

# INTEGRATED WATER RESOURCES MANAGEMENT AND 3R IN CENTRAL-NORTHERN NAMIBIA

PRESENTED BY: THOMAS KLUGE, ISOE/GERMANY (HEAD OF PROJECT)

IN COLLABORATION WITH:



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# CONTENT

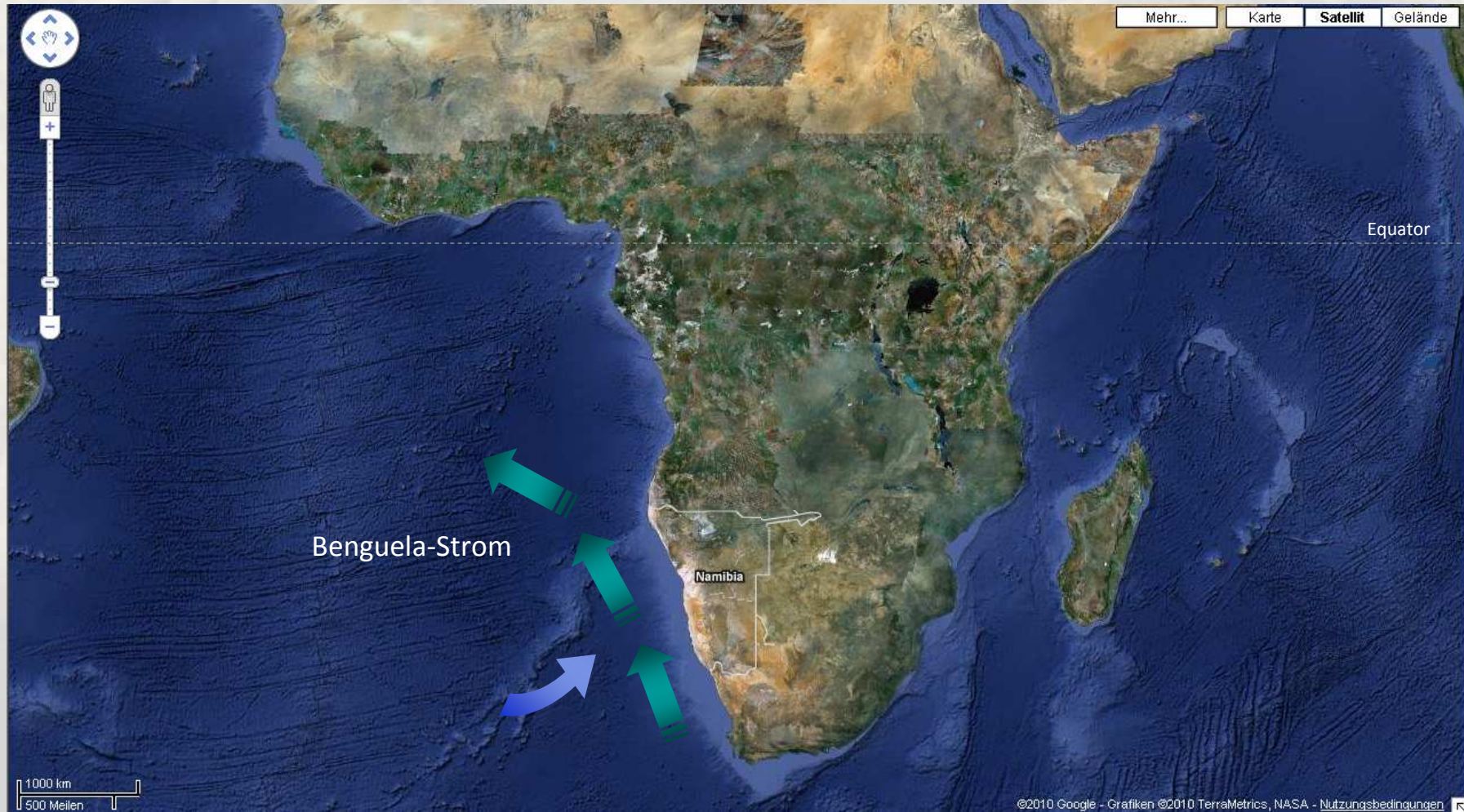
