

National WASH Multi-Stakeholder Forum 8

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Hydrogeology consideration in enhancing rural water supply resilience: Lessons from UNICEF's field activities

Seifu Kebede, Abebe Ketema, Ali Rageh, S. Godfrey



Presentation outline

- Objectives
- Five key messages
- Recommendations
- Recommendations for OneWASH phase II

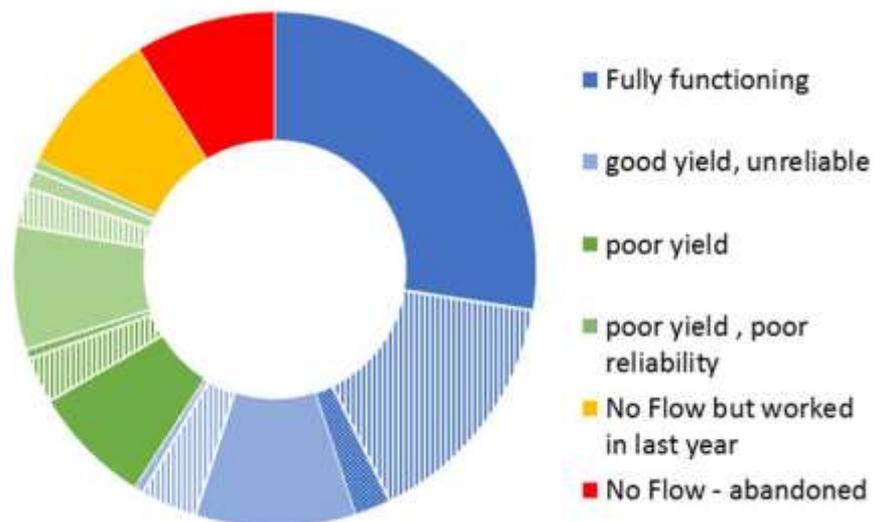
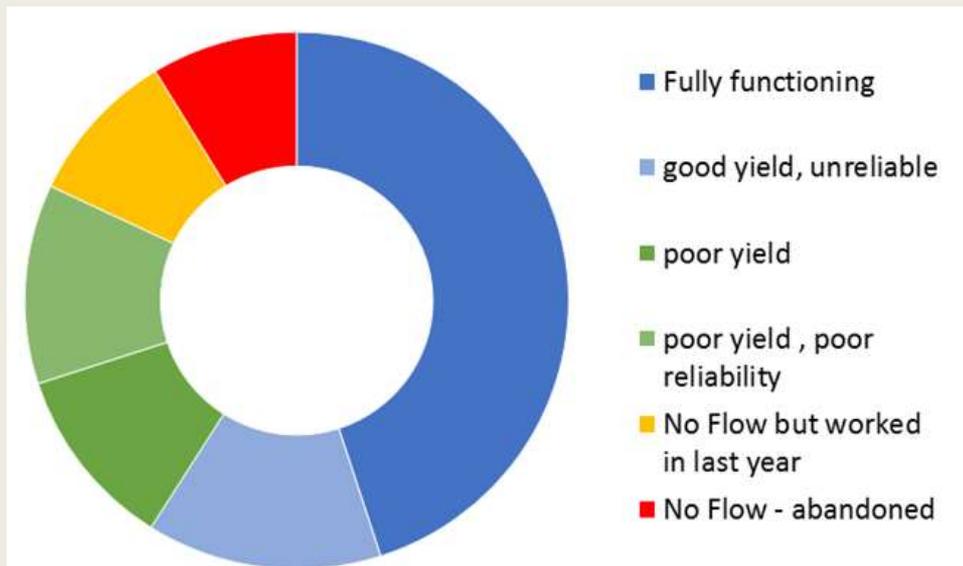
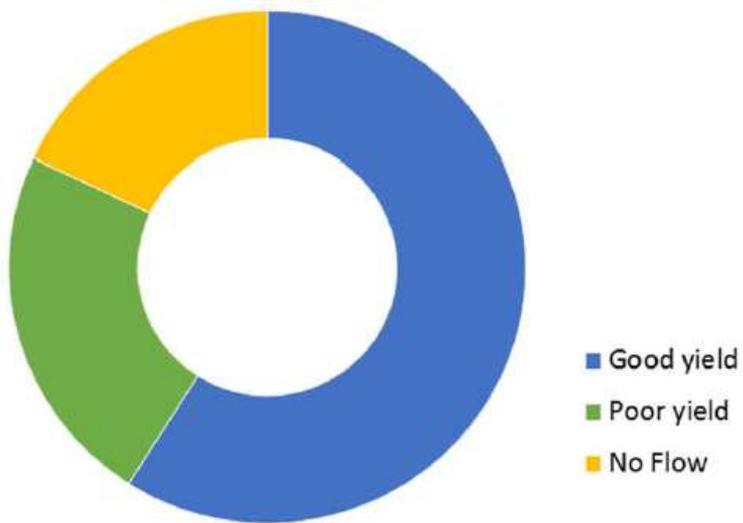
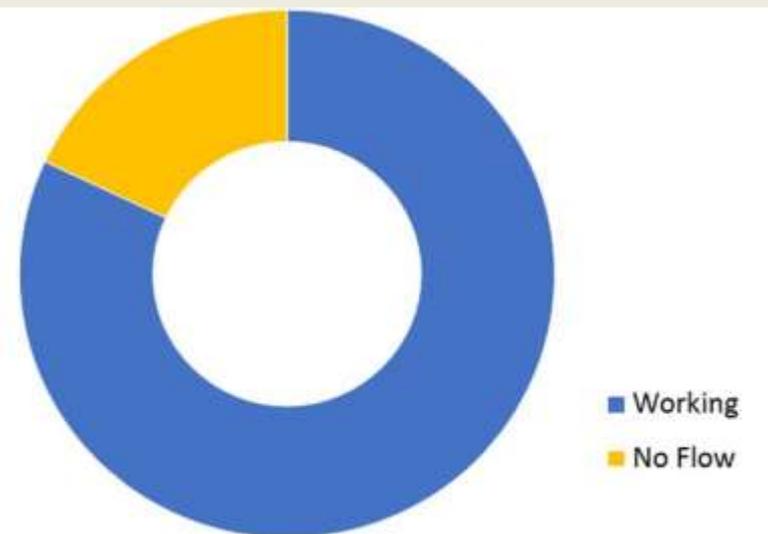


