Rwanda National Workshop on Natural Capital Accounting

Water Accounts: Progress, Key Findings, Next Steps

February 16, 2017, Kigali

WAVES

NISR
NATIONAL INSTITUTE OF STATISTICS OF RWANDA

Rwanda Natural Capital Accounting

- Overview
- SEEA Water Accounts
- Physical Flow & Asset Accounts
- Economic Accounts
- Results
- Implications & Policy
- Way forward & Programme sustainability
- Outreach & Publications

Rwanda NCA for WATER - Roadmap

Feb 2017

Dec 2017

WATER USE

- Sectors covered: Agric., industry, HH, mining, electricity, education, services, transport, water supply
- Data for 2012 (baseline) – 2015 data to be updated periodically

WATER Asset

- 2012 – 2015 beyond NWRMP data
- Updated with rainfall, river flow & evaporation data
- Produced stock account with renewable water (per capita & linked to Supply & Use)

WATER ECONOMICS & VALUE

- Data compiled, now assessed & analyzed
- Water productivity assessment
- Water supply sector economic wise
- Identify options for improvement

WATER ACCOUNT v 2.0

- Consolidated for extra review
- Enhance detail
- NISR, MINIRENA, MINECOFIN
- Plan system upgrade for data management toward v 2.0

POLICY ANALYSIS

- Water use efficiency by sector
- Water value/use vs economic & job contribution
- Water sector

Introduction & Rationale

Water Sector & Institutional Issues

- Water is a cross-cutting resource and Water resources are under pressure due to population growth (> 11.5 M) and rapid economic development (Rda: 6.9% GDP growth in 2015);
- Extremely water dependent agriculture;
  - 31% of GDP (2014) and Employing almost 50% of population (directly) and over 60 – 70 (incl. indirectly);
- Water related issues in the country: Water resources, large & essential input to economy (agriculture), Water efficiency, shortage, water quality, water pollution which harm to economic output and value;

- Previous statistics not detailed enough to provide accurate information on water allocation; water productivity, water resource use and water contribution to GDP and employment.

Why Water Accounts?

- Inform policy makers in decision making and policy formulation as a National Development priority sector (identified in 2014 after scoping study conducted by MINIRENA);
- Clarify and compare the economic values of water in competing uses;
- Provide more accurate picture of overall water use, potential constraints to growth;
- Relate economic production to water use, water productivity;
- Look after performance water supply sector;
- Monitor and enhance water productivity across sectors in Rwandan economy (use efficiency);
- Identify potential for improvement performance ‘water supplying sector, like water efficiency in supply.

Physical Water Flow Accounts

What do PWFA for water measure?

Flows from environment to economy

Flows within the economy

Flows from economy to environment

Water abstraction

Public water supply (WASAC,..)

