

Translating Research Ideas into Water Security Impacts for the Poor in Rural Kenya



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Research jointly supported by the ESRC and DFID



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**10th Anniversary Conference of the ESRC-DFID
Joint Fund for Poverty Alleviation Research**
*Lessons from a Decade's Research on Poverty:
Innovation, Engagement and Impact*

Pretoria – 16-18 March 2016

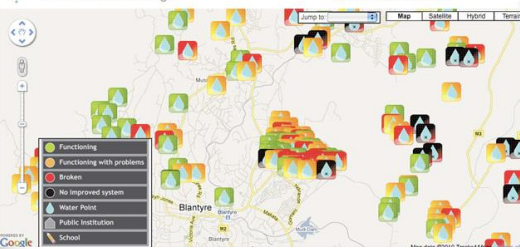
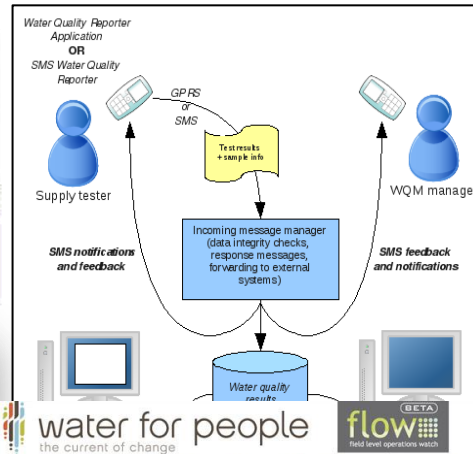
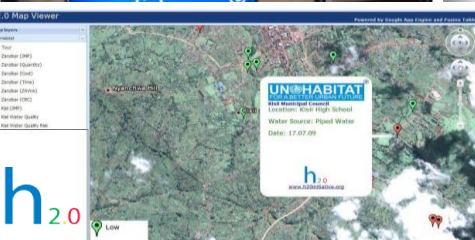
Rob Hope & colleagues, Oxford University

Can the convergence of mobile networks, money and monitoring improve water security for the poor in rural Africa?

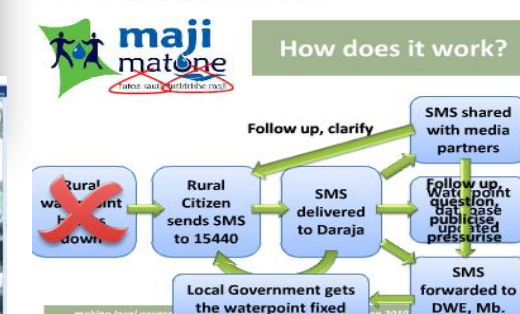
(Smart Water Systems, DFID New & Emerging Technologies, 2010-11)



NWSC to save billions in mobile payments



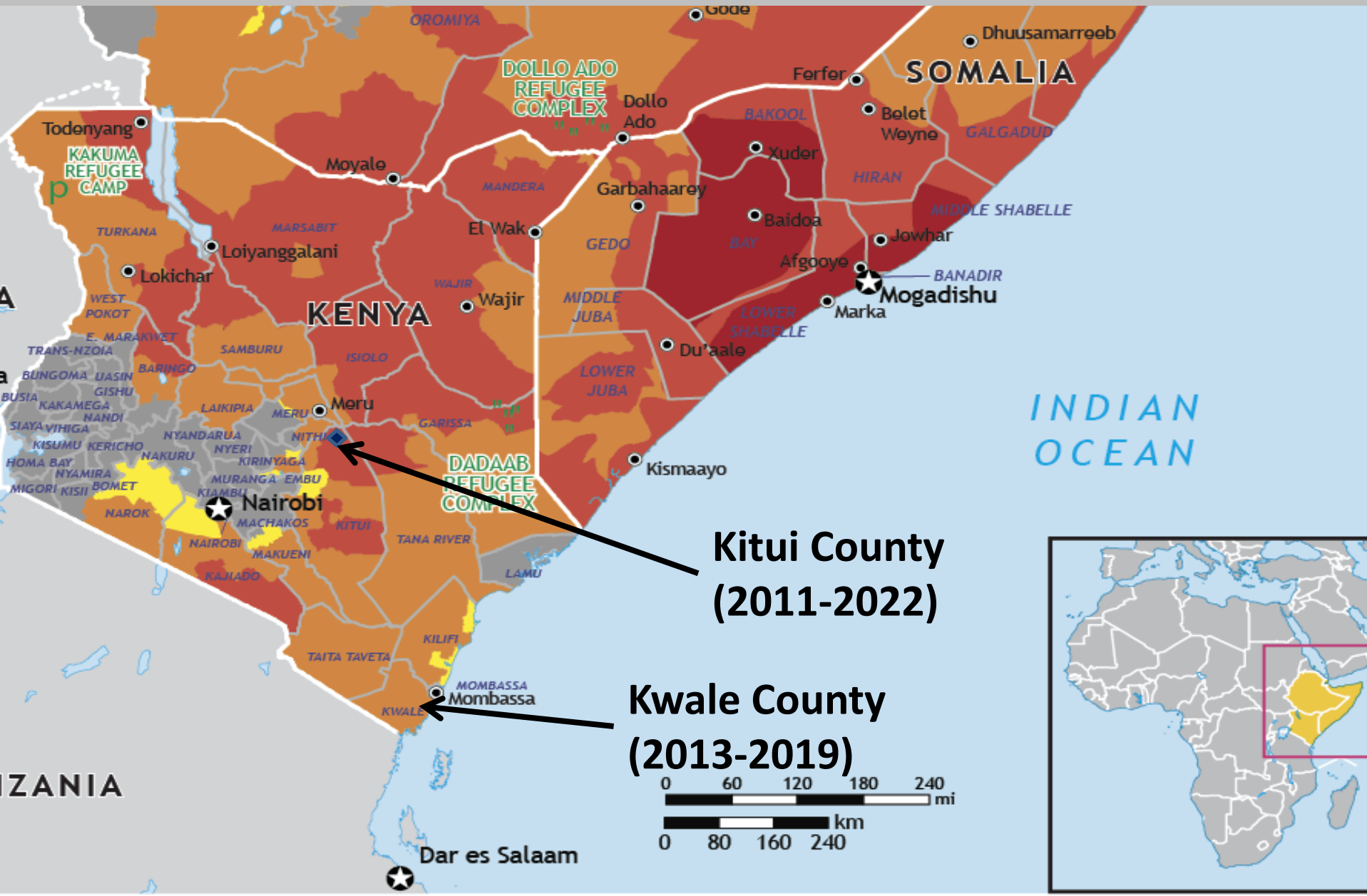
Bringing people and government closer together in rural Tanzania
Identification of Bridge and Water Drops



