Presentation from

2015 World Water Week in Stockholm

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Constructed Wetland for Decentralized Wastewater Treatment in Tanzania Informal Settlements

Workshop: SUSTAINABLE CITIES: A PIPE DREAM OR REALISTIC FUTURE?

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SIWI WORLD WATER WEEK

Outline

- Context
- Approach
- Highlights
- Conclusion

Context

About 60-70% (90%??) of the urban population in Tanzania;

currently lives in unplanned informal settlements,

relying mostly on pit latrines and septic tank soak away systems for sanitation.

Context Cont'd

Major problems with pit latrines and septic tanks are;

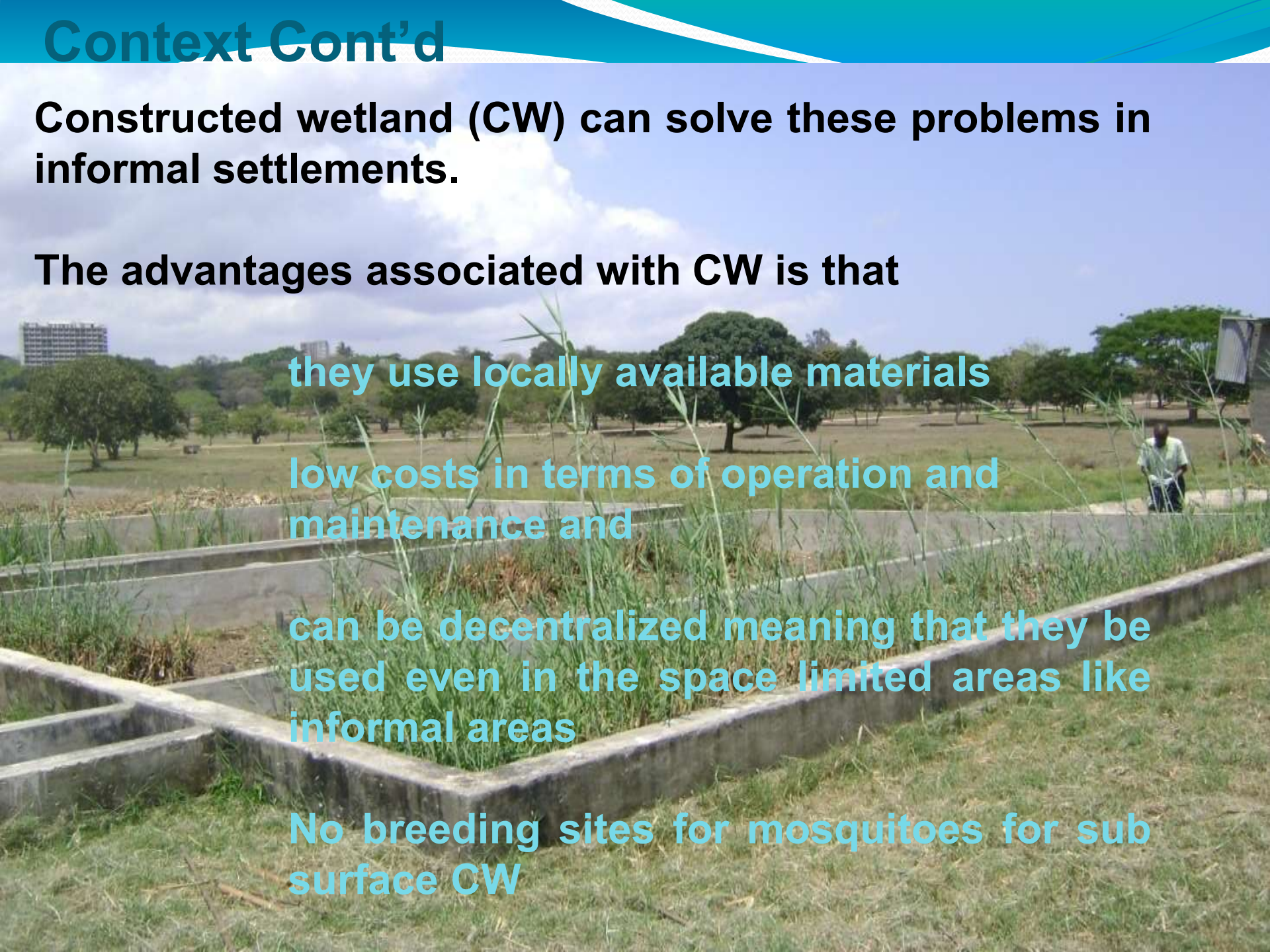
leakages caused by poor construction,
flooding of low lying areas and

