

STOCKHOLM 2010

3R WATER QUALITY

3R
MANAGING THE WATER BUFFER



Rainwater Harvesting
Implementation Network



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

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

IN COLLABORATION WITH:



CONTENT

NAMIBIA - THE REGION

CHALLENGES - PROBLEM FIELDS AND CONFLICTS

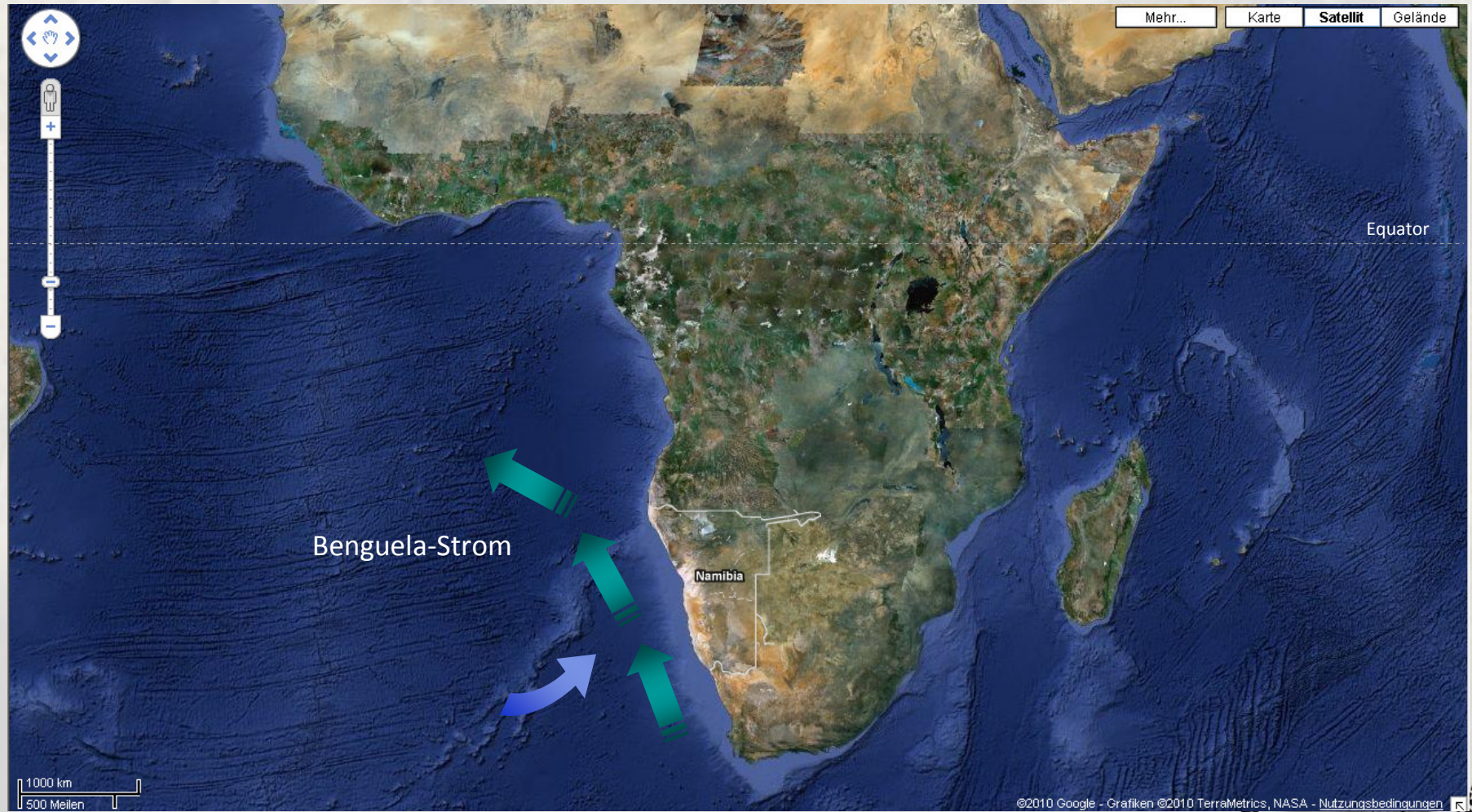
CUVEWATERS - THE PROJECT APPROACH

TECHNOLOGIES - PILOT SITES

3R solutions to improve Water Quality and Quantity



NAMIBIA: THE DRIEST COUNTRY IN SUB-SAHEL AFRICA



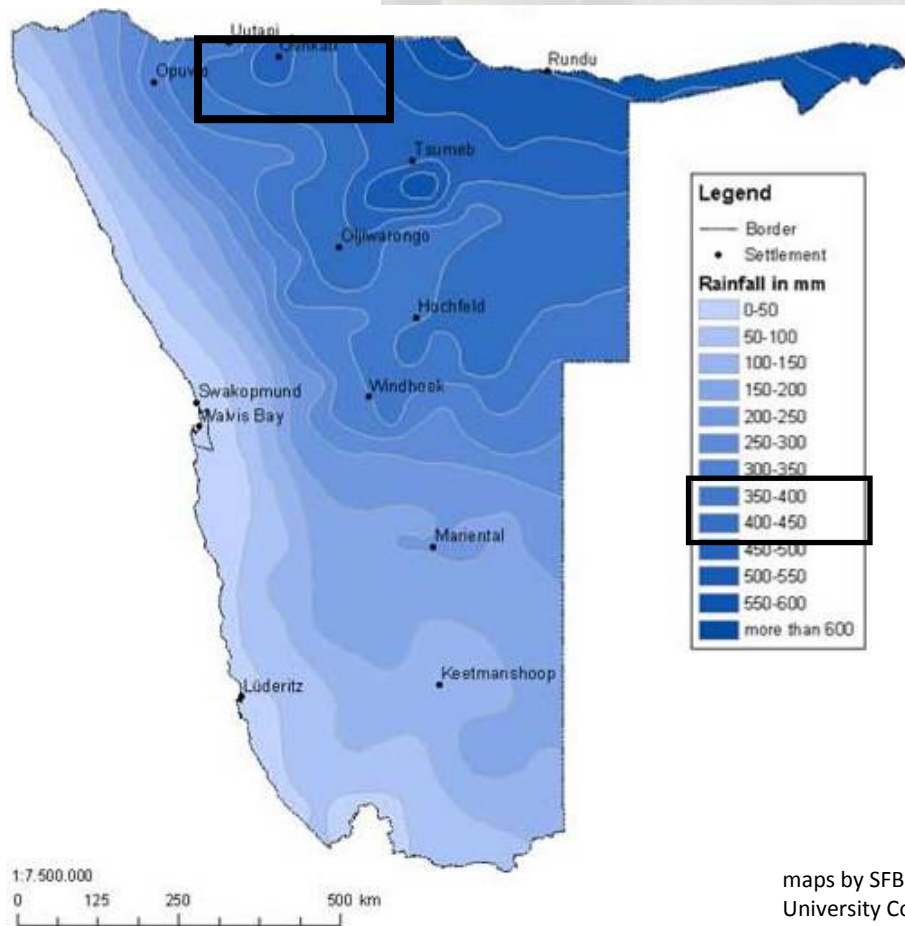
3R SOLUTIONS TO IMPROVE WATER QUALITY AND QUANTITY

MANAGING THE WATER BUFFER