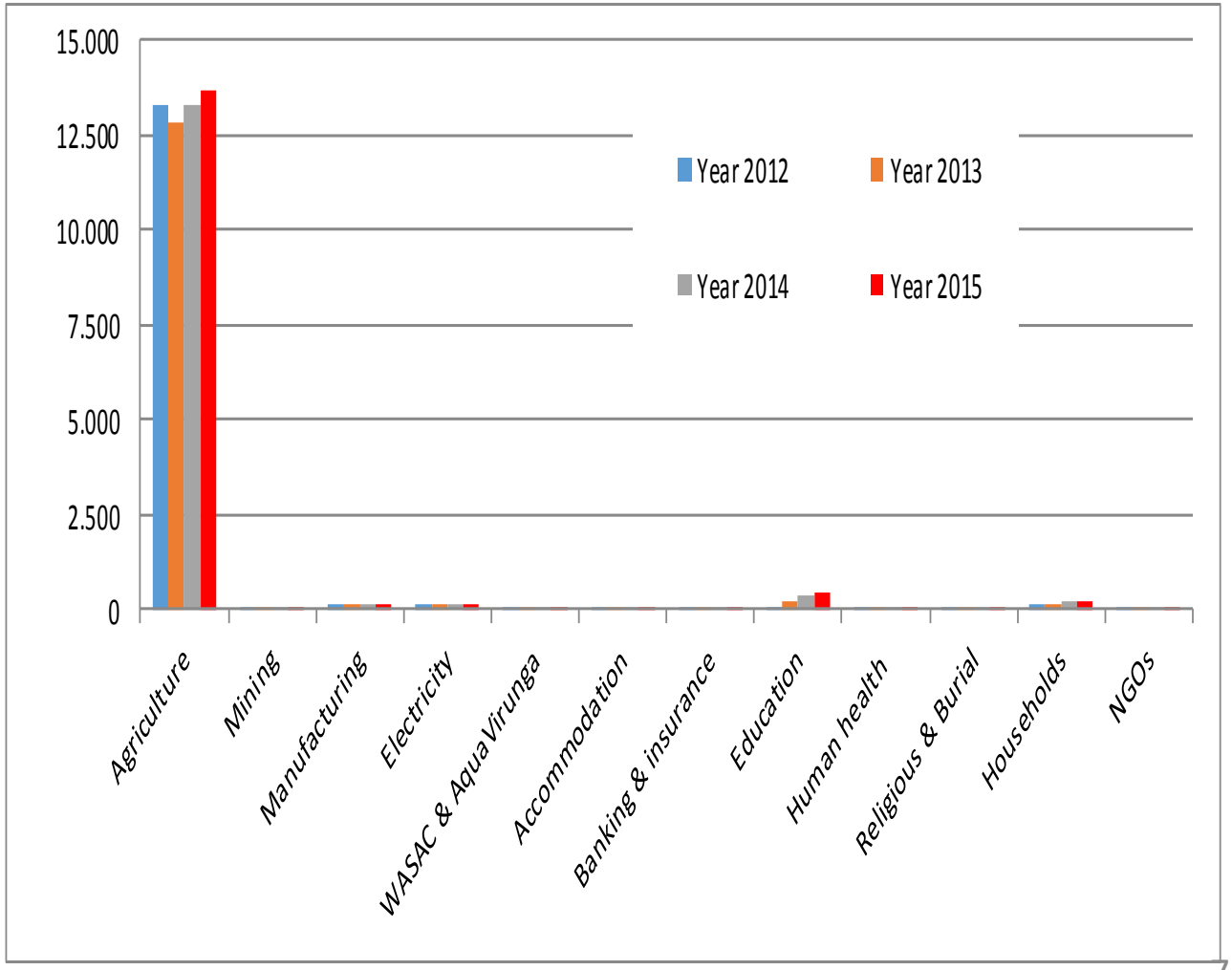
industries

Sewerage

households

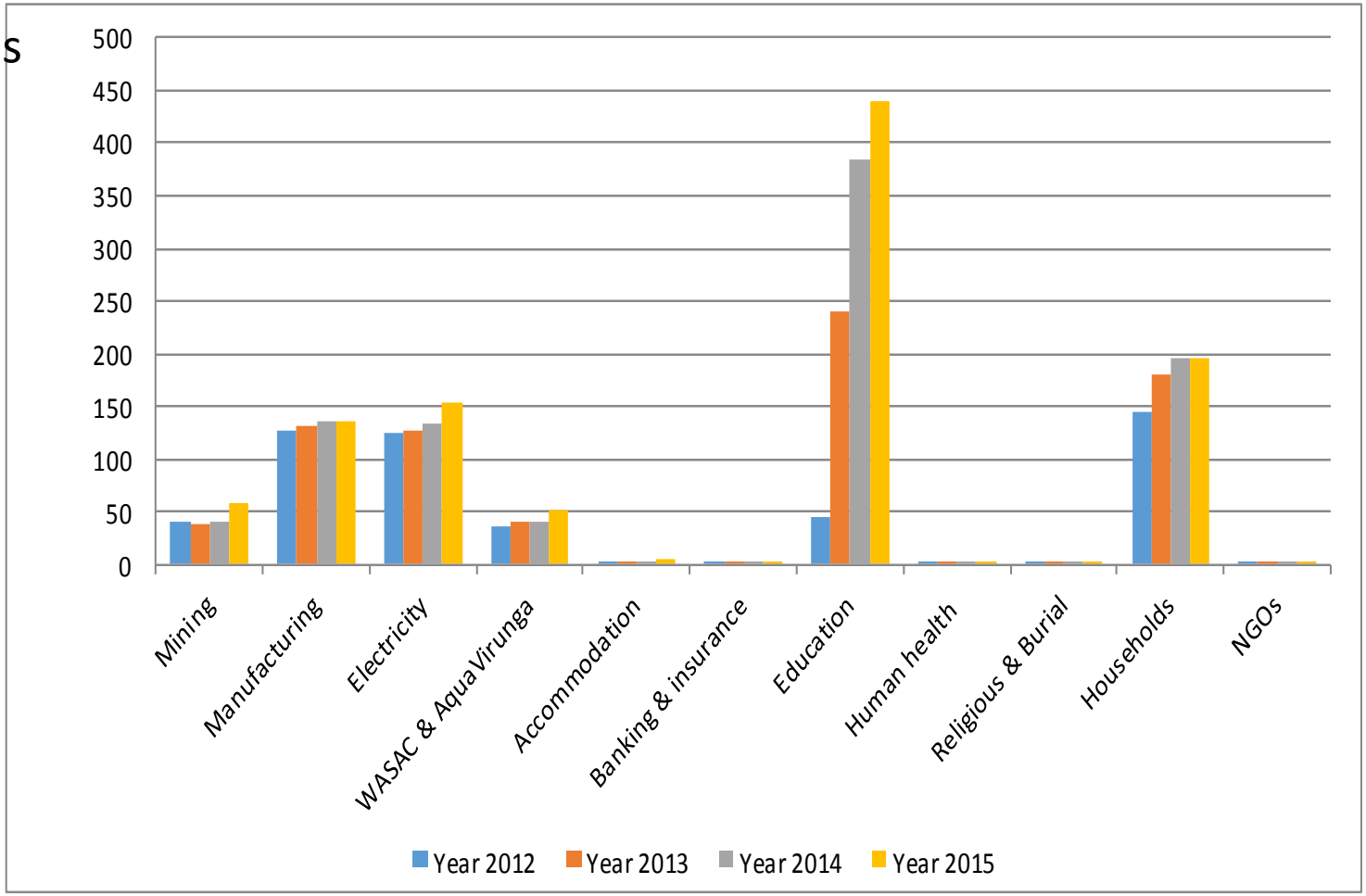
Trends for Water Consumption in Rwanda for 2012-2015 (Mm^3)

