All systems go
Africa

Subsidized self-supply / farm wells

A promising service delivery model for Africa

The example of Zambia

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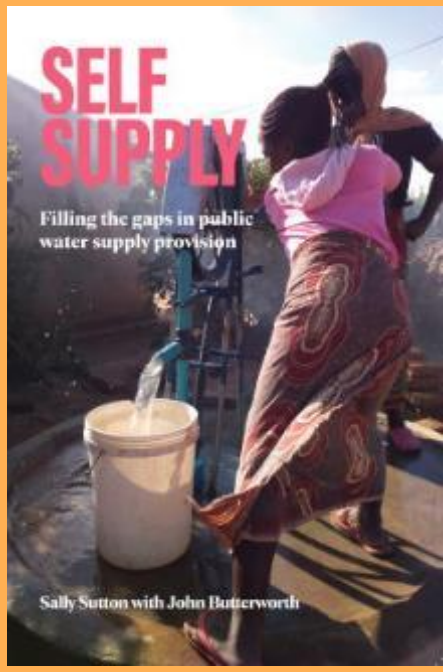
IRC Supporting water sanitation and hygiene services for life

unicef

Goal of this presentation;
Share an example how SDG6.1 in remote rural areas in Africa is reached with subsidized self-supply, mainly farm wells, at the same cost as conventional communal supply

Self-supply is probably the largest water PPP (Public Private Partnership)
World wide over 1000 million people invested in it.
(Book Self-supply. By S. Sutton, J. Butterworth)



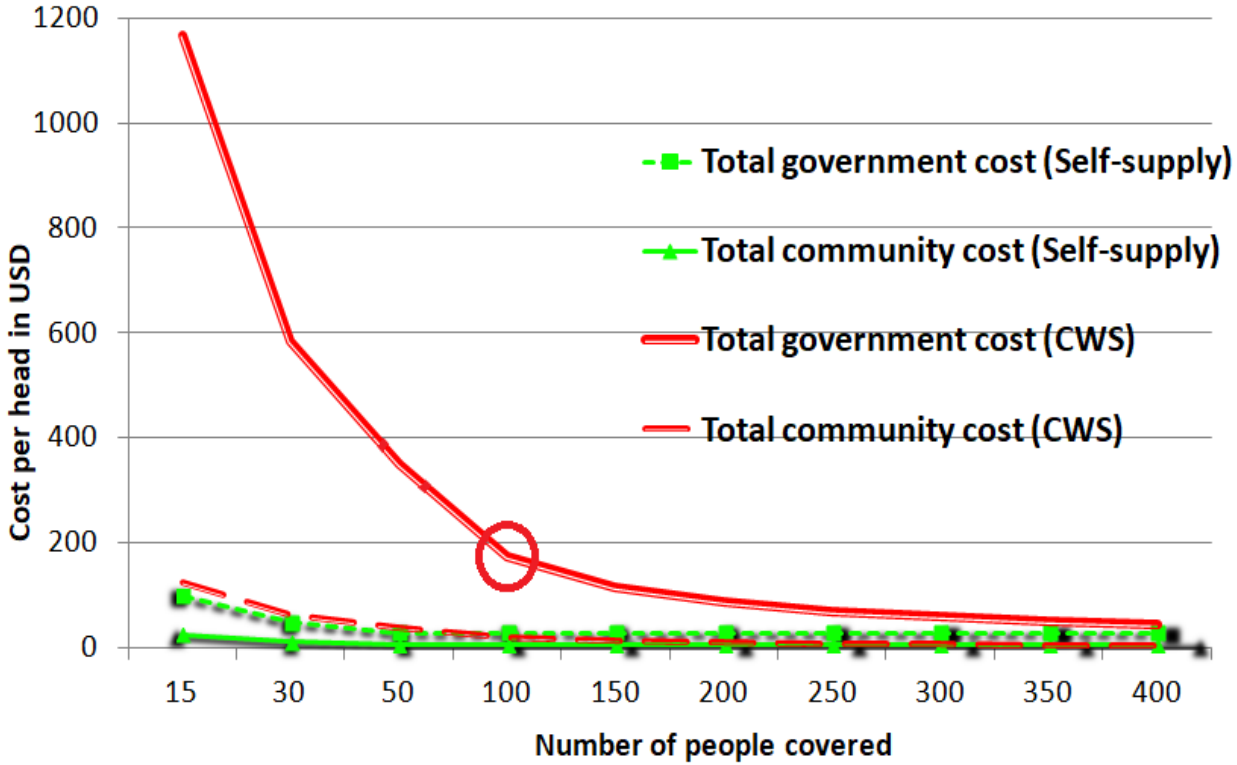
Proposition;
To reach SDG6.1 and SDGs for food and income in Sub Saharan Africa it is more cost-effective to subsidize farm wells that serve 50 people than subsidize communal wells that serve 250 people

