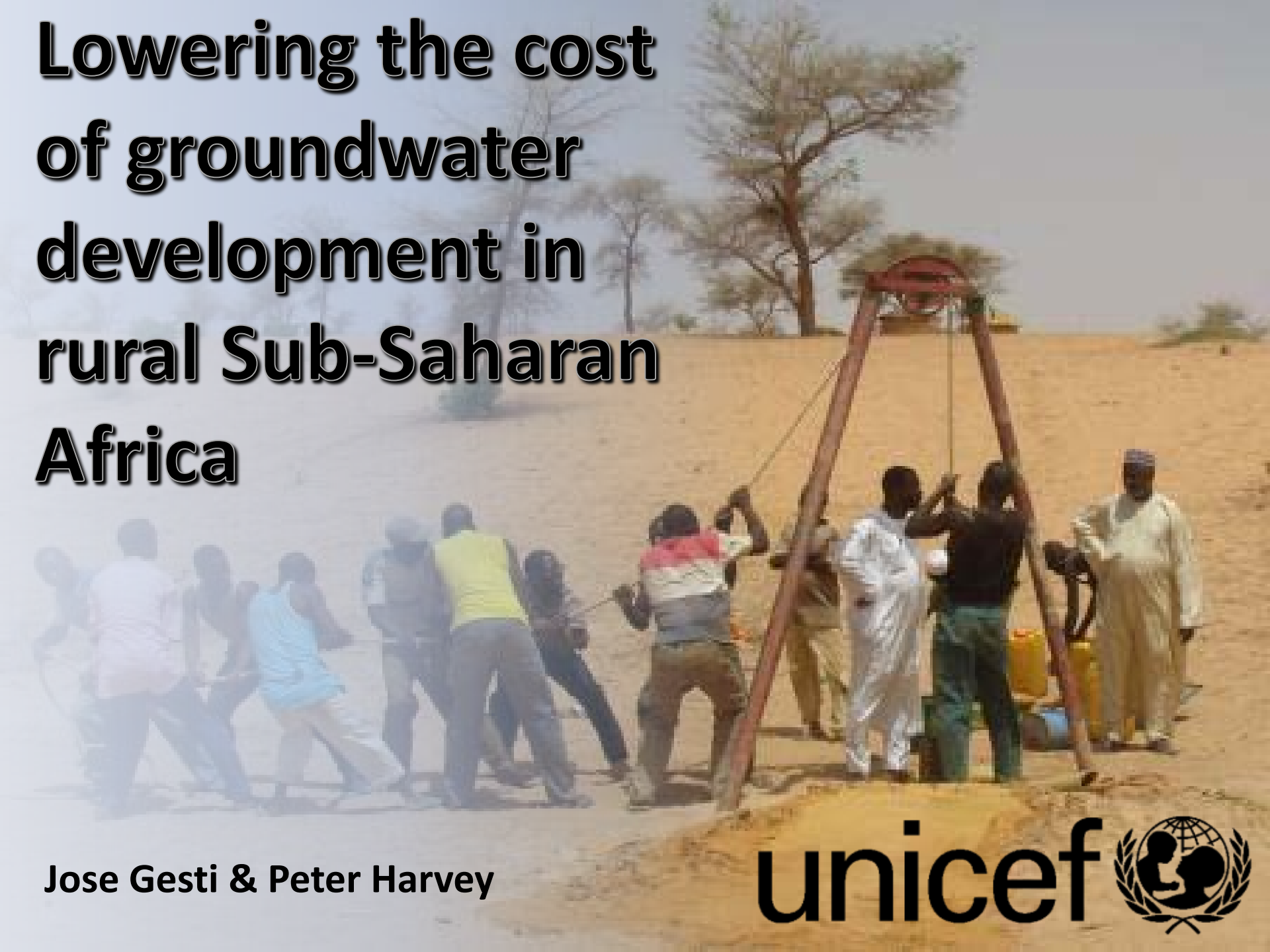
Lowering the cost of groundwater development in rural Sub-Saharan Africa



Jose Gesti & Peter Harvey

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OUTLINE OF THE PRESENTATION

1. MDG WATER OBJECTIVE – FOCUS ON AFRICA
2. COST-EFFECTIVE DEVELOPMENT OF GROUNDWATER
3. APPROACHES TO IMPROVE COST-EFFECTIVENESS

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1. MDG WATER OBJECTIVE - FOCUS ON AFRICA