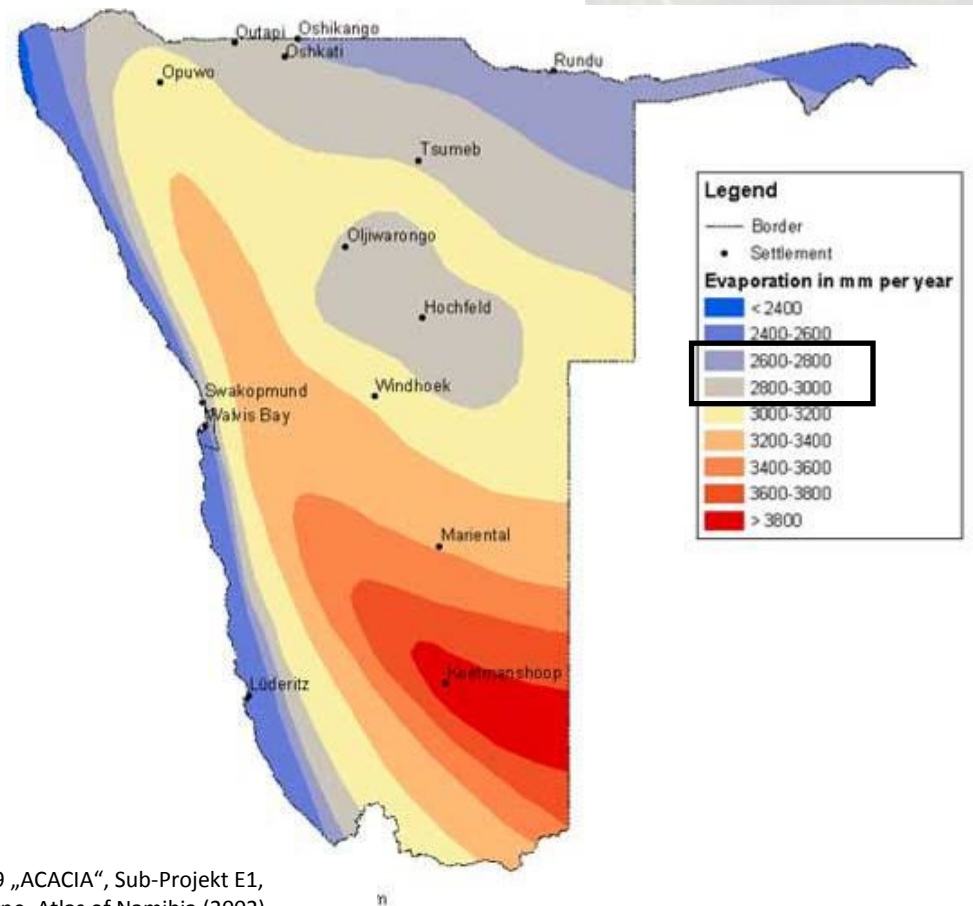


WATER BALANCE OF NAMIBIA

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

3R concept

multi-ressourcen mix

retention

rainwater
harvesting

gardening

decentralised
groundwater
desalination

health

reuse

sanitation system
and water reuse

gardening

recharge

subsurface water
storage

watering livestock

support and framing

knowledge
management

empirical
studies

Participation

Governance &
institutions

capacity
development

improve livelihoods of the people through innovative water supply and
waste water treatment technologies adapted to regional conditions
(economic, ecological, social)