Conventional technology is too expensive for > 70% of the SDG6.1 target group (remote small rural communities)

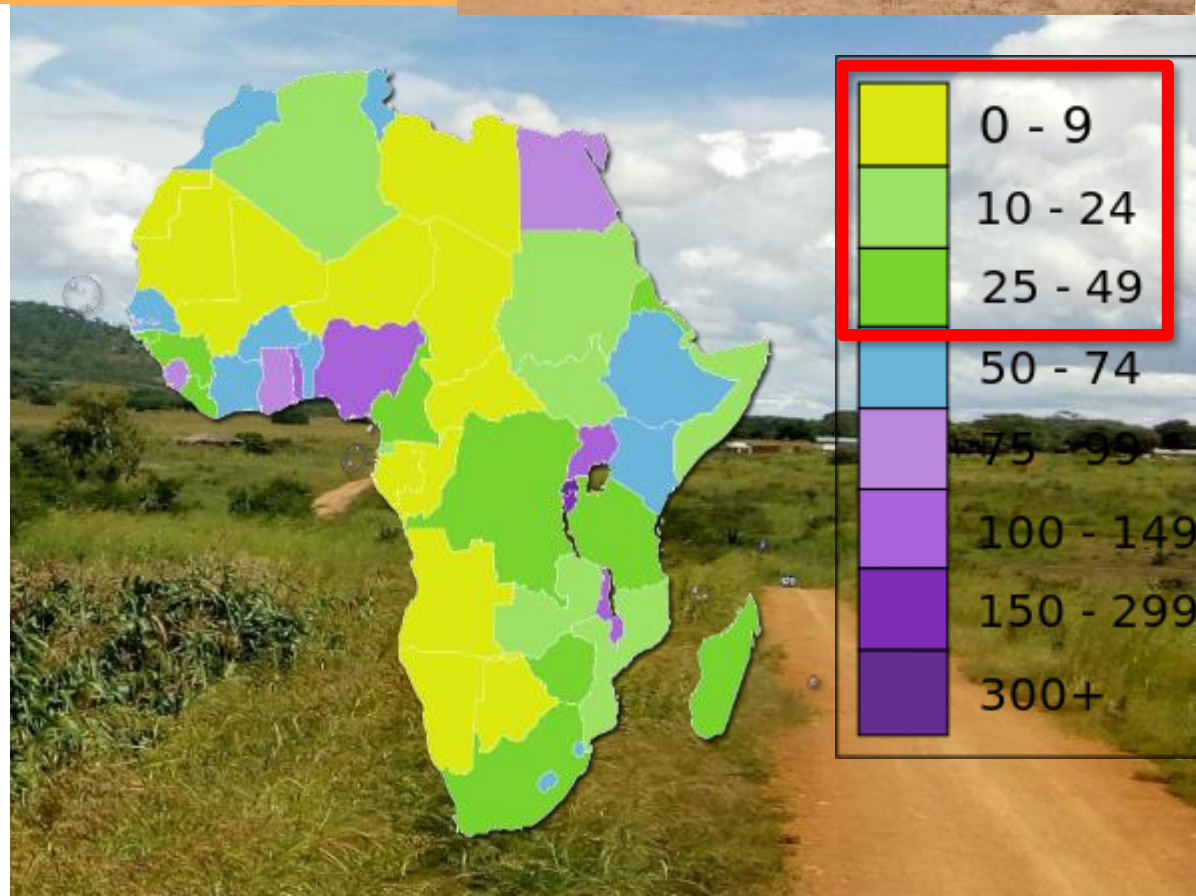
Machine drilled borehole & imported hand / solar pump