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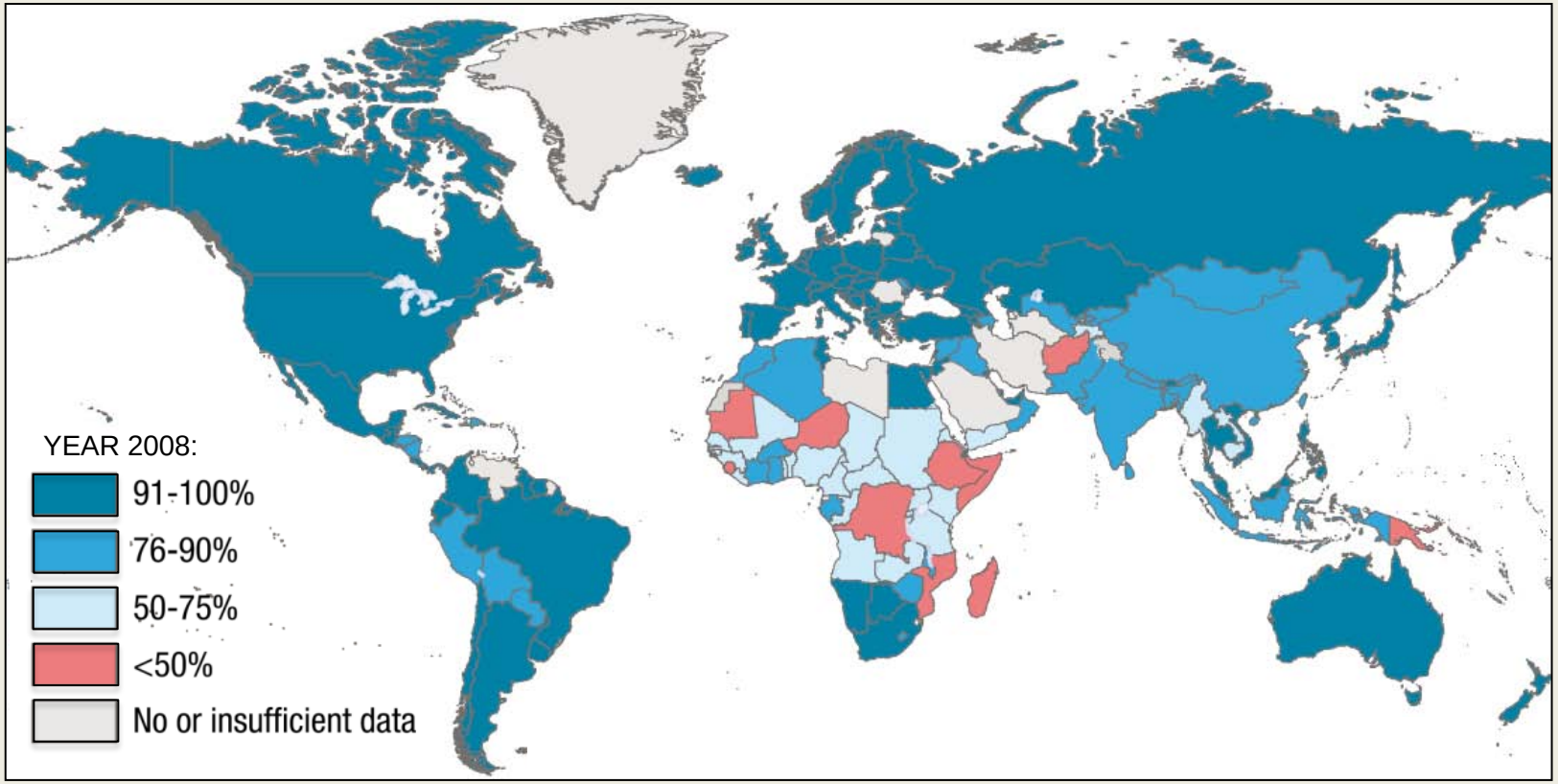
Use of Improved Drinking Water

Sub-Saharan Africa faces the greatest challenge in increasing the use of improved drinking-water.



Source: WHO/UNICEF, 2010

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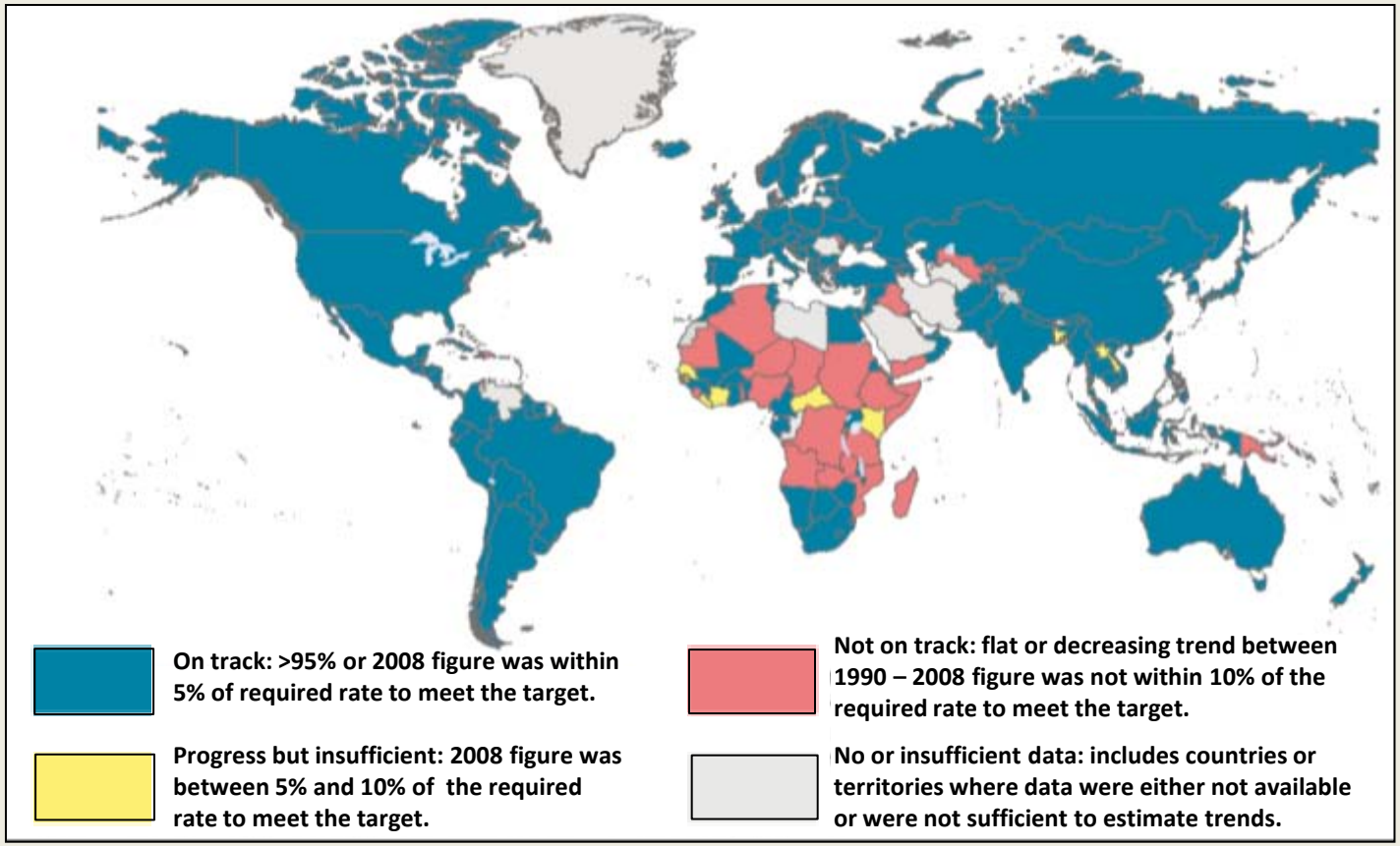
Progress Towards Water MDG