CENTRAL NORTHERN NAMIBIA: SITES FOR PILOT PLANTS



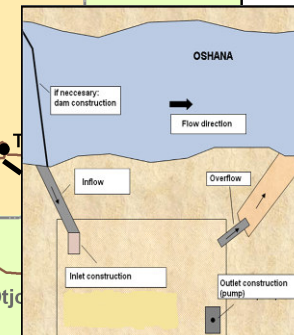
sanitation & reuse



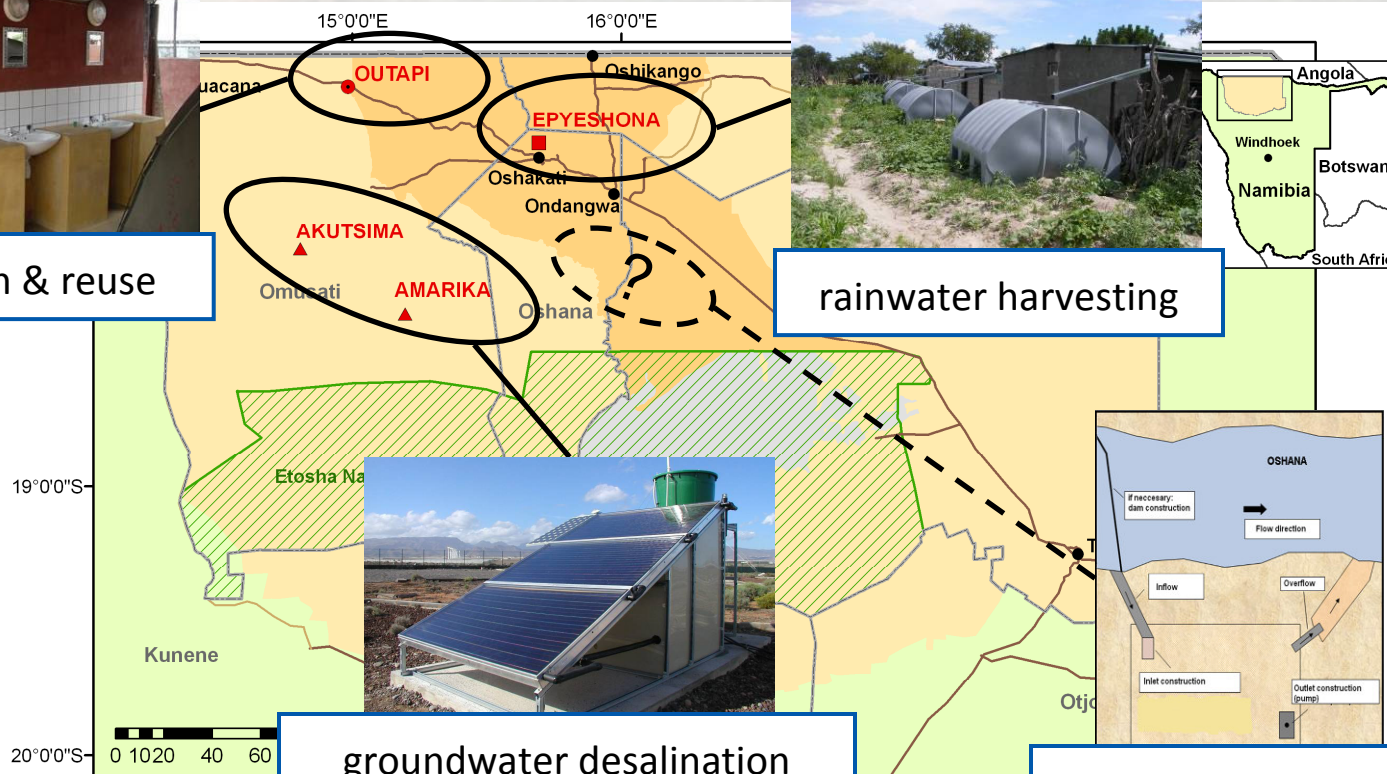
rainwater harvesting



groundwater desalination



subsurface storage



CuveWaters implementation sites

- ▲ Rural: Groundwater desalination
- Rural: Rainwater harvesting
