# Multi-decadal financial assessment of groundwater services for low-income households in rural Kenya



IAH Congress, Dubrovnik 25<sup>th</sup> September 2017 Tim Foster, Rob Hope & Jacob Katuva (presenting) ~200m rural Africans depend on protected groundwater point sources, with O&M costs of ~\$500m p.a.



Community-based financing of O&M assumed in national policies and plans across Africa

### Mismatch between policy and reality

Most communities struggle to pay for groundwater-fed services

#### % of handpumps without revenue collection system



Inadequate financing of O&M likely a key reason why 1 in 3 handpumps is non-functional

### Evidence from water committee records in Kwale, Kenya



## **Research questions**

- What factors promote and hinder financial performance?
- How does financial performance impact operational performance?
  - What impact does revenue collection have on groundwater use?

### A heavy dependence on groundwater in Kwale

В

550+ Afridev handpumps installed 1983-95, with 40% non-functional by 2013



Most handpumps underlain by Pleistocene corals and Pliocene/Pleistocene sands

Pleistocene corals
 Pleistocene sands
 Pliocene sands
 Mazeras sandstones
 Mariakani sandstones
 Maji-ya-Chumvi sandstones & shales

## Characteristics of handpump water supplies in Kwale

Variable	Mean	
Static water level (m)	17	
Electrical conductivity (µS/cm)	1180	The second
Distance: water point to HHs (m)	137	
Monthly fee per HH (USD)	0.51	
Users per water point (HHs)	38	

Revenue collection approach	%
Regular fees	49.2
Flat rate (per month/year)	25.1
Pay-as-you fetch (per bucket)	24.1
Payment upon breakdown	17.2
No revenue collection	33.4

Financial records located at 100 communities

270+ waterpoint years
43,020 monthly contributions
Spanning 1987-2013

Financial data integrated with data from large household survey (n=3,000+) & water point census

## On average, each month around 1 in 4 households do not pay their water user fees



Jan 2014)

# Payment rates predicted by water point location, water quality, rainfall season and productive uses



#### Payment rates highest when:

- pump is located close to users
- pH is >6.5
- Water is palatable
- Rainfall is low
- Households use water for productive purposes

# 'Pay-as-you-fetch': associated with higher revenues and faster repair times, but also unimproved water use



Rainfall also has a major impact on revenue levels

### Further details available in the following papers:

20 A CLUDUDI ICATIONIC

Evaluating waterpoint sustainability and

approaches in rural Kenya

Water Resources Research

A multi-decadal and social-ecological systems analysis of community waterpoint access implications of revenue collection payment behaviours in rural Kenya

#### Journal of Rural Studies

	Journal of Rural Stat	lm 47 (2016) 85-96	
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One of the fore most collective action challenges of keeping rural utrala E-mail addresser: fm.htter@ut.edu.au (T. Forer), Robert hepe@unithschool, mar.uk (R. 1999). wate moints functional is the financing of O&M activities. Revenue

Water Resources Research		
RESEARCH ARTICLE	Evaluating waterpoint sustainability and access implication	
10.1002/201 6WR0 19 634	revenue collection approaches in rural Kenya	
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Supporting Information:	with different revenue collection approaches on the south coast of Kenya. The analysis draws on a un	
Supporting information SI	data set comprising financial records spanning 27 years and 100 communities, operational performan	
• Data Set St	indicators for 200 waterpoints, and water source choices formore than 2000 households. Results sug	
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Correspondence to: T. Fortes	households are more likely to opt for an unimproved drinking water source when a pay-as-you letch	
timforergatueduna	s in place. The findings illuminate a possible tension between financial sustainability and universal as the Sustainable Development Grai of "safe water for all" is to become a reality policymakers and	
-	practitioners will need to address this issue and ensure rural water services are both sustainable and	
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Evaluating waterpoint outtainability and access implications of revenue		
collection approaches in rual Kenya, Write Record Rev. C. 1473-1490		
doi:10.1002/2016WR019634	1. Introduction	
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Acopted 25 DEC 2016	Saharan Africa [Churchill et al., 1987; Briscoe and de Ferranti, 1988; Carter et al., 1996, 1999; Harvey,	
Accepted article online 3 JAN 2017 Published online 13 CED 2017	Community management has been the dominant rural water supply paradigm embraced by govern denors and economications (NCO-Mex exception denotes and is experied upon the	
	tation that local water users are willing and able to self-organize and cover the cost of operation and	
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	Government and Housing (MLGH), 2007; Jones, 2013], technician salaries and equipment [see, e.g.,	
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	access perspectives, and communities independently adopt a diverse range of strategies.	
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A critical mass analysis of community-based financing of water services in rural Kenya

#### Water Resources & Rural Devt

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