Deep Bed Farming & SMART water solutions

Innovative proven options to adapt to climate change & impact poverty, food, gender, water and work in rural Africa

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The SMART Centre Group

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

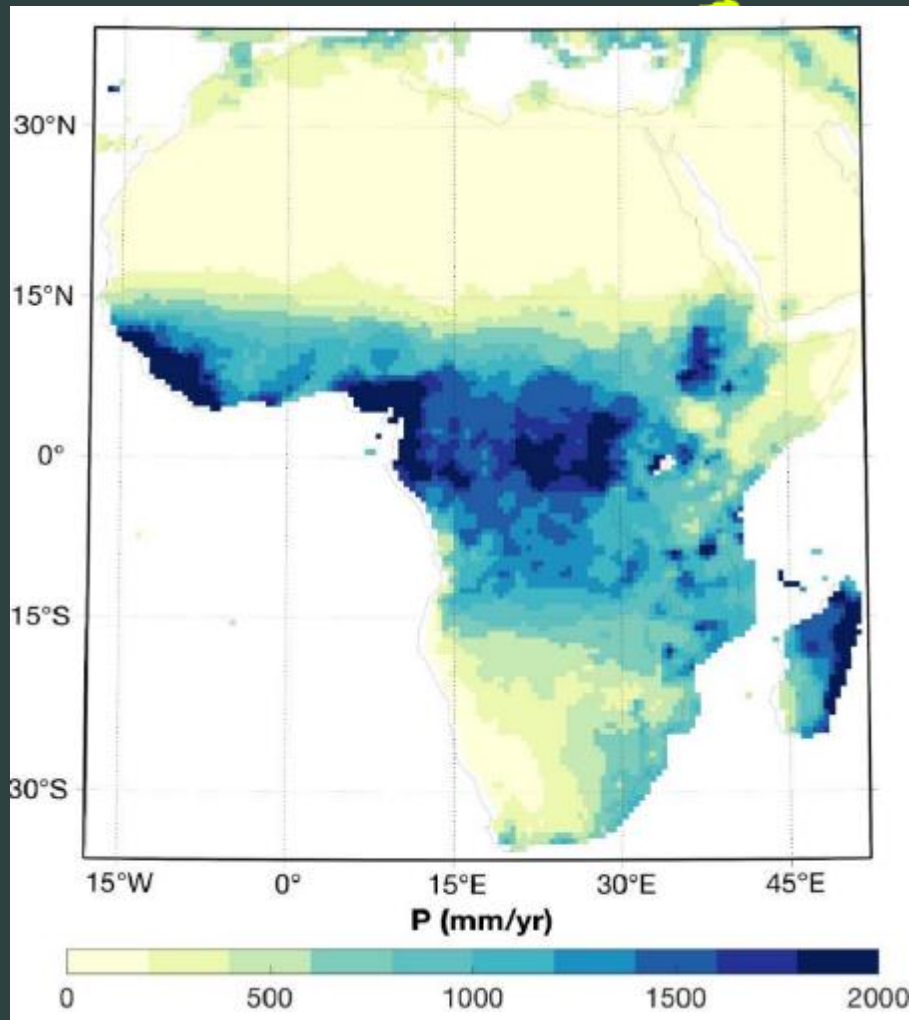
COP28 UAE

Adapt to Climate change?.... store water !

Cheapest option in most areas?.... in the ground

- Groundwater essential for many SDGs
- 80% of African farmers have plots 0.5 - 2 Ha
- Many areas > 500 mm rain / yr = irrigation potential

