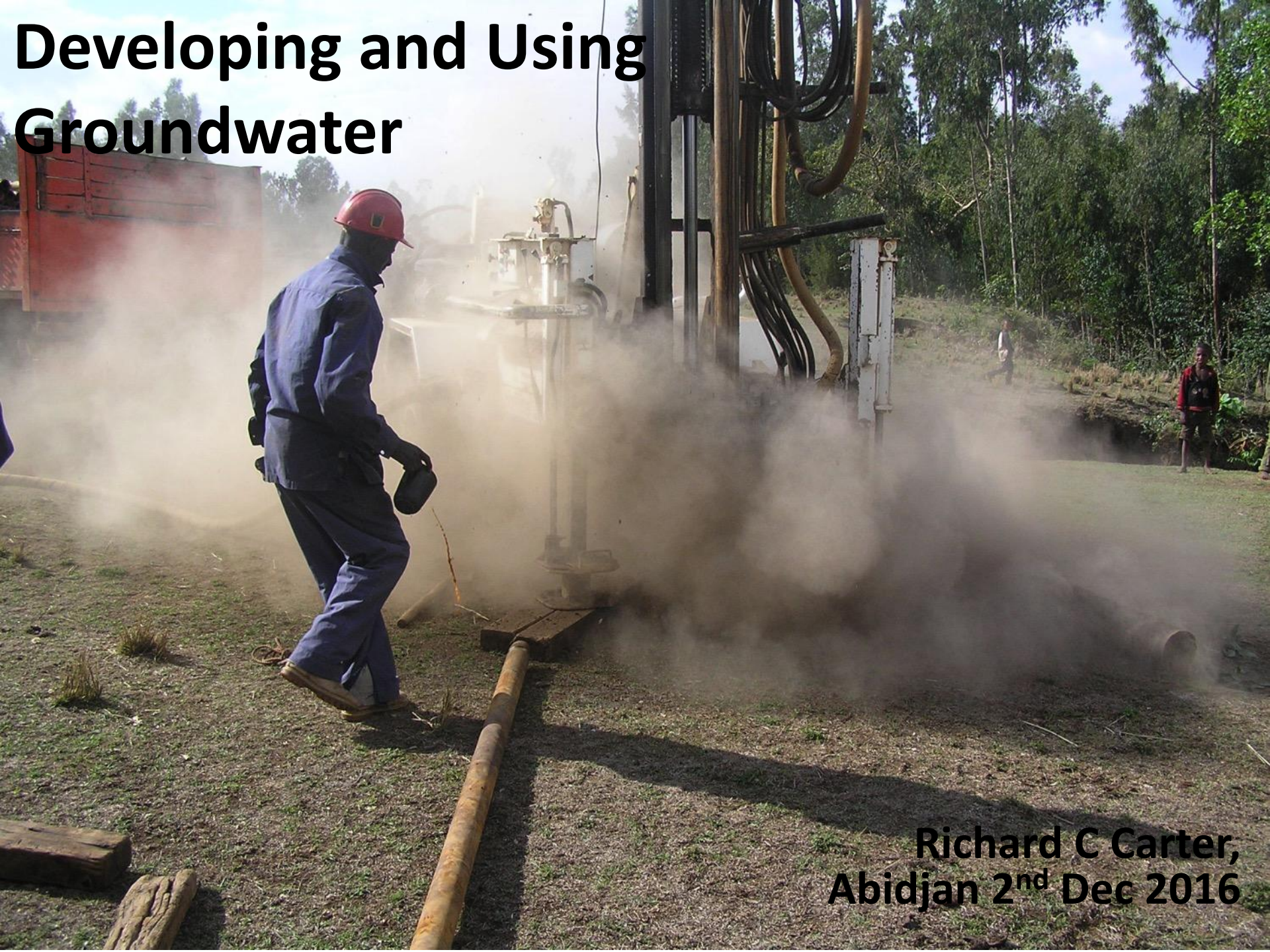
Developing and Using Groundwater

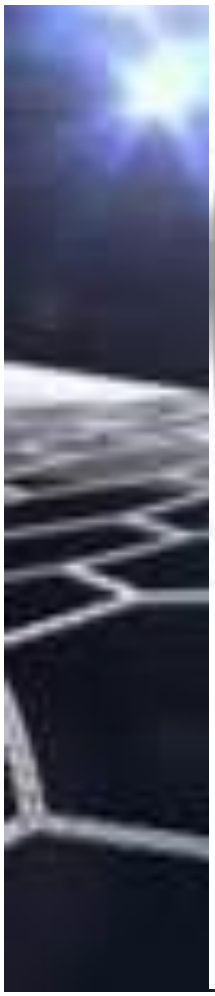


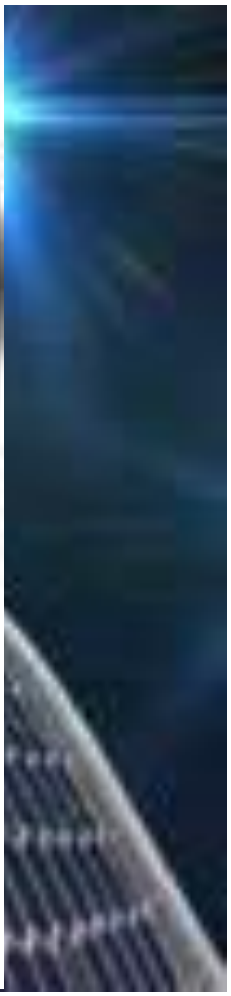
Richard C Carter,
Abidjan 2nd Dec 2016

Out of all the liquid fresh water on earth, what percentage is groundwater?

About 96%

A ga
two





Today's goals

Helping you develop more sustainable groundwater-based water supply services