Objective of the presentation

- To demonstrate from field lessons that
 - Hydro geological consideration in WASH sector investment could increase drilling success rate substantially
 - Implementing water schemes that fits not necessarily the cost criteria but the hydrogeological setting could increase water scheme resilience during droughts or under normal conditions
 - Even in the traditionally most resilient schemes, post extreme event recovery is not linear, meaning need to build robust schemes that accounts for extreme events
 - Increasing service level sought in SDG necessitates introduction of new approaches in delivery mechanism of water services and in scheme technology choice (eg. MVS).



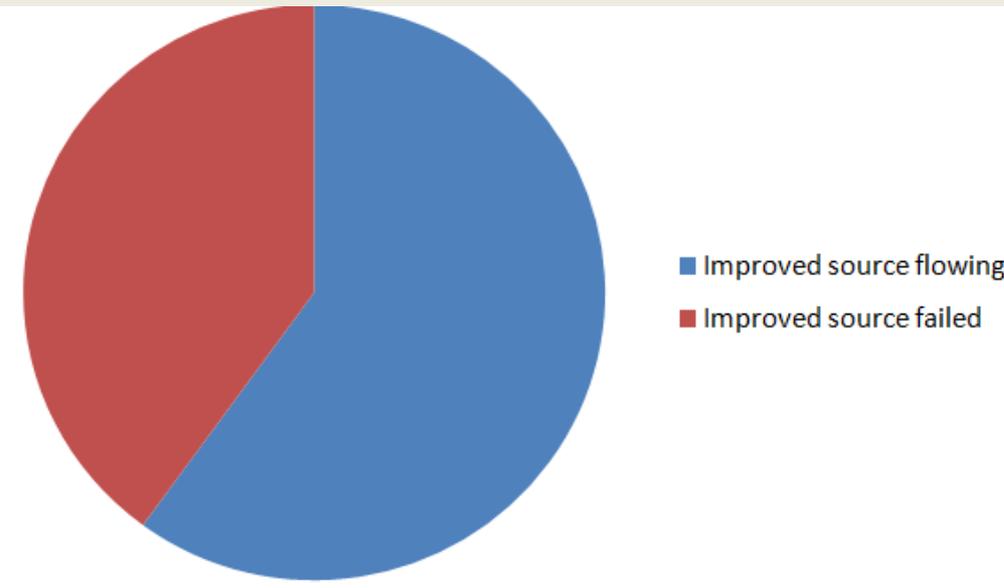
Key message 1. Water scheme functionality greater than NWI when tiered definition is considered! so what lessons?