Indeed, many countries in Sub-Saharan Africa are not on track to meet the MDG target.



Source: WHO/UNICEF, 2010

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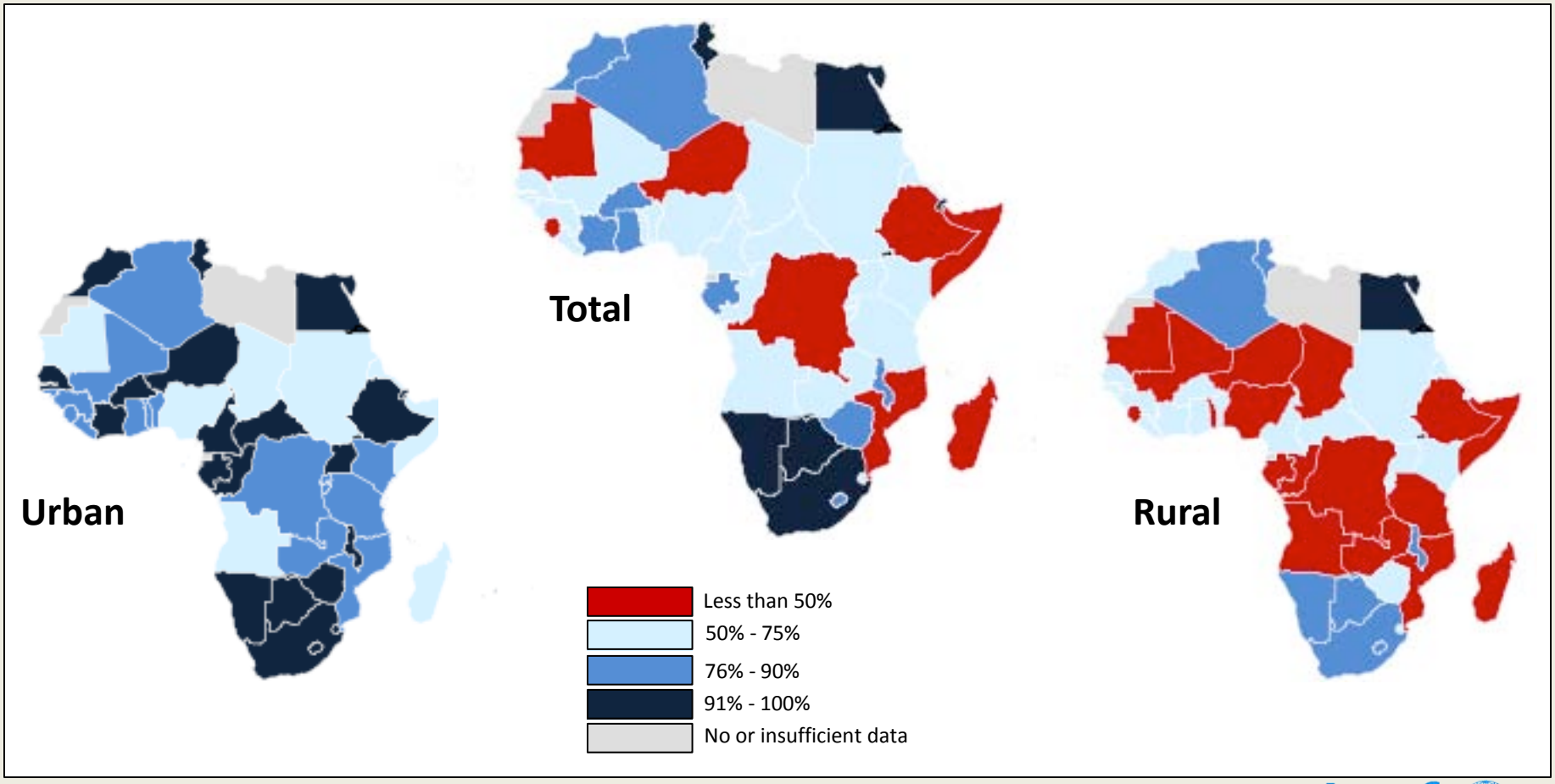
Urban Vs. Rural in Africa