NAMIBIA - THE REGION

CHALLENGES - PROBLEM FIELDS AND CONFLICTS

CUVEWATERS - THE PROJECT APPROACH

TECHNOLOGIES - PILOT SITES

# NAMIBIA: THE DRIEST COUNTRY IN SUB-SAHEL AFRICA



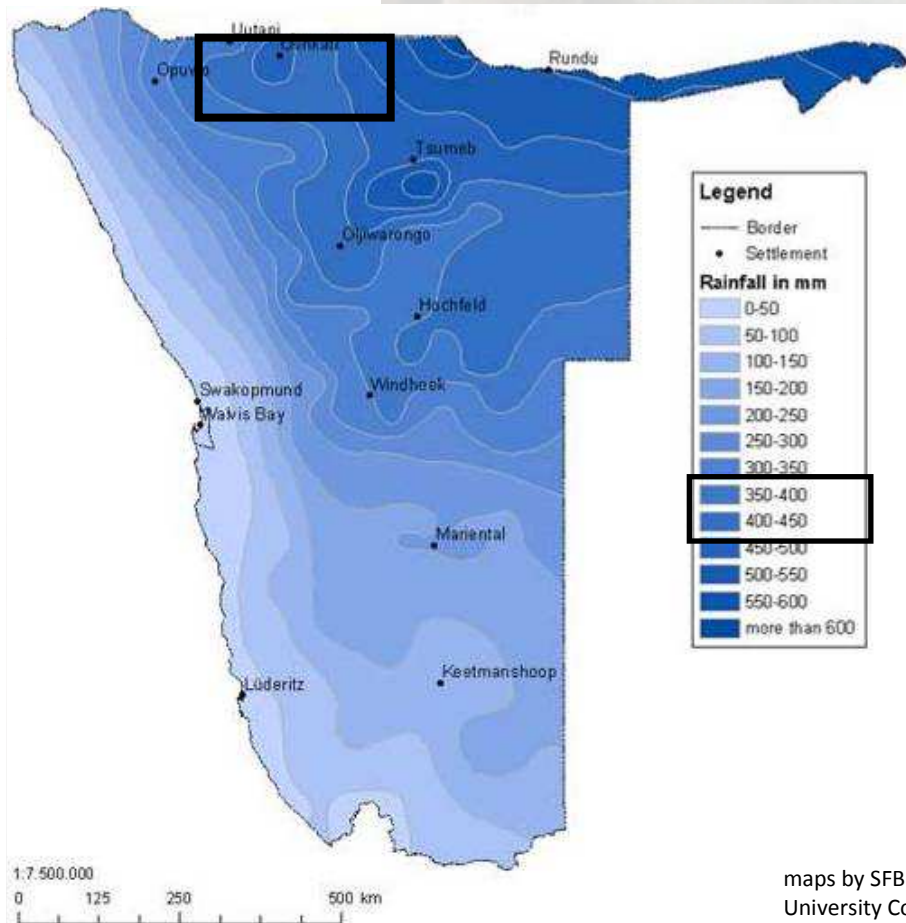
*3R SOLUTIONS TO IMPROVE WATER QUALITY AND QUANTITY*