Capex: $2500 - $7500 for 250 users = $10 - $30/capita

The same technology for 50 users = $50 - $150/capita



Source: Sally Sutton, WSP/UNICEF/SKAT 2015



Maintenance of community owned pumps, an “eternal headache”

Functioning *because*

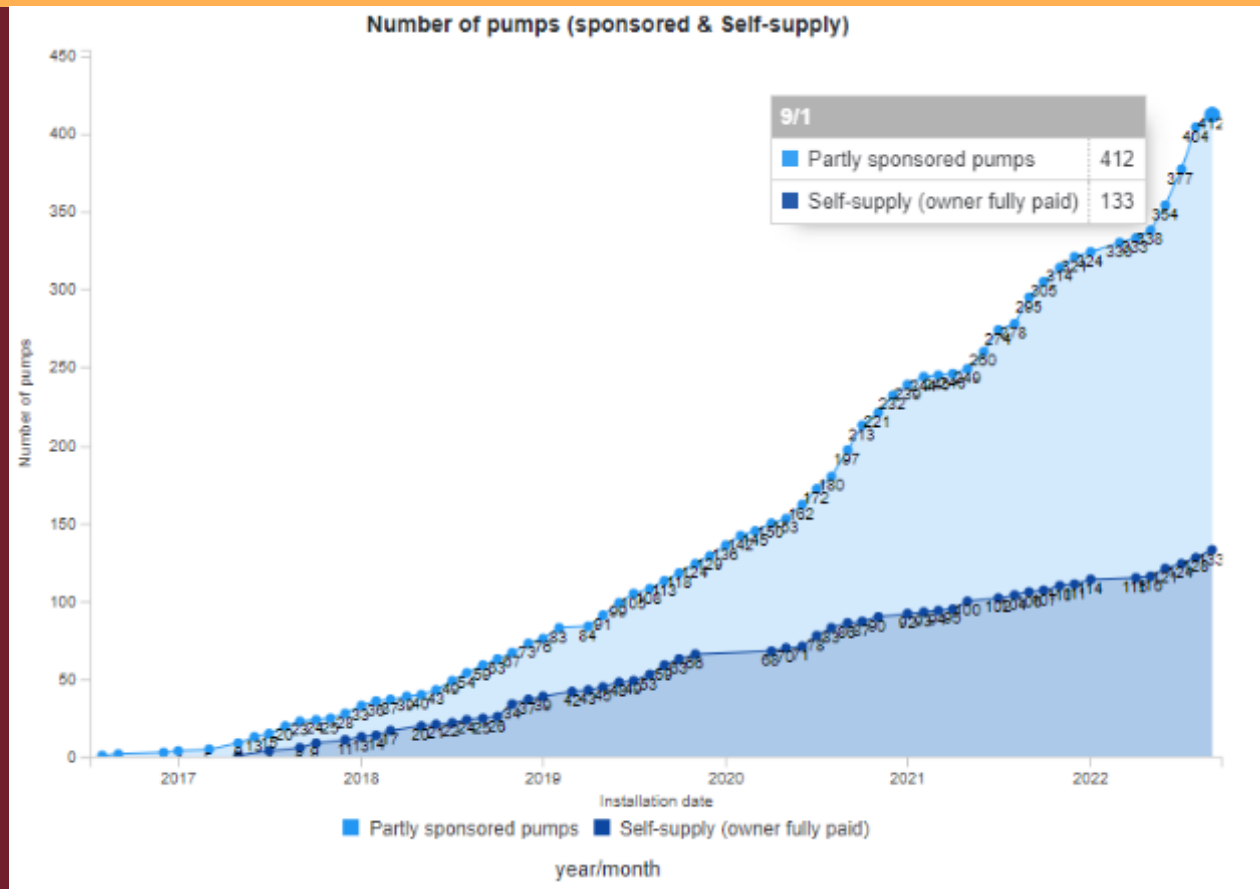
- Privately owned
- Productive use, income
- Local affordable spares