- Urban: Sanitation & wastewater reuse
- Town

- Cuvelai-Etosha 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

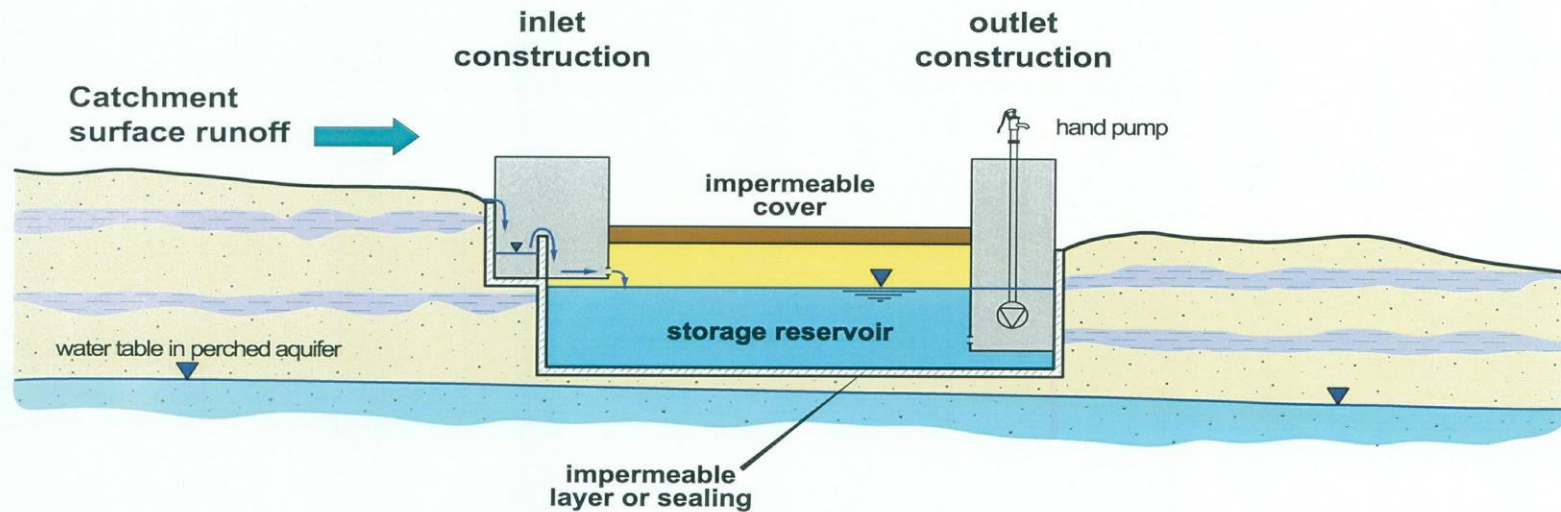
- 9 homesteads supplied by rainwater
- 1.350 m² new irrigated gardening area
- 5 trained technicians for the construction of rainwater tanks
- 10 trained construction assistants



