Supported self-supply in Sub-Saharan Africa

An innovative approach to reach SDG6.1 in rural areas with an investment of $8 billion, with additional positive impact on poverty, food, gender, work & climate.

The SMART Centre Group

Basic service in rural areas

The African Union estimates it will take **$250 billion** to reach Sustainable Development Goal SDG) 6.1 in Africa so *enough and safe water for all*. In rural areas in Sub-Saharan Africa (SSA) over 320 million even lack 'basic service' so an improved water source within 30 minutes from home in Sub-Saharan Africa (SSA).
The conventional approach is (deep) machine drilled boreholes and imported hand / solar pumps that are managed by communities. A challenge with these systems is that 17% to 47% of the pumps are non-functional (IRC, 2019).

A solution to reduce investment cost and improve functionality is **supporting self-supply**, that is using the willingness of families to (co) invest in their own Household Water System (HWS). An example is Ethiopia where government supported part of the cost if 5 to10 families invested in a well.
Experiences indicate that 'basic service' with this approach is possible at $25/person if it includes:

- **Innovative locally produced technologies,** SMARTechs (IRC, 2022)
- **Family-owned wells who share water with 5 to 10 families**
- **Focus on productive use.** Income generation to have funds for pump maintenance
- **Subsidies.** For those who lack basic service (MetaMeta, 2023)

SMARTechs

Household water systems are possible with SMARTechs being *Smart, Market-based, Affordable, Repairable Technologies*. Examples include small tube wells to 50 meter deep, drilled with EMAS, SHIPO or Rotary jetting. Locally produced pumps, that pump from 5 - 35m. deep like EMAS, Rope, Pedal and ZL solar pumps. Where drilling is not possible or too expensive, storage tanks are an option. The cost of underground tanks start as low as $15/cubic meter. To make sure that water is safe at the point of use, household water treatment (HWTS) and especially good quality household water filters can be used.

To avoid that a well for each farmer will deplete groundwater levels rainwater harvesting options can be promoted. One household level option is the "tube recharge" that can infiltrate 100 cubic meters/year at a cost of $20 for materials. Another farm level option is Deep Bed Farming (DBF) which includes breaking hardpan, so all rainwater infiltrates in the ground. DBF can triple yields of rain fed crops like maize without the use of fertiliser as is proven by 17.000 farmers in Malawi (Mvula, 2021). The Government of Malawi intends to scale the approach to 1 million farmers.

For examples of these technologies, see the pictures on the next page.

Examples supported self-supply

Zambia:
The Zambia SMART Centre subsidized 600 wells with one condition; Generate income:

- A well of $1000 serves 40 people for domestic use, so $25/person
- >90% of the pumps are functioning (after 10 years)!
- Demand creation for 100% self-supply. 300 families so far paid themselves for a well or pump.

Tanzania.
Around 2008 some 700 hand drilled wells with rope pumps were subsidized.
Now there are over >15.000 rope pumps and 80% is paid for by families. Key for success are:

- Market-based - People are willing to pay
- Repairable - Local production = local skills and spare parts
- Ownership - 1 family owner instead of a community
- Profit - Generate income for pump maintenance and repairs
- Training - Long term coaching, because "simple is not easy"

Conclusions

The effects of supported self-supply include:

1. SDG6.1 "basic service" in all areas with >200mm rain/year at a cost of 25$ /person
2. High pump functionality due to clear ownership, income generation and local spare parts
3. Beside water also impact on SDGs for Poverty, Food, Gender, Work & Climate
4. Basic service in rural SSA seems possible at a cost of 320 million @ $25 = **$8 Billion**

Suggestions

1. **Start with quality.**
   Safe water for all is possible with household water filters at **$4 billion**
2. **Focus on productive use.**
   Multiple Use Systems, so water for irrigation,

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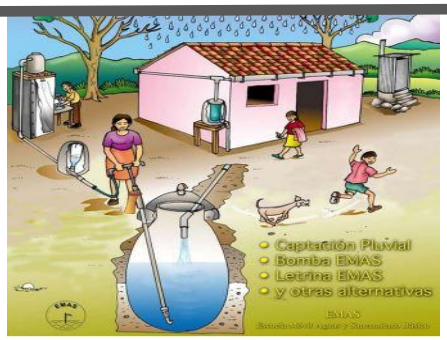
livestock, etc., so there is food for the family. Extra income provides funds for pump maintenance.

3. **Build supply chain of low-cost technologies.** A large scale program to train entrepreneurs in the local production of innovative WASH technologies. Demonstration and training centres in each region to show & train in the most cost-effective water technologies for each situation
4. **A critical mass of 5 to 10%.** Examples of good functioning systems to create demand
5. **Subsidize those who lack "basic service" with $25/person.** This is similar to the subsidy for people who already have basic service. "Similar subsidies for all" could be considered a human right.

Examples of SMARTechs

Manual drilled household wells with local pumps cost $200 - $1000

Household wells for domestic and productive use generate income



Where wells are not possible, rainwater can be stored in tanks

DBF increases yields. 2 ton/ha (left) to 6 ton/ha (right)

Household water filters make water safe to drink. Cost $22 - $60

Key to scale self-supply is training in a range of low-cost technologies

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Training the local private sector in Simple, Market based, Affordable and Repairable Technologies

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