



# 10,000 Septic Tanks Later

Impacts and Results of Starting Large Scale FSM

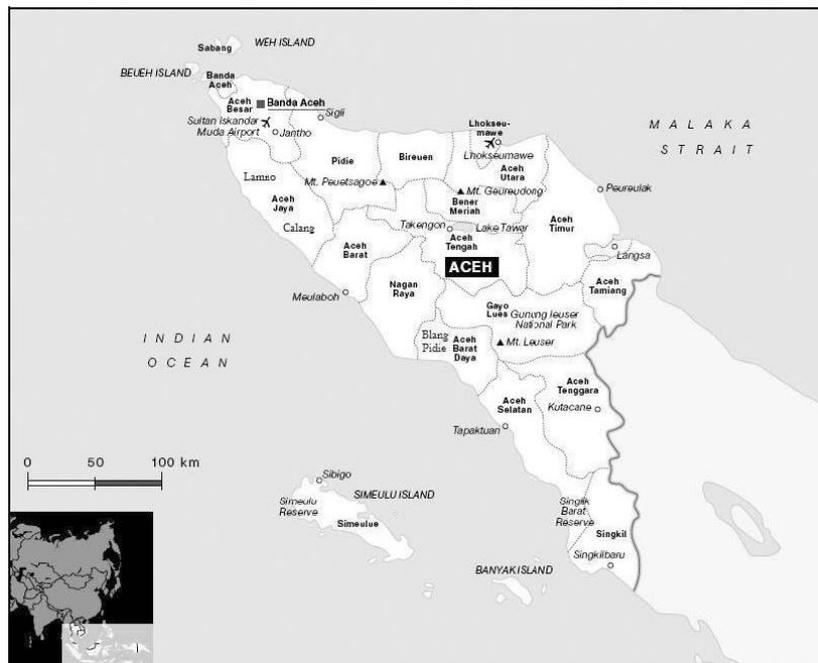
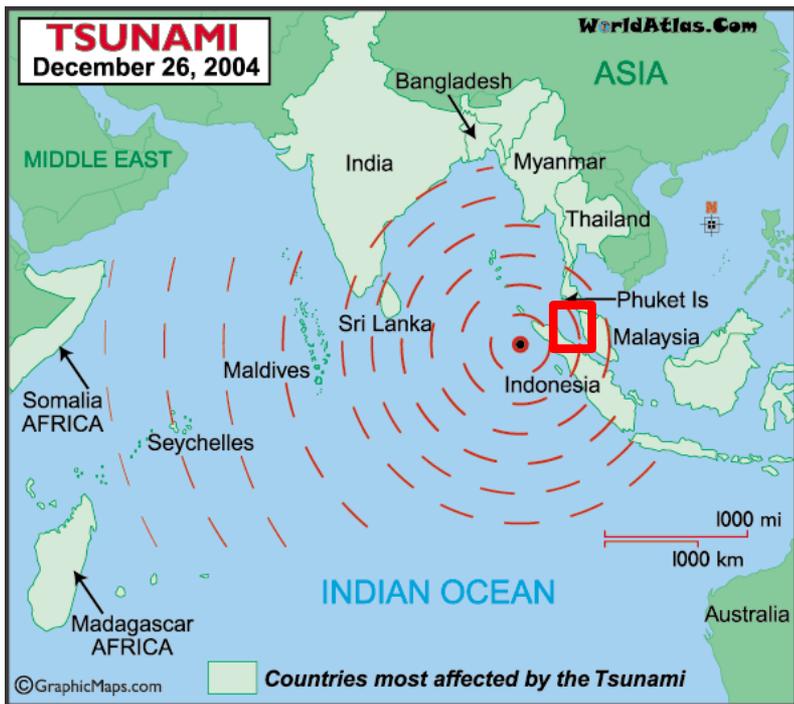
Michael McWhirter