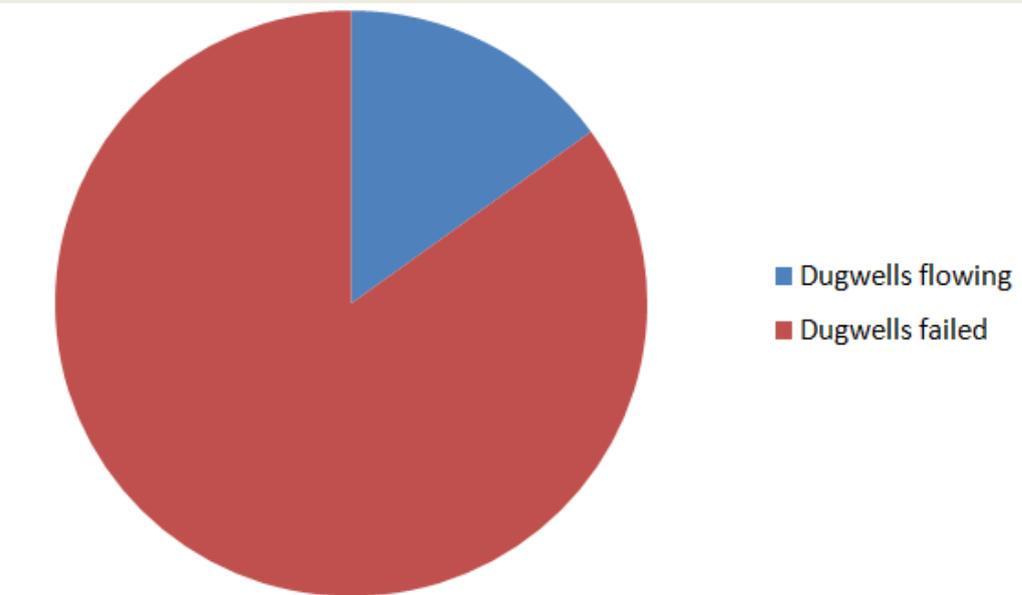
Hidden Crisis Project, 2017
[BGS, ODI, AAU etc]



Key message II: Scheme resilience learning from 2015/2016 El Nino real time monitoring- Improved source vs dug wells



Linking this with drought impact may be difficult to conclude in absence of baseline performance data..but evidence is showing differences in resilience of schemes [ODI, 2017]



Flag!