- **In the first half** you will better understand what information you need, where to find it, what it can tell you, and how to contribute to it
- **In the second half** you will better appreciate how to use groundwater information in the design and implementation of borehole and pumping solutions

Water supply services must be

- accessible
- convenient
- sufficient in quantity
- of adequate quality
- affordable
- manageable

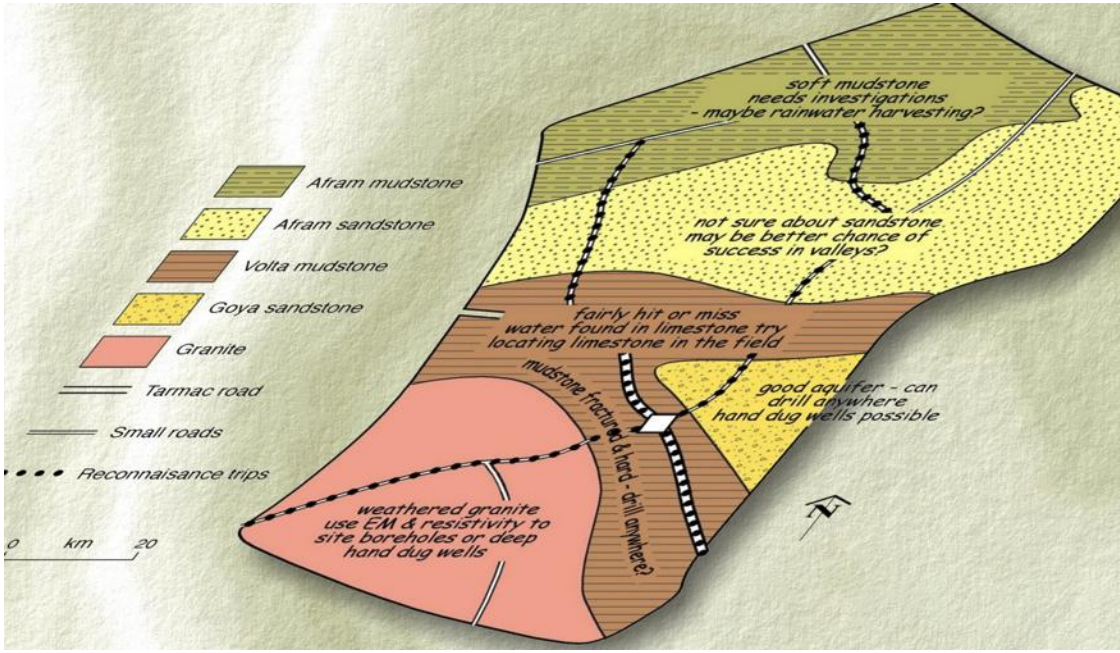
Groundwater information must be useful too

