

# International Maji Scientific Conference

31 January – 2 February 2024, Dar es Salaam, Tanzania



## Rainwater Harvesting and Climate Change Adaptation

Han Heijnen  
IWA RWHM & President IRHA  
[Han.Heijnen@IRHA-H2O.org](mailto:Han.Heijnen@IRHA-H2O.org)



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The IWA RWHM Specialist Group brings together IWA members and their capacity to understand and

promote the role and importance of rainwater harvesting to achieve SDG6 for drinking and non-drinking water on a decentralized basis, and to advocate rainwater management adaptation measures to mitigate climate effects in cities, islands, agriculture and ecosystems.



IRHA's mandate is to promote rainwater harvesting as an effective and sustainable adaptation to water scarcity and climate extremes due to climate change.

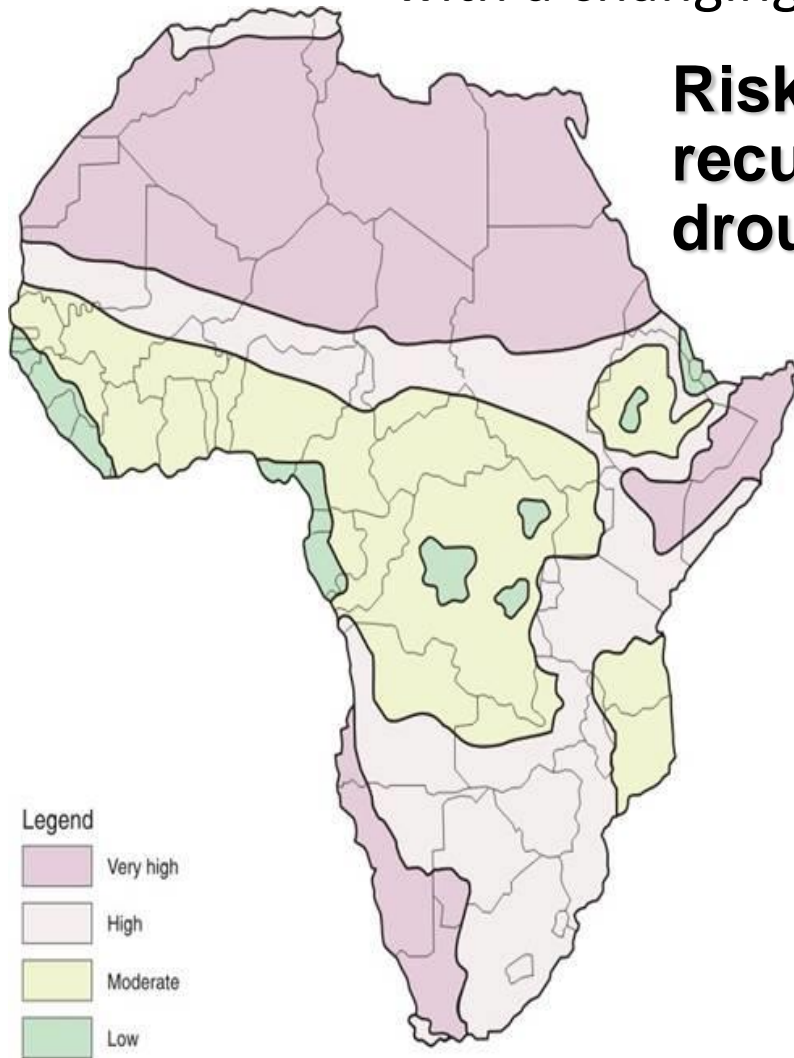
The Alliance includes national RWH NGOs in Korea, Cambodia, Sri Lanka, Nepal, Malawi, Senegal, USA, Brazil and Mexico.

[contact: [www.irha-h2o.org](http://www.irha-h2o.org)]



People have been living with water shortages from time immemorial, but population growth and urbanization, combined with a changing climate requires us to act and adapt urgently

## Risk of recurrent drought



or intense rain, travelling fast and not able to penetrate the hardened soil.