Rapid expansion of mobile banking services in Sub-Saharan Africa: 2007-2011

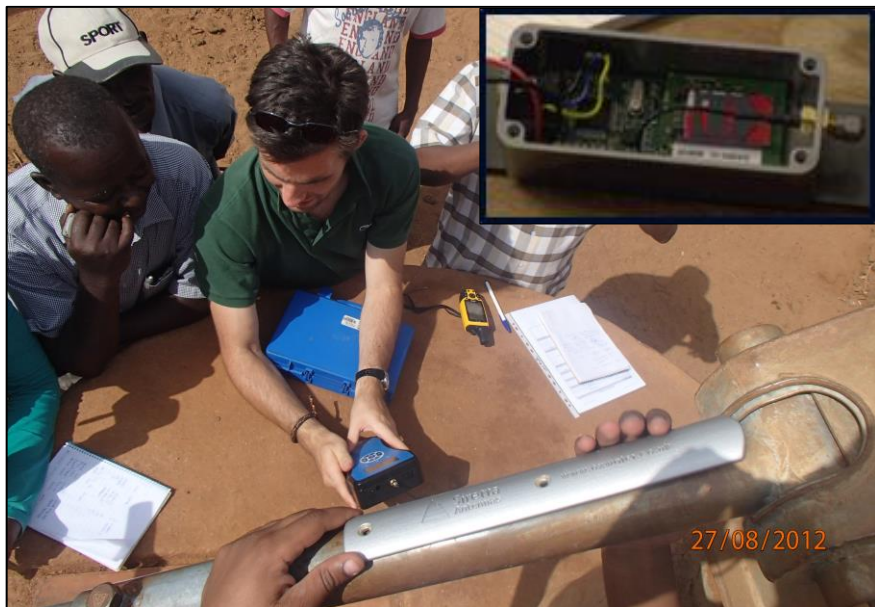


Kenya study sites

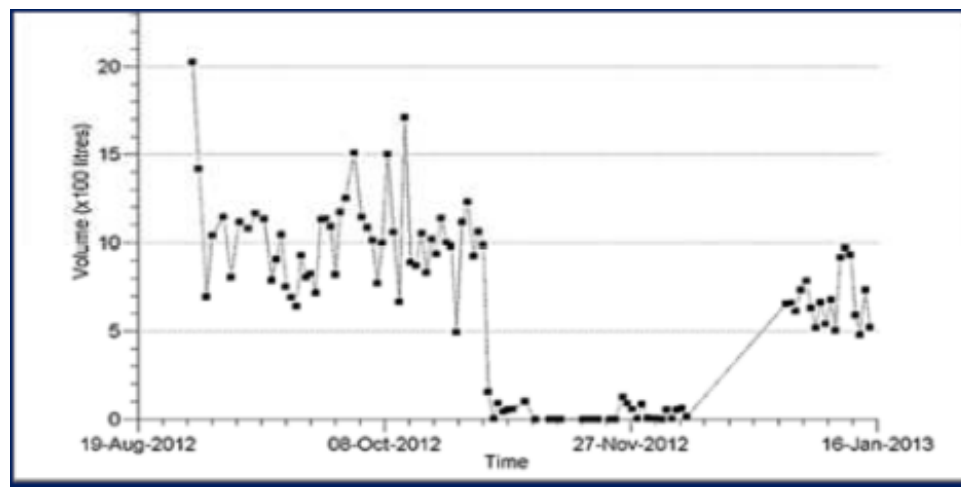
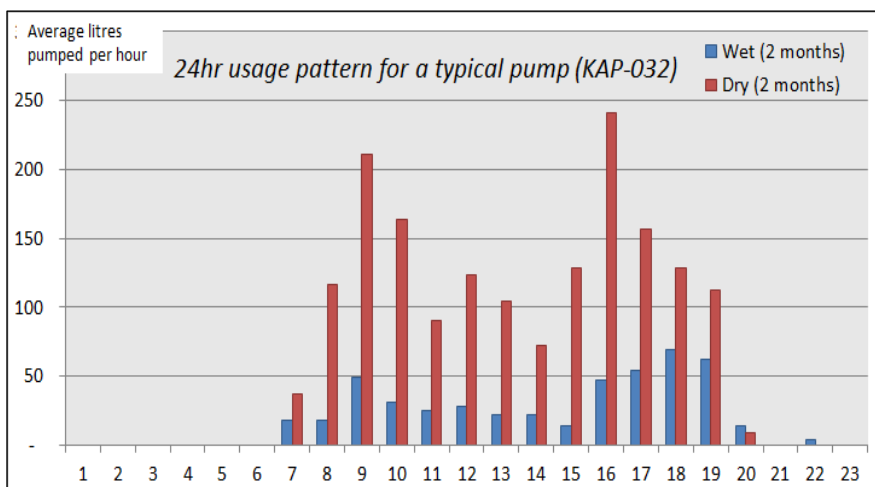


Can information improve institutional design?

(New mobile citizens and rural water sustainability in Africa, ESRC/DFID, 2012-15)

