

---

# Ensuring sustainability of WASH services: the need for good groundwater mapping, management and monitoring

Guy Howard (DFID)

---

## Why is groundwater management important to us?

- Groundwater critical to effective WASH & water resources programmes, not investing has led to problems in the past
  - Darfur (poor planning led to unsustainable supplies and increased risk of conflict)
  - South Asian mega-deltas (need for new programmes to assess arsenic presence)
- Climate poses future challenges and groundwater may be central to adaptation, but we need to improve understanding
  - Changes in rainfall patterns may impact recharge (whether negative or positive will vary by region and probably over time)
  - Serious risk that groundwater development is not based on understanding of the resource base and therefore unsustainable
  - Groundwater flooding is potential future risk, but rarely considered

## Why assess, monitor and map?

- Without investment in understanding groundwater resources before the project starts increases risk of failure and unsustainable water supplies
- Need continued investment in monitoring after project is completed to ensure that changes are understood
- Mapping of resources is critical to improve decision-making and increasing transparency in trade-offs that may be made
- **But** groundwater investments remain limited and often a difficult political sell

---

## What does DFID fund in water & WASH?

- We fund WASH programmes (through 17 Country Offices, plus two major centrally managed programmes)
  - We fund water resources work (a mix of country office programmes, major regional initiatives in Africa and South Asia, and 3 global programmes)
  - We fund research (water security, plus smaller regional initiatives)
-

---

## Building groundwater assessment into new WASH programmes

- Increasing emphasis on ensuring groundwater assessments built into programmes where water supply based on groundwater or risk of pollution, for example@
    - WASH Results programme – environmental sustainability was a key criterion (water resources, climate change, pollution); groundwater and pollution assessments must be reported on
    - Partnership with UNICEF – we require water resource & pollution assessments taking into account climate change
    - Both programmes subject to independent monitoring, verification & evaluation
-

---

## Addressing lack of groundwater data in Sierra Leone

- A small project to advise on cost effective boreholes to enhance knowledge on drilling.
    - A handbook “Principles for Borehole Construction & Rehabilitation in Sierra Leone”
    - Practical course drilling supervision (21 participants)
    - public-private dialogue meeting for the drilling sector
    - workshop on manual drilling (funded by UNICEF-NY).
    - Result: 79 professionals trained in technical, managerial and administrative aspects of drilling; high class training materials developed and available online improved dialogue between government, NGOs & private sector.
  - DFID-AfDB co-funded rural WASH project supporting groundwater mapping and monitoring, and development of guidelines for construction of water and sanitation facilities
-

## Tanzania

# DFID support to Rufiji river basin authority with TA on hydrogeological monitoring and assessment:

- pump tests, drilling observation boreholes, developing a conceptual model and assessing hydrogeological potential.
- guidance, mentoring and training on aquifer systems characterization, hydrogeological assessment methods (field hydrogeology, recharge assessment and modelling)
- setting up an optimal groundwater monitoring network to enable long term groundwater and compliance monitoring
- review data collected from existing and new equipment to check outputs and demonstrate how groundwater information can be presented

---

## In the DRC

- ‘Healthy villages and healthy schools programme’ uses the national hydrogeological map to determine the potential for manual drilling.
    - Where mechanical drilling (notably Katanga) geophysical testing used to identify 3 potential drilling locations at each site
  - WASH Consortium
    - plans to undertake hydrogeological investigations in areas where drilling will take place. Agreed that:
      - Hydrogeological site investigations by a qualified hydrogeologist
      - May involve test drilling/auguring or geophysical surveys
      - A brief Hydrogeological Site Investigation Report produced for each individual site/village
-