Not-functioning

- Community owned
- Domestic use only
- Imported spares

High cost of wells & maintenance could be solved with SMARTech & subsidized farm wells. An example from Zambia, the Jacana SMART Centre

- >500 wells drilled in 5 years (SHIPO drill & Rope pump, 20 - 35m deep)
- Average cost $1000. (excl. overhead) Installed at 1 family, partly subsidized.
- Condition for subsidy; **the well needs to generate income**



Key for this approach; low cost wells & low cost pumps

Hand dug wells

- In areas with aquifer <10mtr, and/or low permeability
- > 5 million dug wells in Africa (Sutton 2021)

Manual drilled wells, example EMAS

- Small casing 50 mm, pump 30 mm. To 60 m deep.
  Cost; $10 - $20/metre, incl. pump

- Cost of well 20 mtr.: $200 - $400
- 70.000 wells in Latin America,
  and Sierra Leone
- 70% self-supply, (paid by the family)

Other manual drilling options for low cost wells

- Mzuzu.	Max. 25 metre.	Cost 20 m. well- $200 - $500	
- Shipo.	Max. 45 metre.	Cost 20 m. well- $800 - $1400	(>4.000 wells East Africa)
- Rotary jetting:	Max. 80 metre.	Cost 20 m. well- $800 - $?	(>?200.000 wells Nigeria)

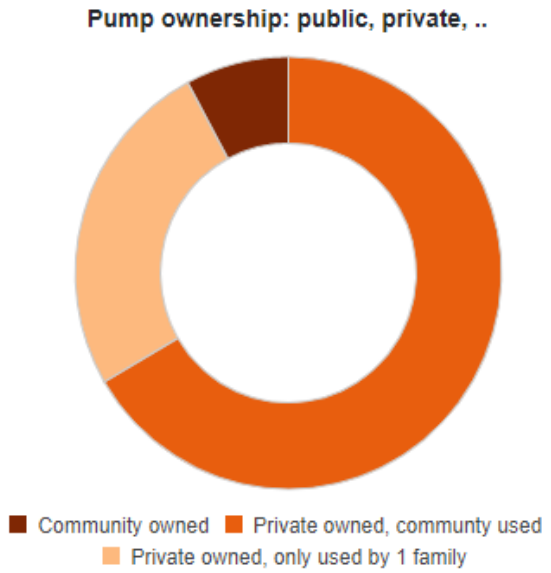
Low cost, locally produced pumps. Pump heads to 35 m