Use of improved drinking water sources is significantly lower in rural areas of Africa.



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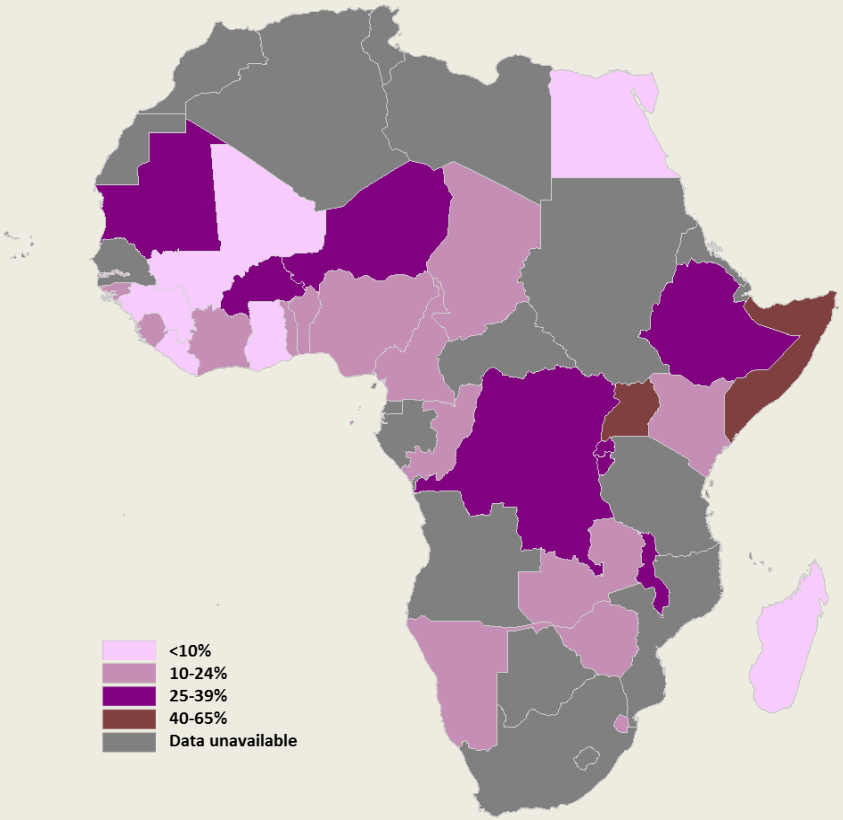
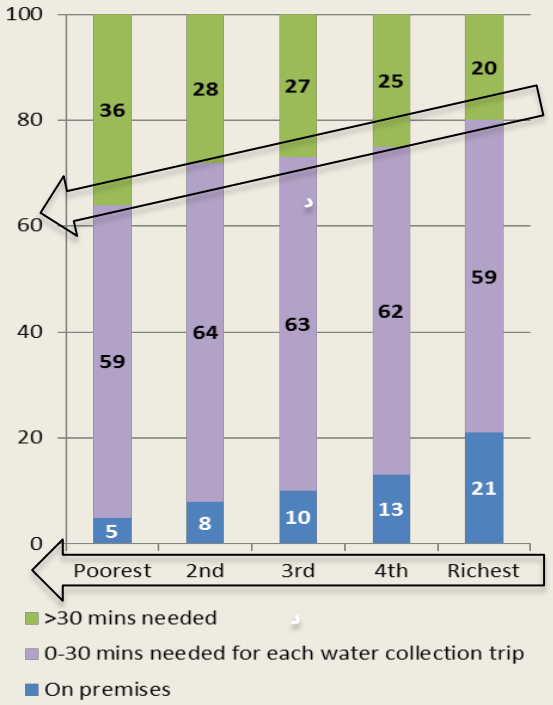
Rural Wealth Quintals in Africa

The poorest rural communities are the worst served.



Source: WHO/UNICEF, 2011

Percentage of population that spends more than 30 minutes on a water collection trip



Proportion of rural population spending more or less than 30 minutes per round water collection trip, by wealth quintile, Sub-Saharan Africa

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2. COST-EFFECTIVE DEVELOPMENT OF GROUNDWATER

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Groundwater Development

- Groundwater provides potable water to an estimated 1.5 billion people worldwide daily (DFID, 2001).
- It has proved the most reliable resource for meeting rural water demand in Sub-Saharan Africa (MacDonald & Davies, 2002).
- However, current rate of progress via conventional drilling programmes is insufficient due to: 1) restrictive costs; 2) difficulty in targeting the most marginal and poorly-served communities.
- There is a critical need to lower the costs of drilling programmes and adopt alternative complimentary strategies to reach the worst served areas.