Acknowledgement:  
American Red Cross





# Large Scale FSM Activities Occurred After The Indian Ocean Tsunami in Aceh, Indonesia





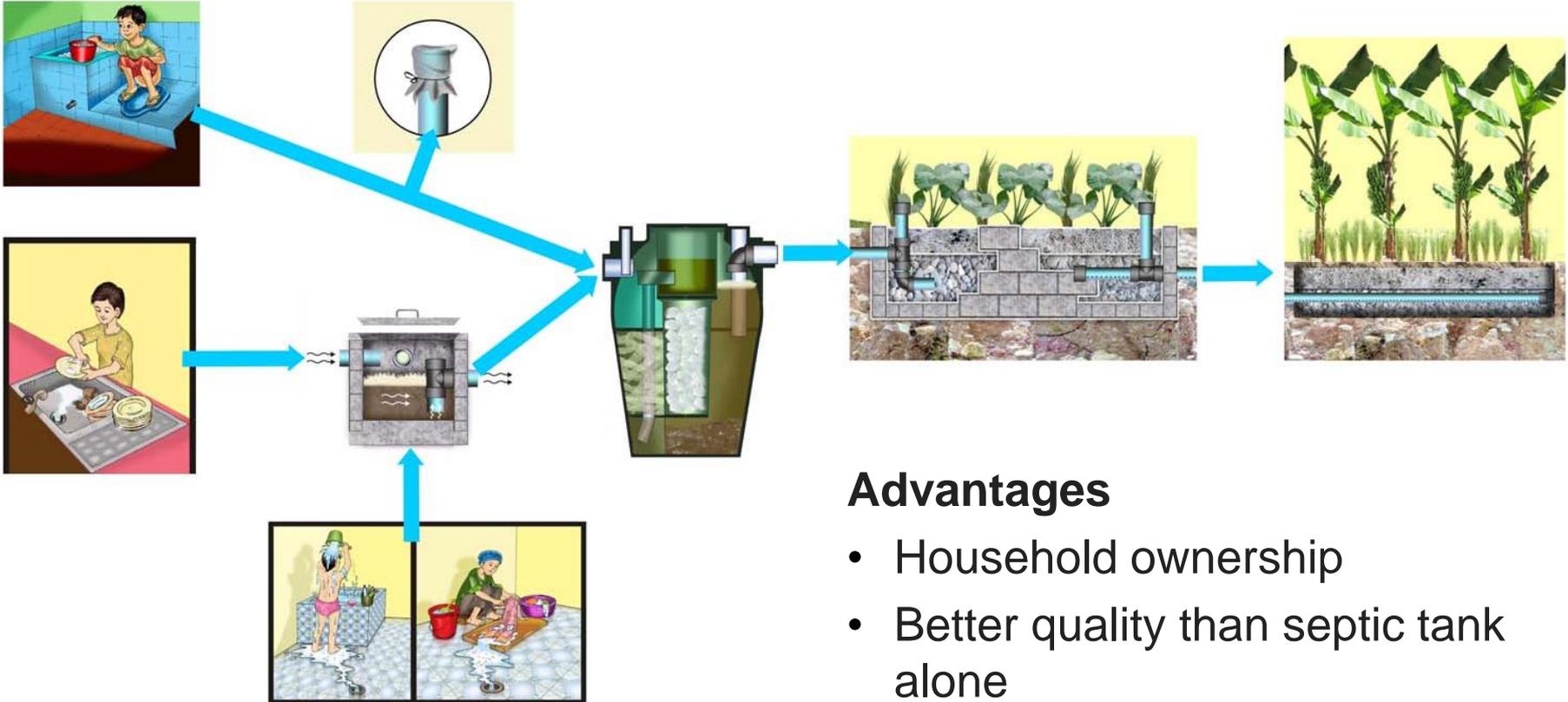
# Challenging Conditions Existed for Onsite Sanitation

- High Water Table
- Often clay soils
- Cramped plots
- Limited contractor and community capacity