accessible	to professionals and public
convenient	easy to understand
sufficient in quantity	enough
of adequate quality	quality-assured and up-to-date
affordable	free or low-cost
manageable	in simple standardised formats

Siting, designing and constructing boreholes – data requirements

Siting

- Geology and hydrogeology of the area
- Effective siting procedures used in the past

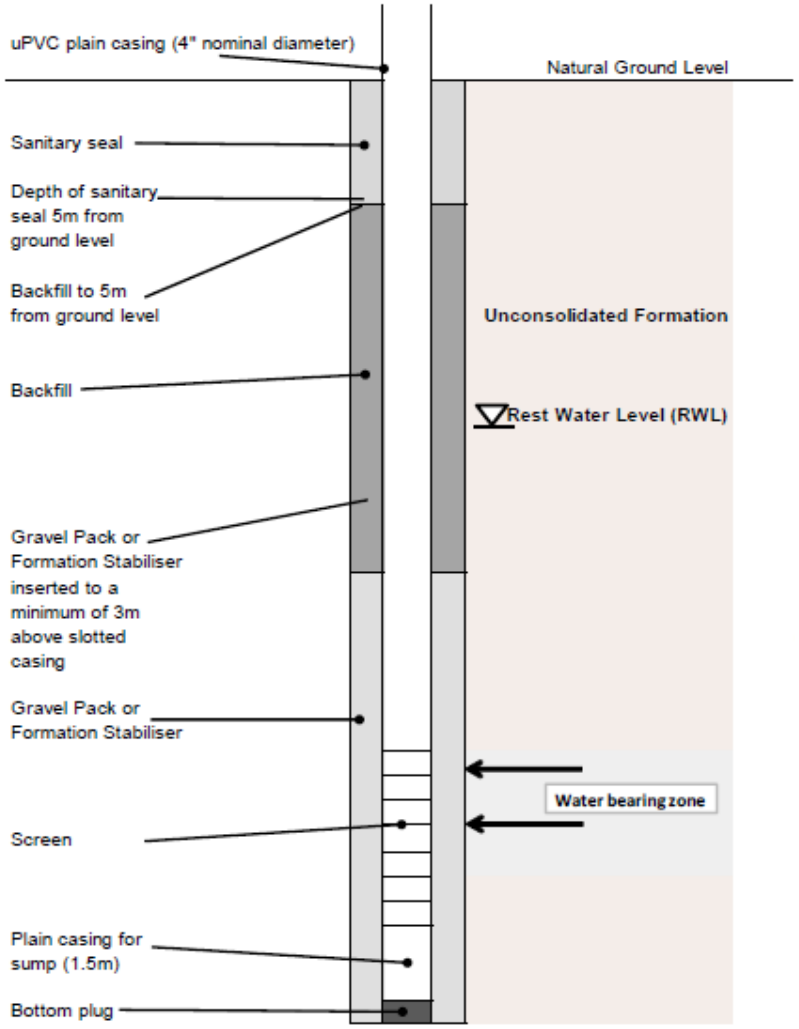


- Likelihood of drilling success with and without scientific siting

Siting, designing and constructing boreholes – data requirements

Design

- Likely thickness / depth of formations
- Depth to first and subsequent water strikes
- Rest water level
- Aquifer properties
- Recharge seasons and rates of recharge



Siting, designing and constructing boreholes – data requirements

Construction (supervision)

