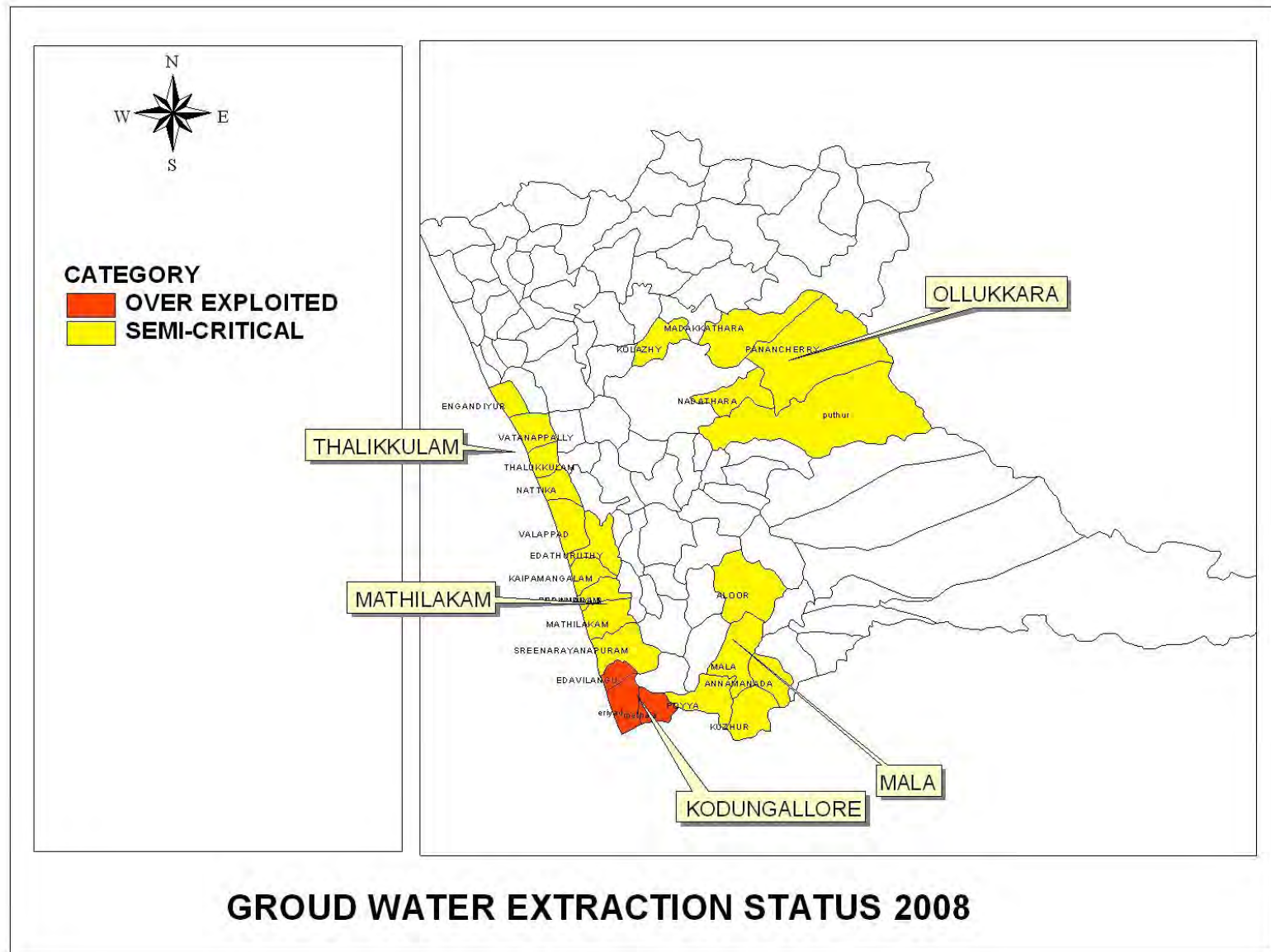


AREAS OF SALINE INTRUSION (APPROXIMATE)