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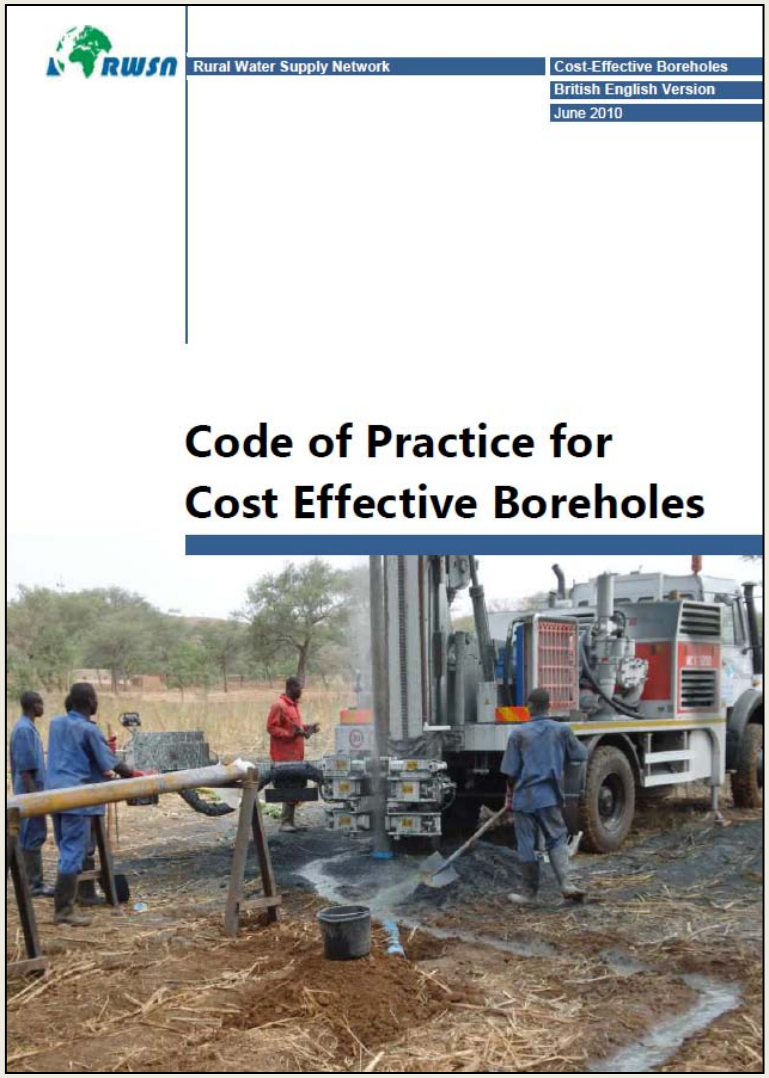
The RWSN Code of Practice



- Provides a basis for the realization of economical and sustainable access to safe water through 9 principles.
- Cost-effective: optimum value for money invested over the long term.
- Boreholes are drilled to function for a lifespan of 20 to 50 years.
- The lowest cost is not always the most cost-effective.