# A Common Solution was used for Sanitation in New Houses

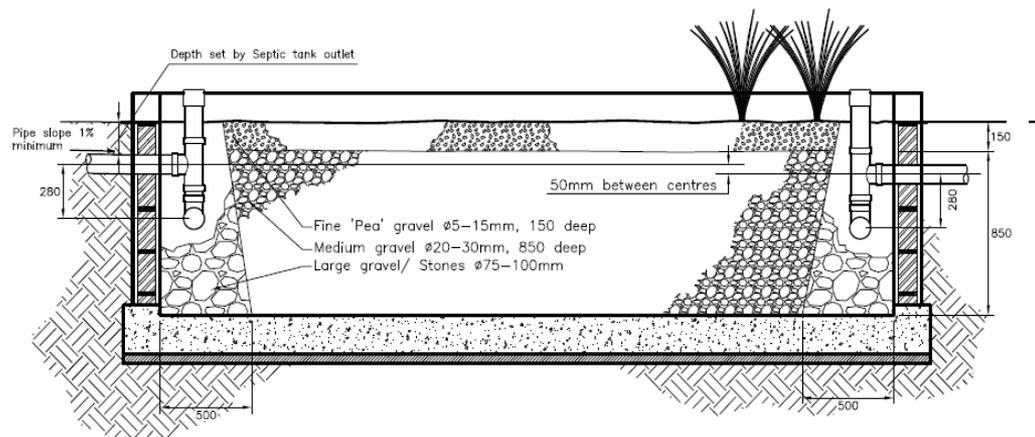


## Advantages

- Household ownership
- Better quality than septic tank alone



# Household Constructed Wetlands were a Major Feature of the Solution



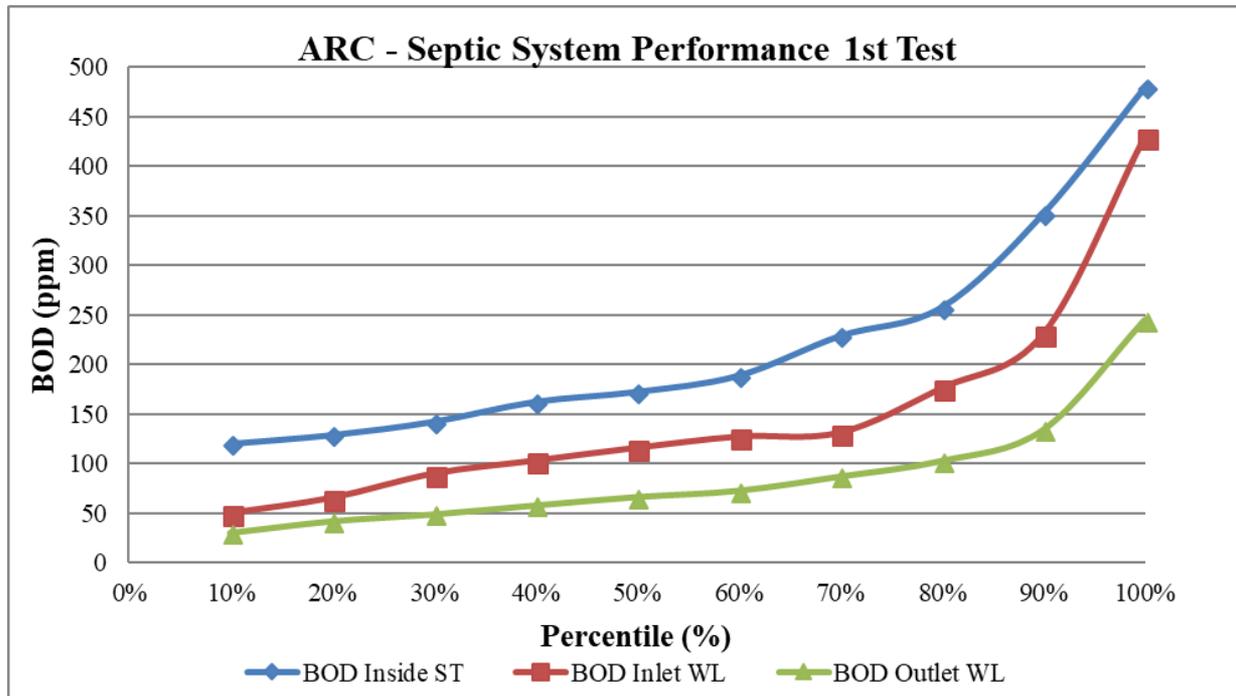
SECTION C-C





# The Wetlands Improved Effluent Quality Significantly

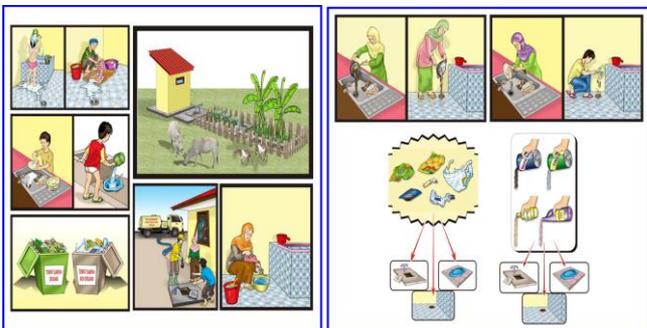
- Median BOD reduced
  - 33% by Septic Tank Alone
  - 61% by Septic Tank & Wetland



