

# **Identifying the preferred arsenic mitigation options in Bangladesh**

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## Policy position in 2004

- **2004 National Policy for Arsenic Mitigation (NPAM)** noted a policy preference for surface water giving lowest priority to groundwater in mitigation
- NPAM also recognized that no single blanket option exists for effective mitigation
- Use of surface waters pose other (potentially more serious) water quality risks

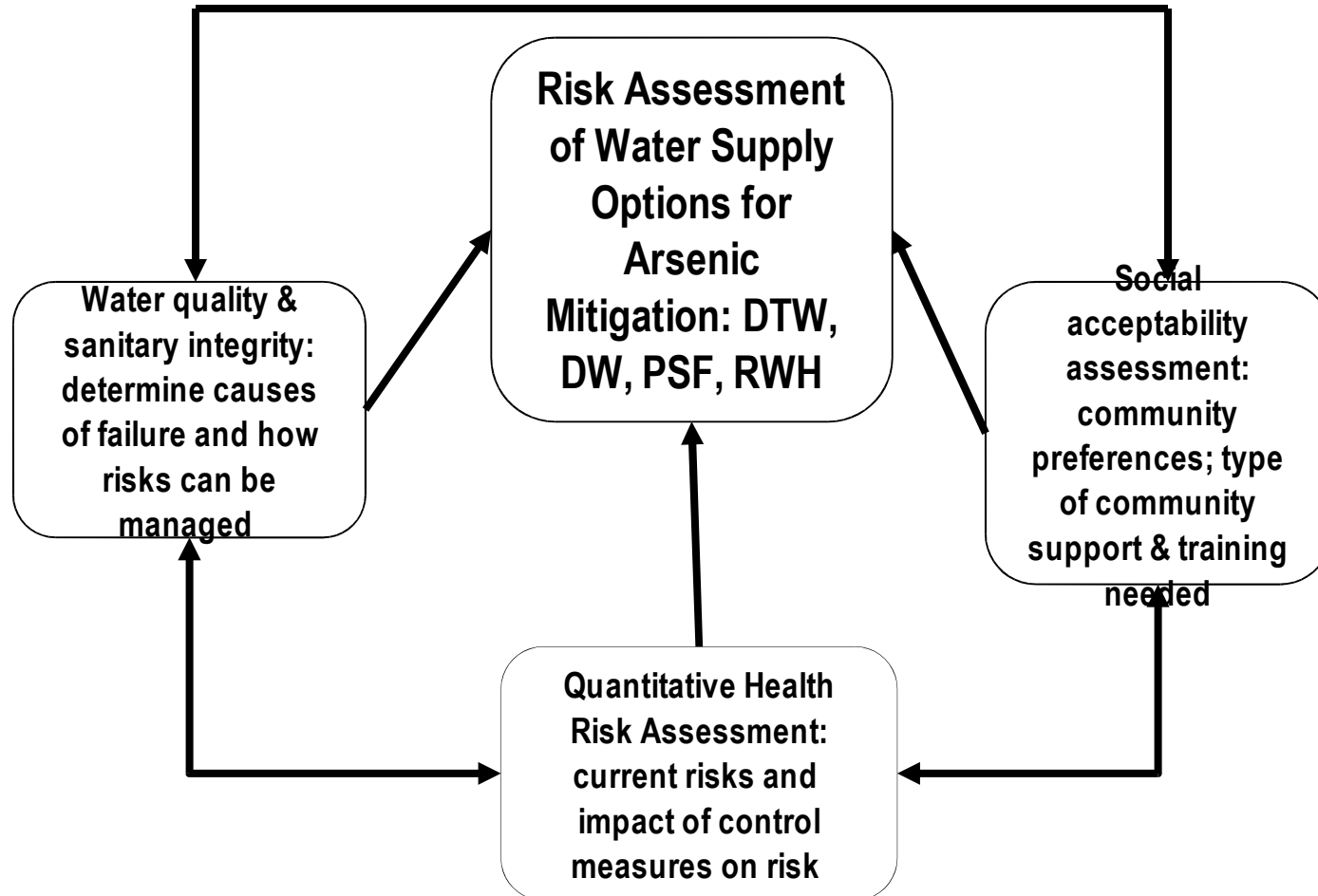
# Preferred mitigation options should:

- Meet demands from community for technology
- Have arsenic within BDS and preferably within WHO GV
- Limited or no risk substitution
- Have a reliable year-round source
- Be easy and inexpensive to maintain