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Assessment Reports

RWSN Rural Water Supply Network unicef USAID FROM THE AMERICAN PEOPLE

The Code of Practice for Cost-Effective Boreholes
Ghana
Country Status Report

Dotun Adekile and Clement Kwei
September 2009

COST-EFFECTIVE BOREHOLES IN MOZAMBIQUE

AN ANALYSIS OF PRACTICE UNDER THE ONE MILLION INITIATIVE 2008 - 2010

May 2011
José A. Gesti Canuto
For WASH Section, NYHQ, UNICEF

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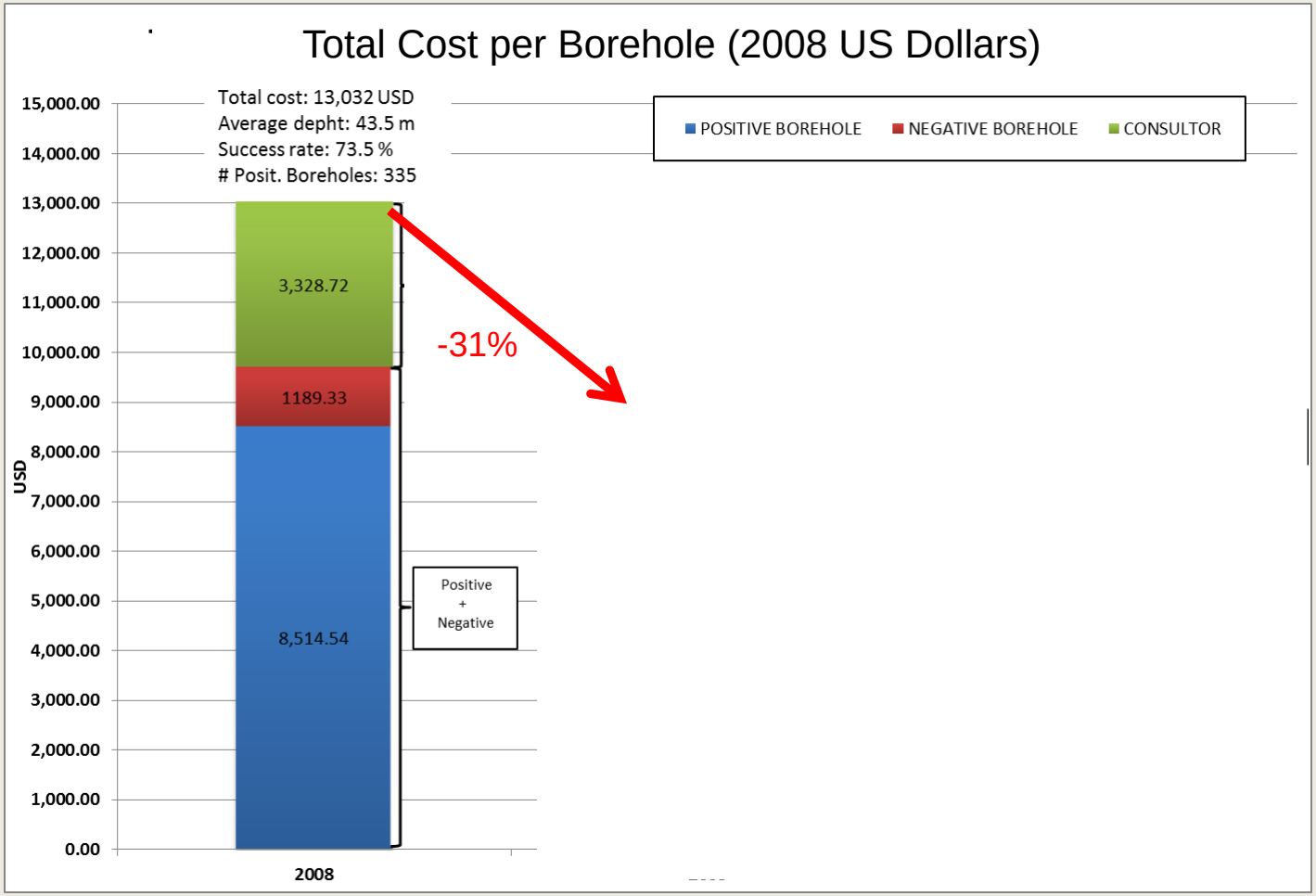
Cost Reduction in Mozambique

Cost analysis within the “One Million Initiative” (2008 – 2009)



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3. APPROACHES TO IMPROVE COST-EFFECTIVENESS

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Clustered Contracts

- Drilling companies offer better unit prices when boreholes are geographically clustered in contracts.
- Mobilization and demobilization costs are reduced when packages of boreholes are contracted.
- The use of lump sums for mobilisation and demobilisation when a clustered contract approach is used can be fair for the drilling company and convenient for the programme manager.
- Small drilling companies can benefit from clustered contracts through the enabling of simple approaches such as forming consortia.

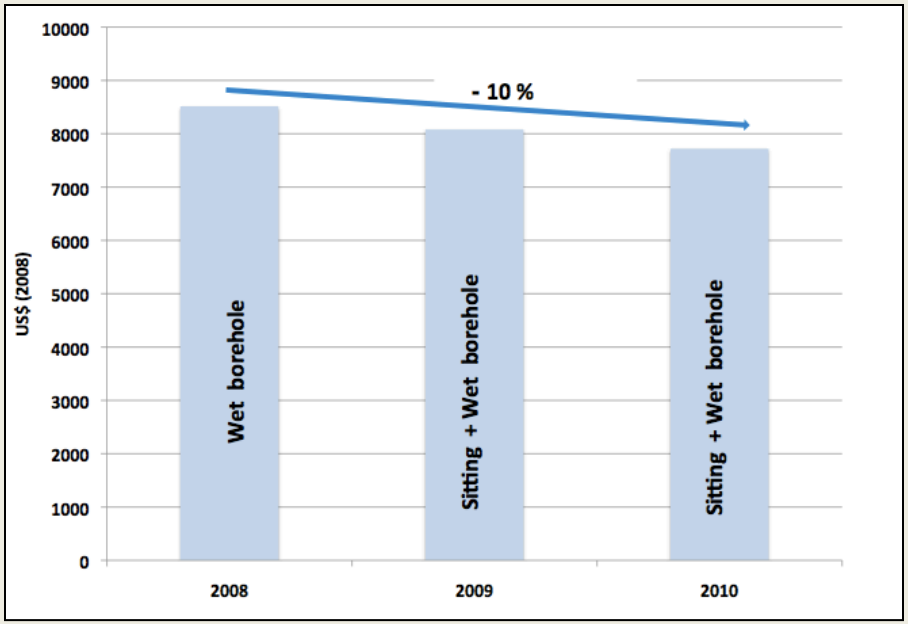
Turn-Key Contracts

- Assigning the responsibility of sitting boreholes to drilling companies in turn-key contracts improves cost effectiveness:
  - Cost can be considerably reduced
  - Drilling companies operate more efficiently on its own schedule
  - The speed and rate of drilling success increase
  - Contractual disputes with third parties are avoided