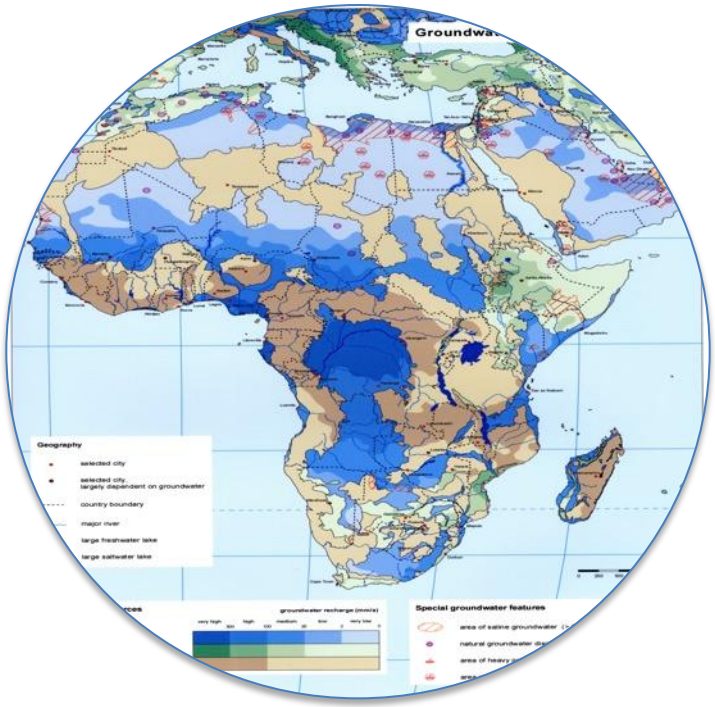
- Drilling equipment and consumables
- Rates of drilling
- Depths of formation changes
- Water strikes
- Completion details
- Test pumping records
- Water quality tests and samples

The ‘beautiful game’ is played at many levels

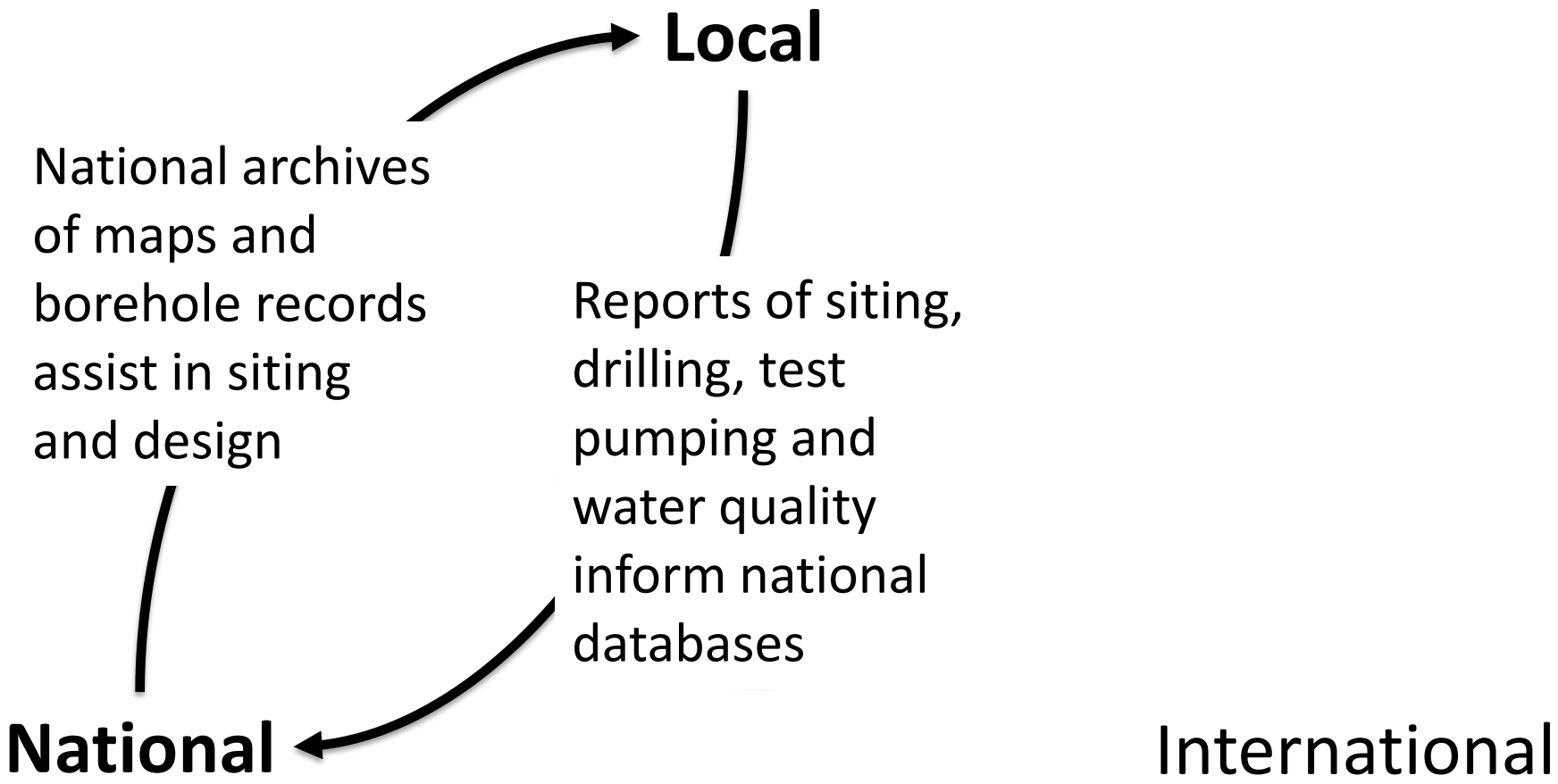
… as with groundwater data and information