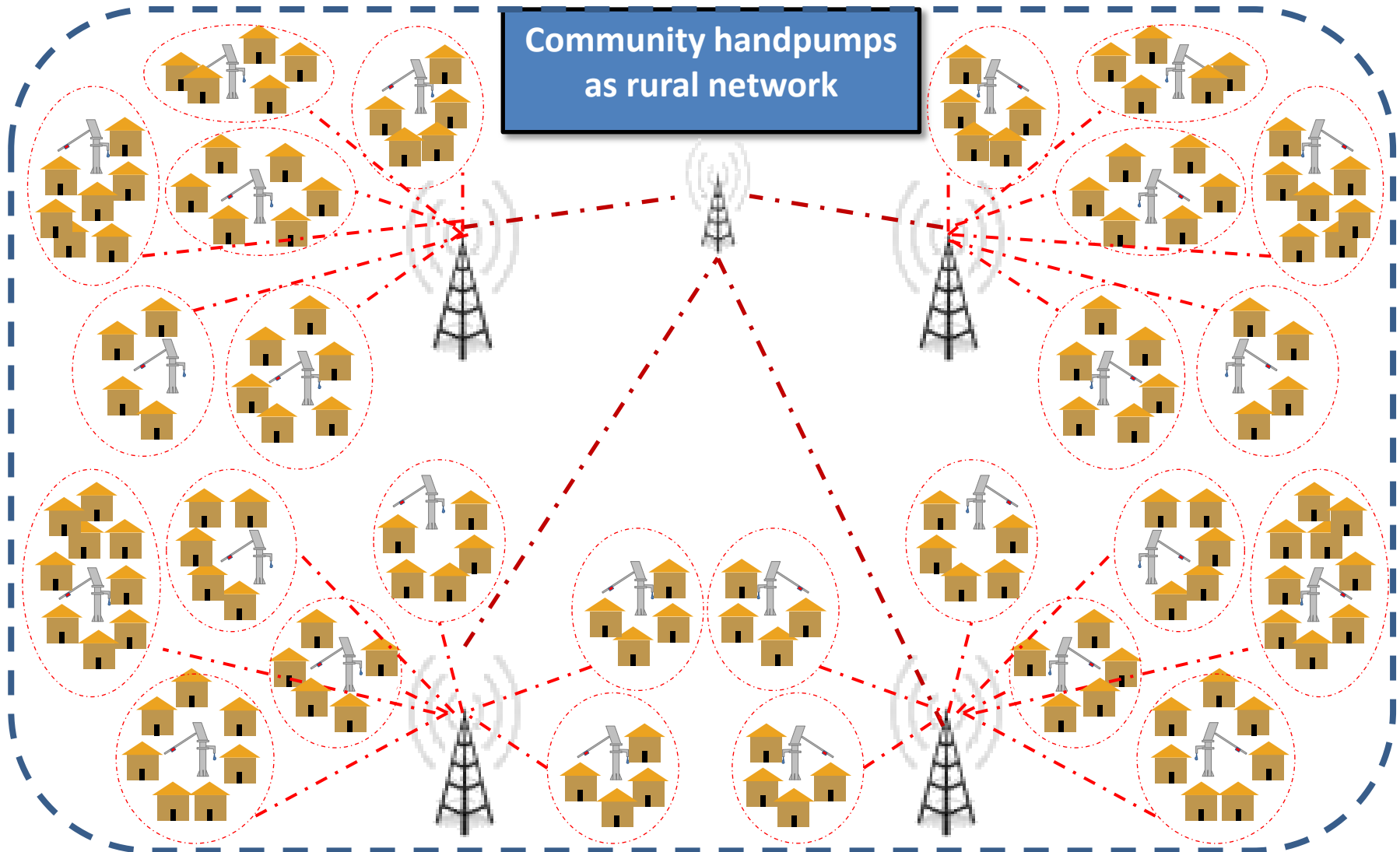


A smart handpump has a GSM transmitter securely fitted in the handle of the pump. The transmitter automatically sends data on handpump water use via SMS over the mobile network. A user interface provides immediate performance metrics. The transmitter is small and robust with no moving parts. Installation is simple, enabling it to be retrofitted to existing pumps in the field or built into new pumps prior to deployment.

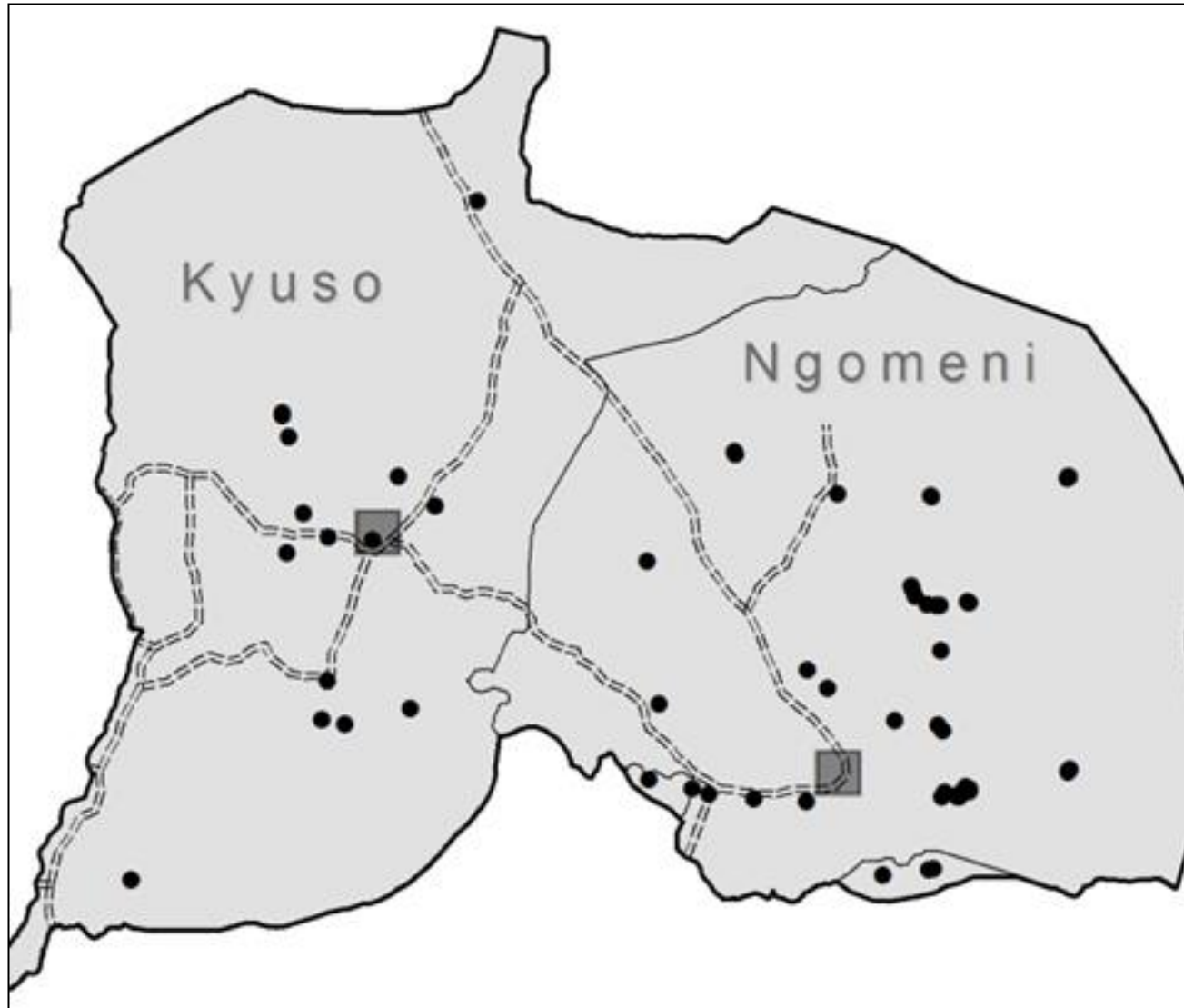


Does scale reduce risk? (operational, financial, institutional)