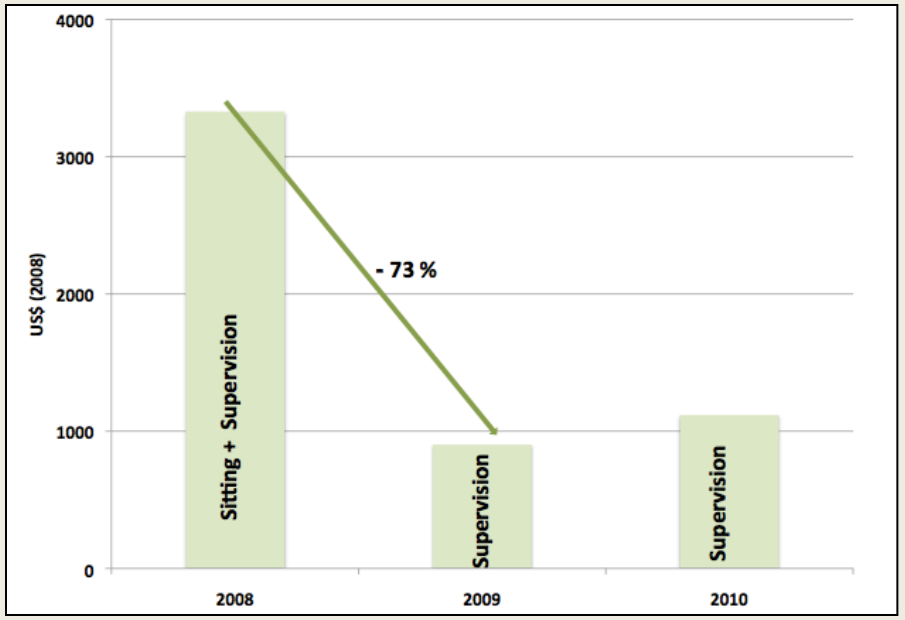
Turn-Key Contracts

Example of the “One Million Initiative” in Mozambique:

Cost Per Wet Borehole



Consulting Cost



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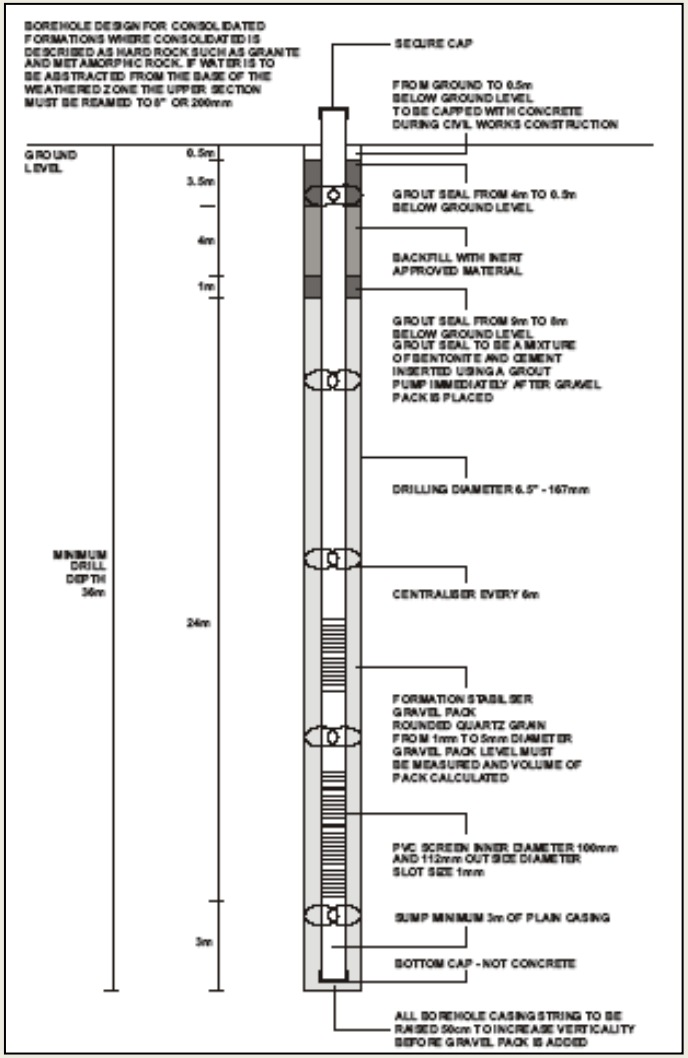
Technical Specifications

- Reconsideration of borehole diameter to match pump design and expected water delivery helps to improve cost-effectiveness.
- UNICEF Zambia has successfully advocated for a reduction of the drilling diameter, from a range of 8-10 inch (depending on geological formations) to a more cost-effective range of 6-8 inches.



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Manual Drilling

- Manual drilling is 4-10 times less expensive than machine drilling in Africa.
- It has been included as one of the MDG Good Practices 2010 by the United Nations Development Group (UNDG) to achieve MDG 7.
- Is not meant to replace mechanized drilling but can be used as a complementary approach in areas unlikely to be reached and serviced by mechanized drilling operations.
- Manual drilling also offers a quick response in emergencies.

Process to Professionalize M. D.

