WATER STORAGE AND GUIDELINES FOR RWH IN RWANDA

MUSABYIMANA Alexis
Water Storage Development Officer
Rwanda Water and Forestry Authority

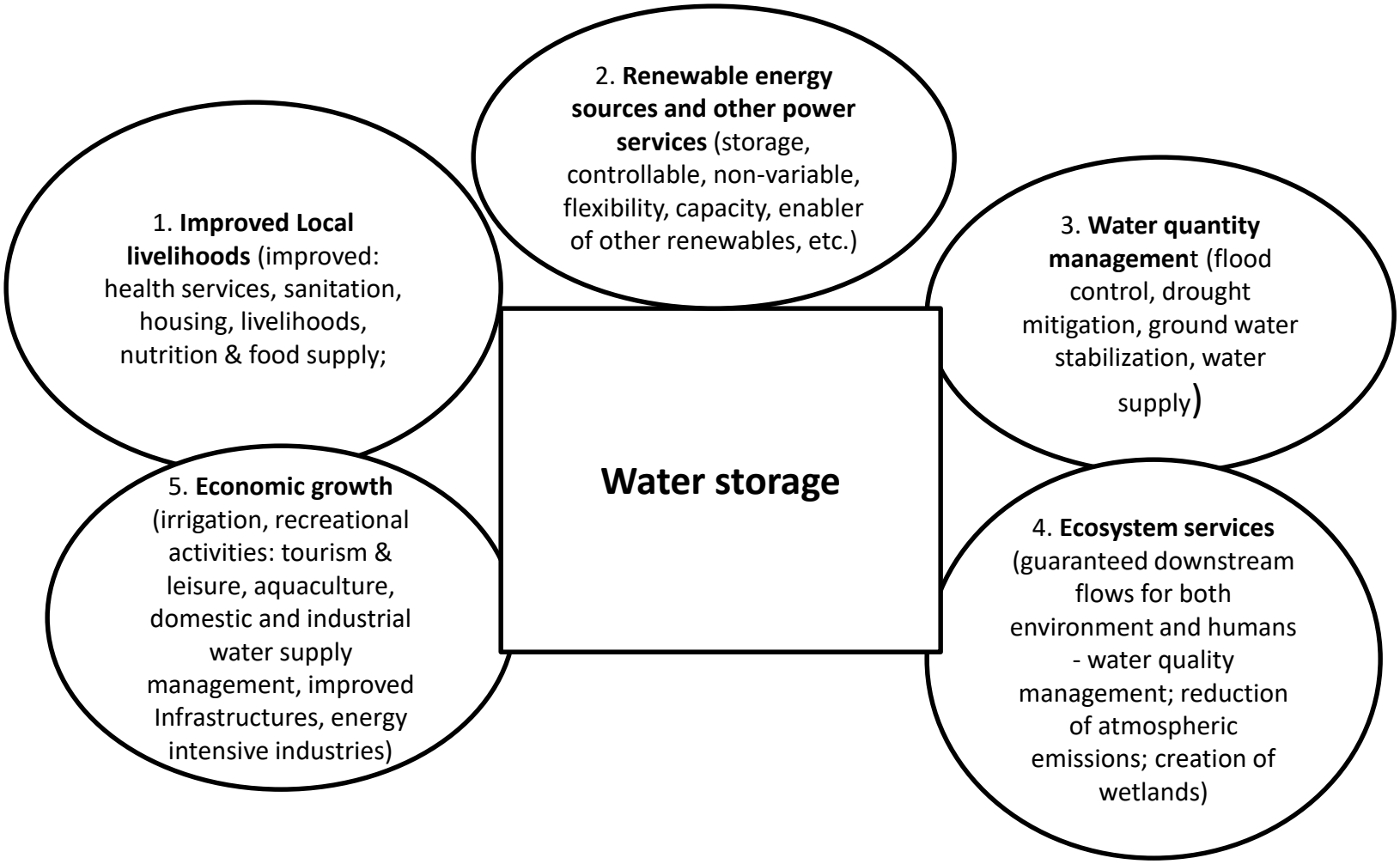
Introduction

- In the context of the current climate change where rains are no longer predictable, there is need to understand how water is distributed and how related impacts can be managed.
- The rains can either be so intense and cause extreme floods or minimal and cause severe drought.
- The two extremes can be dealt with, by investing in water storage systems

Introduction, cont.