Perennial Wells in Thrissur



Ground Water Scenario: Thrissur District



Mazhapolimal Approach and Strategy

Community Driven

Participatory approach

Demand Driven

PRI Centric – Govt. department convergence

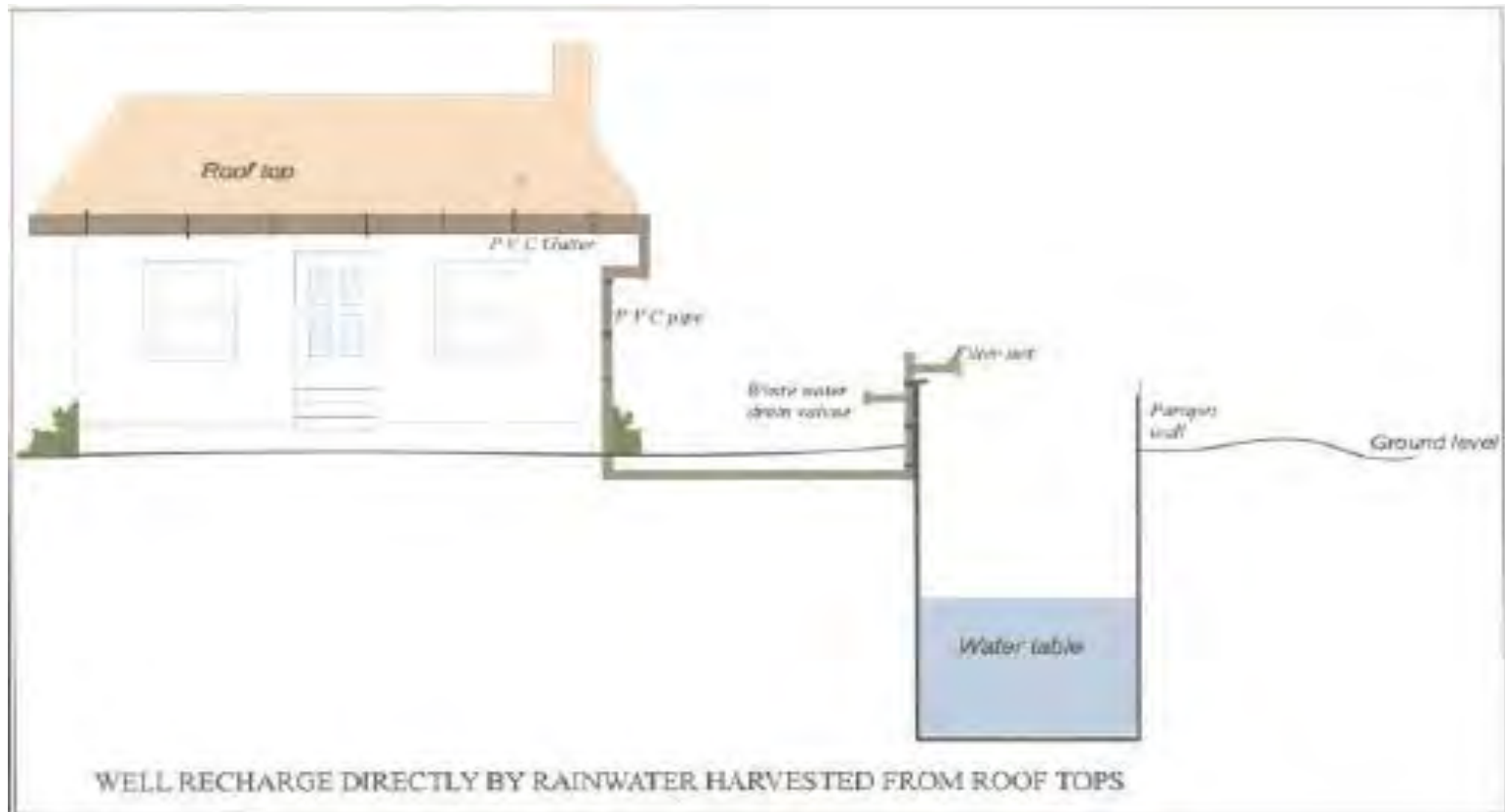