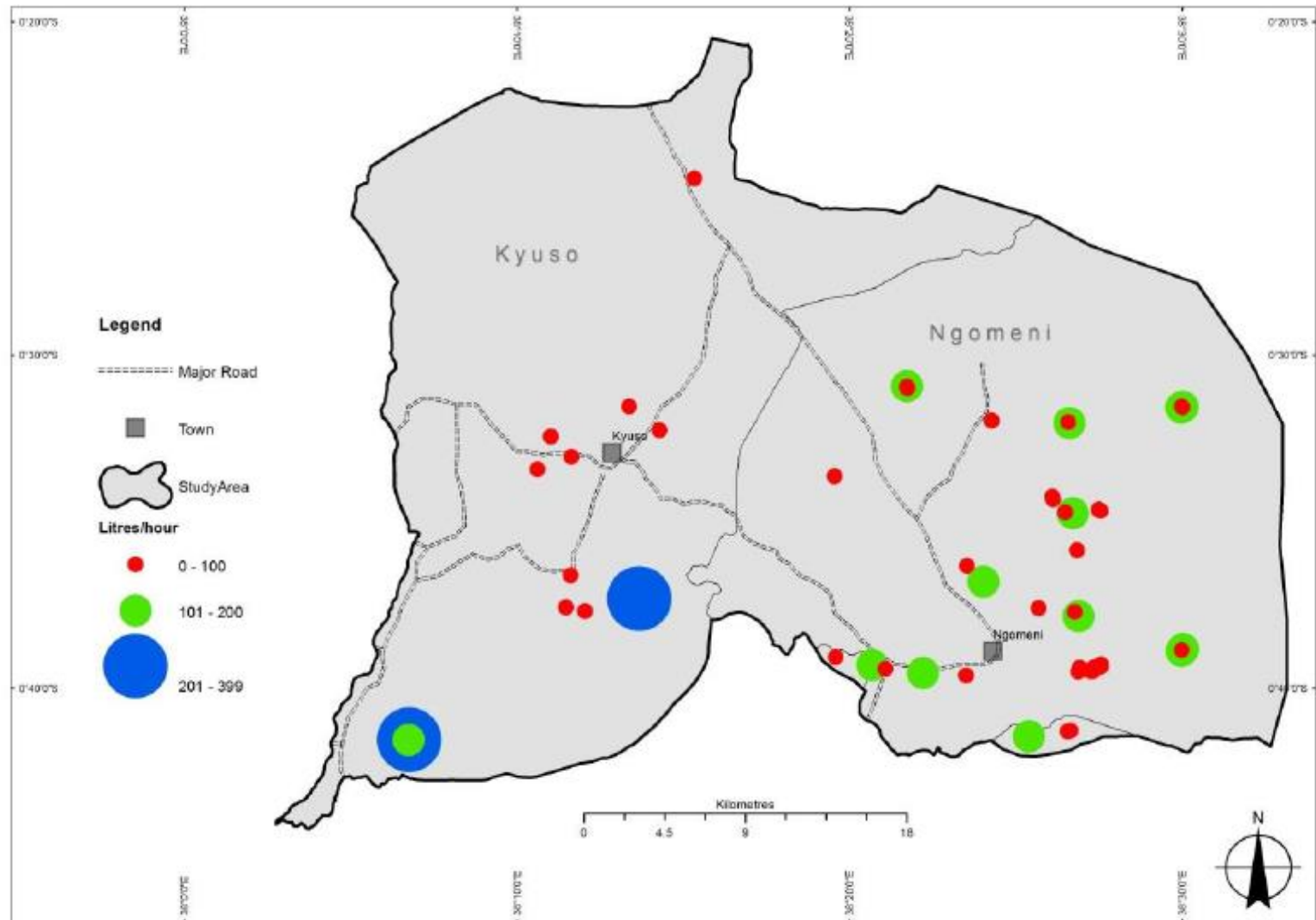
(Reducing Risks to Rural Water Supply in Africa,
Development Frontiers, ESRC/DFID, 2013-16)



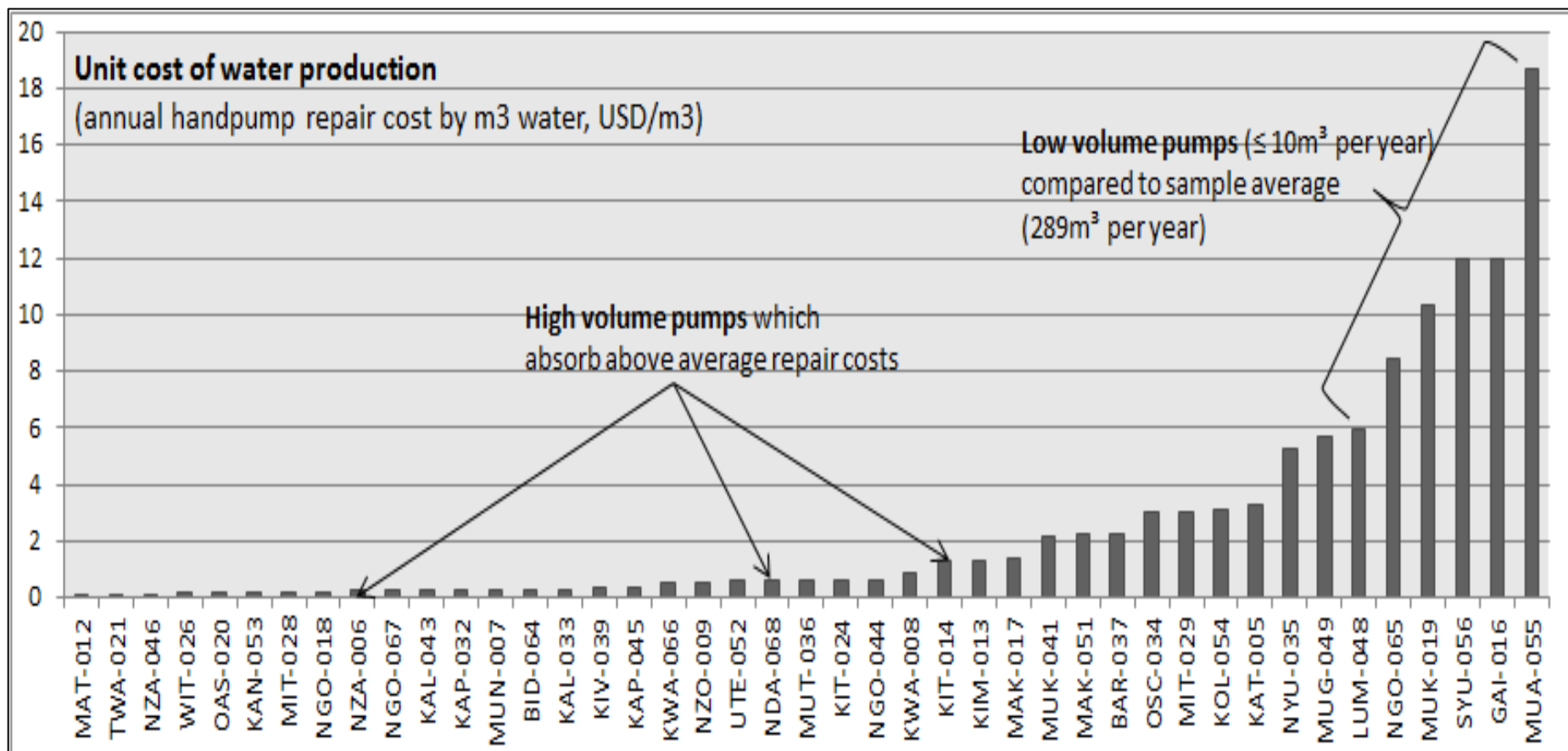
Where would you install the next pump?