**A lost opportunity !**

# South African Health Review 2016



## How sad!

- They spend so much time and energy collecting water
- Less school attendance
- Less hygiene, resulting in less health

What about the elderly and the chronically ill?

# Rainwater harvesting: essential part of Integrated Water Resources Management



- Synergy with agriculture enhancing food security
- Aquifer recharge/soil and moisture conservation
- Raises ecosystem quality and productivity
- Watershed restoration and improvement
- Slows run-off, mitigates flooding, less disasters
- Decentralized resource for domestic water supply
- Improves urban water management (& urban agriculture)



## Rationale

- In all countries, water stress is growing, due to human activity, agriculture, urban development, pollution, etc.
- Droughts are nowadays more frequent, as are extreme weather events leading to floods and disruption
- So, we need to plan and invest in our water security; balancing protection through 'traditional' engineering with **conservation** including 3R practices: retention, recharge and (re-) use later



# Raising resilience and income



- Rainwater Harvesting for Agriculture: collect in ponds, in the field (half moons, pits, bunds, deep bed farming (Tiyeni Malawi: [tiyeni.org/](http://tiyeni.org/))), slowing down water (reducing erosion), green roads for water (borrow pits), spate irrigation

combined with resilient food-systems: agro-forestry, agro-ecology , permaculture, etc.

Malawi

Tiyeni deep bed farming

Breaking the hardpan





# Raising sustained resilience



- Watershed restoration/ ecosystem services/ greening the landscape (Farmer Managed Natural Regeneration – JustDiggit), managed aquifer recharge, etc.



Nepal  
Pond in the hills



# Increasingly more RWH actors and functioning examples



National RWH NGOs: **SearNet**  
Southern and Eastern African Network  
**Enthusiasm, commitment, output dependent on external funding**

Government Water Agencies  
**Policy & guidance, regulation**

Development Banks and Donors  
**Funding**

Private Sector & Consultants,  
**Piloting, implementation**

Universities & Consultants  
**Research, survey, piloting**

**Still limited funding,  
Slow expansion,  
Action please. . .**

**Membership**  
**Legally registered** National Rainwater Associations of Botswana, Ethiopia, Kenya, Malawi, Rwanda, Somalia, Tanzania, Uganda, Zambia, and Zimbabwe  
**Associates:** Burkina Faso, Burundi, Ghana, Mozambique, Namibia, South Africa, Swaziland,

Experiences from SearNet

WORLD AGROFORESTRY CENTRE

It leads to good work, such as adoption of deep-bed farming by Govt. of Malawi; Sponge Town in Nakuru, Kenya; Green Roads for Water application, flood-based farming etc. Planners need to learn from these examples and see how they can use these experiences to further water security and reduce harmful flood events



# Community sand dam with well

Ethiopia





# Raising resilience and convenience



- Rooftop Rainwater Harvesting: water for home, school or hospital – can easily be treated for drinking, otherwise use as is for cleaning, flushing, etc.

Malawi  
Calabash  
Cistern







Published on *Parliament of Uganda* (<https://www.parliament.go.ug>)

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## Motion on rainwater harvesting and storage Bill tabled



**Posted on:** 11 Oct 2023

The House has granted Tororo Municipality Member of Parliament (MP), Hon. Apollo Ofwono Yeri leave to introduce a Private Member's Bill entitled, "The Rainwater (Harvesting and Storage) Bill".

The MP presented the motion seeking leave to introduce the Bill during plenary sitting on Wednesday, 11 October 2023.