Condition?... **Water balance**
What is pumped out should be recharged

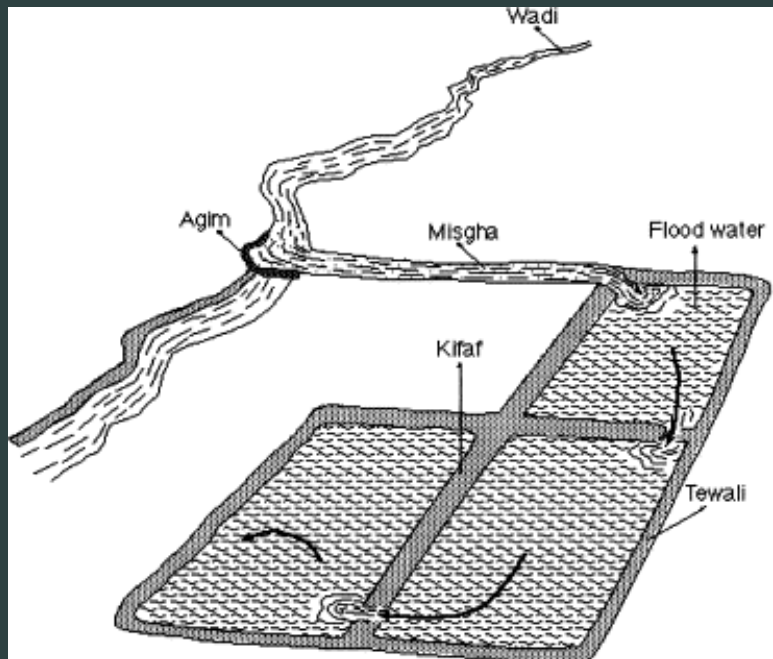


Groundwater recharge options. Larger scale

- Half moon bunds
- Run off water from roads
- Temporary flooding
- Sand dams

JustDiggit
Green Roads for water
Spate irrigation

Info: www.metameta.nl



Groundwater recharge household level

The Tube recharge

- Example mr Ziko Tanzania; Before 2010, well dry 2 months /year
- After installation Tube recharge. All year Water for cow, garden, domestic use
- For drinking? Treatment with a $30 household water filter!
- Cost? $20 in materials + training

Recharge, household level. Deep Bed Farming

Breaking “Hardpan”, a human induced hard layer 20 cm deep
& regenerative agriculture (Compost, cover crops, mulching...)

Effects Deep Bed Farming

- Stops water running downhill / erosion
- Yields Rainfed crops like maize **from 2 to 6 tonnes / hectare**
- Recharge groundwater (long term). Farmers become catchment managers
- 25,000 farmers in Malawi. Government supported. Promoted by Tiyeni

Other challenges in rural Sub - Saharan Africa

- 300 million lack “basic service”
  Source within 30min. from home
- 20 - 40% hand pumps broken
  of ownership, funds

Imagine; You want to reach SDG 6.1 in Africa and have $25 subsidy /person

Proposition:
It is more cost-effective to use that subsidy for farm wells than for communal wells

Examples productive uses / self-supply

Zambia

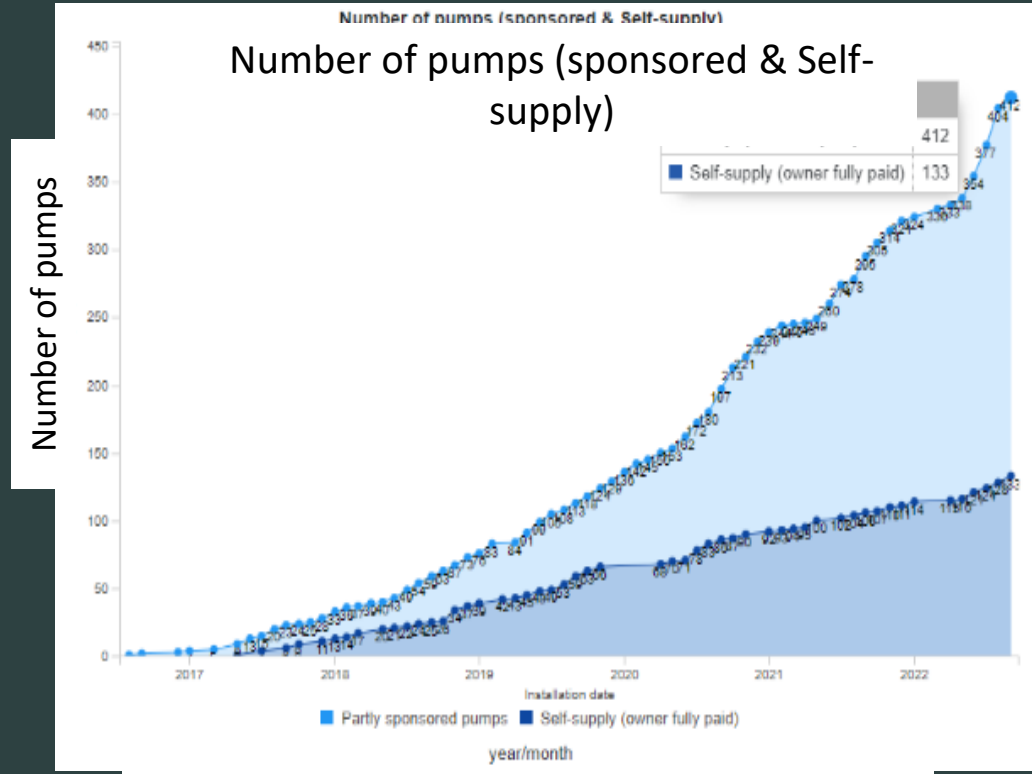
- 500 subsidized wells $1000. Condition? **Income**
- 1 well, 40 people so cost/capita $25
- >90% pumps functioning!
- Demand creation. 150 wells full self-supply