- a) Resilience =f(stressor, ++)
- b) Scheme feasibility \neq scheme resilience



Key message III: drilling success rate and post construction resilience

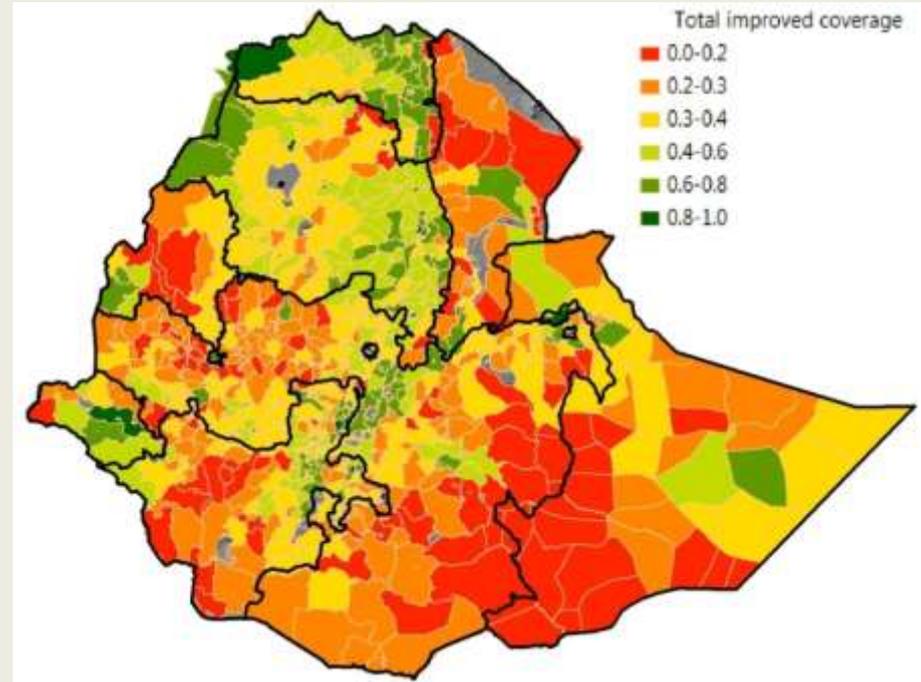
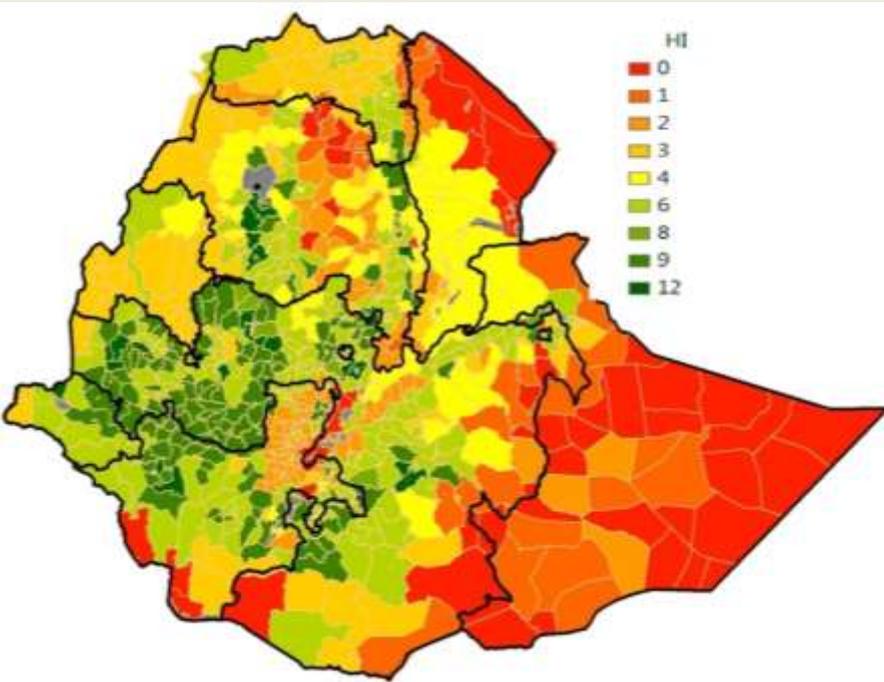
Existing practices [2000-present]

- WASH-WR decoupling and sustainability of schemes problems
- Cost (NB: not necessarily unit cost) criteria used in sequencing scheme choice
- Where water exists and where people live doesn't match locally; WASH programs target people and institutions which are often far away from the high potential water sources

Key message: Drilling success rate increased to nearly 80% in the most difficult areas of Afar region after applying systematic groundwater exploration approach [UNICEFs projects]



Key message IV: But easy water availability hasn't been a guarantee for higher improved water coverage in 'Ethiopia'!