- The NWRM has classified Rwanda as water scarce country with r***enewable water resources availability*** is ***670 m3/capita/annum*** compared to normal of 1700m3 per capita;
- *Artificial water storage per capita* of only *6.8 m3*;
- *EICV5 (*2016/2017), revealed that only 14.5% of households have rainwater management systems;
- Rwanda needs to invest in appropriate water storage infrastructures to ensure sustainable and reliable productivity of water related investments (agriculture, energy, domestic water supply, etc.)

Water storage and its associated advantages

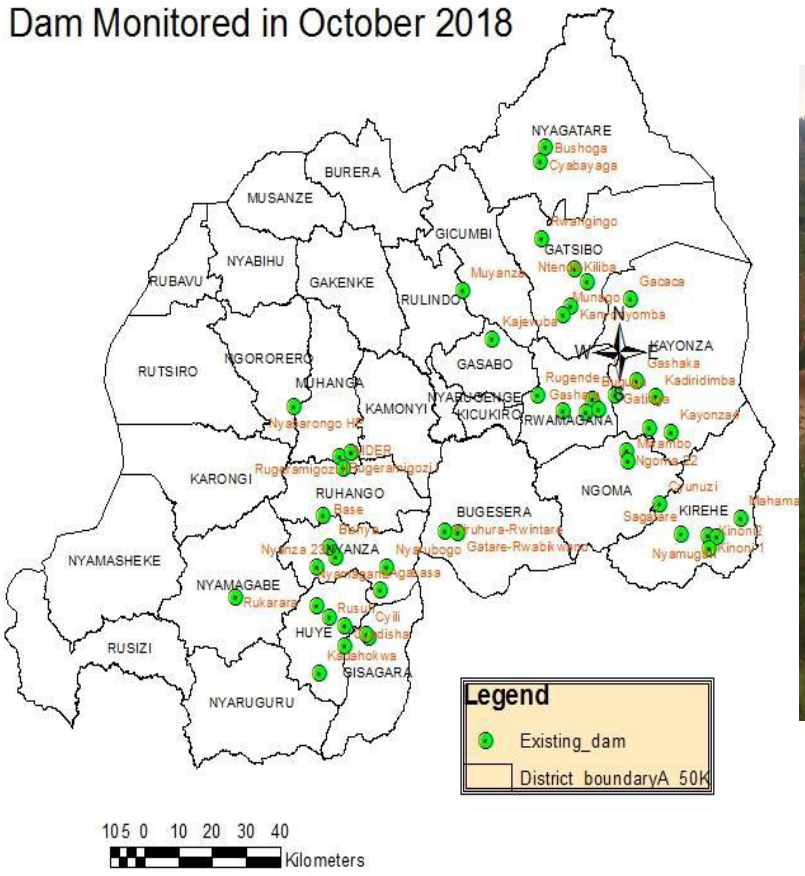


EXISTING MECHANISMS FOR RAIN WATER HARVESTING

The systems of water storage in use are :