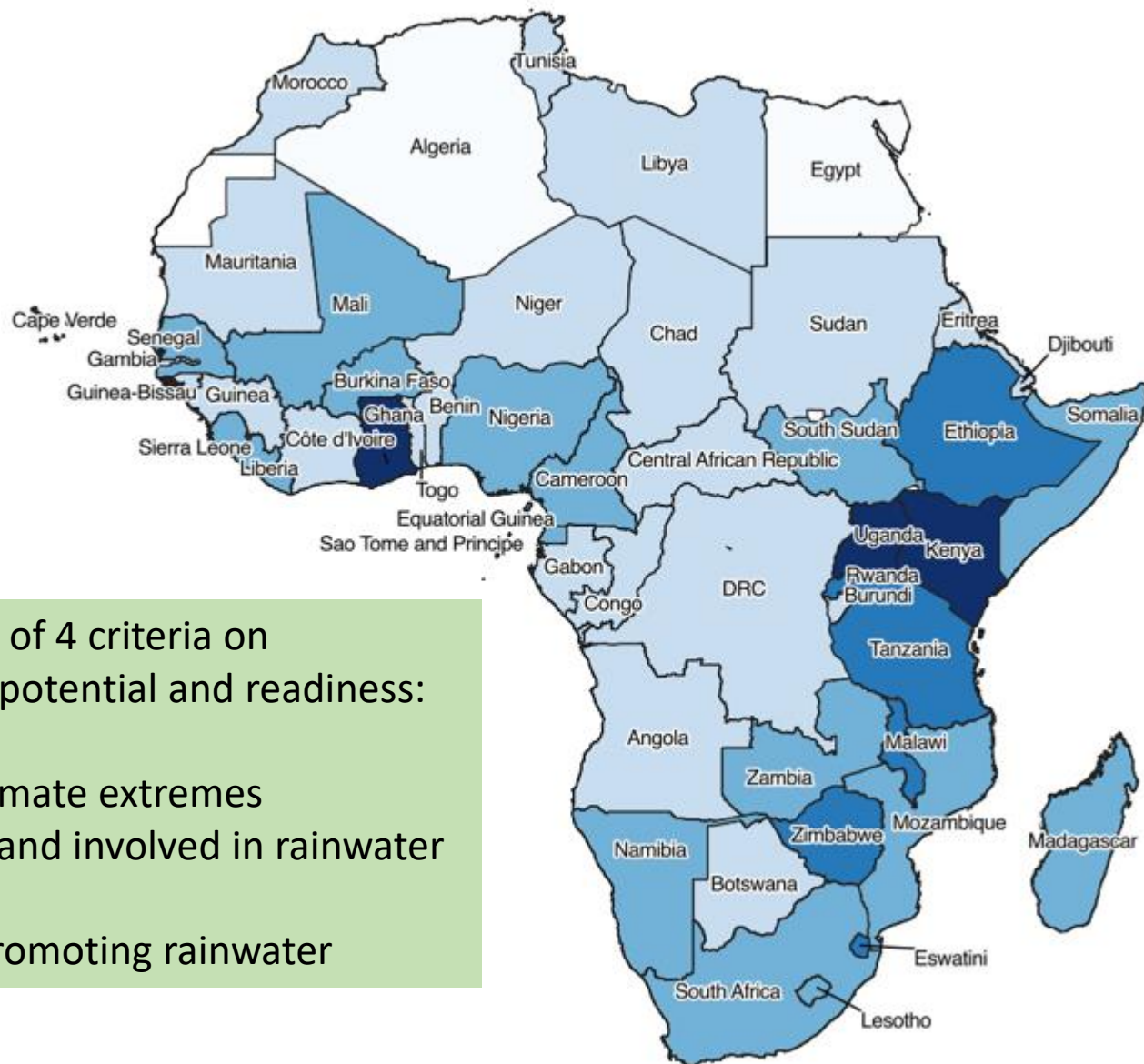
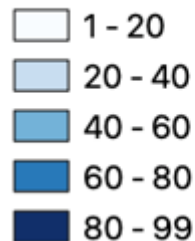
The draft Bill provides for mandatory harvesting and storage of rainwater, to conserve, establish, maintain and manage rainwater harvesting systems and facilities in Uganda.