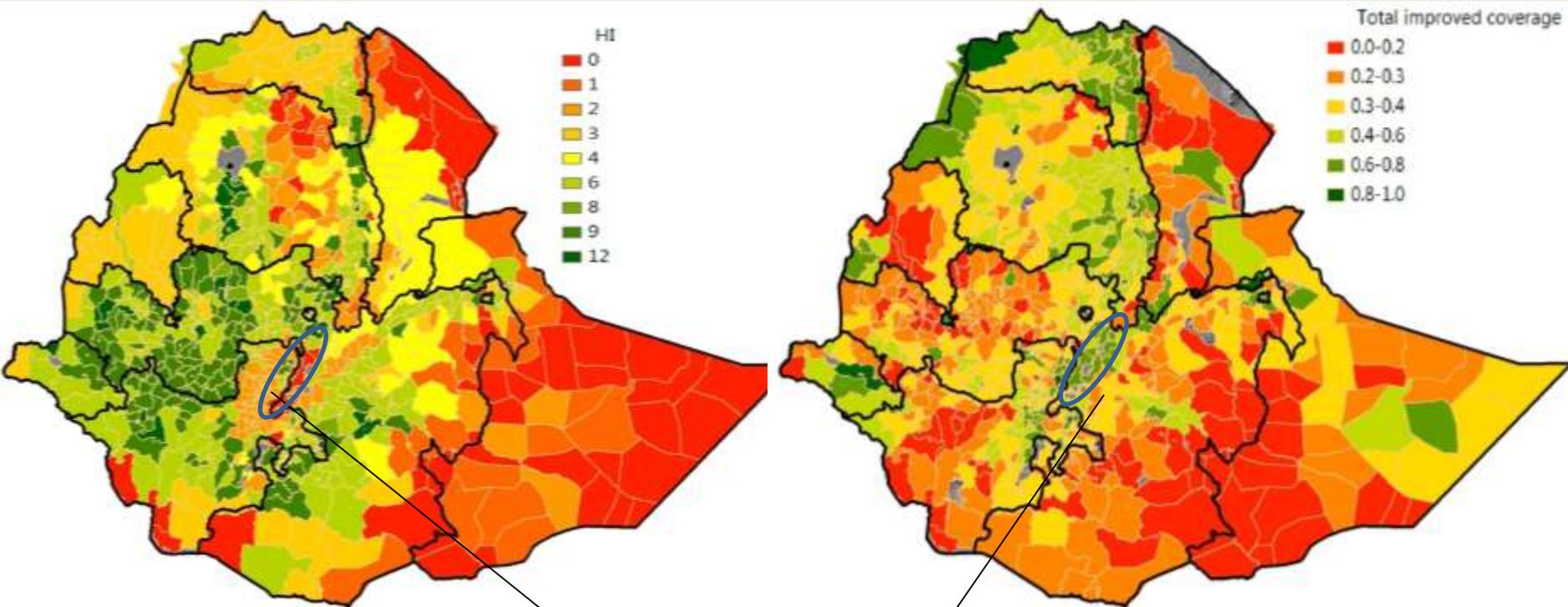
Hydrogeology difficulty index [0 most difficult, 12 easy]

Total Improved Coverage [NWI]

Work for WB, ODI, 2017



Key message V: RPS/MVS helping to overcome difficult hydrogeology- some woreda's score above national total improved coverage as the result of RPS?