Facilitatory role for GoK

Process Oriented, Outcome based

Cost Effective – transparency audit

Campaign Mode

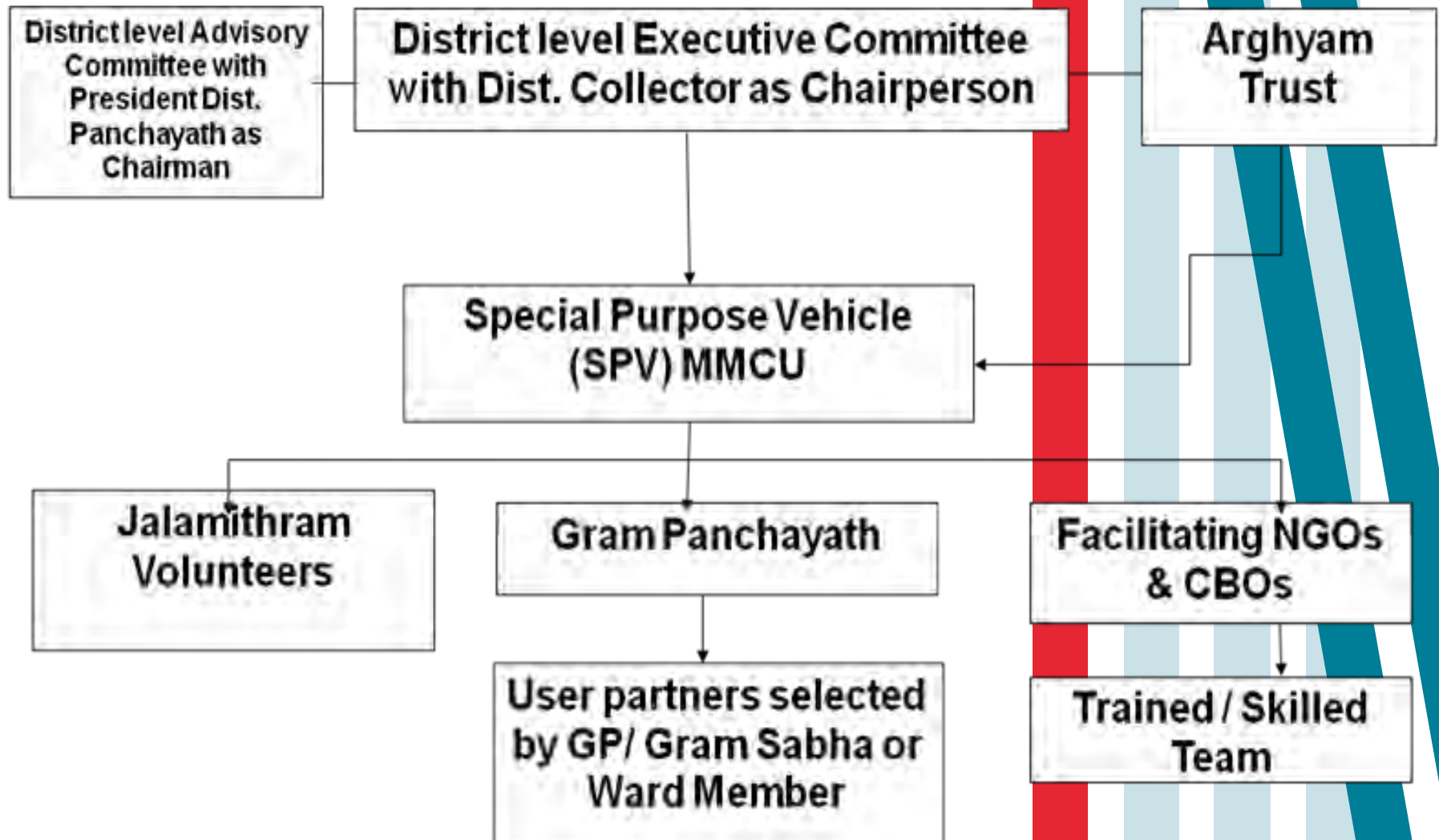
Mazhapolima: Direct Well recharge by roof top rainwater harvesting