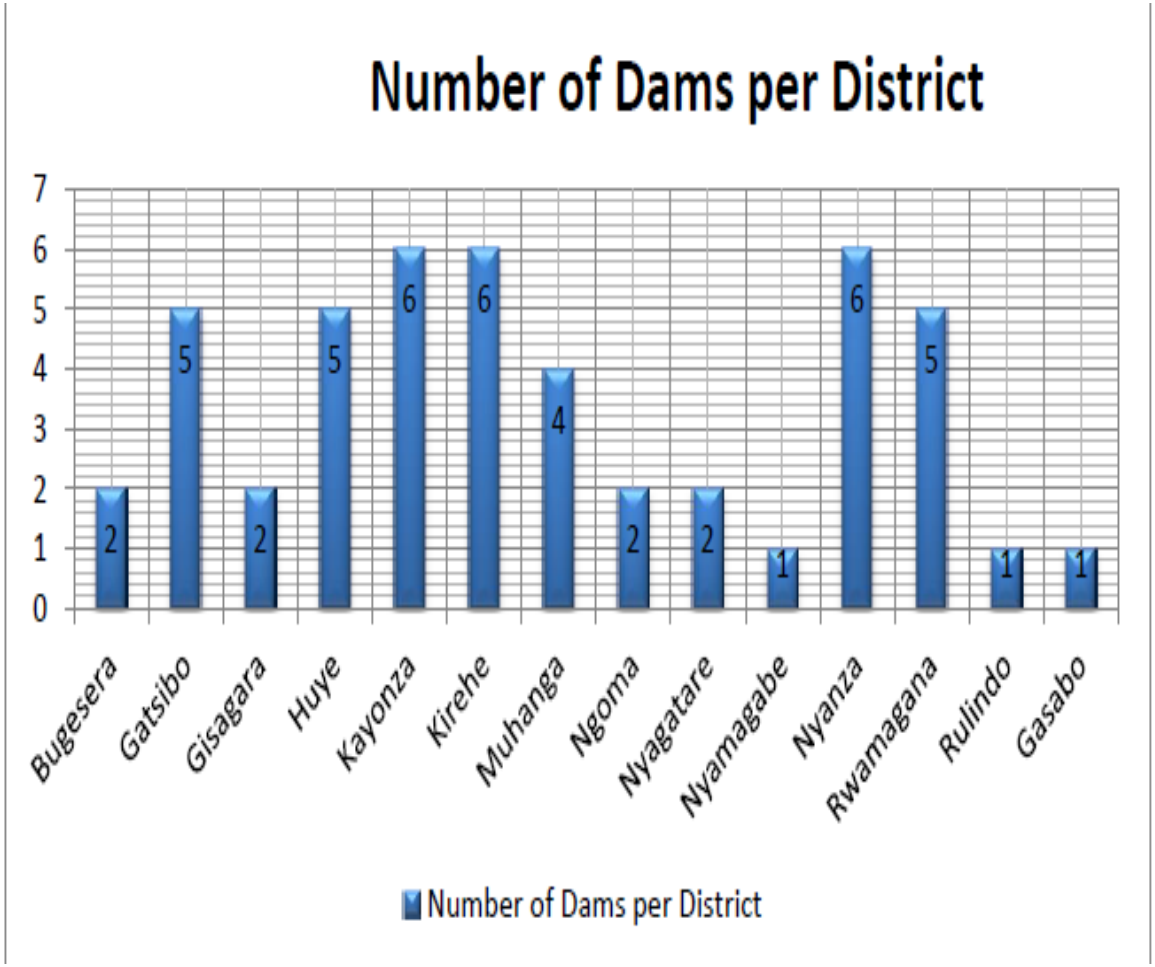
- Storage by construction of Dams
- Construction of Valley dams
- Construction of water Ponds
- Use of Rooftop rain water harvesting tanks including masonry tank, Plastic tanks,