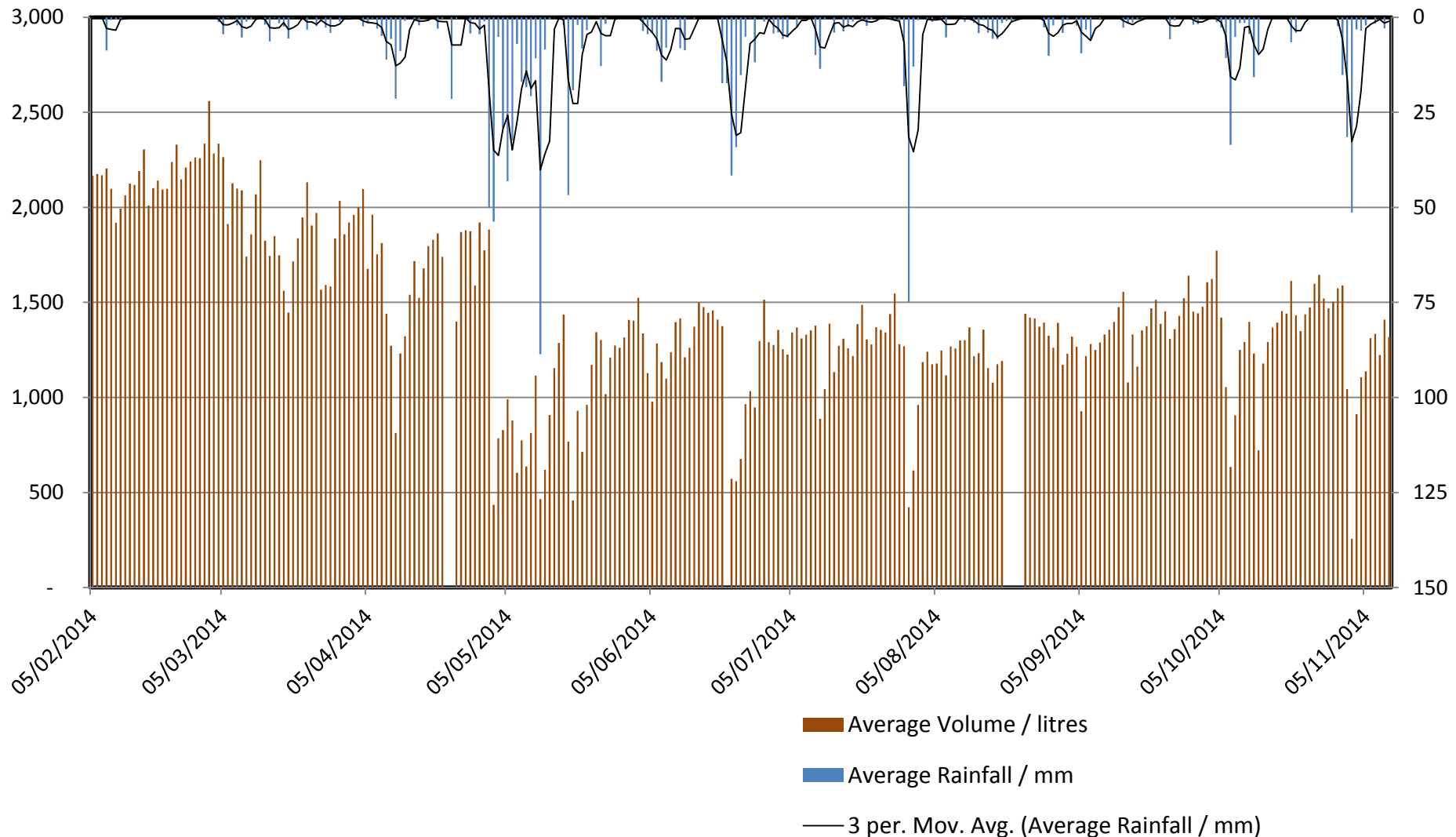
...for more accountable and fairer investments?



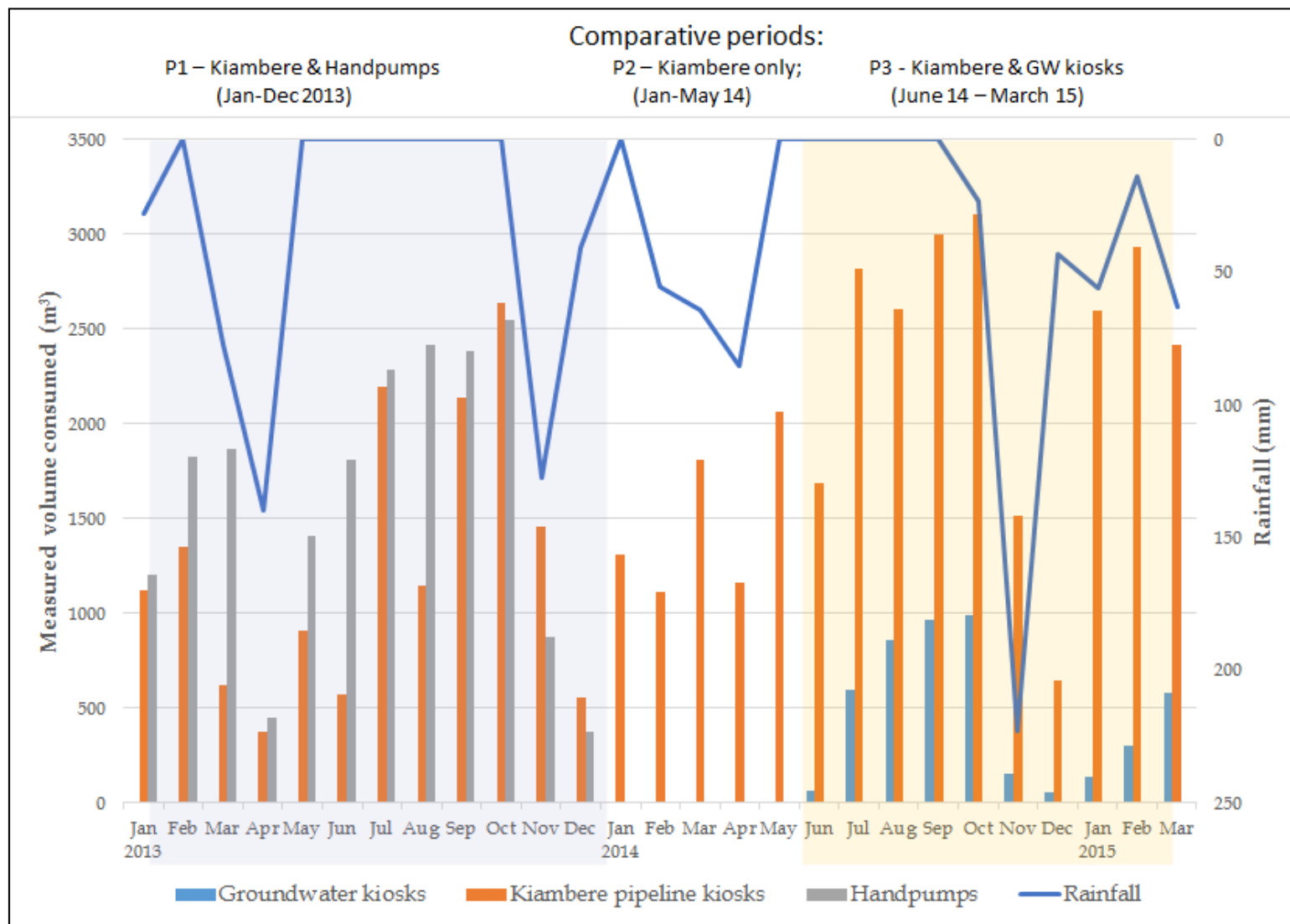
Asset management to manage new and existing infrastructure - unit cost of production (USD/m³)