Mazhapolima -Menu of Technology Options



Institutional Architecture



Activity Plan – Bottom UP Process

Activity	Description
Special Gramasabha/ Ward sabha	Special grama/ward sabha - message” Our water our future” and ‘wells for welfare’. reconnaissance survey/PRA for water resource atlas /scarcity Map
Preparation of Action Plan and Approval Ward/GP level	Approve the Action plan -components: (i) Awareness campaign: (ii) Training and Capacity Building Plan; (iii) implementation plan: (iv) financing plan and (v) monitoring (quantity and quality) and documentation plan
Implementation Task Force / Jalasuraksha Samithies	Task Force with resource team from stakeholders at the GP level with the mandate of programme implementation.
Block Jalasuraksha Samithies	Block Committee will consolidate block plan, oversee implementation, coordinate and direct action, leverage resources and programme convergence
District Jalasuraksha Samithies	District Advisory Committee chaired by the DP President and DC Vice Chairman with selected experts and officials members and DPO as convener. The Executive Committee will be Chaired by the DC and selected experts, NGOs and key departments as members

Mazhapolima: **Impact**

- **Target** exceeded by 200% in 14 months – 20,000 wells recharged directly benefitting 1,25,000 population by Jan 2015
- At 8,065 units – **Ground water increased** by 7.5, 14.8 and 43.3 million litres in high lands, midlands and low lands respectively/hydrological year (CWRDM, 2013)
- 78% households reported significant increase in **water availability**
- **Water quality** improved – significant decrease in pH and salinity
- GoK **scaled up** as a State-wide programme and as a climate change adaptation model

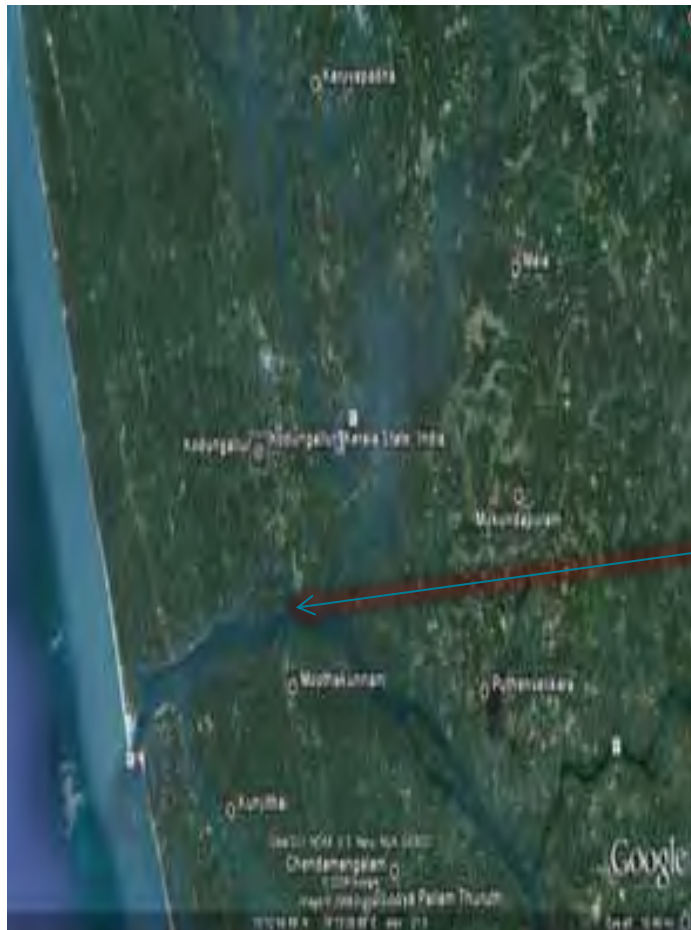
Recognitions and Awards

- GoI Bhujal Samwardhan Award for Adat GP 2010
- Water Digest Award 2010



Recharging Open Wells in the Coastal Riverine Island of (VP)Thuruth improves water quality

Satellite image of VP Thuruth at the confluence of Periyar River.