**Data from all 70 villages ARC worked in, first test.**



# Training and Sustainability: A Point of Pride for Us





# Solutions Were Found to the Challenges

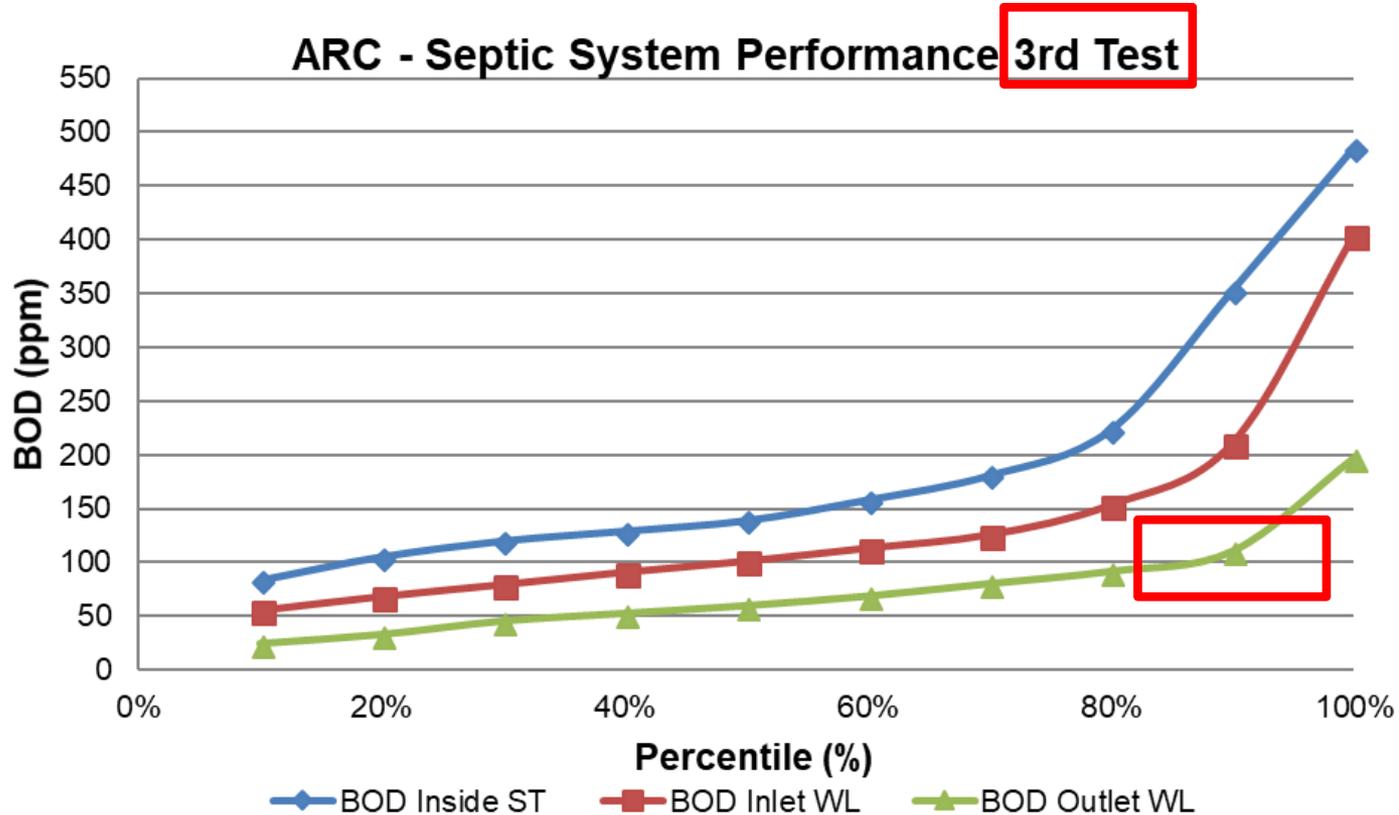


E.g.s

- Preventing blockage with kitchen waste (technology and understanding)
- Disposal with high groundwater (raised units)
- Desludging (FSTP built, now government improved)



# With Monitoring, Training and Repair We Achieved 90% of BOD <100ppm from Wetlands





## The Facilities Were Well Used

	Total % of households
<b><u>Defecate before the Tsunami?</u></b>	
Private toilet	54
Public toilet	18
River / sea / Bush / Garden	28
<b><u>Is the toilet now in house used?</u></b>	
Yes	96

Data professional final randomized survey of 642 households



# Well Designed and Delivered Onsite Sanitation Formed a Backbone for Recovery



2005



2010



**And  
continue  
to do so  
today.**





# Session Themes

- Advantages of Wetlands: Improvement in Effluent Quality
- O&M Challenges: Poor Design, Construction or Operation Leads to Blockages
- Secrets to Scale: Careful oversight, heavy community engagement





## Points to Remember

- Wetlands Improve Septic Tank Effluent Quality
- But only to ~65%
- Carefully plan design and construction
- Capacity building and support for longterm value

