Geophysical Research Abstracts
Vol. 18, EGU2016-16969, 2016
EGU General Assembly 2016

First step to understand the importance of new deep aquifer pumping regime in groundwater system in a developing country, Kwale, Kenya.

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The population growth in the world carries on the one hand, an increased demand of fresh water and on the other hand, a decrease of quality and quantity of this resource. To avoid this deterioration it is essential doing a good management of surface water and groundwater, specially the second one, which has become the major source of water supply for domestic, industrial and agricultural sectors of many countries (UNEP 1999). This groundwater management starts with an accurate hydrogeological characterization of aquifer systems, mainly in that aquifer systems in which is changing the abstraction regime.
In this context of population growth and new abstraction regimes on aquifer system is where the project “Gro for Good: Groundwater Risk for Growth and Development” is founded by UPGro. This interdisciplinary project has the main goal to design, test and transfer to the society an innovative Groundwater Risk Management Tool to improve and get by new governance transformations the balance between economic growth, groundwater sustainability (in terms of quality and quantity) and human development (http://upgro.org/consortium/gro-for-good/).
The study area is located on the south eastern coast of Kenya, in Kwale County. The Kwale coastal groundwater system formed by a shallow and deep aquifer systems has long served urban water demands and an established tourism industry but now faces unprecedented ground and surface water resource demands especially from KISCOL’s (5,500 hectares of irrigated sugarcane) and the country’s largest mining operation (Base Titanium Ltd.). Despite both companies have drilled deep boreholes around the study area (416 km2) to extract groundwater from deep aquifer; no major pumping activity has started yet, allowing baseline evaluation. Scattered around the study are 440 handpumps providing drinking water to over 90,000 people. The relationship between the shallow and deep aquifers remains uncertain and so, the future influence on groundwater level and its quality either.
So, in order to define the system and start to understand the different complex interactions, we present the initial results of the first complete water sampling field campaign (September 2015). Water isotope data and major ions were analyzed from 78 shallow and deep wells and surface water spread around study area. This field survey has been useful to understand the recharge, discharge areas and groundwater quality of deep aquifer system and which will have an important role for sustainable water management in the of Kwale area.

Acknowledgements
The research is primarily supported under the NERC/ESRC/DFID Unlocking the Potential of Groundwater for the Poor (UPGro) as a Catalyst Grant (NE/L001950/1) with work extending until 2019 as a Consortium Grant (NE/M008894/1), see http://www.upgro.org. Data for the paper will be publicly posted on the National Geoscience Data Centre and the UK Data Archive under the terms of the UPGro data management agreement.