Mazhapolima: Backwash Method -Before and After



Water Security – Sanitation Nexus Story

- **Contamination of Ground Water** – Majority samples are bacteriologically contaminated, mainly faecal in origin ≥ 1100 MPN/100mL (CWRDM 2013)
- **Contamination of Well Water** – Kerala over 90% of 7.6 million open wells are bacteriologically contaminated (Jalanidhi 1999, KWA)
- **Studies corroborate the sanitation link** in Kerala – 53% by unscientific toilets; 11% by animal sources and 33% mixed (Harikumar, et al July, 2013)

Water Security –Sanitation Nexus Story

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- Kerala over 90% of 7.6 million open wells are bacteriologically contaminated (Jalanidhi 1999, KWA)
- Studies across Kerala (Harikumar, et al July, 2013) corroborate the sanitation link - 53% by unscientific toilets; 11% by animal sources and 33% mixed

Water Quality and Sanitation Nexus

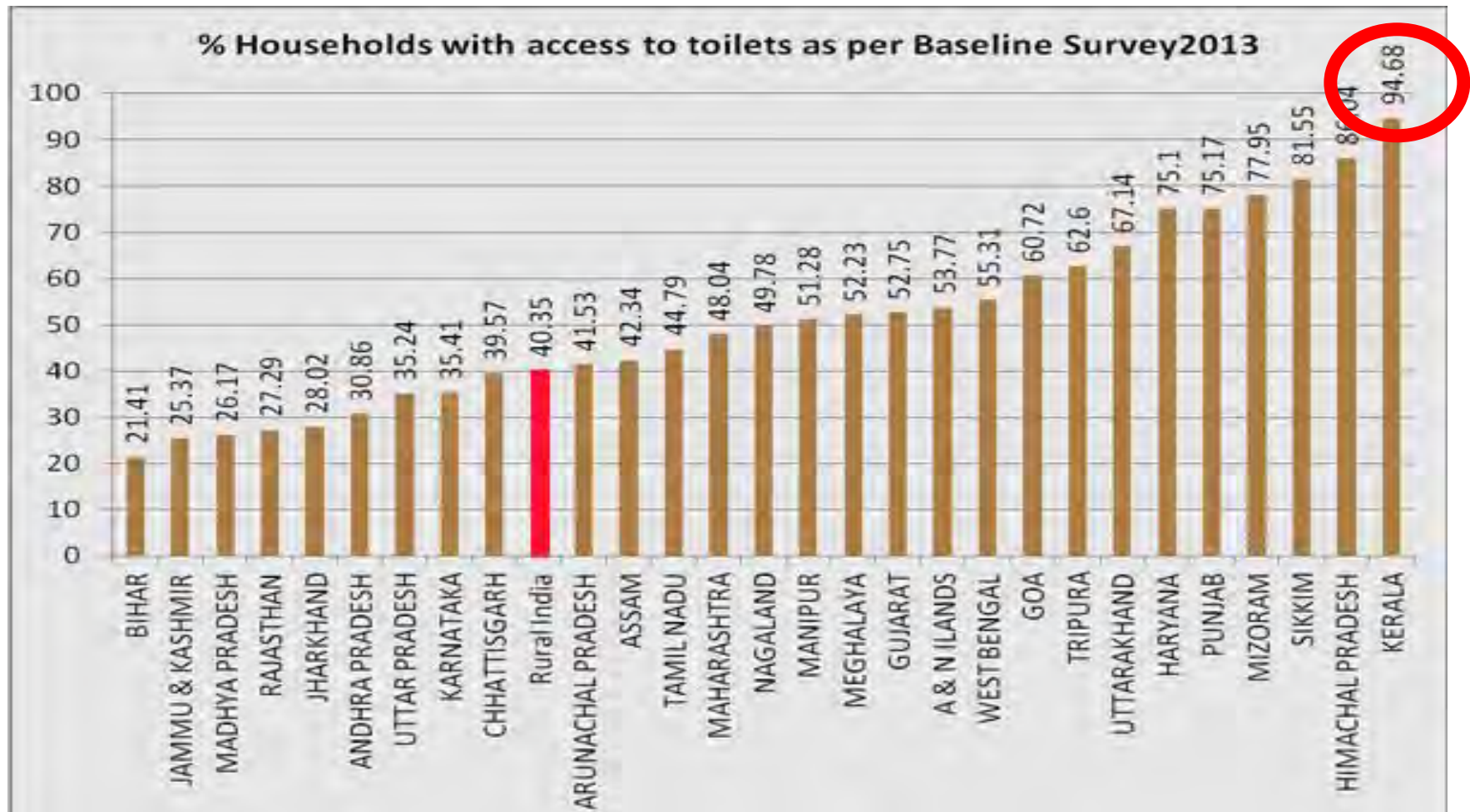
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graph TD; A[Water Quality and Sanitation Nexus] <--> B[Liquid Waste]; A <--> C[Solid Waste]; A <--> D[Leach pit Toilets and Septage];
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Liquid
Waste