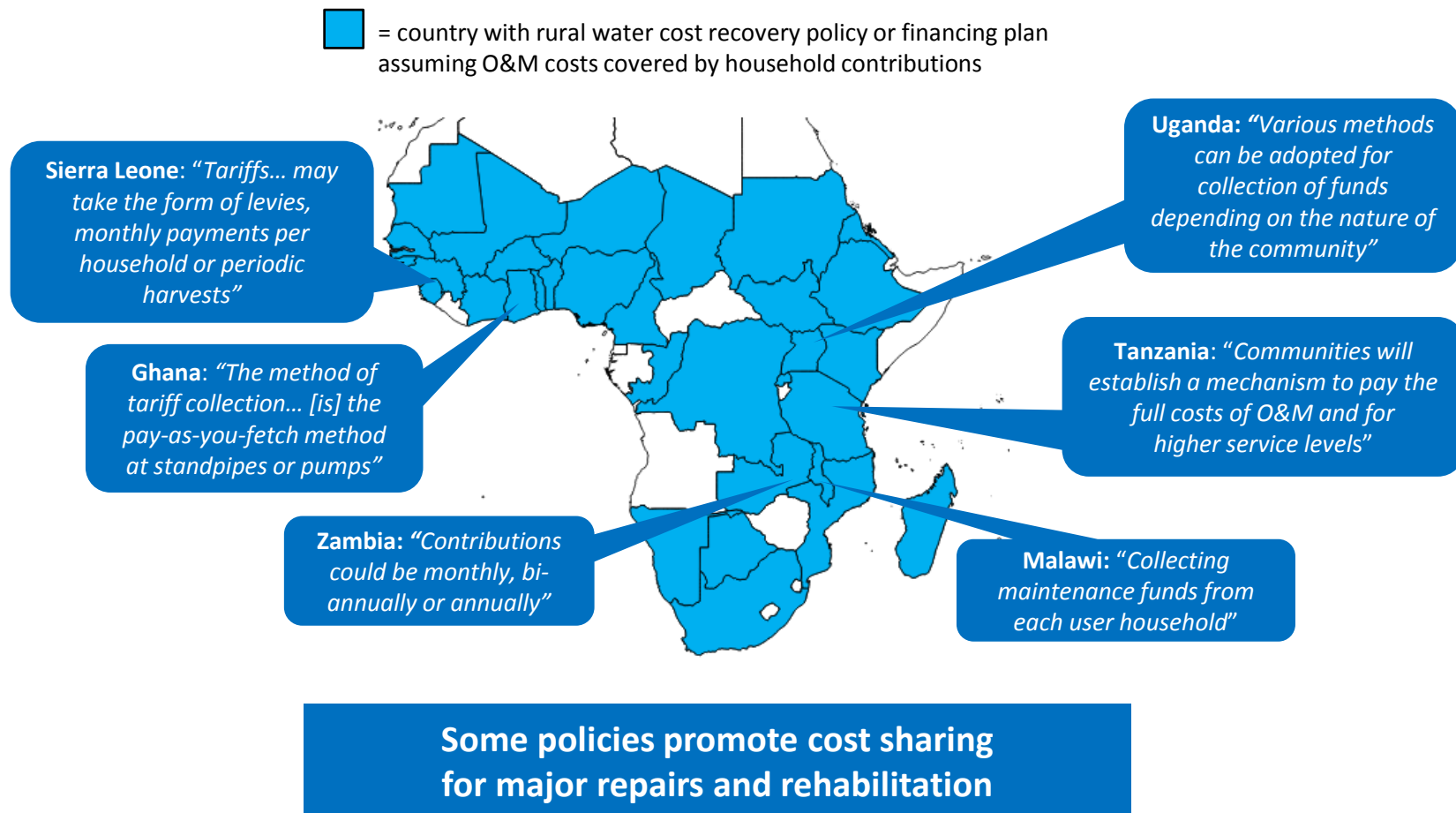
New insights into rainfall patterns and water use behaviour (Kwale, Kenya, Feb-Nov 2014)



Similar behaviour observed with piped schemes, groundwater kiosks and handpumps in Kitui County



Theory & practice - Community-based management of rural water established in policy but contested in practice

