TOWARDS SUSTAINABLE AND RESILIENT WATER RESOURCE MANAGEMENT: DEVELOPMENT OF AN INNOVATIVE GREY WATER REUSE ASSESSMENT TOOL

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Backgrou

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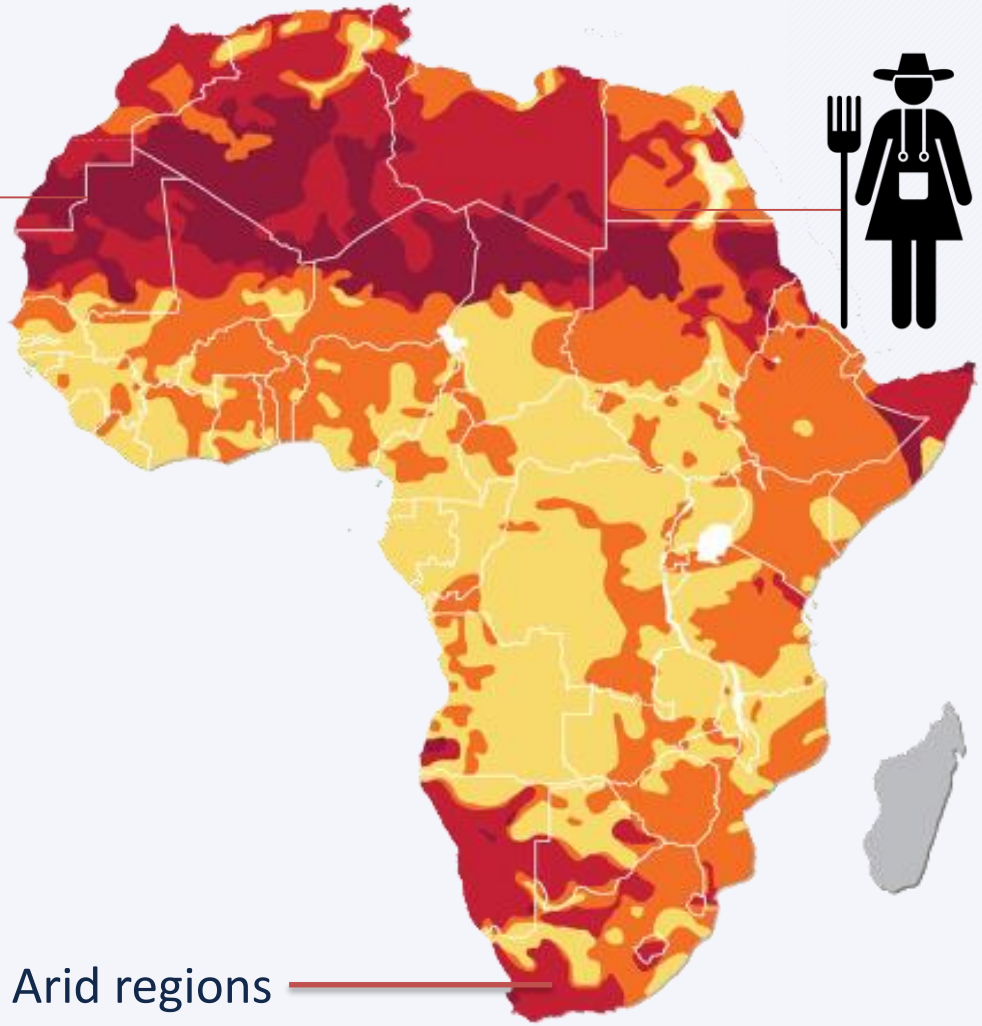
1 in 3 people

95% of Africa's farming relies on rainfall.



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2023 Nile Basin Development Forum, Uganda

Method

Case Study - University of Cape Town

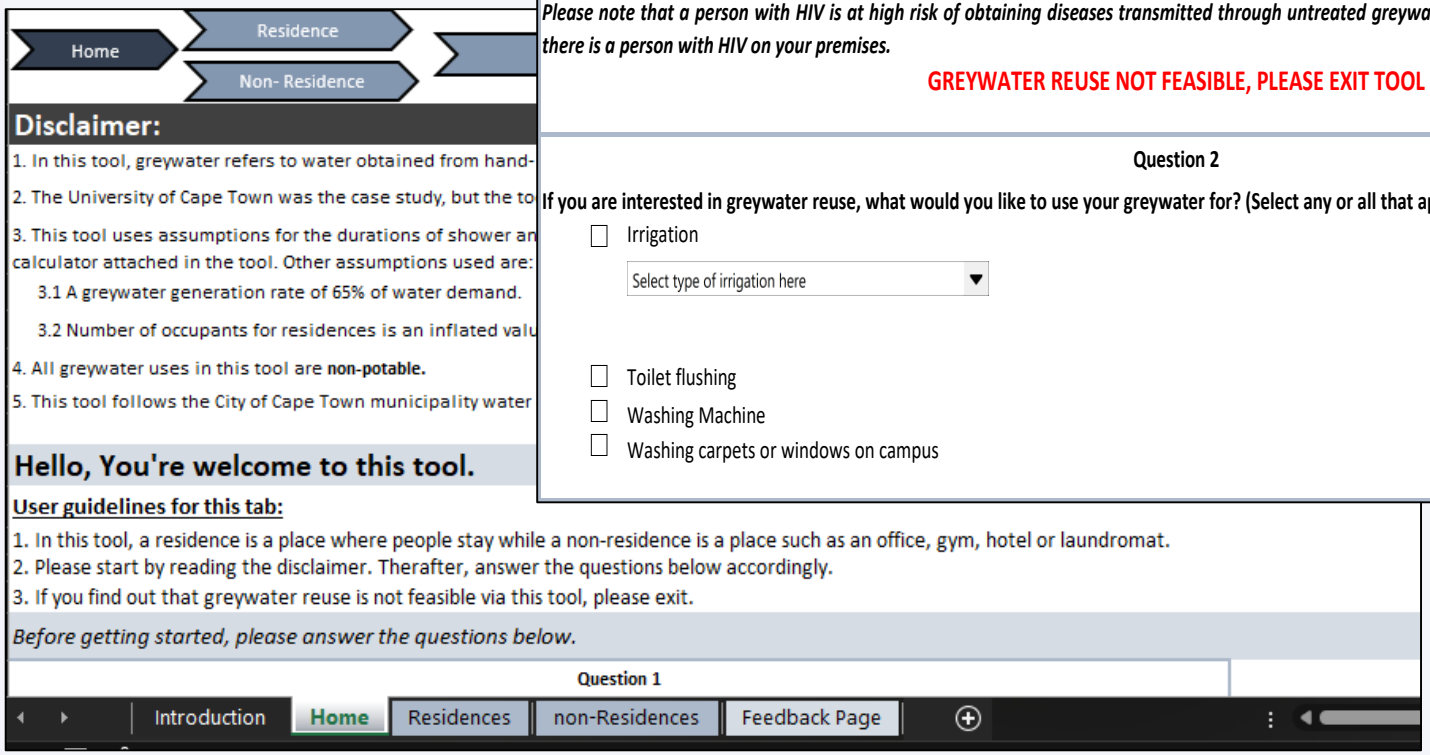
Main literature- Guidelines for greywater use in South Africa