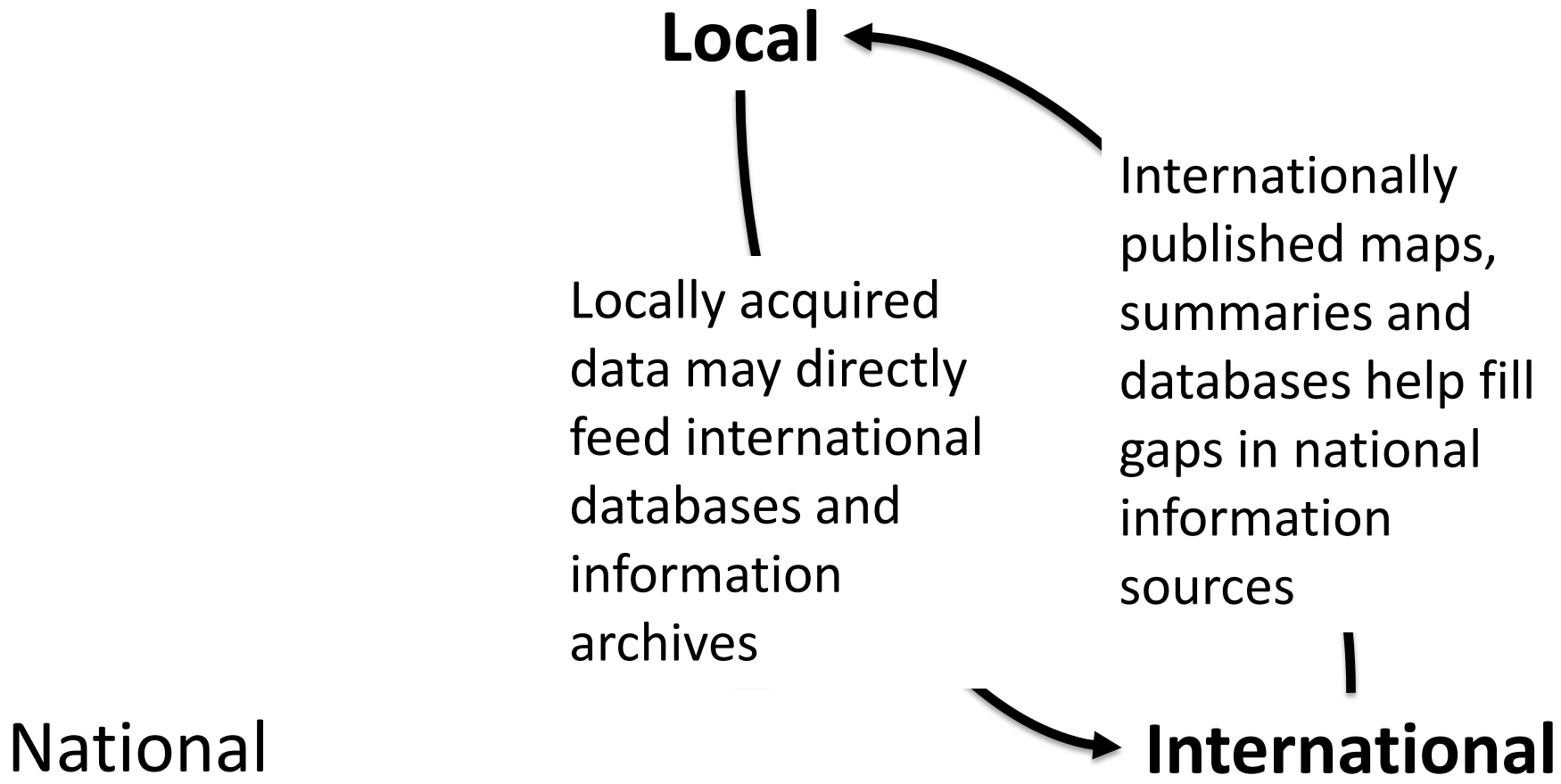
Local

National

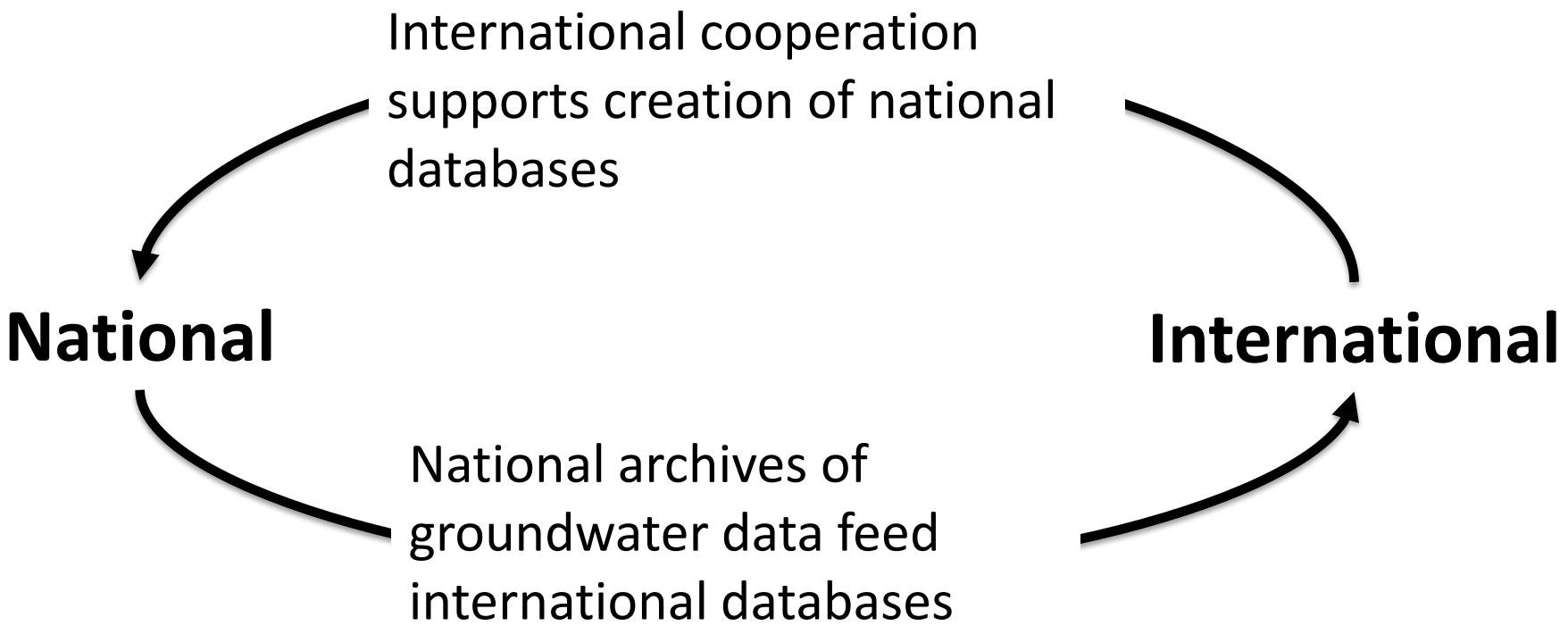


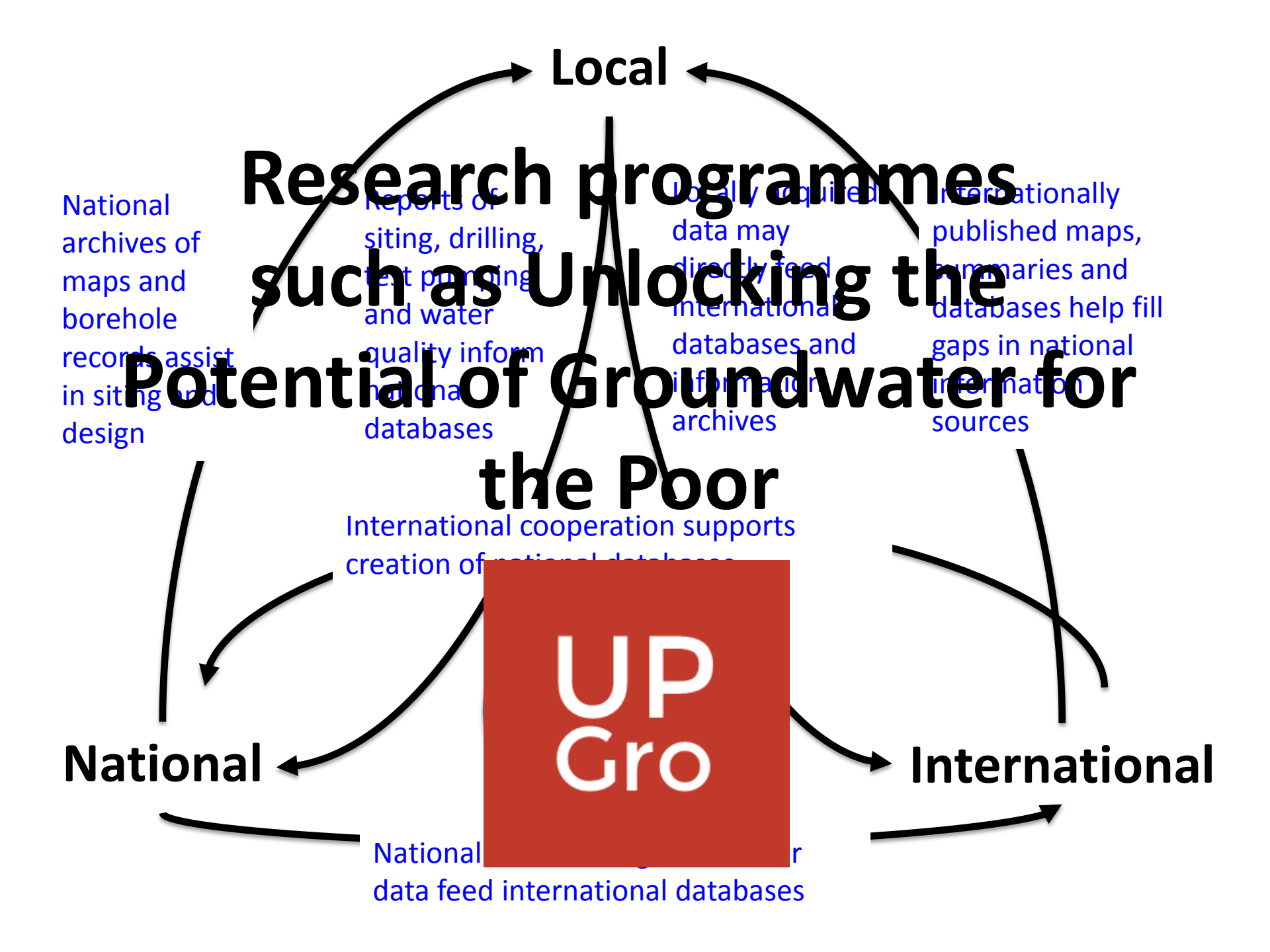
International


Local
National archives of maps and borehole records assist in siting and design
Reports of siting, drilling, test pumping and water quality inform national databases
National
International


Local
Internationally published maps, summaries and databases help fill gaps in national information sources
Locally acquired data may directly feed international databases and information archives