1. Rural Water Supply Sector Assessment
Favourable hydrogeological conditions for manual drilling
Substantial market for manual drilled wells
Dynamic private sector to support manual drilling enterprises
National policy open to manual drilling

2. Selection of Drilling Enterprises
Identify experienced well drillers or well diggers
Mechanical well drillers interested in expanding into manual drilling
Businesses in related field

3. Training of Drilling Enterprises
Well Drilling Techniques and hydrogeology for manual drilling
Business management and tendering
Supervised practical field experience

4. Training of Supporting Businesses
Quality control firms, Well drilling tool makers
Social mobilization trainers, Pump installers and repairers

5. Certification of Drilling Enterprises
Nationally recognized certification, branding and promotion of certified drillers
Use of certified drillers by others

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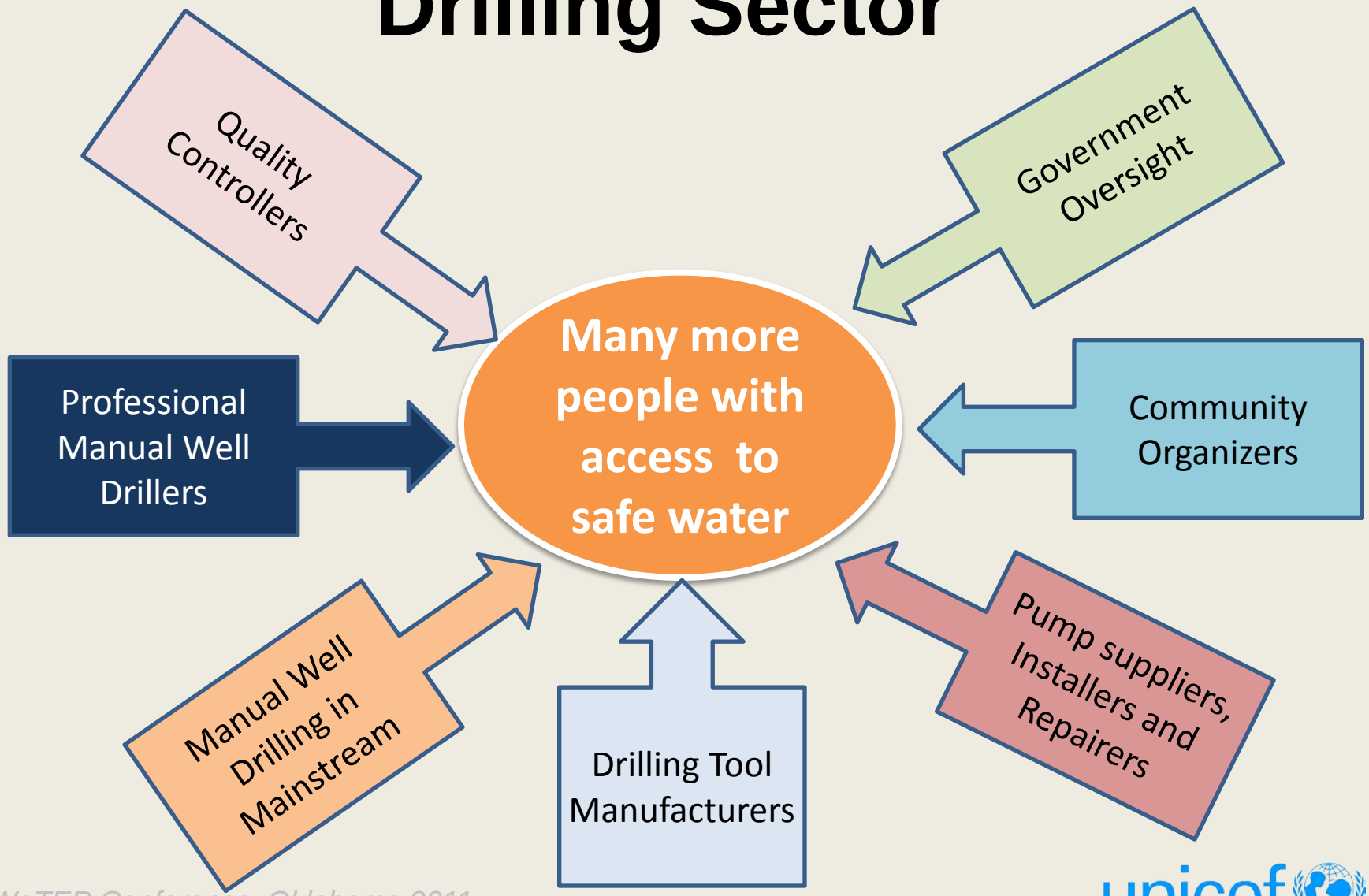
Goal – Professional Manual Well Drilling Sector



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Manual drilling toolkit

- Maps of potential
- Technical Notes
- Case Studies
- Videos
- Manuals

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Concluding Remarks

- Application of the code of practice for cost-effective boreholes can reduce groundwater development costs significantly.
- Promotion of manual drilling can also dramatically reduce costs and ensure that remote rural communities are adequately served.
- These interventions have the potential to make a significant contribution to the attainment of MDG7c in Sub-Saharan Africa.
- The resource needs and potential impact in serving the 275 million people in rural Africa that currently lack access to an improved drinking-water source can be modeled.

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More information available at:

http://www.unicef.org/wash/index_49090.html