## Research: African groundwater maps

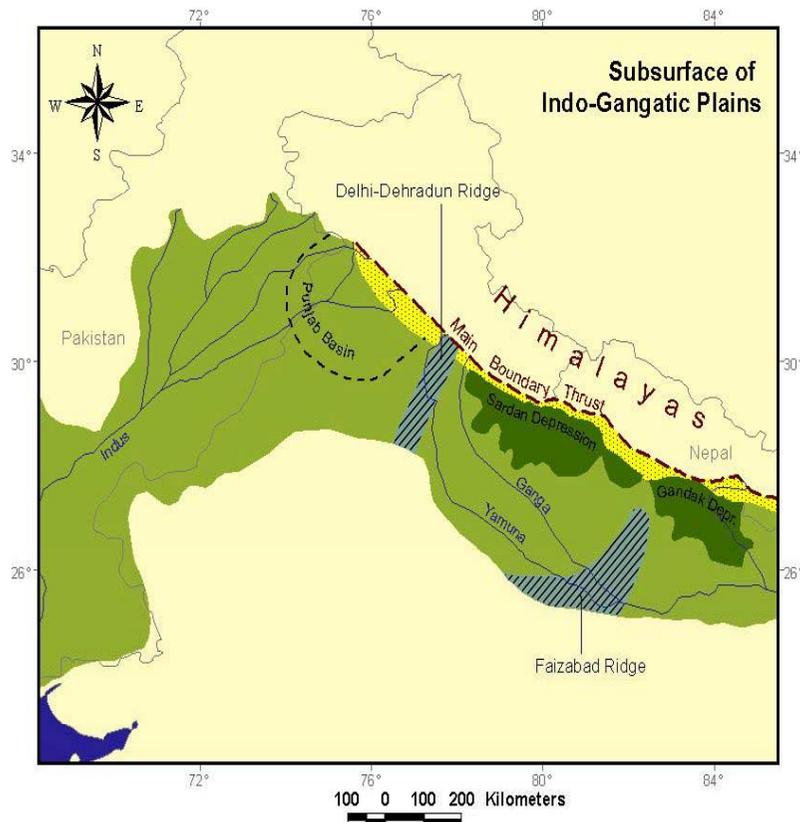
- Research to improve wider understanding of resource base
- Study to synthesise existing data on African groundwater led to new set of maps of groundwater availability and potential vulnerability to climate change (see Macdonald et al 2012)
- Case studies of how different types of aquifer are likely to respond to climate pressure – including recognition of the importance of decadal recharge for some aquifers (see Taylor et al 2012)



# ..Follow-up study in South Asia

## Vulnerability of groundwater in the Indo-Gangetic plain to climate and pumping pressures

- Consolidating large volumes of existing data plus case studies:
  - Older aquifers in arsenic affected areas of Bengal basin
  - Intensive pumping regimes in irrigated plains
  - Groundwater use & storage in Himalayan foothills
  - Salinisation in the Indus plain



---

## Investment in research: UpGro

### **Unlocking the Potential for Groundwater for the Poor**

- Collaboration with NERC to provide state of the art research into African groundwater
  - Has made a number of catalytic awards now moving towards full consortium grants
  - Expected to yield very significant body of data on effective groundwater management for the continent
-

## Groundwater post-2015?

- WASH & Water resources likely to feature in post-2015 development framework
  - Both the HLP & OWG proposed similar goal and targets
- For WASH, sustainability will be at the core
  - Important this is not focused solely on functionality but on genuine sustainable resource development
  - Creates good basis for more investment in groundwater assessment, management & monitoring
- For water resources, sustainable and efficient use as well as quality management are key

---

## What can the groundwater community offer?

- Better evidence on cost-effective approaches to groundwater management, monitoring and mapping
  - Innovation and use of new technologies – developing better and easier to use management information platforms
  - Ensure that the wider case for groundwater management is better articulated and understood
  - Help DFID – and others – understand where the best investments lie
-

---

## In conclusion

- DFID recognises the key importance of groundwater for WASH and wider water use
  - We invest both in relation to WASH programmes, but also water resources programmes & research
  - We will look to the groundwater community to help ensure DFID & other partners have effective approaches & tools
  - Climate change needs to be a specific focus moving forward
-