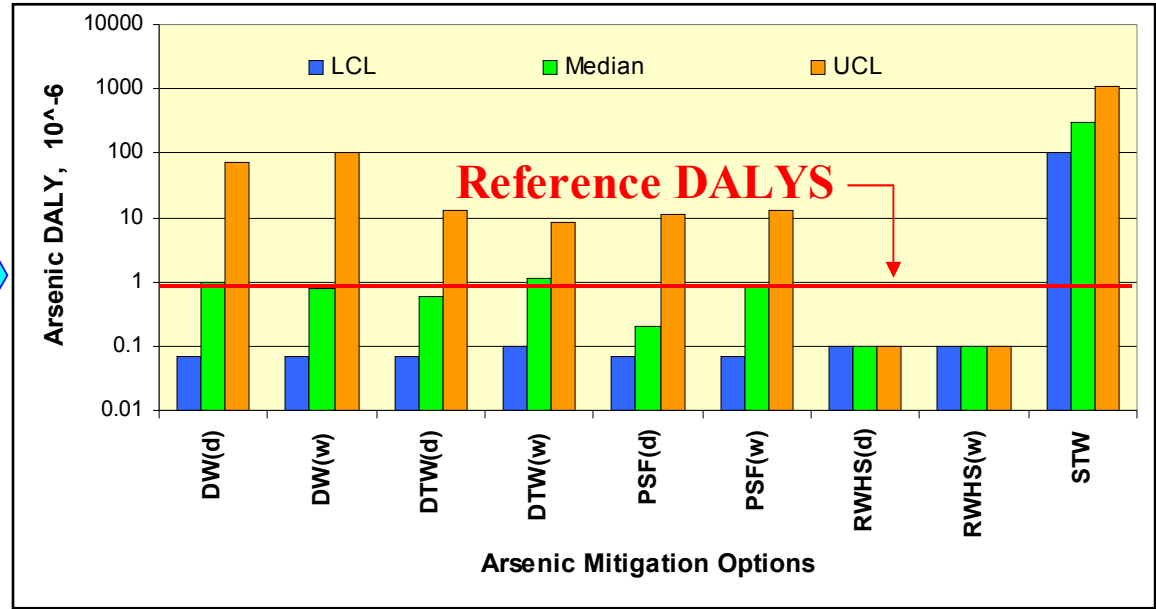
# Actions taken to identify preferred options by Arsenic Policy Support Unit (APSU)

- Risk assessment of arsenic mitigation options
  - Disease burden estimates using QHRA
  - Acceptability through social surveys
  - Sanitary inspection of water supply options
- Also
  - Assessment of surface water sources in arsenic-affected Unions
  - Assessment of adequacy of groundwater data and modelling of deep aquifer
  - Functionality survey of existing options

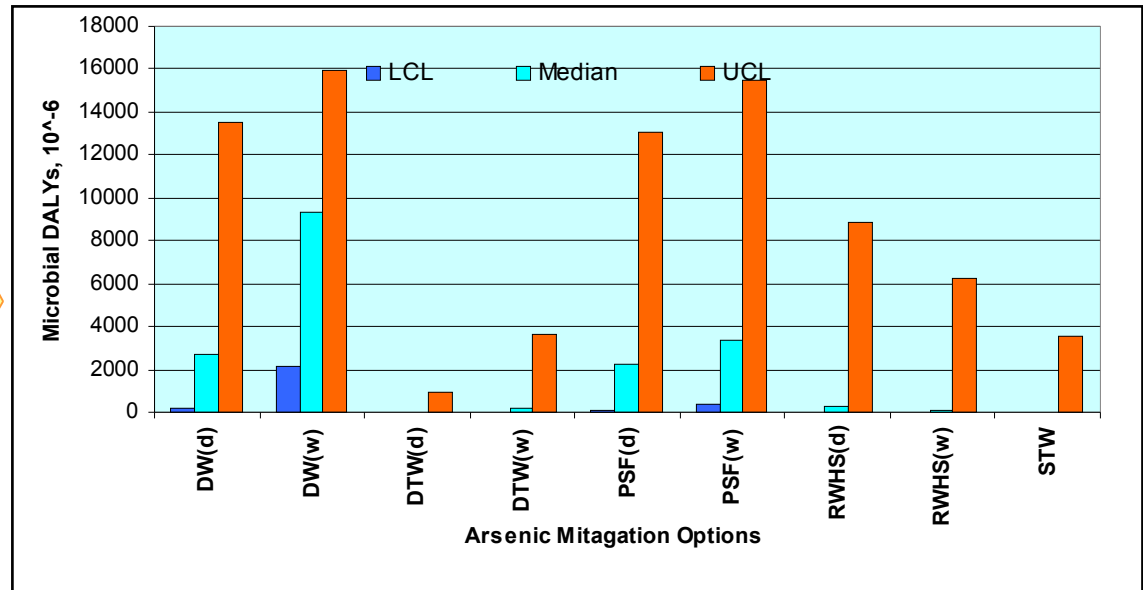
# Structure of the RAAMO study



# Arsenic DALYs



# Microbial DALYs



# Key findings

- Data shows DTWs have lowest DALY score
- WHO reference level of risk is 1 DALY/million
- Social assessment suggests all technologies viable
- O&M poor
  - limited impact on DTW,
  - pronounced effect on other technologies