Separated buildings into residence and non-residence, and grouped according to number of Floors.

Obtained water demand data & used this data to select buildings for the tool.

Designed the tool based on main literature and data available.

Results



Question 1

Are there any of the following on the property where you intend to use greywater? (Select any or all that apply)

- ☐ Babies below the age of 3 years or a pregnant woman
- ☑ Elderly people above the age of 70 years
- ☐ Anyone infected with an ear infection, skin infection, Tuberculosis or Diarrhoea

Please note that a person with HIV is at high risk of obtaining diseases transmitted through untreated greywater, therefore greywater reuse is not advised if there is a person with HIV on your premises.

GREYWATER REUSE NOT FEASIBLE, PLEASE EXIT TOOL

Question 2

If you are interested in greywater reuse, what would you like to use your greywater for? (Select any or all that apply)

- ☐ Irrigation
  - Select type of irrigation here
- ☐ Toilet flushing
- ☐ Washing Machine
- ☐ Washing carpets or windows on campus

Results

Part A: Occupant density input

Select the number of floors and estimated number of people in your residence building: 1 floor with less than 15 occupants

Part A : Assumed demand

*This part (**Part A , Table 1**) is for users that do not know their water demand or the water fixture specifications in their residence. Estimates are based off different residences at the University of Cape Town.*

Table 1 : Assumed demand

Water demand element	Flowrates of water fixtures (L/min)	Estimated Water Demand (L)	Estimated Water Demand per person per day (L)	Volume of greywater produced per Person per day(L)	Recommended Analysis level for greywater reuse	Recommended Category	Greywater end use (Type "Yes" and enter)	Click "PRINT" below to print guidelines for your recommended category
Irrigation	Medium sized garden space, not approached by students	3		None	No analysis	I	YES	PRINT
Laundry	Based on a 7 kg washing machine	13	13	8.45	Full Analysis	II/ III		-
Handwash basins	10	30	75	48.75	Full Analysis	II/ III		-
Showers	10	50	100	65	Full Analysis	II/ III		-
Toilets (No urinal)	10	10	23	N.A	Full Analysis	II/ III		-

Results

If your greywater after analysis does not pass the water quality guidelines in section 4, DO NOT use the greywater without full treatment.

3.1 Minimum analysis

- Electrical Conductivity (EC)
- Sodium Adsorption Ratio (SAR)
- *E. coli*
- pH

3.2 Full analysis

- Electrical Conductivity (EC)
- Sodium Adsorption Ratio (SAR)
- *E. coli*
- pH

In addition

- Boron
- Chemical Oxygen Demand (COD)
- Oil and grease
- Suspended solids
- Total inorganic nitrogen
- Total phosphorus

Restrictions R1, applicable to greywater use in Category 1

Restrictions relating to health impact

Do:

Wash hands and arms well with soap after handling greywater.

Use bathwater water and laundry rinse water only.

Use all greywater within 24 hours of collection.

Grow only non-food plants or food plants with crops that will be cooked before consumption.

Use irrigation methods that minimise contact of greywater with above-ground plant parts.

If using on lawns, avoid direct human contact for 8 hours after irrigation.

If using on crops, stop irrigating with greywater 2 weeks before harvesting.

Reduce volume of greywater per application if ponding occurs on surface of irrigated ground, or if water runs off the surface.

Wash all crops well in soapy water after harvest and dry in sunlight.

Peel and cook crops prior to consumption.

Do not:

Do not use greywater falling in this category of use restrictions for **any form of communal gardening**. Do not use greywater if someone in the household has an infectious disease.

Restrictions relating to impacts on plant growth and yield Do:

Use irrigation methods that minimise contact of greywater with above-ground plant parts. Switch to salt-tolerant plants, if plants show symptoms of salt stress.

Do not:

Do not plant or irrigate plants prone to boron toxicity.

Restrictions relating to soil and environmental deterioration

Conclusion

- Implementation of greywater use at a large scale to save potable water and the need for using water from the Nile.
- Study of other water reuse alternatives such as rainwater and stormwater harvesting for large scale implementation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THANK
YOU!