- Clearly agriculture is biggest
- Largely due to Evapotranspiration (ET), from land.
- ET mainly in agriculture (crops) & forests
- Trend impacted by both precipitation and weather & climate impacting ET



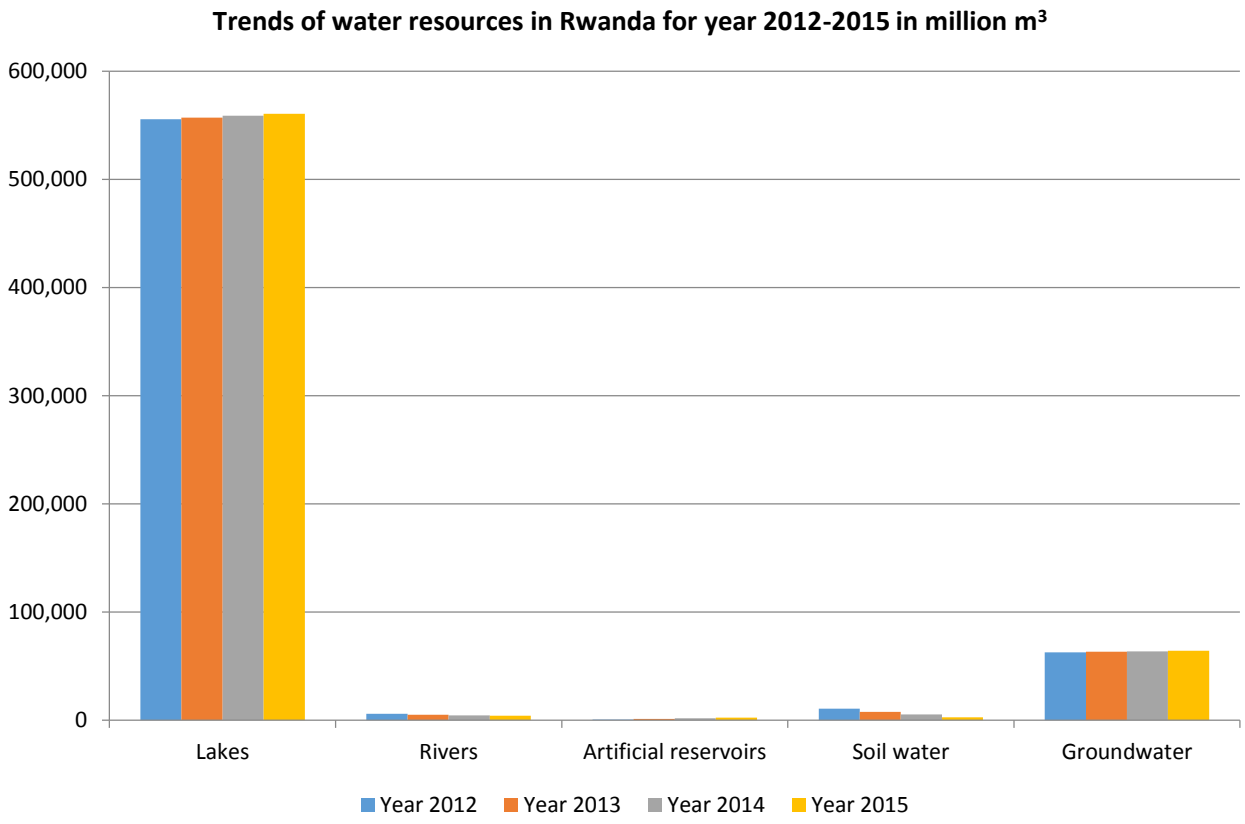
Trends for Water Consumption in Rwanda for 2012-2015 (Mm^3)