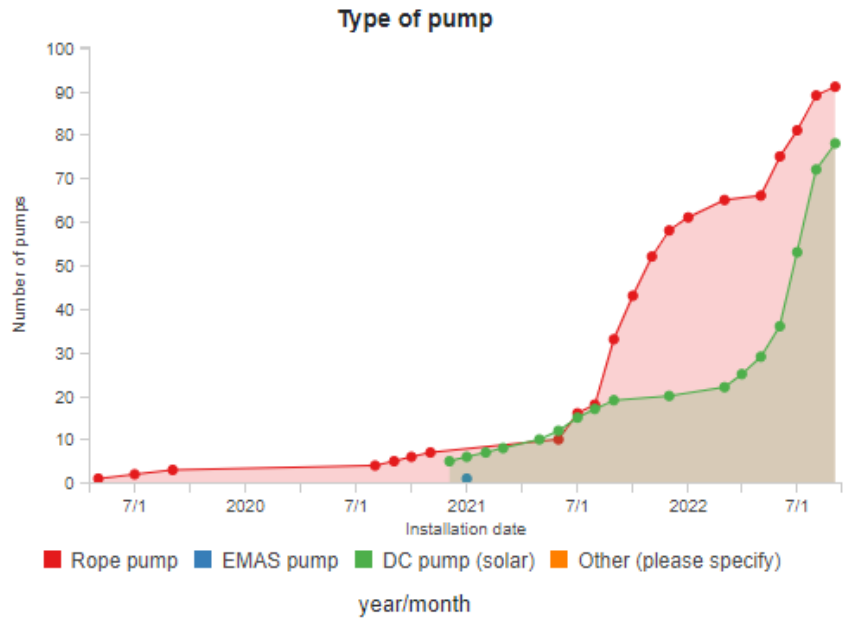
- EMAS pump. $30 - $50 (can pump uphill, or overhead tanks)
- Rope pump. $50 - $120 (130.000 pumps worldwide)
- ZL solar pumps. $150- $500 (locally assembled)

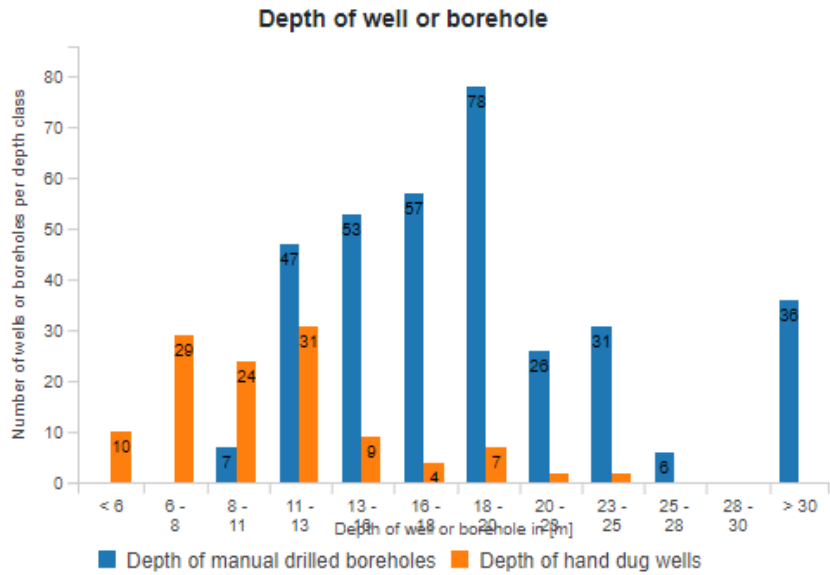
Results in Zambia

- **Sharing;** Families with a well share water for domestic use with others (av. 50 people/well)
- **Low cost**; Capex $25/cap (donated). Same as machine drilled well &imported pump for larger communities
- **Maintenance:** > 90% of pumps functioning due to income & convenience
- **Self-supply**; 400 subsidized farm wells created market for 130 self-supply wells / pumps