lack of maintenance

Context Cont'd

Constructed wetland (CW) can solve these problems in informal settlements.

The advantages associated with CW is that



they use locally available materials

low costs in terms of operation and maintenance and

can be decentralized meaning that they be used even in the space limited areas like informal areas

No breeding sites for mosquitoes for sub surface CW

Context Cont'd

The main objective of the study was

To determine the technical feasibility of CW in terms of the performance treatment with respect to organic compounds (TSS and BOD_5) and pathogens (Fecal Coliform-FC)

To identify the current financial mechanisms for construction, operation and maintenance of the CW

To explore the potential of alternative financial mechanisms in informal areas


worldatlas
North Atlantic Ocean
EUROPE
Mediterranean Sea
MIDDLE EAST
23°5'N
TROPIC OF CANCER
Red Sea
AFRICA
Arabian Sea
0°
N
W
E
S
Lake Victoria
EQUATOR
0°
South Atlantic Ocean
PRIME MERIDIAN
TANZANIA
Indian Ocean
23°5'S
TROPIC OF CAPRICORN
1000 mi
1000 km
0°
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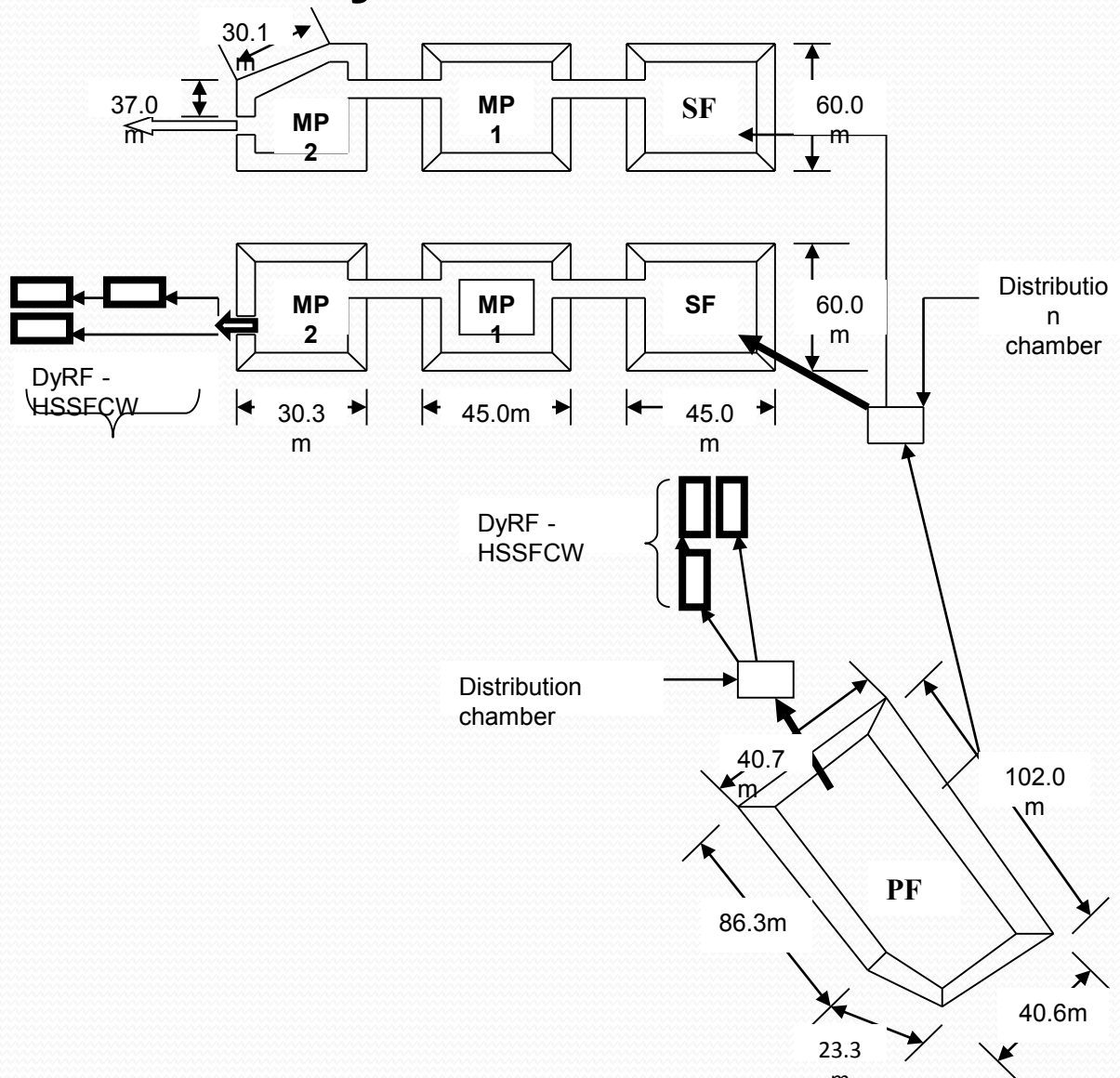
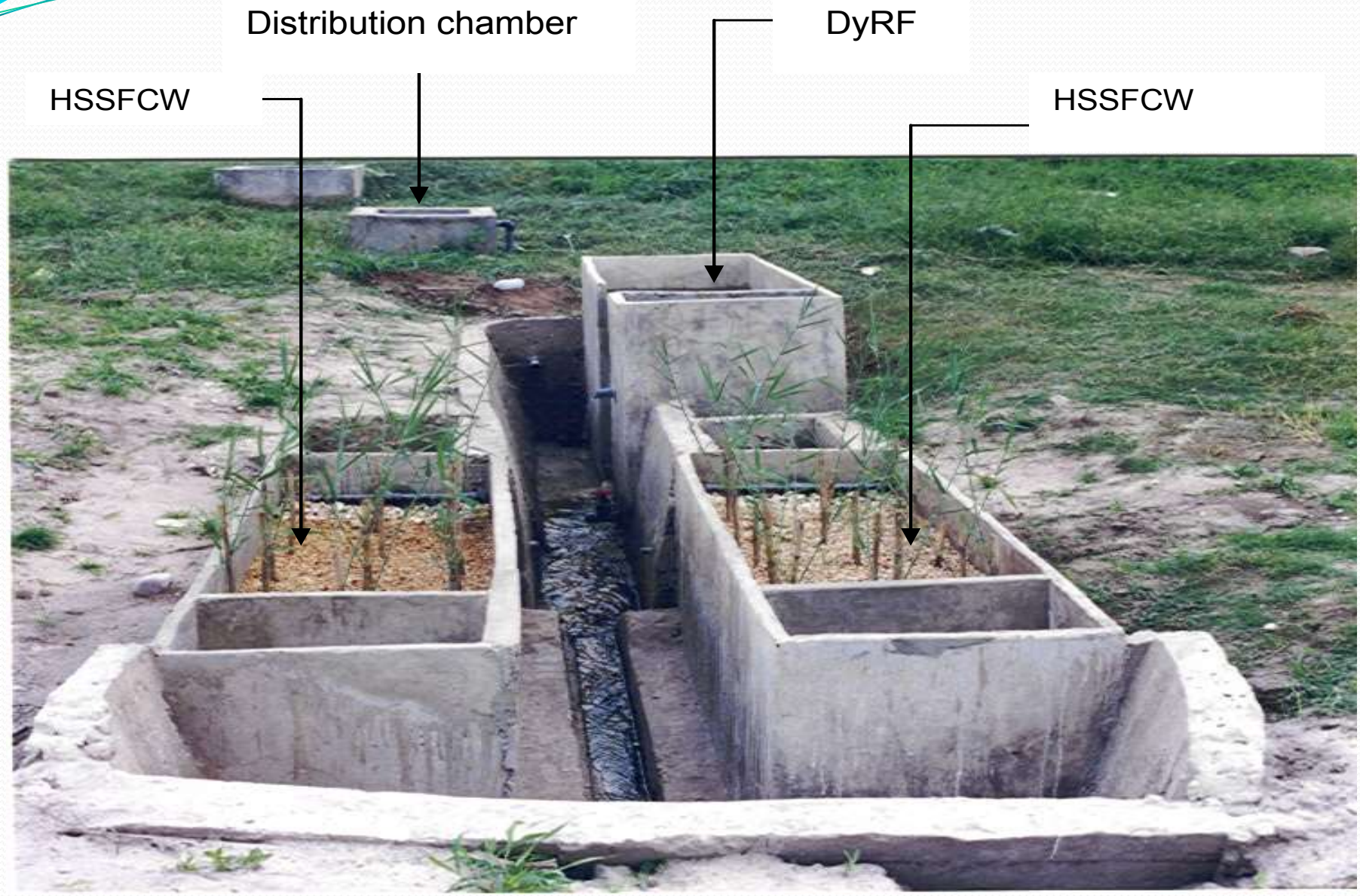
Approach