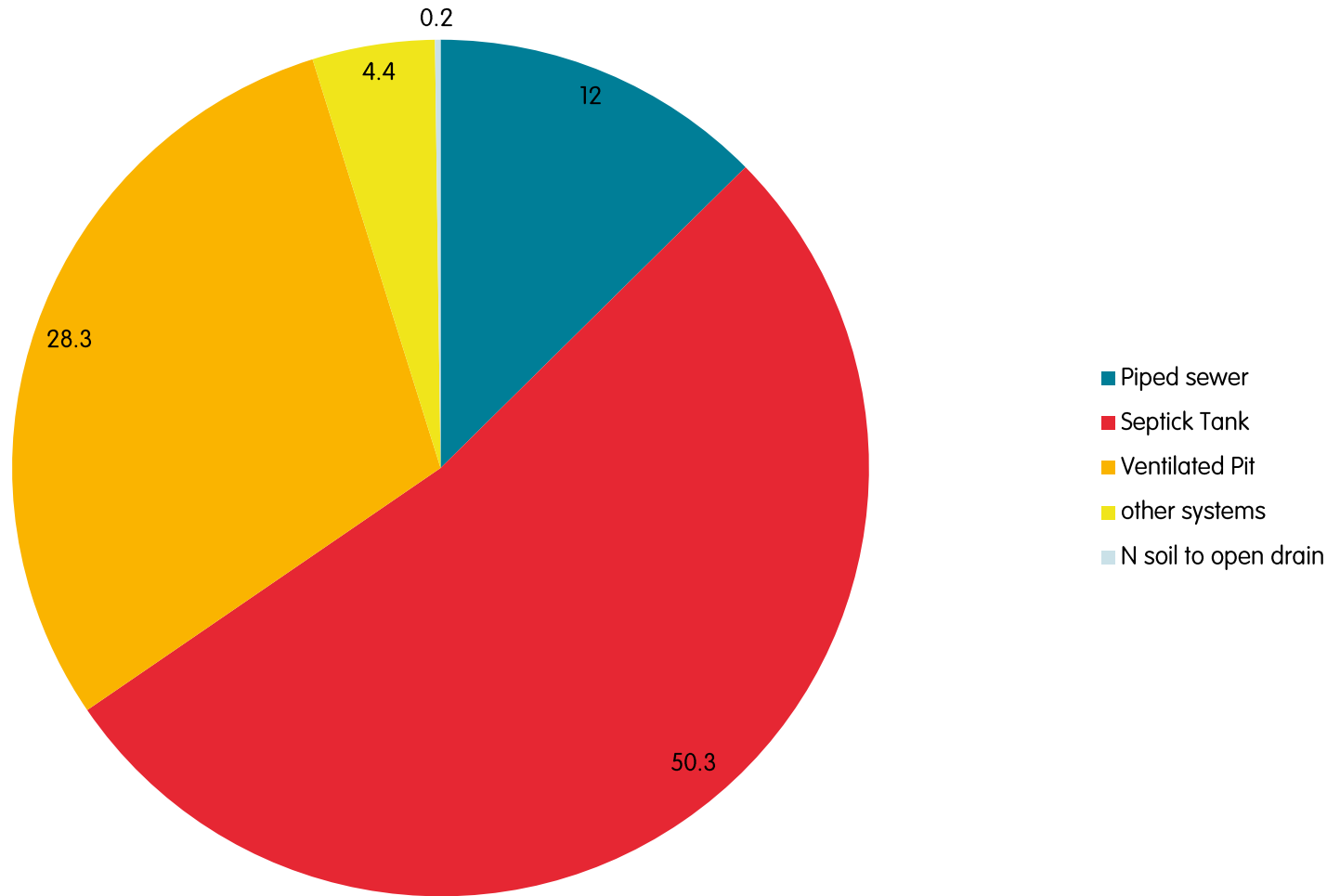
Solid
Waste

Leach pit
Toilets and
Septage

High Coverage – Low Outcome: Kerala has the highest access to toilets