# Rainwater Harvesting Global Index

Mapping rainwater harvesting potential



## Score rainwater harvesting



Based on assessment of 4 criteria on rainwater harvesting potential and readiness:

- Rainfall variation
- Vulnerability to climate extremes
- Actors promoting and involved in rainwater harvesting
- Policies in place promoting rainwater





UN  
2023 WATER  
CONFERENCE

NEW YORK  
22-24  
MARCH  
2023

# Harvesting rainwater: essential to achieve 6.1 and for water security

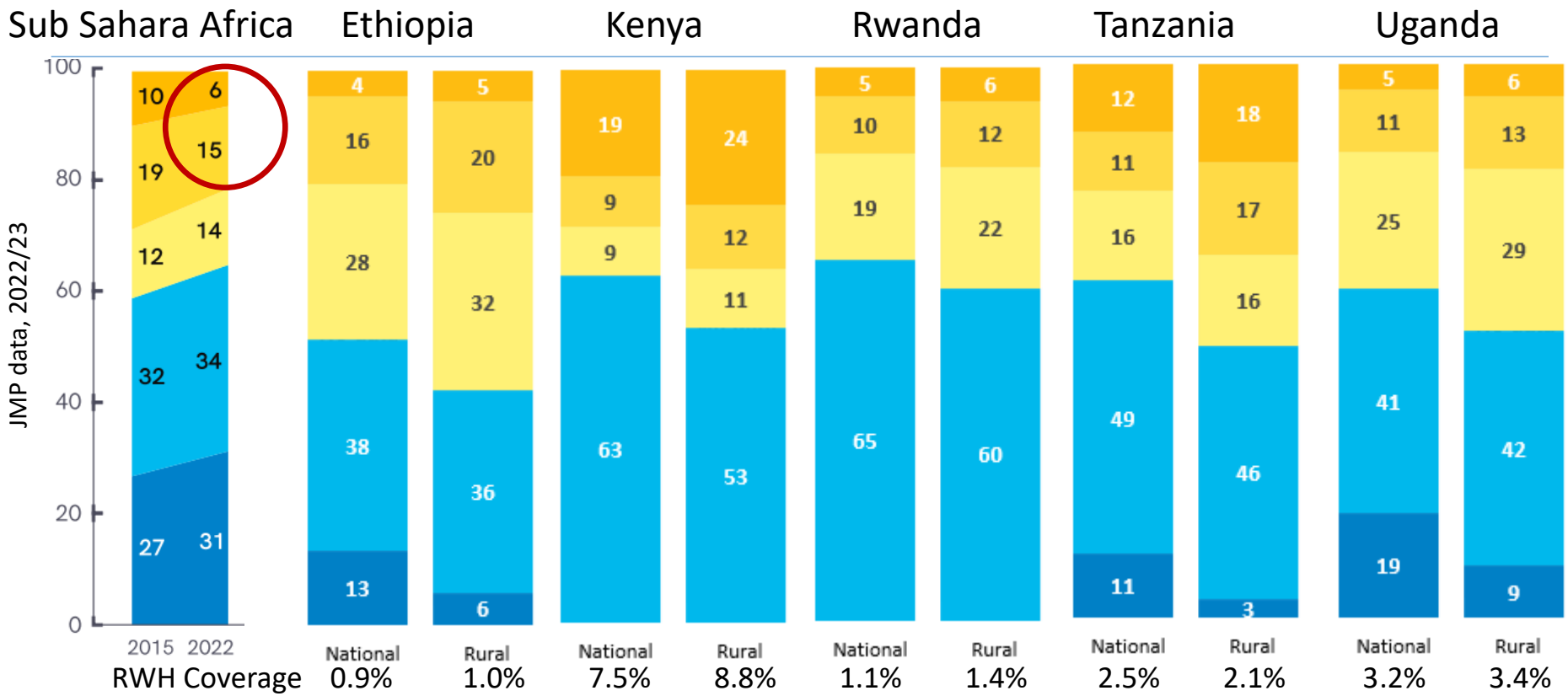
## The Importance of Rainwater Harvesting and Management for realizing SDG 6



Zomba, Malawi

Han Heijnen  
President IRHA  
[han.heijnen@irha-h2o.org](mailto:han.heijnen@irha-h2o.org)





## The remaining SDG 6.1 challenge ! Advanced planning & technology to reduce future water stress:

How to provide the last 21% with water?