**IMPROVING THE WATER BUFFER**

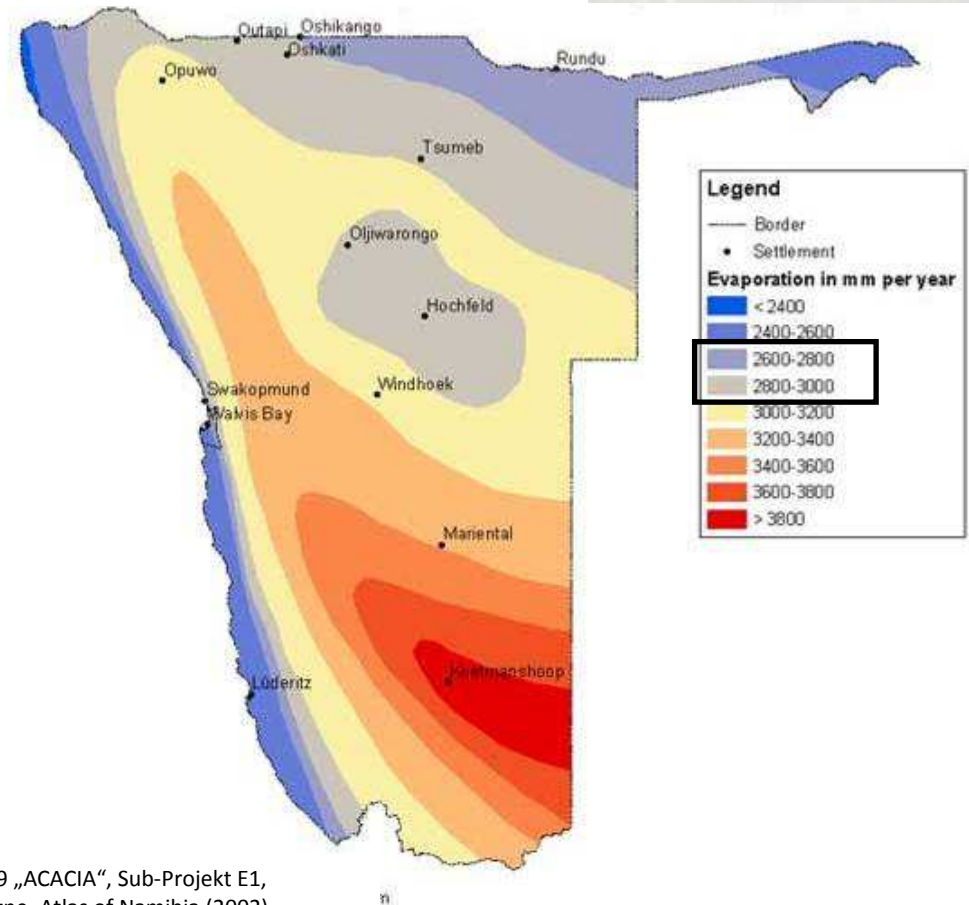


# WATER BALANCE OF NAMIBIA

precipitation:



(potential) evaporation:



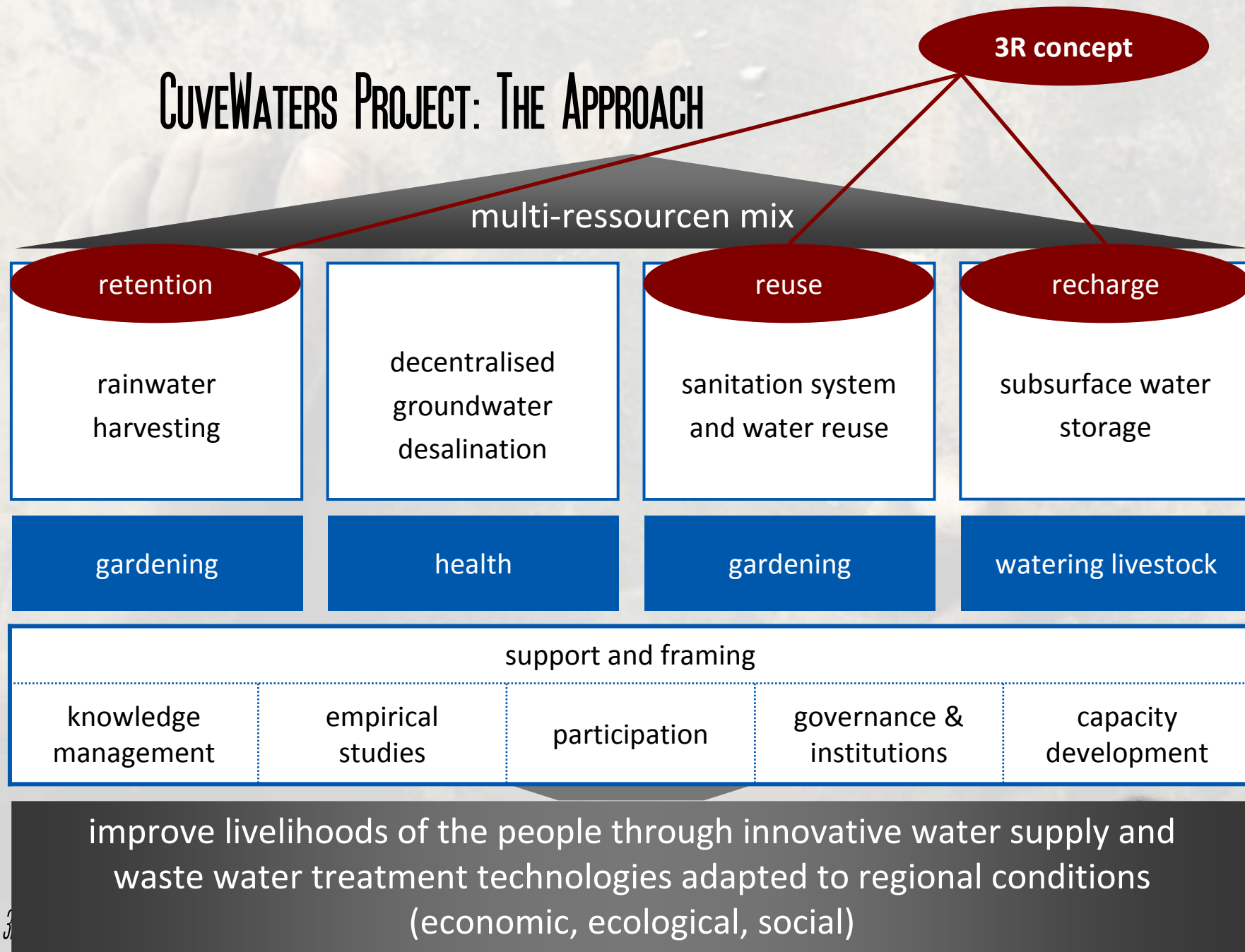
maps by SFB 389 „ACACIA“, Sub-Projekt E1,  
University Cologne, Atlas of Namibia (2002)