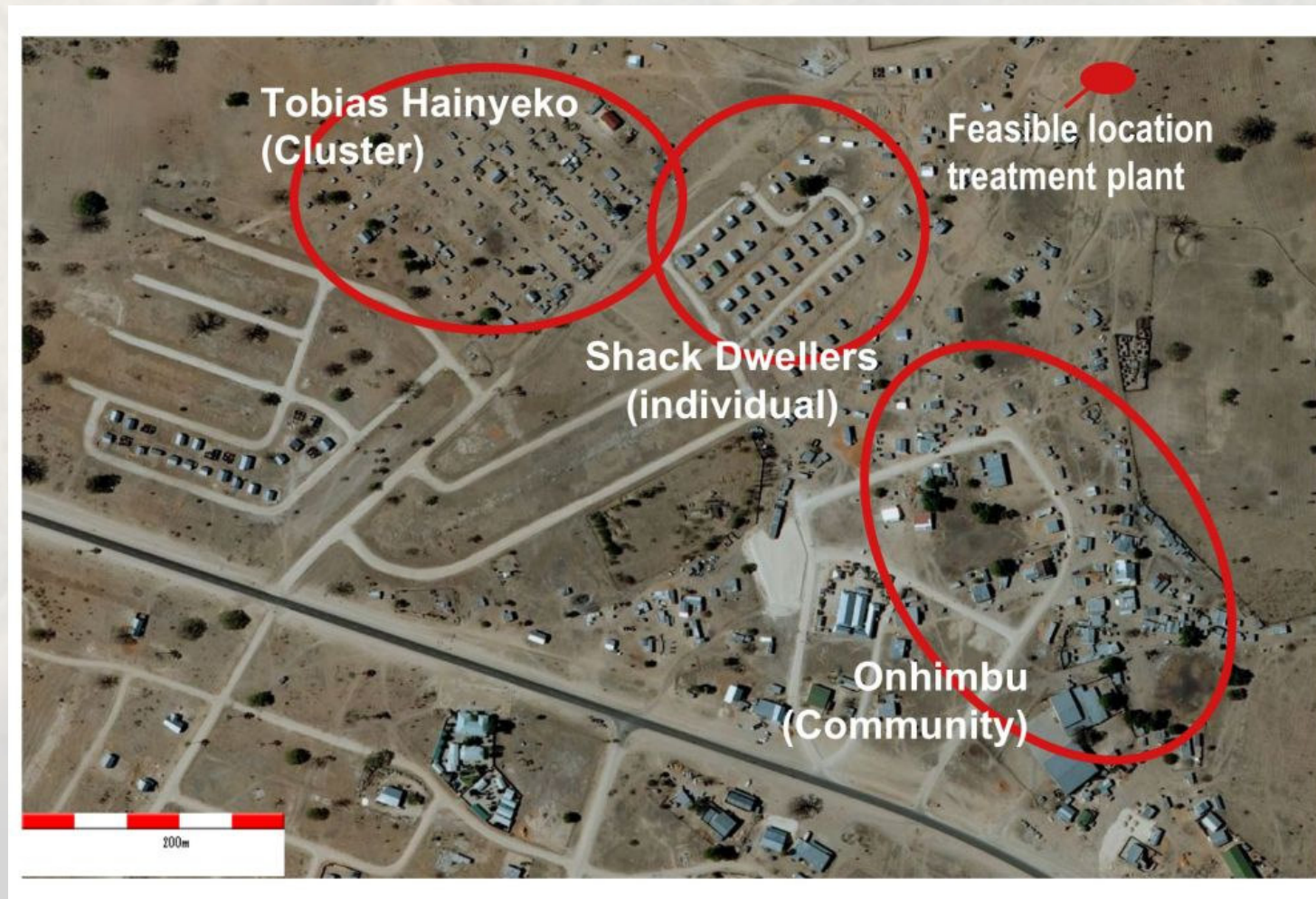
3R solutions to improve Water Quality and Quantity