- New development; Much demand for low-cost solar pumps







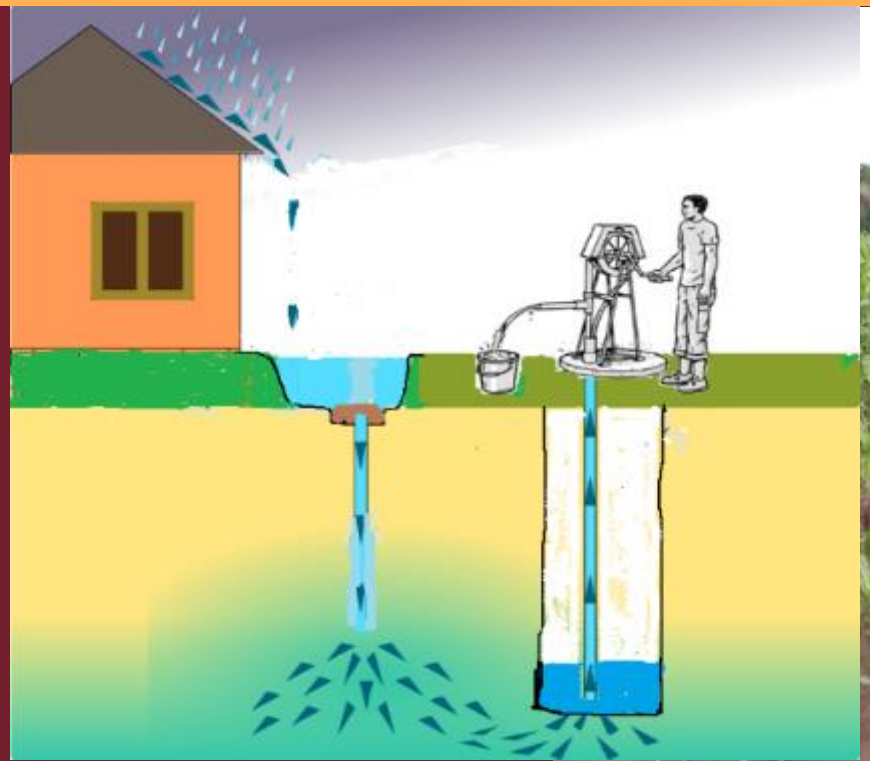
Impact of this approach

- **SDG6.1 for yet unserved**
  400 farm wells serve 20.000 people (improved water source **<10 minutes** from home)
- **SDG1 and 2, Food & income**
  Family with the pump increase food security & income ($ 225/yr/family. RWSN field note 2022)
- **SDG 3. Gender**
  Less or no need to walk to communal wells so time saving and more safety for women/ girls
- **Employment**
  Well drilling, pump production = employment for 20 companies. Irrigation = work for 400 farm families

Concerns with farm wells

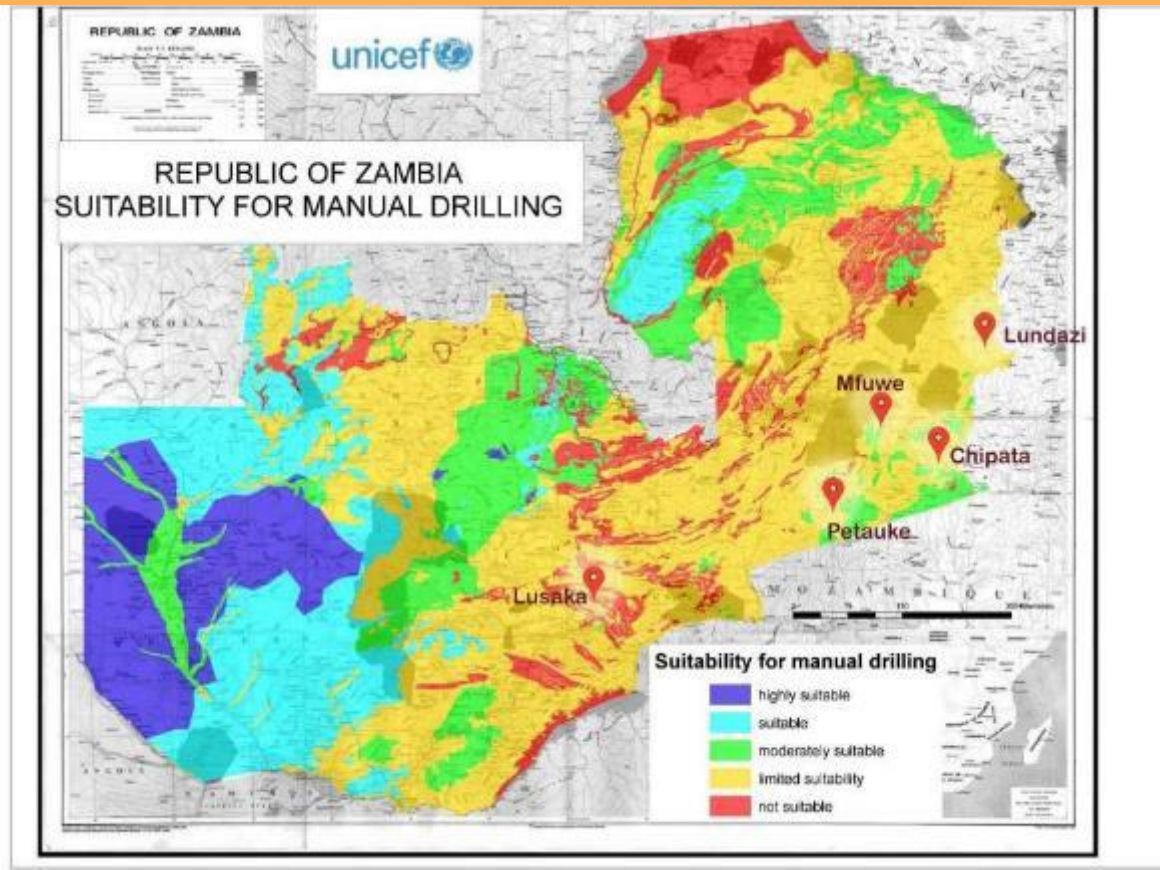
1. Water quality; who will test all wells?
2. Depletion of groundwater if all farmers have wells