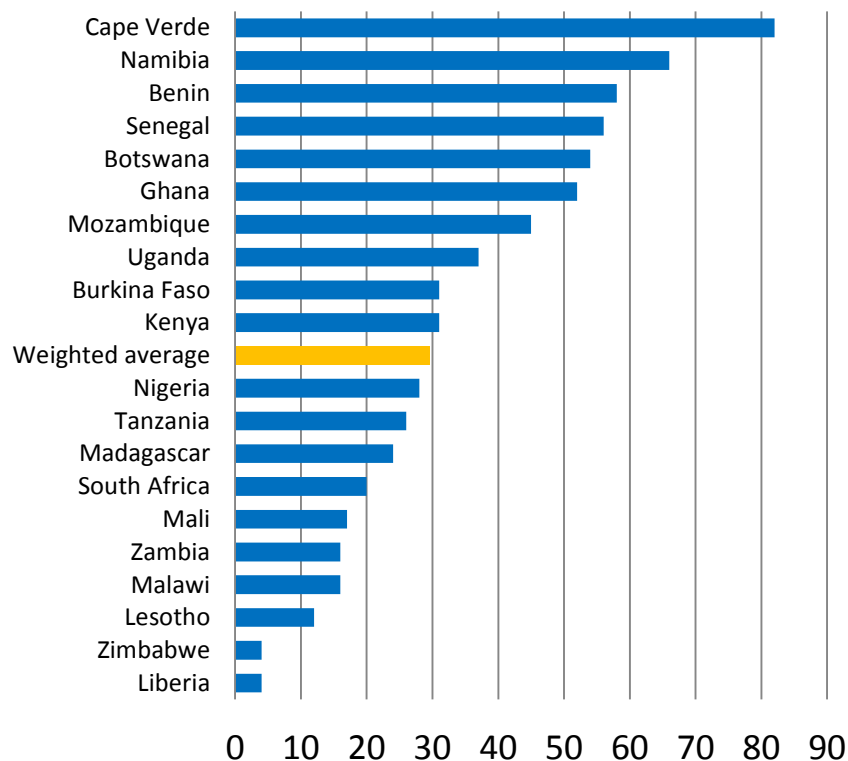


1. Based on information presented in Banerjee & Morella (2011) and GLAAS (2014). Banerjee & Morella (2011) listed countries with a rural water cost recovery strategy. GLAAS (2014) listed countries with a "financing plan [which] defines if operating and basic maintenance is to be covered by tariffs or household contributions". Quotes taken from the following sources: Malawi Ministry of Irrigation and Water Development (2010), Tanzania Ministry of Water and Livestock Development (2002), Zambia Ministry of Local Government and Housing (2007), Uganda Ministry of Water and Environment (2011), Sierra Leone Ministry of Water Resources (2013), Ghana Community Water & Sanitation Agency (2011),

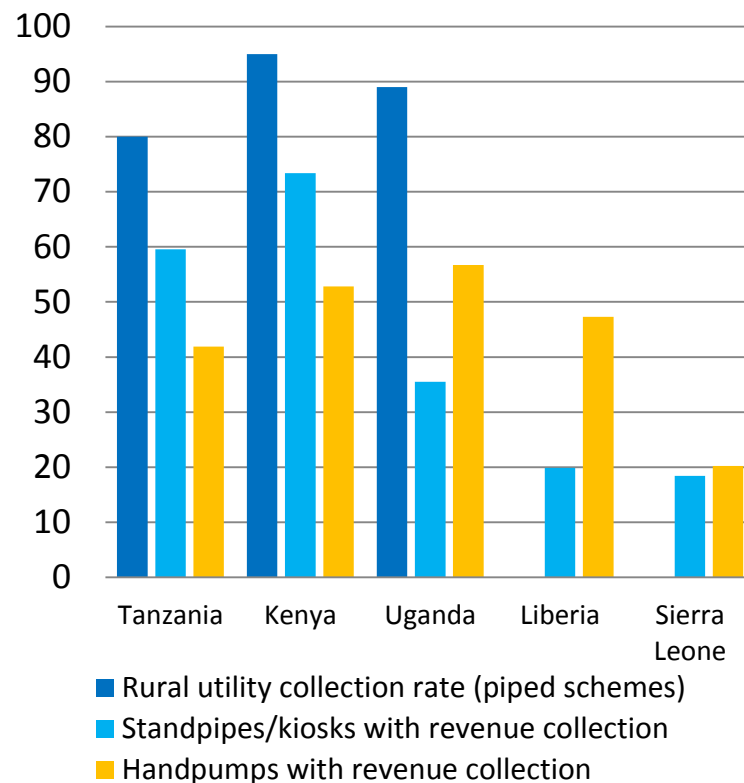
Mismatch between policy and reality

Majority of waterpoints lack revenue collection

Rural households paying for water (2008-09)¹



Revenue collection rates²



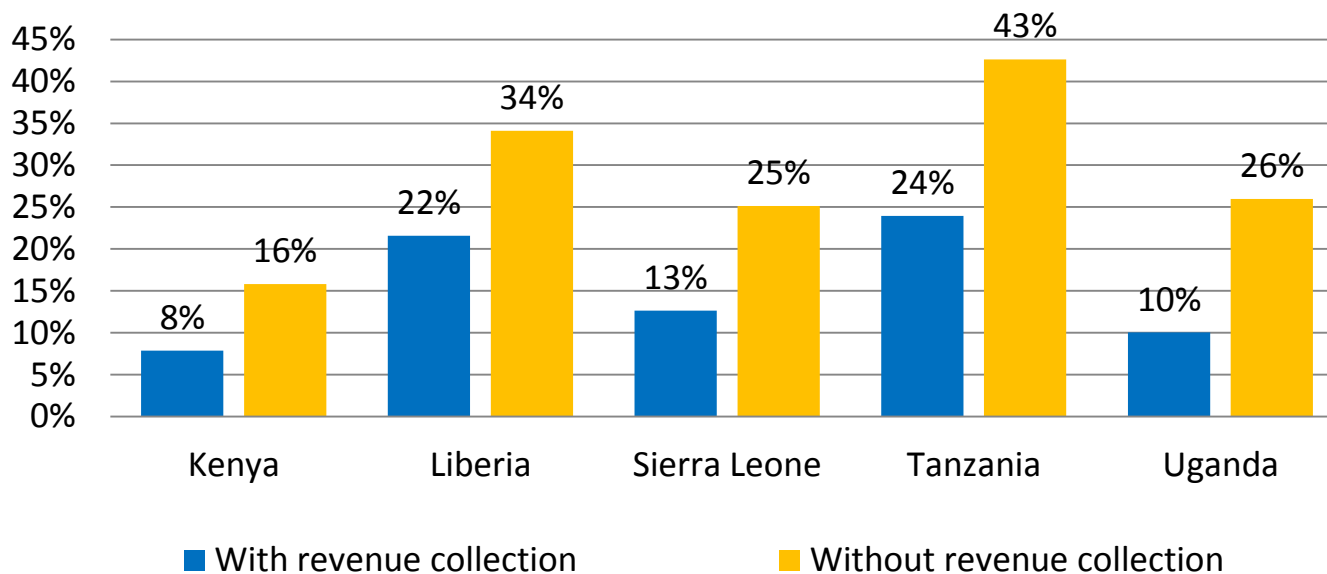
1. n=17,515 (Afrobarometer, 2014). Available at: <http://afrobarometer.org/data>.