3R/RECHARGE - SUBSURFACE WATER STORAGE



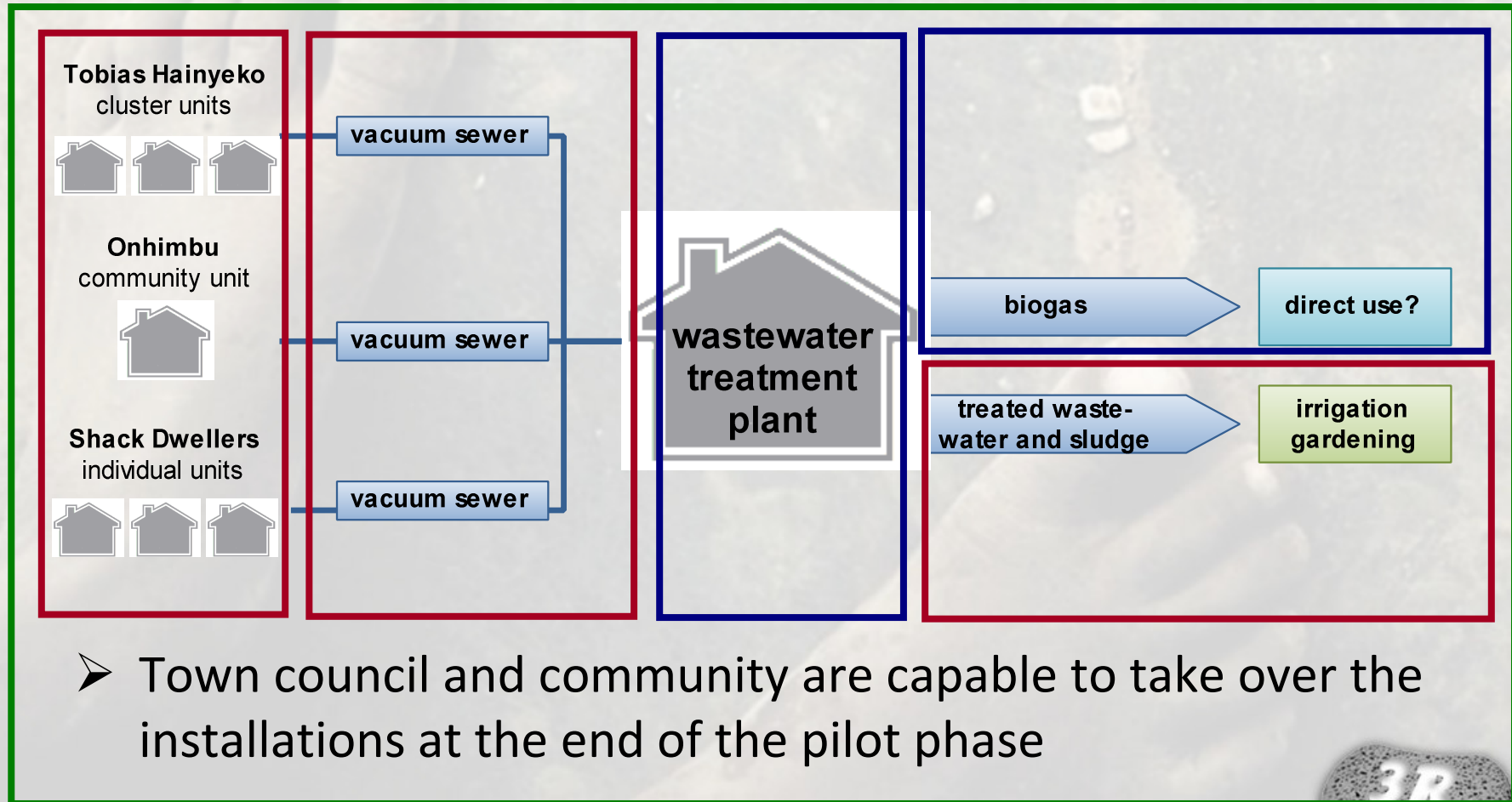
3R/REUSE - SANITATION & REUSE: URBAN SITES IN OUTAPI



3R solutions to improve Water Quality and Quantity



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
www.isoe.de

3R solutions to improve Water Quality and Quantity





THIS AREA IS
PREPARED FOR
FLOOD AND
DROUGHT

IS YOURS?

WWW.BEBUFFERED.COM