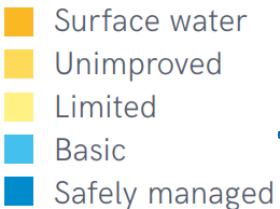
**Communication and water education:**  
Engaging and informing society, people, to conserve and save water, offer suitable options

- Domestic/homestead RWH systems
- Facilitate storing of rainwater: ponds, lakes, managed aquifer recharge
- Integrate rainwater analysis into IWRM and watershed/ecosystem protection

**Good use of rain will make the difference !**

**The world can not afford to waste it !**

**Subsidy Financing**





# Why Domestic Rainwater Collection and Storage ?

- **(Semi-) Arid Areas, Higher Elevation**
  - Retention and conservation for survival: household & agriculture
- **Bad Taste :**
  - Salinity: coastal belts, small islands
  - High iron content of groundwater
- **Better Service : Urban & Rural**
  - Storage gives water security at home, bridges (seasonal) water shortage
- **Substitution : Fluoride, Arsenic,**
- **Savings: less water charges**
- **and offering more convenience**



Uganda

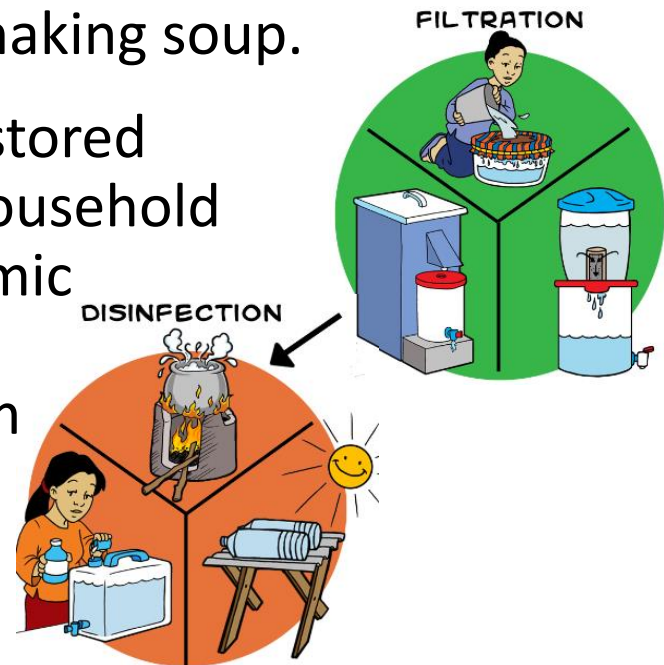


Senegal

# Is collected rainwater safe to drink?

Yes, but make sure your rainwater harvesting systems is clean from collection to storage. If possible use rainwater after boiling, for your cup of tea or for making soup.

To be very sure, one can treat the stored rainwater before drinking with a household treatment method: chlorine, ceramic filter, solar disinfection (SODIS), boiling or any other suitable system available in the market.



**STOP MICROBES  
TREAT YOUR WATER**

Source: CAWST

Check for guidance with  
[https://www.cawst.org/  
services/expertise/hwts](https://www.cawst.org/services/expertise/hwts)



# Water quality



15 February

14h00 - 15h30 CET

Generally good if system is well designed and constructed with first flush, inlet filter, etc.

GUIDELINES FOR DRINKING-WATER QUALITY:

Risk-based regulation, management and surveillance of small water supplies

## Sanitary inspection packages

A supporting tool for the *Guidelines for drinking-water quality: small water supplies*



## Rainwater collection and storage

A rainwater collection and storage system consists of a catchment area (usually the roof of a permanent structure), guttering channels, and downpipes that direct rainwater into a water collection vessel (e.g. storage tank, pot, bucket).

