Mapping UNSW Impact

Global Development

Primary SDG	**6: CLEAN WATER AND SANITATION**
Broad theme	Water quality and climate change
Research	Assessing the impact of weather on drinking water quality
Impact region	Tanzania
Faculty	Engineering
School/Institute	Civil and Environmental Engineering
Academic	Dr Fiona Johnson
Project partners	Ifakara Health Institute for World Health Organisation, funded by DFID – USD 300,000
Related SDGs	11: Sustainable Cities and Communities

Elevator pitch

Fiona was part of a global team that assessed the relationship of a weather and climate variability with water quality from a number of different water sources in Tanzania, demonstrating the key contributor to poor water quality is storage in the household.

The Challenge: Poor drinking water quality

In Tanzania, over 20 million people do not have access to clean water. Most people have to physically collect water from nearby bores or tanks, and then store the water in their homes. The quality of water they collect is variable, and often has high levels of bacterial contamination, plaguing locals with water-borne illnesses.

UNSW's solution: Test impact of weather on water quality

To test the climate resilience of water infrastructure in Tanzania, Fiona and her colleagues measured water quality in three districts that were chosen to cover urban, rural and remote communities. They collected data on water quality and weather, and they surveyed households. Fiona was responsible for the design of the model to measure potential relationships between variations in weather and water quality, and the presence of E.coli. The model was successful in explaining the variations in water contamination around baseline values throughout the study period, with changes leading to poor water quality outcomes. Results showed, however, that storage of water in homes was a larger contributor to water contamination. Fiona is currently applying climate change scenarios to the model to understand how the resilience of different infrastructure options may influence water quality in the future.

In other work, Fiona is currently leading the development of the new Humanitarian Engineering teaching program at UNSW. The new courses are designed to train the next generation of engineers to take a people-centred approach to solving challenges, and to equip them with the skills to collaborate widely across the development sector. Fiona is interested in projects in Australia and the Pacific around flooding, disaster and climate change.

The Impact: Demonstrate the need for policy, education and new ideas

Fiona’s work in Tanzania discovered that weather is not the driving force in relation to water quality and the presence of disease. The real issue is how locals are storing and treating water, and their hygiene practices. This finding has strong implications for government around policy and education, and for NGOs working on water-related projects in the region.

Researcher

Dr Fiona Johnson is a Senior Lecturer at UNSW in the Water Research Centre and in the School of Civil and Environmental Engineering. She has over 15 years' experience in water resources, and in civil and humanitarian engineering working as a consultant for government. Fiona's areas of research interest are in statistical hydrology, particularly with respect to flooding and extreme events, as well as the use of global climate models for climate change assessments of water resources systems. Fiona is passionate about ensuring that sustainable solutions to the important challenges being faced around the world can be accessed by everyone.

Ben Falkenmire 14.08.18