National
International

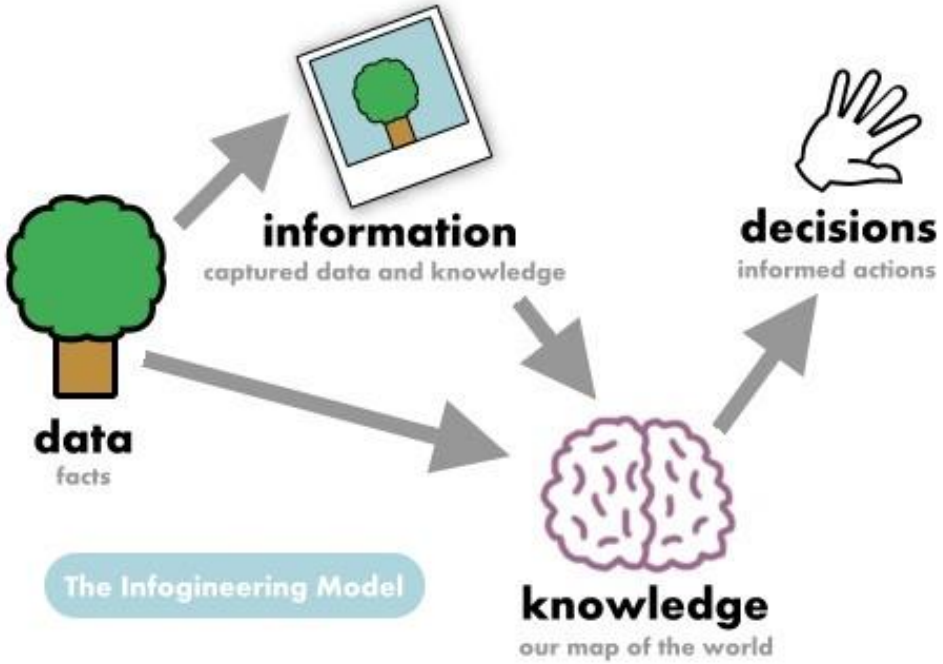
Local


International cooperation supports creation of national databases
National
International
National archives of groundwater data feed international databases



Research programmes such as Unlocking the Potential of Groundwater for the Poor


Today's "beautiful game" is about
helping you "do" groundwater
better



Asking the right questions

- What data and information do I need?
- Where can I find data and information?
- If there are gaps in the available data, what is my role in helping to fill those gaps?

This morning's "first half" focuses on data and information

Asking the right questions

How can I best use the available data and information, especially in regard to borehole design and solar pump specification?

This afternoon's "second half" focuses on the use of data to improve designs and specifications

But before we go on … who are you?

What kind of job do you have?

- in national Government?
- in local Government?
- in academia or training institution?
- in an NGO?
- in the private sector?
- other?

Do you work in groundwater development?

- Do you site boreholes?
- Do you design boreholes?
- Do you supervise construction?
- Do you specify pumps?

And finally …

When you seek groundwater information, are you satisfied with what you are able to find?

- Yes, I find almost everything I need
- I sometimes find some of what I need
- I almost always fail to find what I need
- I’ve given up looking as I know it’s not there