Tanzania

- 700 subsidized wells/ pumps
- Now>15.000 rope pumps, 60% self-supply

Nicaragua

- 50.000 rope pumps on farms, profit $225 / yr.
- $100 million on increased incomes
  Result of $2 million aid for training



mWater Dashboard, Jacana SMART Centre (2022)

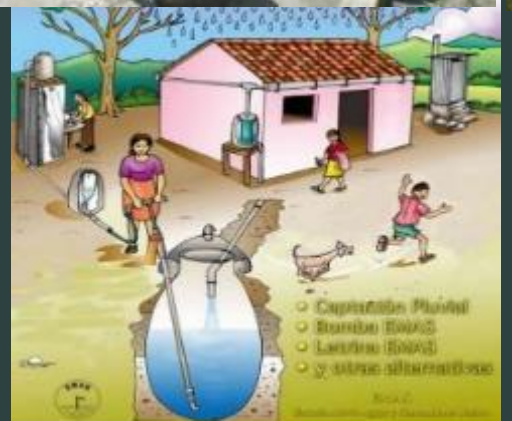
SMART technologies for households / self-supply

- **Wells:** Upgrading dug wells, manual drilling tube wells Cost $10 - $40/m.
- **Pumps:** EMAS, Rope, Treadle, Solar pumps. Cost $60 - $300
- **Storage:** Underground, Tube recharge, DBF Cost $0.1- $20/m3
- **Treatment:** Household Water Filters Cost $20 - $40







Areas >200mm rain “basic service” possible at $25/cap.

Key for success

- SMART — Simple, Market-based, Affordable, Repairable Technologies
- Ownership — 1 family owner instead of a community
- Profit — Generate income = money for repairs
- Training — Long term coaching to guarantee quality

Lesson is **“Simple is not easy”**

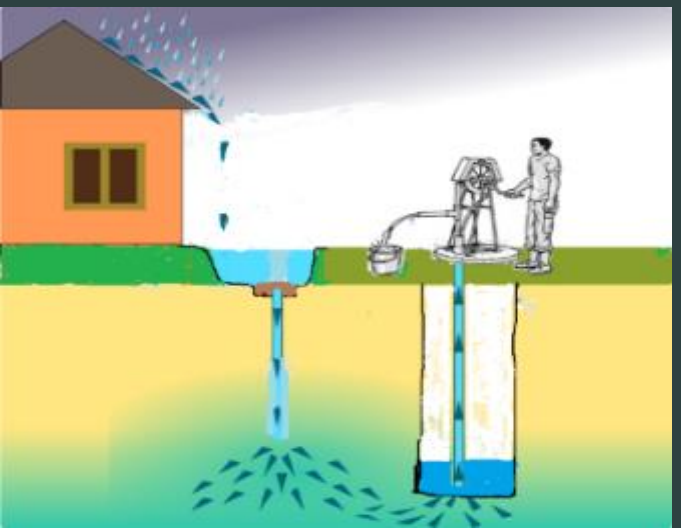



Concerns Household wells/ self supply

Water quality
- Is water safe? Who is going to control it?
- **Solution?** Point of use treatment. Boil, Chlorine, Filter

Depletion of Groundwater
- What if millions of farmers drill wells?
- **Solutions?** Recharge groundwater

Tube recharge, 100 cubic mtr/yr. cost $20



Deep Bed Farming

Conclusions

DBF & SMART solutions for productive self-supply can;

- reach SDG6.1 in rural areas with “basic service” at 25$ /person
- solve problems of pump maintenance
- impact SDGs for Climate & Poverty, Food, Gender and Work

Suggestions

- Combine Agriculture & WASH. Nexus
- Use subsidies SDG6.1 for farm wells
- Scale with 3 actions that start with a T.
  Training, T…, T…,

Information

Deep Bed Farming? www.tiyeni.org

Evaluation SMART approach. IRC. 2022
www.smartcentregroup.com

Reach SDG6.1 with subsidized farm wells?
www.smartcentrezambia.com

SMART Centres in 10 countries

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Proposition:

To reach SDG6.1 in rural Africa it is more cost-effective to use subsidy for farm wells so wells for productive use than communal wells for domestic use