# PROBLEM FIELDS AND CONFLICTS

- dependency on transboundary and interbasinal water transfer
  - population density and urbanisation
  - climate variability and extremes
  - wastewater treatment inefficient
  - conflicting water uses
  - land degradation
  - coexistence of traditional and modern institutions
- **increasing requirements and challenges for the management of natural resources**



# CUVEWATERS PROJECT: THE APPROACH



# CENTRAL NORTHERN NAMIBIA: SITES FOR PILOT PLANTS



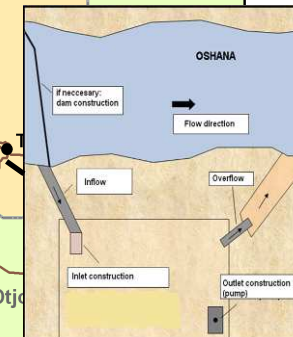
sanitation & reuse



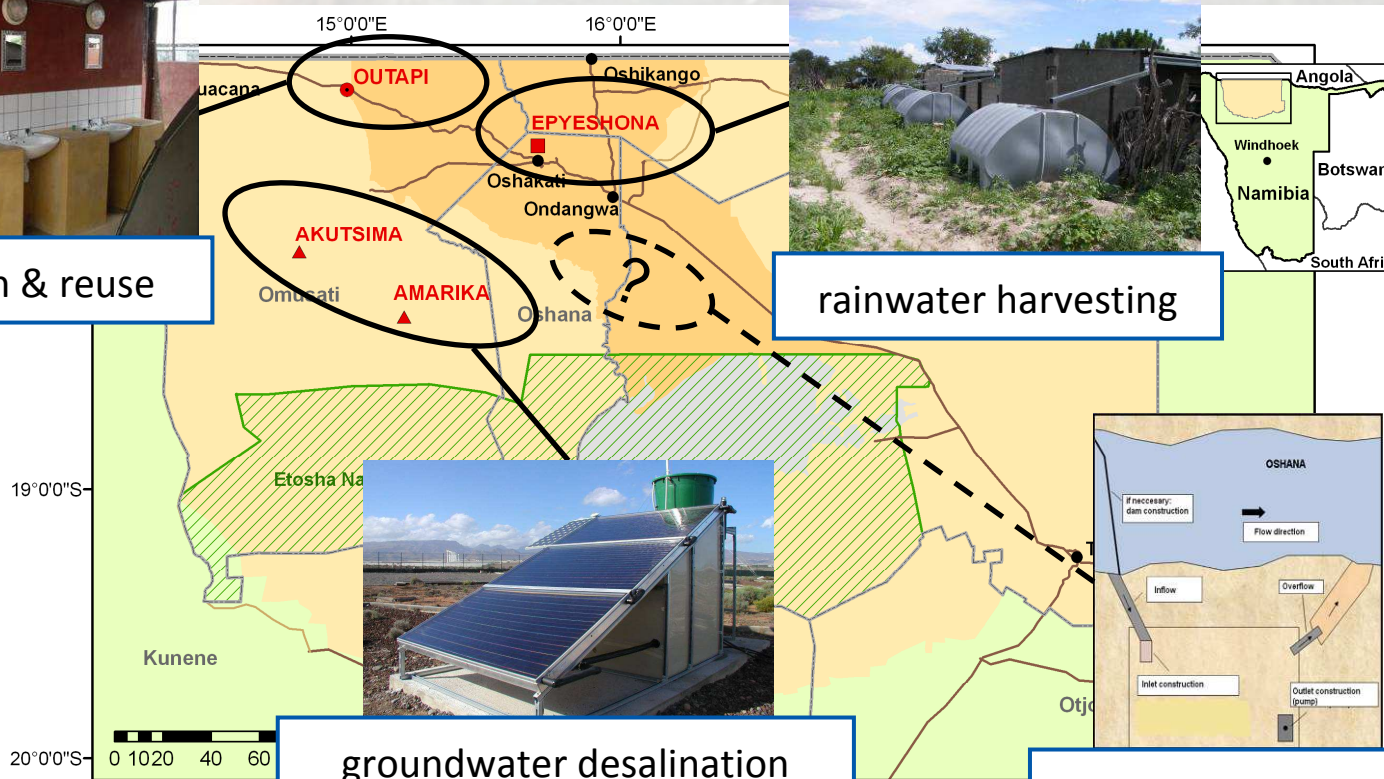
rainwater harvesting



groundwater desalination



subsurface storage



## CuveWaters implementation sites

- ▲ Rural: Groundwater desalination
- Rural: Rainwater harvesting