<b>Median DALY/million</b>		
<i>Option</i>	<i>Dry season</i>	<i>West season</i>
DTW	6	163
DW	2665	9302
PSF	22	3342
RWH	267	103

# RAAMO conclusions

- All technologies viable, but DTW offer the lowest disease burden risk
- At least seasonal chlorination of dug wells & PSFs is essential
  - Further pressure on already weak O&M
- Where conditions permit, DTWs are the preferred option

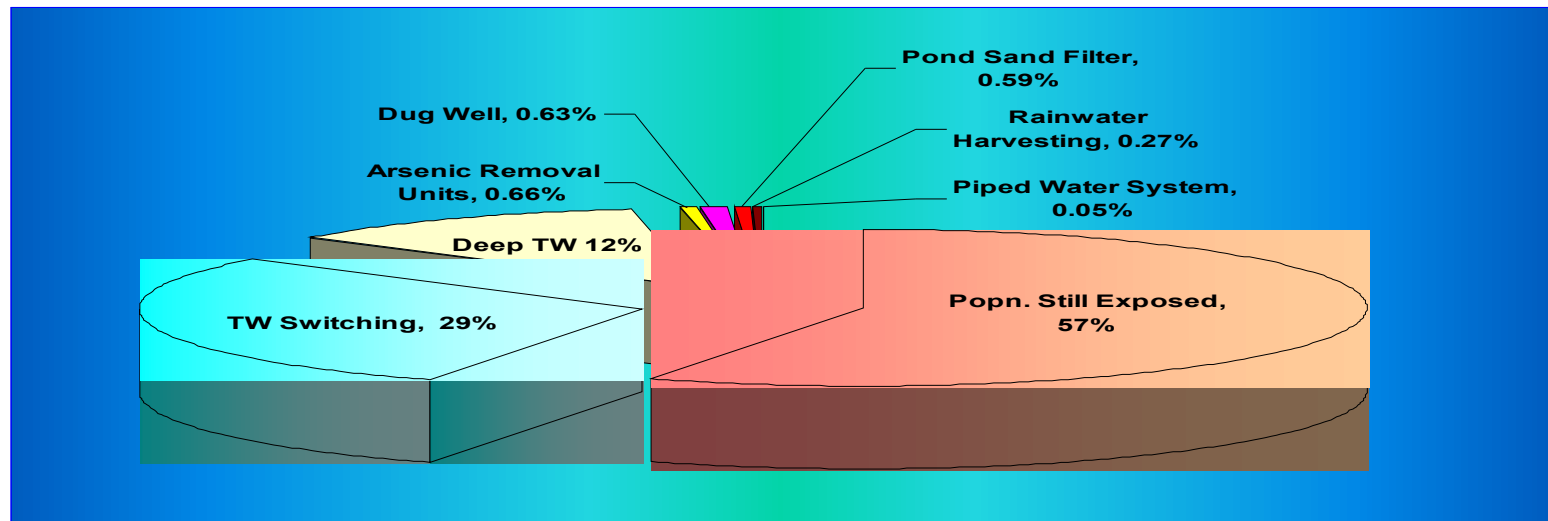


# Other data point to DTW as preferred option

- Functionality survey

DTWs more likely to remain functional (90%) compared to others (65-78%)

– DTWs most commonly deployed option – 2006 survey shown below



# Assessment of ponds show more limited availability than often stated

- CEGIS study for APSU of 6000 ponds taken from 39 unions affected showed that:
  - Only 60% had the *potential* for consideration based dry seasons water quantity, colour and vegetation cover
  - Emphasised the need for further assessment of water quality of these ponds given undesirable uses

# If DTWs are preferred, why not scale up rapidly?

- Limited information on resource is a constraint
- Poor construction techniques may place deeper aquifers at risk
- But, modelling by USGS suggest that a split strategy (shallow = irrigation; deep = domestic) provides hydraulic barrier & increases recharge to 10,000 years

# So, what are policy implications

- The NPAM should be updated to reflect the results of action research & give greater recognition of the value of DTWs
- Priority should be on groundwater mapping and management strategy
  - Complemented by better characterisation of surface water quality
- Mitigation strategies must focus on water resources as well as technology performance