Hydrogeology
easiness index

Improved source
coverage map

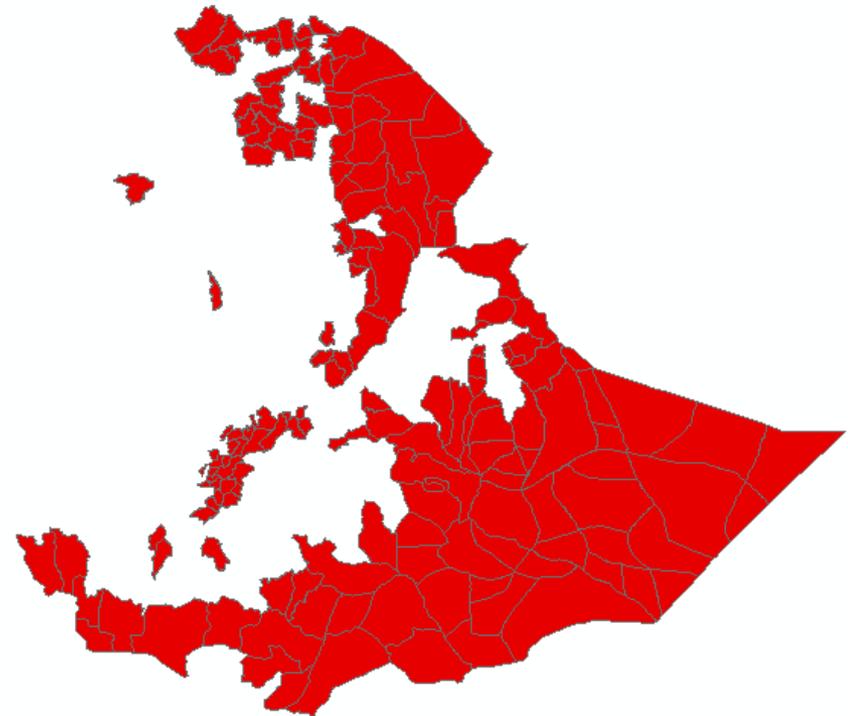
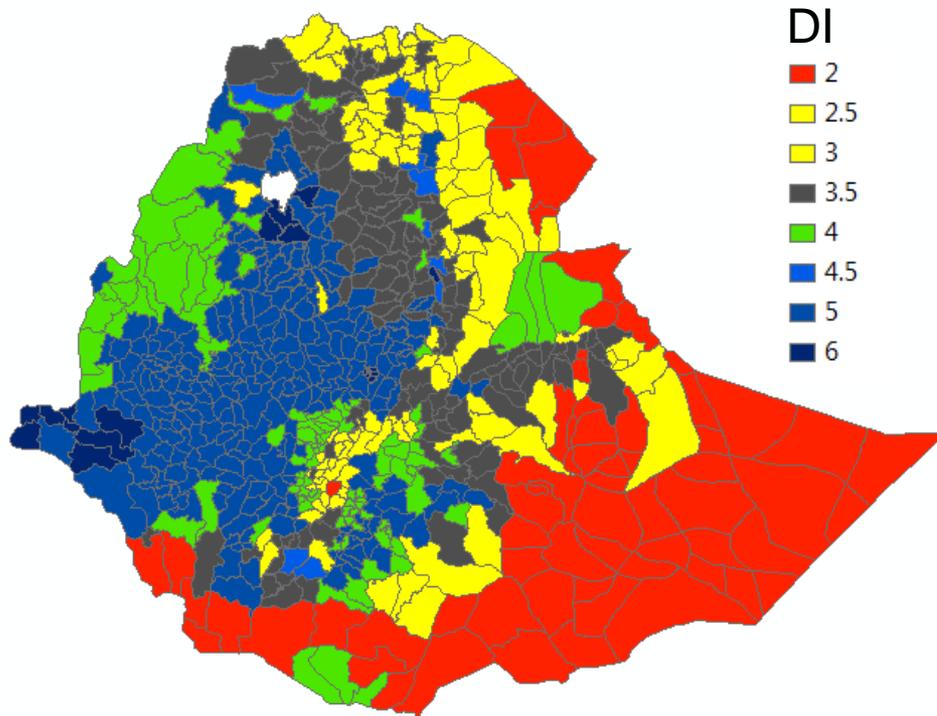
Hydrogeologically difficult Woredas with high improved WASH coverage as the result of Multi Village Schemes



Work for WB, ODI, 2017



Key message VI: Delineating where vulnerable aquifers exist and where vulnerable people live helps preparedness and responses?



Isotope validated groundwater resilience map, Ethiopia

The 165 priority 1 Woreda's during 2015/16 El Nino

Areas with the lowest aquifer resilience correspond with the most affected areas

Q. How can we reach the people in such areas, what technology, what water scheme management approach?

Ongoing work- UNICEF, AAU; 2017



Major recommendations (technology and institutions)

- Mapping aquifers and aquifer resilience and hydrogeology difficulty for identifying resilient scheme type; compound this with integrating WASH and water resources
- Non linearity in scheme resilience (need further investigation) means the most robust schemes are needed to buffer climate shocks so as not to slide back on SDG gains
- Given the hydrogeology difficulty, as well as the nature of groundwater distribution in Ethiopia, SDG targets may not be achieved if hydrogeological considerations are ignored. Raising service level also necessitates these considerations.
- New technology means new institutional arrangement (eg. Private Sector Involvement) for scheme management



Recommendations : Proposal for strategic direction

- Considering robust sources with imbedded variation, new water distribution and management approaches in OneWASH national program and thereby in meeting SGD targets in difficult areas.

and

- Mind your step no panacea-learn from failures in the existing Multi Village schemes! [eg the HC project] , sometimes the least obvious cause for the most trouble.



Figures: Water Scheme supplying 40 stand pipes in Malawi failed because of scaling in the distribution network

Thank You