in India! Yet 90% water bacteriologically contaminated!!



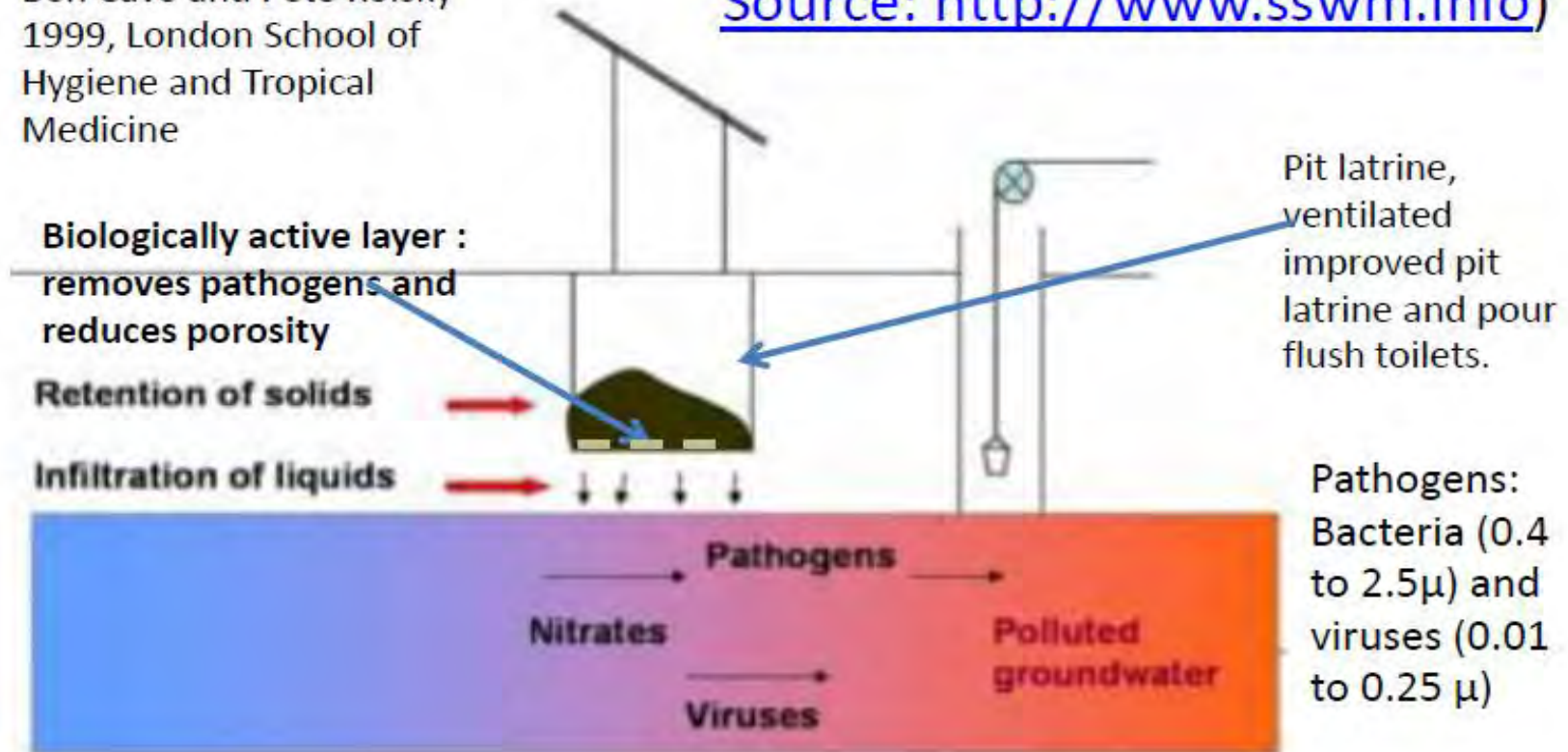
Types of toilets: Kerala (Census 2011 - % Share)