Ref. 1. Household well? ; Treat water; chlorine or water filter
Chemicals (Fluor,.)? ; Store rainwater & use a filter
Ref. 2. Many small wells = less risk for depletion than few big wells
Stimulate farmers to infiltrate rainwater, recharge groundwater with options like.
3R, JustDiggit, Roads for water, Tube recharge.
Deep Bed Farming practised by tiyeni.org infiltrates all rain that falls on the farm land!!



Conclusions; Subsidized farm wells have;

- **much potential to reach SDG6.1 for part of the yet unserved in rural areas** in many cases with the same subsidy ($25/cap.) as subsidized communal supply
- **also impact on SDGs 1, 2, 3 and 8** (Poverty, Food, Gender, Employment,..)
- **potential in an estimated 50% of Sub-Saharan Africa**,(=areas without rocks)



Recommendations

- **Maps**: For each country, maps for “suitability of manual drilling” like UNICEF Zambia
- **Select best technologies**: Compare different options for best, most cost-effective, market-based options fit for the local situation
- **Enabling environment**; Regulation, payment systems, subsidies for unserved,…
- **Build local capacity.** Invest in South-south exchange on best practices. Invest in the 3 Ts. Training, T……, T……

Take away 1

- Water at the farm (90% wells) = essential for rural development and food security in Africa
- 45 million farmers in the USA had a well & hand pump for domestic & productive use (garden, chickens, cattle,.)
- Farmers climb **the water ladder**. From hand pump to electric pump to piped system. Farm well stays.

Can the same logic apply for Africa?

- >80% of African farmers, subsistence, small plots of 0.5 to? 5 Ha
- With 500 - 5000 ltr/day at premises farm families can get out of poverty
- Key to get water = rainwater infiltration + low-cost wells & low cost and simple pumps
- Simple is not easy. Hence need for long term training & coaching

Water ladder

Take away 2

Reach water, food and poverty SDGs in Africa? Think about shifts

A shift from;

- Water for drinking/domestic use to **also**… productive use; food & income
- Community Based Management to **also**… Family Based Management
- Imported Hi-tech to **also**… ……. locally produced Lower tech

Key is sustainable access to groundwater

Combination of rainwater infiltration + low-cost wells & low cost pumps

SMART Centres train in: Simple, Market-based, Affordable, Repairable, Technologies
SMART Centres in 10 countries

SMART approach = self-supply, local production. Evaluated by IRC. 2022
MetaMeta / SMART Centre Group www.smartcentregroup.com
SMART Centre Zambia www.smartcentrezambia.com

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