Though rainwater sources are generally considered to be of a higher quality than surface water sources, appropriate disinfection/treatment of rainwater is recommended where there is a risk of contamination.

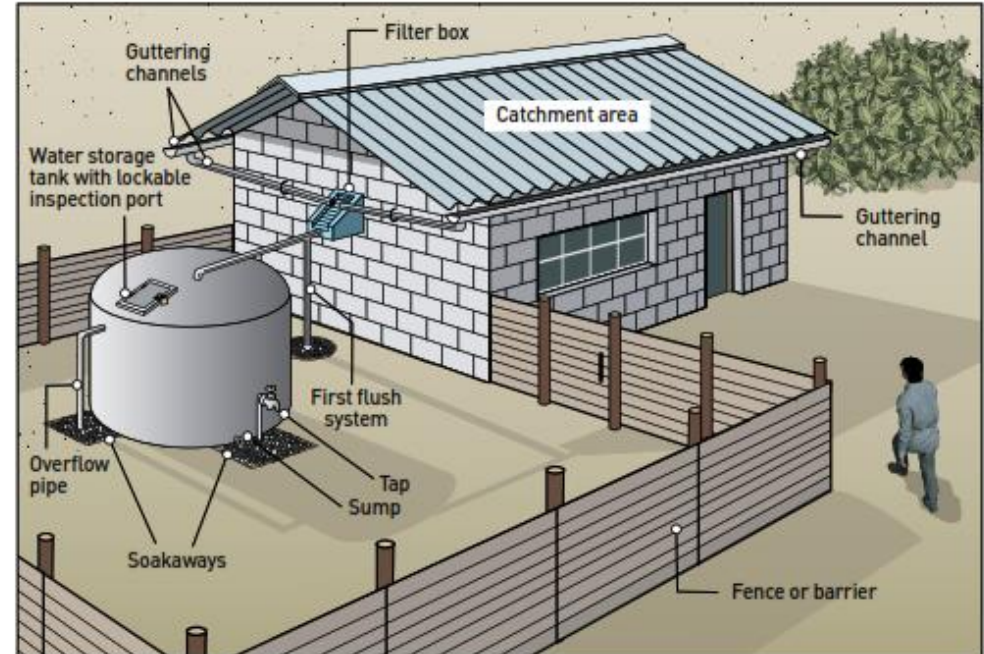


Figure 1 A common rainwater collection and storage system for drinking-water

# Investing in RWH&M, a must to adapt to climate change



- Promote buffering of water in the landscape (ponding, lakes, MAR, half moons, pits, sand dams
  - Invest in capacity to identify opportunity (remote sensing, AI, people, communities)
- Focus on nature-based solutions, especially those that people can largely take up themselves
- Subsidize domestic and farm level RWH, incl. bank loans
- Advocate, explain, encourage, advertise, community action
- IRHA 2018 (JMP 2017): 6-8% of the world population can only be served adequately through rainwater harvesting as other solutions are too expensive or not sustainable.

**In conclusion: without rainwater harvesting the world will not be able to close the gap and achieve SDG 6.1: universal domestic water supply by 2030**



Rain is vital to all life on Earth.

Have you thought about rainwater harvesting this coming season?

Talk to us

**HAPPY RAIN DAY**

#Rainday #GreenerStepsEveryday



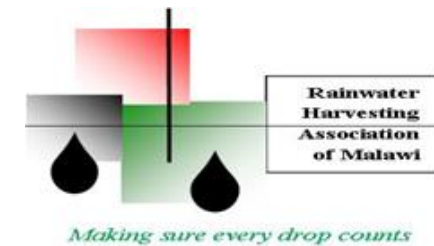
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RHAM/MEAMALAWI  
rainwater harvesting  
promotion  
28 July 2020



IRHA, Geneva





One vision of the future . . . .

Tobang, Nepal

Thank you for your attention