2. Piped scheme data obtained from Uganda Ministry of Water and Environment (2014), WASREB (2014), EWURA (2014). Analysis excludes waterpoints located in urban areas. Analysis based on publicly available waterpoint datasets (Virtual Kenya, 2015; National Water Sanitation and Hygiene Promotion Committee, 2014; Sierra Leone, STATWASH Portal; Government of Tanzania, 2014; Government of Uganda, 2012). For additional data see Waterpoint Data Exchange <http://www.waterpointdata.org>

Inadequate finance has major operational implications

Non-functionality rate twice as high when no revenue collected

Rural waterpoint non-functionality rates (n=183,149)¹



**If SDG is to be achieved in rural Sub-Saharan Africa
then financial sustainability must be addressed**

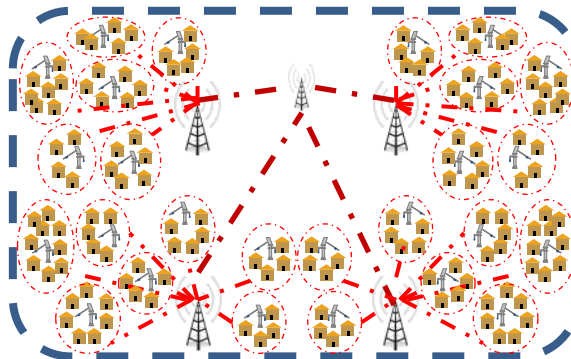
1. Waterpoints analysed include standpipes, kiosks, handpumps and protected springs. Analysis excludes waterpoints located in urban areas. Data drawn from publicly available waterpoint datasets (Virtual Kenya, 2015; National Water Sanitation and Hygiene Promotion Committee, 2014; Sierra Leone, STATWASH Portal 2014; Government of Tanzania, 2014; Government of Uganda, 2012). For additional data see Waterpoint Data Exchange <http://www.waterpointdata.org/>

Collaborative design with government, communities and other partners (UNICEF, private sector, FrontlineSMS, etc.)

Community support for trial and performance payments



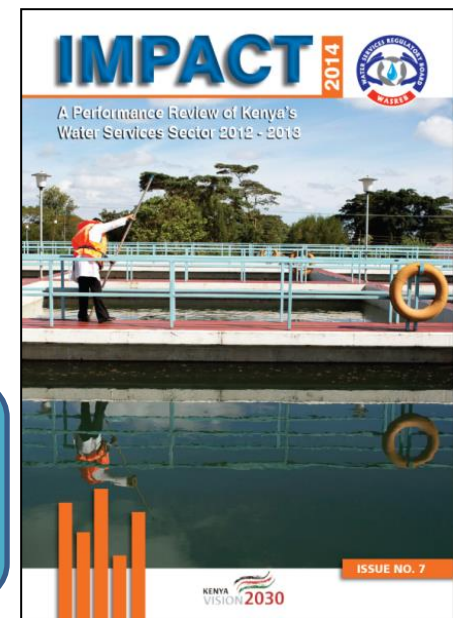
Handpumps are clustered and monitored at scale



FundiFix Ltd.
- trained, stocked, mobile



Institutional design to align with national/county policy and water service regulation, and be replicable at scale



FundiFix Ltd. – a local enterprise to promote sustainability

Phase 1 – Maintenance system (14/15)

- One year 'free' trial – control/treat.
- 369 repairs for 213 *treated* pumps over 12 months.
- Ave. 1.7 repairs per pump per year.
- Mean days to repair <3 days.
- Hourly data on pump usage

Phase 2 – Institutional design (16/17)

- Community monthly fees to register with FundiFix
- Design of Water Services Maintenance Fund blending user fees, county government and donors
- Universal rural drinking water security at county level

FundiFix KWALE

Dhamira: Kutoa huduma endelevu ya utengenezaji wa maji kwa wepesi na unafuu kwa jamii za vijijini



- Huduma ya haraka (isiyozidi siku 3)
- Nambari ya usaidizi inapatikana wakati wowote
- Malipo nafuu ya kila mwezi
- Vifaa bora vinavyotolewa
- Mafundi walio na ujuzi na uzoefu
- Kampuni ya kuaminika na ya kutegemea

Kwa habari zaidi PIGA simu
0719 723000 ama TEMBELEA afisi zetu
hapa Bomani

Nambari ya Pampu yako:



1000/- TU! kwa mwezi
(Mfano: 50/- kwa kila nyumba kwa nyumba 20)

Utapata manufaa gani kutokana na malipo yako?

- Huduma ya haraka isiyozidi siku 3 (au huduma ya mwezi mmoja bila malipo)
- Kubadilisha vifaa vilivyofunjika kwa vingine vipya na bora zaidi
- Mafundi walio na ujuzi na uzoefu na wanaopatikana kila wakati

Jukumu lenu ni nini?

- Kulipia huduma kwa kutumia M-PESA (kila mwezi, baada ya miezi mitatu ama kwa mwaka – vile ambavyo mtakubaliana)
- Kutoa usaidizi wakati wa marekebisho
- Kusajili nambari 10 za simu za wanajamii zitakazopokea ujumbe kila wakati wa malipo

Taarifa nyingine

- Huduma hii haitasimamia marekebisho yatakayo sababishwa na wizi wa vifaa, uharibifu ama kupungua kwa kiwango cha maji katika kisima

Reflections

- **Social impacts**
 - Over 50,000 rural people experience reliable water supplies
 - Established local maintenance companies, FundiFix Ltd.
 - Communities pre-paying each month by MPESA to FundiFix Ltd
 - Collaboration with UNICEF and Govt (Kenya, Zimbabwe, Bangladesh)
 - Kenyan water policy reviewing new legislation for a 'maintenance fund'
- **Policy orthodoxy - shaken not stirred**
 - Politics of change – design a 'solution' to a political problem
 - Investment orthodoxy insulates 'principals' from 'agent' accountability
- **Don't wait for the phone to ring**
 - New finance model blending govt, donor and user funds
 - 'Accidental infrastructure' to predict failure and shallow aquifer depth

If you want to know more...

- Thomson, P. et al (2015) Distributed Monitoring of Shallow Aquifer Level using Community Handpumps. At: <http://goo.gl/8uvcPE>
- Oxford/RFL (2015) Financial Sustainability for Universal Rural Water Services – evidence from Kyuso, Kenya. SSEE Water Programme, Working Paper 2, Oxford University, UK
- Koehler et al. (2015) Pump-Priming Payments for Sustainable Water Services in Rural Africa. World Development Vol. 74, pp. 397–411, 2015
- Hope, R.A (2015) Is Community Water Management the Community's Choice? Implications for Water and Development Policy in Africa. Water Policy, 17: 664-678
- Oxford/RFL (2014) From Rights to Results for Rural Water Services – evidence from Kyuso, Kenya. SSEE Water Programme, Working Paper 1, Oxford University, UK
- Thomson et al., (2012) GSM-enabled monitored of rural handpumps – a proof-of-concept study. Journal of Hydroinformatics, 14(4): 29-39
- Water Programme, Smith School of Enterprise and the Environment
 - <http://www.smithschool.ox.ac.uk/research-programmes/water-programme/>
 - REACH – Improving Water Security for the Poor
 - www.reachwater.org.uk/
 - Groundwater Risk Management for Growth and Development (Gro for Good)
 - <http://upgro.org/consortium/gro-for-good/>