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*Groundwater research into policy within the  
context of Africa & the SDGs*

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## The role of groundwater in the SDGs

- Relevant to many SDGs but particularly:
  - 6: Clean water and sanitation (all targets)
  - 1: No poverty (particularly target 1.4)
  - 2: Zero hunger (particularly targets 2.3, 2.4, 2.6)
  - 11: Sustainable cities and communities (particularly targets 11.1, 11.5, 11.6, 11.9)
  - 13: Climate action (particularly targets 13.1, 13.2, 13.3, 13.5)
  - 15: Life on land (particularly targets 15.1 and 15.3)
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## Scale of SDG ambition implies significant research need

- Mix of applied and fundamental research
  - For groundwater this is likely to mean:
    - Availability, accessibility and distribution of groundwater resources
    - Improving understanding of water quality – natural and man-made pollutants and also sub-surface processes that reduce pollution risks
    - Economics: in particular comparative value for money for groundwater development
    - Climate impacts in the medium and long-term, taking into account other drivers
    - Groundwater in the water-energy-food nexus
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## Availability, accessibility and quality

- Where and how much groundwater exists?
  - How accessible is this and how much will it cost to abstract
  - What are sustainable rates of abstraction? Can we cope with short-term 'over-abstraction' if we balance over the long-term?
  - What is the quality of the water and what will it cost to treat?
  - What are the emerging threats to water quality and how do we manage these cost-effectively?
  - Can we use sub-surface processes to treat wastewater and augment supply?
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## Economics

- How much will it cost to develop, manage and protect groundwater?
  - What is the cost-benefit of developing groundwater and how does this compare to alternatives? (both short-term and long-term)
  - What is the right mix of surface and groundwater sources in supply that offers the best value for money?
  - Do new technologies either greatly increase value or reduce costs (or ideally both)?
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## Groundwater and climate

- Will climate change affect the availability and/or accessibility of groundwater and what will this mean for water security and supply?
  - Will climate change have an impact on water quality and what can be done to limit this?
  - Should groundwater resources be held in reserve or developed now?
  - Where will hot-spots occur that will create additional stress on groundwater?
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## The dreaded nexus...

- How much groundwater is needed for domestic, food and energy supplies and do we have enough?
  - What is the right balance and what trade-offs need to be considered in allocation of water?
  - What actions are needed to manage demand? (noting that this may mean research into consumer demand for energy rather than water)
  - Can groundwater be used for energy development and what would this cost?
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## Policy-research interface

- Good policy and operational decisions need sound evidence
  - To achieve requires time, engagement and co-creation of research (whether short or long-term)
  - For policy makers understanding where evidence gaps exist helps ensure that research that is commissioned is relevant
  - For researchers understanding policy needs helps design better research
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## Making research policy relevant

- Some of this is straightforward – the ‘what should do I now questions’
  - Research focused on key policy questions that deliver results in a short time-frame and gives actionable recommendations
  - E.g.: mapping of groundwater resources in drought affected regions that show the degree to which new water sources can be brought online
  - Clear, actionable research showing availability, accessibility and costs of development in a short-time frame
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## Longer-term policy issues

- Some policy questions require much longer-time frames and will have much less certain outcomes
  - E.g.: what are the implications of climate change for groundwater availability and what strategies are needed to protect and manage these resources?
  - Research will take longer to deliver final answers and will need to be structured to provide interim findings to provide direction.
  - There will be significant uncertainty both in terms of being able to answer question and what that answer may be
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## Translating research into policy

- Possibly the most tricky bit of the interface - what appear to be eminently sensible suggestions to researchers often fail to gain traction
  - This is usually because these fail to appreciate:
    - Costs of implementation
    - Failing to understand trade-offs – e.g. your great idea for multi-million pound investments to upgrade water supplies has to compete with other equally urgent needs in health or education
    - Political realities when long time frames required for action
    - Public perceptions
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## So who are the key policy makers?

- Research commissioners are often not involved in policy (this is true of DFID for instance) – so greater outreach needed
  - Most important are the policy makers in the country(s) where research carried out
  - Donor policy makers – useful to consult and trick is to ensure research policy aims complement donor policies
  - Ultimately it is who will actually pay for implementing recommendations who need to be on board
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## And finally

- There are major research questions on groundwater for the SDG delivery – we need to ensure we are getting the questions right to answer policy concerns
  - Good research comes about when there is not just lip-service to policy needs but genuine and comprehensive dialogue and co-creation
  - Research that focuses on delivering practical solutions (even if not as strong scientifically) tends to delivery better outcomes than fantastic science that no-one can use!
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