New and Emerging Technologies - Smart Water Systems

Interim Report, October 2013

Prepared by Dr Rob Hope, Oxford University

To: Dawn Wood, Jasdeep Sandhu, David Woolnough, Simon Bibby, Jean-Paul Penrose

---

SUMMARY

The Smart Water Systems project (2011-14) continues to generate new evidence and insights to inform water security and poverty reduction in Africa. The Kenya projects remain within budget and agreed time-frames. Updates are regularly reported by tweets or updates on http://oxwater.co.uk

Smart Handpumps

a) Provisional results of impacts on handpump downtime in Kyuso from 41 days to 4 days. This generates 4,884 water access days per year across the 66 handpumps in the pilot study.
b) Results were shared at the IWA Development Congress in Nairobi (14-17 October).
c) Community demand for continuing maintenance services offers a viable and scalable business model which has been submitted to DFID's funding of GSMA MECS scheme;
d) A sister ESRC/DFID project in Kwale County, Kenya, is now installing 300 smart handpumps. An ESRC-funded PhD student has recently published the largest evidential assessment of handpump functionality in Africa: http://pubs.acs.org/doi/pdf/10.1021/es402086n
e) Lake Victoria North Water Service Board has requested a pilot study of smart handpumps which will be installed in November 2013.
f) UNICEF, DGIS and many others are actively monitoring the pilot to explore collaboration in several other countries.
g) A project-supported paper in the Philosophical Transactions of the Royal Society A contextualises the smart handpump work in the wider goal of universal drinking water security: http://rsta.royalsocietypublishing.org/content/371/2002/20120417.abstract

Smart Rivers

a) Africa's first smart meter transmitters are actively recording gravity-fed river abstractions in the Burguret River, Nanyuki.
b) Two river gauging stations are now monitoring flow measurements to complement abstraction data. Government of Kenya, Water Resources Management Authority (WRMA), are actively monitoring and supporting the work.
c) Existing scientific models of climate and land use change can now be complemented by actual river water abstractions to provide the basis for actual rather than modelled environmental fluxes.
d) Interim results indicate:
    a. Strong community support as water resource abstraction tariffs are now verifiable by observed water abstractions;
    b. WRMA has stronger evidence to understand water resource impacts to improve policy and practice;
    c. Mobile-enabled data transmission has proven problematic. Security and network connectivity have created significant challenges;
    d. Manual data collection is considered a simpler, more secure and lower cost alternative.