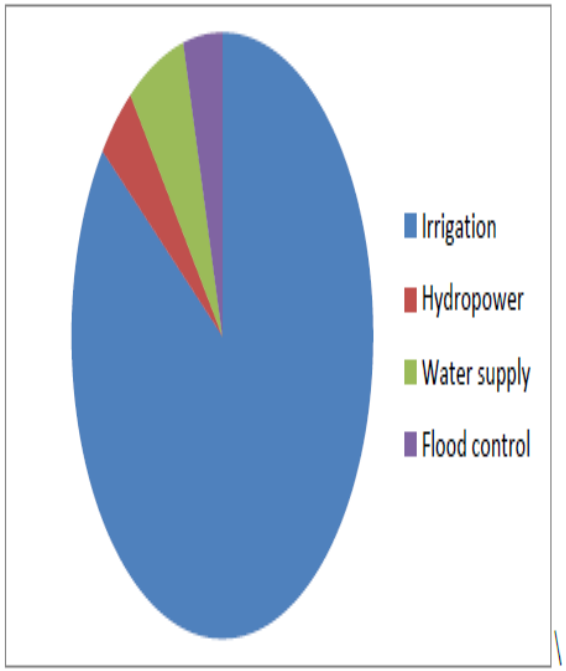
DAMS


Dam Monitored in October 2018
NYAGATARE
Bushoga
Cyabayaga
BURERA
MUSANZE
GICUMBI
GATSIBO
NYABIHU
RUBAVU
GAKENKE
RULINDO
Muyanza
Gacaca
Kajevuba
KAYONZA
Gashaka
RUTSIRO
NGORORERO
GASABO
MUHANGA
Rugende
Kadiridimba
KAMONYI
NYARUGENGE
KICUKIRO
RWAMAGANA
Kayonza
KARONGI
RUHANGO
NGOMA
KIREHE
BUGESERA
NYAMASHEKE
NYAMAGABE
HUYE
RUSIZI
GISAGARA
NYARUGURU
Legend
Existing_dam
District_boundaryA_50K
105 0 10 20 30 40
Kilometers

RWH through dams. ex of Kiruhura

Distribution of Dam per District and per use





VALLEY DAMS

District	Number of valley dams
Kayonza	18
Gatsibo	8
Nyagatare	39
TOTAL	65

WATERPONDS (813 countrywide)

Rooftop Rain water harvesting systems

Community RWH In Kanyeneyeri IDP Model Village

Challenges

- Water storage per capita is still low;
- Number of buildings having RWH facilities are still low;
- Water related disasters are increasing;
- The use of harvested water for non potable uses is still low and people prefer the use of WASAC water for all purpose;
- Though the laws and regulations are in place but still they need to be reinforced.

GUIDELINES FOR RWH

Every building must minimize run off and improve infiltration by:

- Using pavers and other permeable materials instead of impervious paving;
- Reducing impervious surfaces by promoting gardens and lawns.

RAINWATER HARVESTING METHODS

1) Surface tanks (plastics and masonry tanks);
2) Underground tanks;
3) Low cost artisanal tanks in rural areas;
4) Appropriate water ponds for small scale irrigation;
5) Water detention basins;
6) Safe infiltration basins filled with stones and gravels.

Different building with different RWH systems

- **For public buildings** preference should be made to underground water tank. However, small public buildings may use surface tanks to collect rainwater
- **Residential buildings in urban area:** underground or surface tank with a minimum capacity of three cubic meters (3 m^3) per household
- **Residential buildings in rural area:** surface tank or low-cost artisanal tank

- **Real estate developments and grouped settlements:** Every real estate or grouped settlement must have collective rainwater harvesting tanks
- **Existing unplanned settlements:** Rainwater harvesting must be included in unplanned settlement upgrading;
- **Use of individual soak-away pits:** no person is allowed to have an individual soak-away pit.
- **Rainwater harvesting in schools:** Rainwater harvesting facilities are designed in a manner that is student friendly.

USE AND MAINTENANCE OF RAINWATER HARVESTING INFRASTRUCTURES

- Keep the roof catchment area clean and free from contamination;
- Use non-toxic roof materials;
- Cut tree branches that overhang the roofs;
- Conduct regular inspection, maintenance and cleaning of the rainwater harvesting system like gutters, down pipes, tanks;
- Monitor and repair any leaks in the rainwater harvesting system;
- Avoid stagnation of water on the roof, in the gutters and near storage tank;
- Flush out the first rain before collection.

ROLES OF DIFFERENT INSTITUTIONS INVOLVED

- **Districts and CoK**: Awareness, Plans , Inspection, technical supports
- **RHA**: Monitoring, Design, layout Plans, inspection
- **RWFA**: Manuals, research on RWH
- **RTDA:** Design of adequate Road drainage systems
- **MININFRA and MINALOC**: Coordination and Monitoring;
- **MoE**: establishment of Joint RWH Forum
- **Stakeholders**: contribute to the implementation

THANK YOU