Pathways of Pathogen: Pollution in open wells from Toilets

Ben Cave and Pete Kolsky
1999, London School of
Hygiene and Tropical
Medicine

[Source: http://www.sswm.info](http://www.sswm.info)



Most nitrogen is excreted as urea, which readily degrades to ammonium. Nitrate is formed by the sequential, microbially-catalysed oxidation of ammonia to nitrite and then to nitrate

Septage: Dumping in Water bodies



Charred septage Tanker by angry local residents

Solid Waste: 738 truck loads per day not collected in 2007

% of Waste Un-Collected to Total Generation:

Own estimation of Municipalities : 46 %

As per standard norms of 300gm / per capita / day : 65%

In terms of quantity / per day of Uncollected Waste:

Own estimation of Municipalities :1840 tons

As per standard norms of 300gm / per capita / day : 65% : 2215 tons

**This is the waste left Unattended !
Per day.
In Your & OUR
NEIGHBOURHOODS
To decay – rot and invade into
our Water, Sanitation and Health
System.
NIMBY ?????!!**



Even Treated Water is contaminated by leaky distribution network



Liquid Waste Management!



Waste Hidden is Waste Disposed

Overflowing dumpsites

Dysfunctional treatment facilities

Serious health and environmental hazards



“Sanitation” in Kerala: High Coverage – No Outcome!!

IHHL Coverage Latrine: 95.2% – Rural 93.2%
Urban 97.4%

More than 50% latrines have leach pits – 90%
open wells are biologically contaminated –
flourishing business of emptying of pits and illegal dumping in
water bodies – II Generation issues

44.5% households do not have drainage facility
(21% open and 33.5% closed drains)

Sewerage system only partially established

Total waste generated 8300 tpd
(only less than 50% collected for disposal)*

70% biodegradable to be managed in 24 hours

Takeaways for Swatch Bharat Abhiyan...

Design it right !

- Water security and sanitation are integral, complementary and inseparable
- Swatch Bharat Abhiyan **if** driven on coverage alone means (125 million in 5 years) **deferred open defecation** – addressing privacy without health outcomes
- Design it right with sustainable right technologies and construction quality assurance
- Link the entire sanitation chain to water cycle IWRM for water security

Design it Right!

- Intention not to highlight Kerala's sanitation owes – Kerala is better than many states
- But : unscientific sanitation is as good as open defecation

How?

- Focus in health outcomes in awareness campaign
- Location specific technologies
- Quality assurance and monitoring construction – adhere design parameters
- Link water cycle to sanitation chain
- Factor second generation challenges in Planning, design and roll out



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Poor hygiene and sanitation –
a threat to water security

THANK YOU

Mazhapolima links:

<http://www.ircwash.org/news/india-kerala-mazhapolima-participatory-well-recharge-programme-%E2%80%93-video>

<http://www.indiawaterportal.org/node/27451>

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Drinking Water by Source: Kerala Census 2011

Source	Percentage	Percentage
Tap water • Treated source • Untreated source	29.3	• 23.4 • 6.0
Well • Covered well • Uncovered well	62.0	• 14.6 • 47.4
Hand pump	0.5	
Spring	1.4	
River/Canal	0.2	
Tank, Pond, lake	0.7	
Any other	2.1	