- **Technical Feasibility**



Approach

Technical Feasibility



Approach

Technical Feasibility

Approach

Technical Feasibility

A pilot CW was constructed at the University of Dar es Salaam

Dimensions of 0.6-m wide, 1.75-m long and 0.6-m deep

Packed by gravels (aggregates)

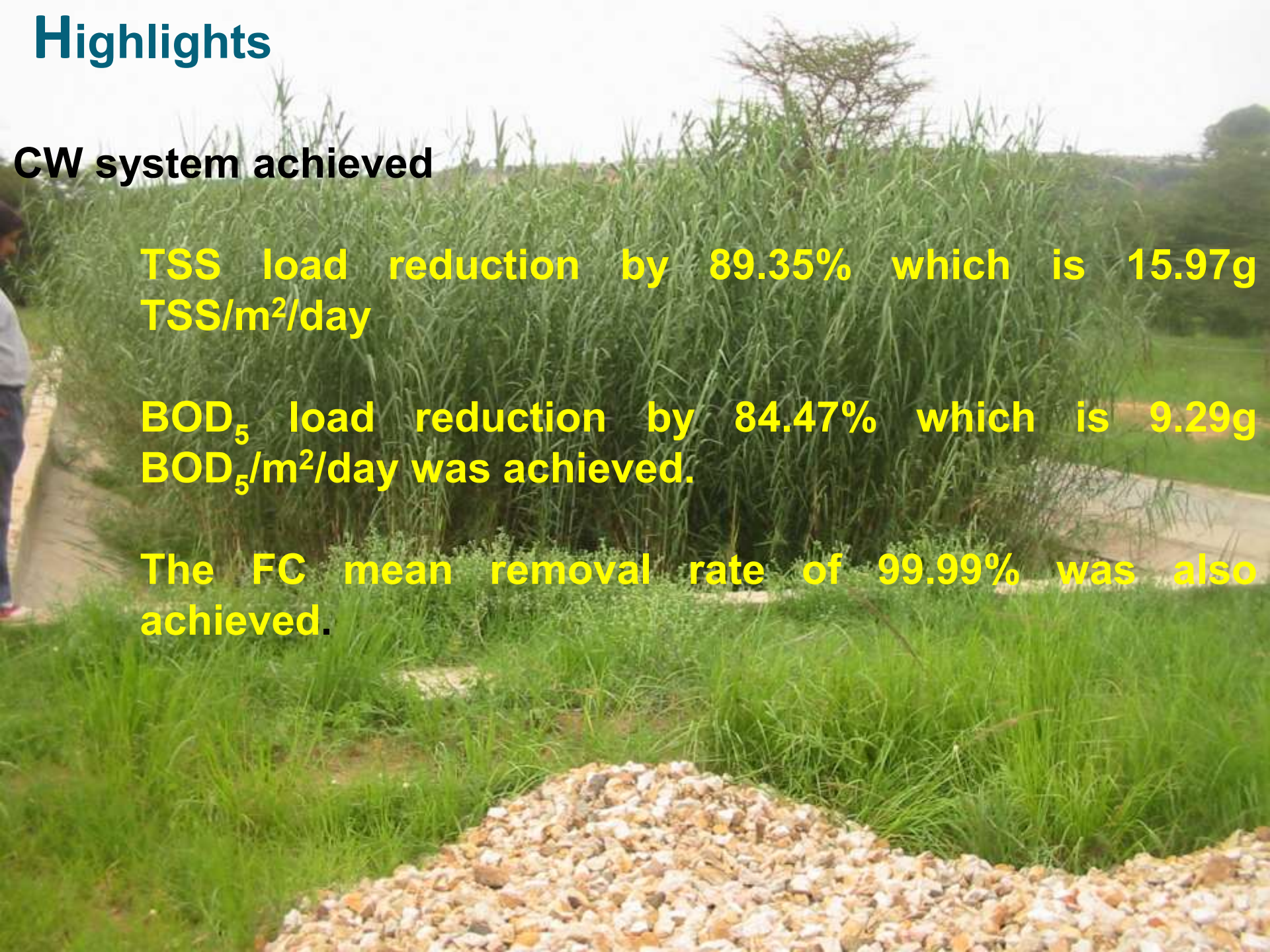
Planted with *Phragmite Mauritianus*

Approach

Current Financial Mechanisms and Exploration of Innovative Funding Mechanisms

Using structured and semi-structured questionnaires, interviews and field observations tools

Highlights



CW system achieved

TSS load reduction by 89.35% which is 15.97g TSS/m^2/day

BOD_5 load reduction by 84.47% which is 9.29g BOD_5/m^2/day was achieved.

The FC mean removal rate of 99.99% was also achieved.

Highlights Cont'd

By achieving

mean effluent TSS of 12.64±4.12mg/l,

mean effluent BOD_5 14.12 ± 3.84mg/l

mean effluent FC concentration of 790 FC/100ml

It was thus concluded that application of CW technology can be considered technically as one of the most appropriate technologies for wastewater treatment in informal settlements of Tanzania.

Highlights Cont'd

- In terms of the current financial mechanisms, the study has identified

  - National authorities, external support agency and regional and local authority, with the type of funding being subsidies, loans, grants and salary payment (7%),

  - Private sector which provides loans and financing (23%),,

  - NGOs, CBO with the type of funds being grants, soft loan, donations of material, salary payment (47%) and community/user which provides taxes and tariffs constituting (14%)

  - With others which include household contribution and in kind contribution was 9%.

Highlights Cont'd

- For informal areas of Tanzania it is seen that the main contribution of financial mechanism is
  - NGOs, CBOs followed by
  - Private sector and
  - Least from regional and local authorities.
- Furthermore, a willingness to pay for CW analysis reports that
  - 35% are willing to pay in cash for CW in their area,
  - 40% are willing to contribute through labor charge and
  - 25% are not willing to pay in their area due to the fact that they are aged and don't have enough money.

Conclusions

Financial mechanisms for building CWs that have a potential for future in informal areas of Tanzania include

micro credit savings,

government subsidy,

public financing, and private sector in complimentarily nature.

The study concludes that there is no single financial mechanism that suits CW but a combination of different financial mechanisms is crucial for sustainability of the financial mechanisms.

Thank You Very Much for Your Attention