- Urban: Sanitation & wastewater reuse
- Town
- Cuvelai-Ishana subbasin
- Other parts of the Cuvelai-Etosha basin
- Regional border
- International border
- Tarred road
- Gravel road
- ▨ National Park
- Salt pan

**Cartography:**  
J. Röhrig (2010)

**Data sources:**  
NNEP and EEP,  
MET (2000)

# 3R/RETENTION - RAINWATER HARVESTING: CATCHMENTS

3 different kinds of catchments were built 2009 to 2010

ground catchment



roof catchment with plastic tank



roof catchment with ferrocement tank



# 3R/RETENTION - RAINWATER HARVESTING: NUMBERS, DATA, FACTS

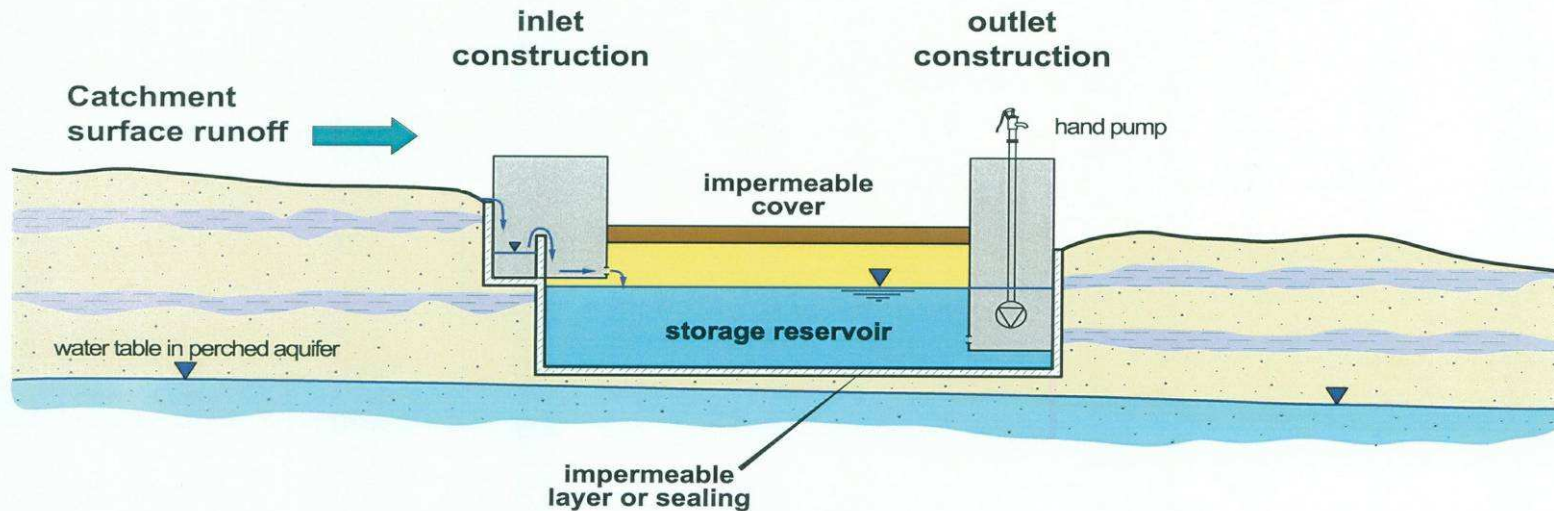
- 9 homesteads supplied by rainwater
- 1.350 m<sup>2</sup> new irrigated gardening area
- 5 trained technicians for the construction of rainwater tanks
- 10 trained construction assistants



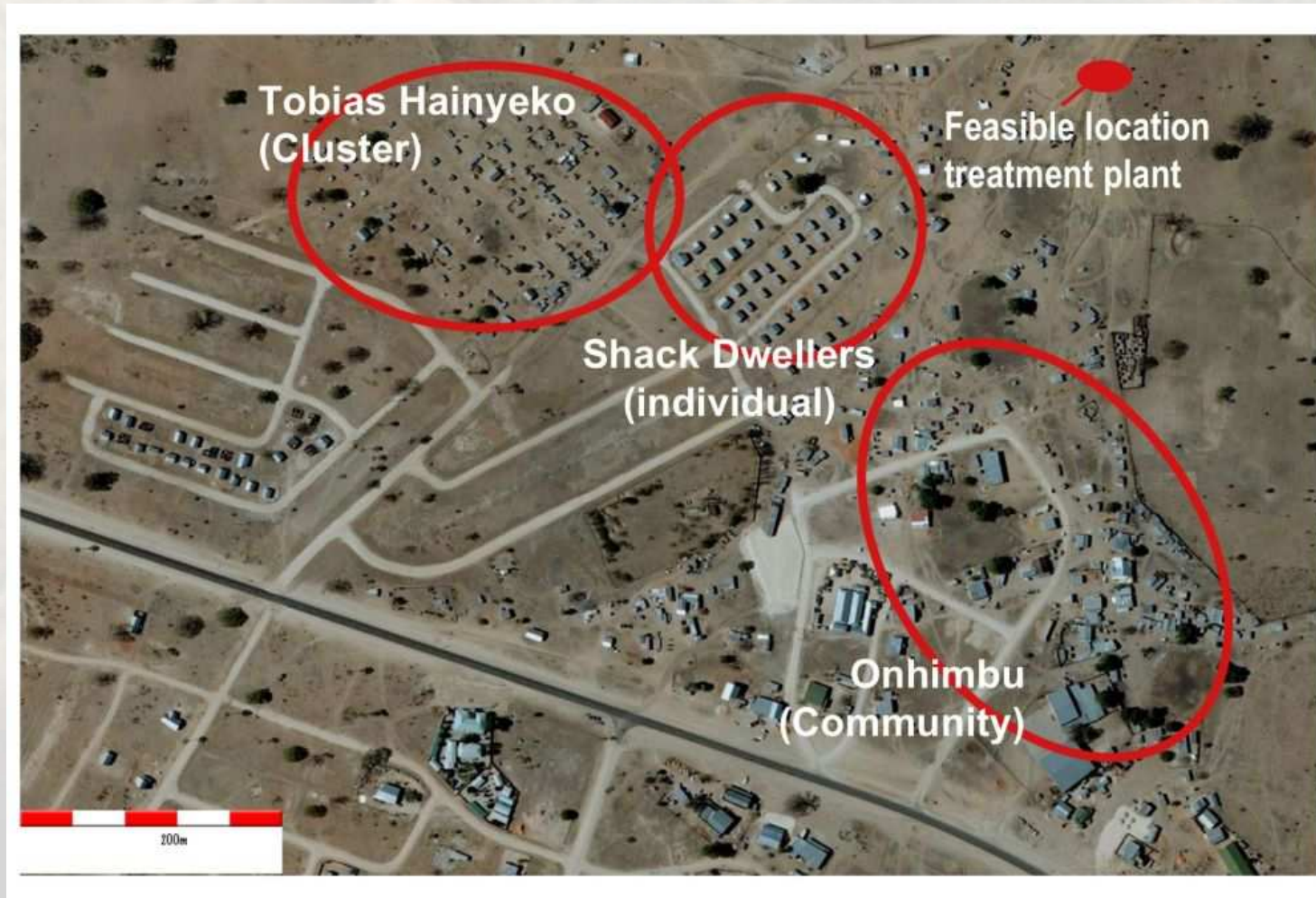
*3R SOLUTIONS TO IMPROVE WATER QUALITY AND QUANTITY*



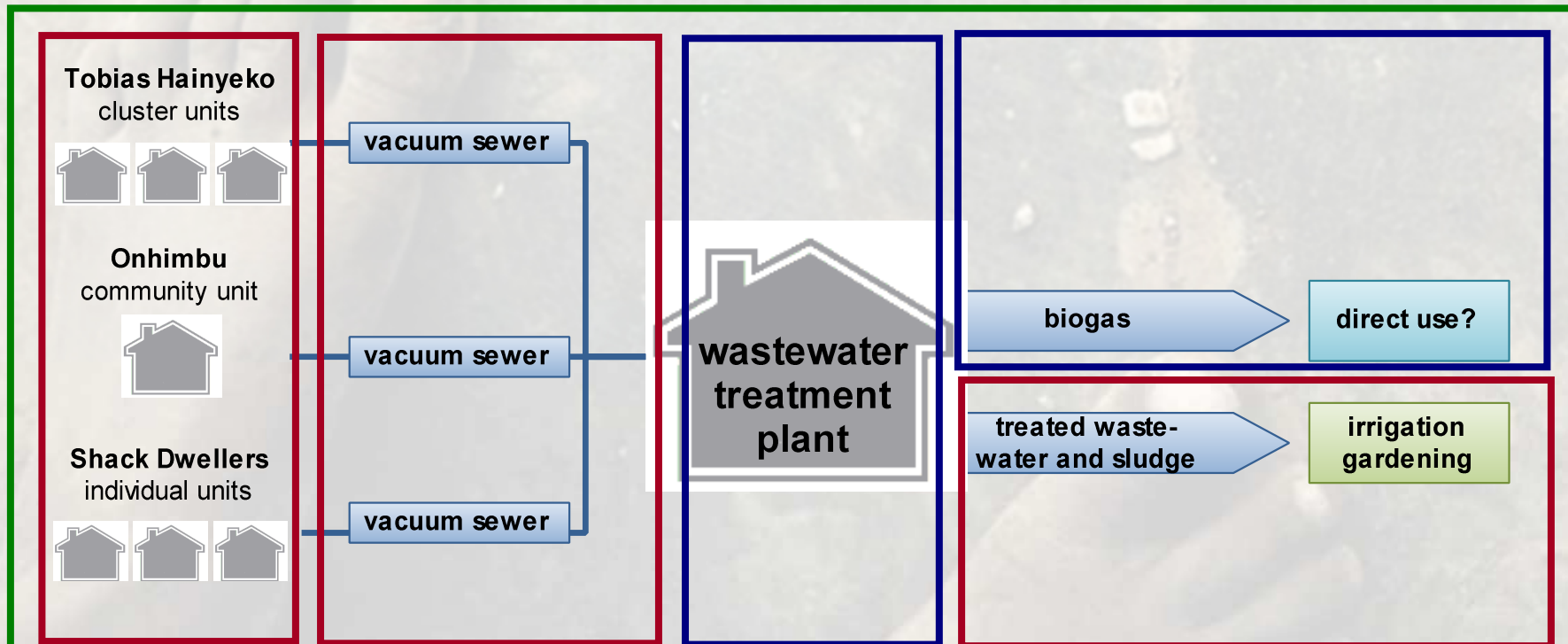
# 3R/RECHARGE - SUBSURFACE WATER STORAGE



# 3R/REUSE - SANITATION & REUSE: URBAN SITES IN OUTAPI



# 3R/REUSE - SANITATION & REUSE: SYNERGIES



- Town council and community are capable to take over the installations at the end of the pilot phase

Thank you for your attention!



More information:  
[www.cuvewaters.net](http://www.cuvewaters.net)  
[www.iso.de](http://www.iso.de)

*3R solutions to improve Water Quality and Quantity*