- Graph excludes agriculture
- To show other sectors
- Apparent growth



Trends on physical asset account for water resources Year 2012-2015 in Million m^3

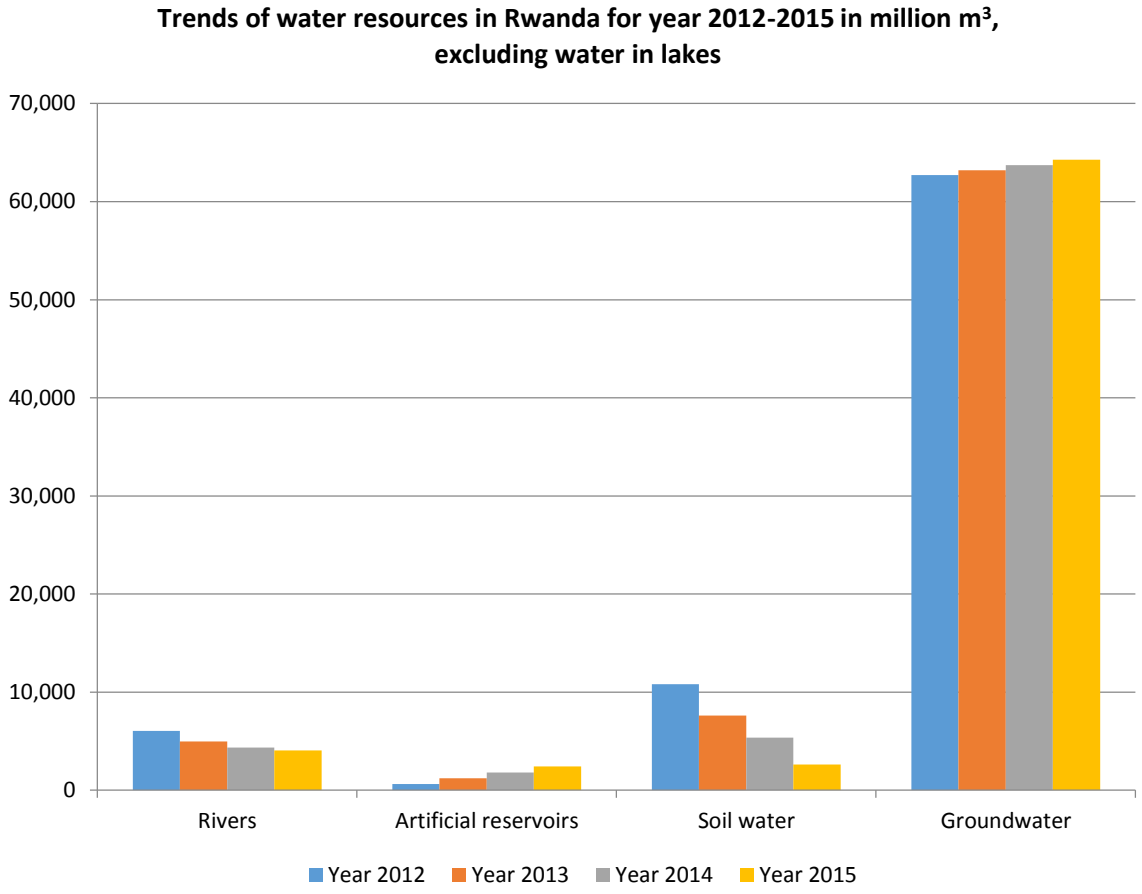
Increase of water resources in lakes, AR and GW systems is explained by observed increase in rainfall than abstracted water in each year (e.g. 31.939 Mm^3 of Rainfall against 17.023 Mm^3 abstracted water for year 2013)



Trends on physical asset account for water resources Year 2012-2015 in Million m^3

The increase of water resources in some stocks like lakes, AR and GW systems is explained by observed increase in rainfall, related abstracted water in each year

(e.g. 31.939 Mm^3 of Rainfall against 17.023 Mm^3 abstracted water for year 2013)



* Soil water: need further assessment, due to incompleteness of the current data

Water stress on Renewable Water Resource

- Linking Water flow Accounts to Water Asset Accounts
- Total Water Withdrawals (TWW), all sectors:
  - Fresh Surface water abstractions
  - Fresh Ground water abstractions

- Total Renewable Water Resource (TRWR) = IRWR+ERWR

- Water Stress %:

  TWW / (TRWR-Env.)*100

Environmental Water requirements (Env.), to be included

Indicators SEEA – Water Accounts

Indicators derived from Rwanda Water Accounts:

- Water productivity
- Water stress (per capita & to water resource)
- Allocation

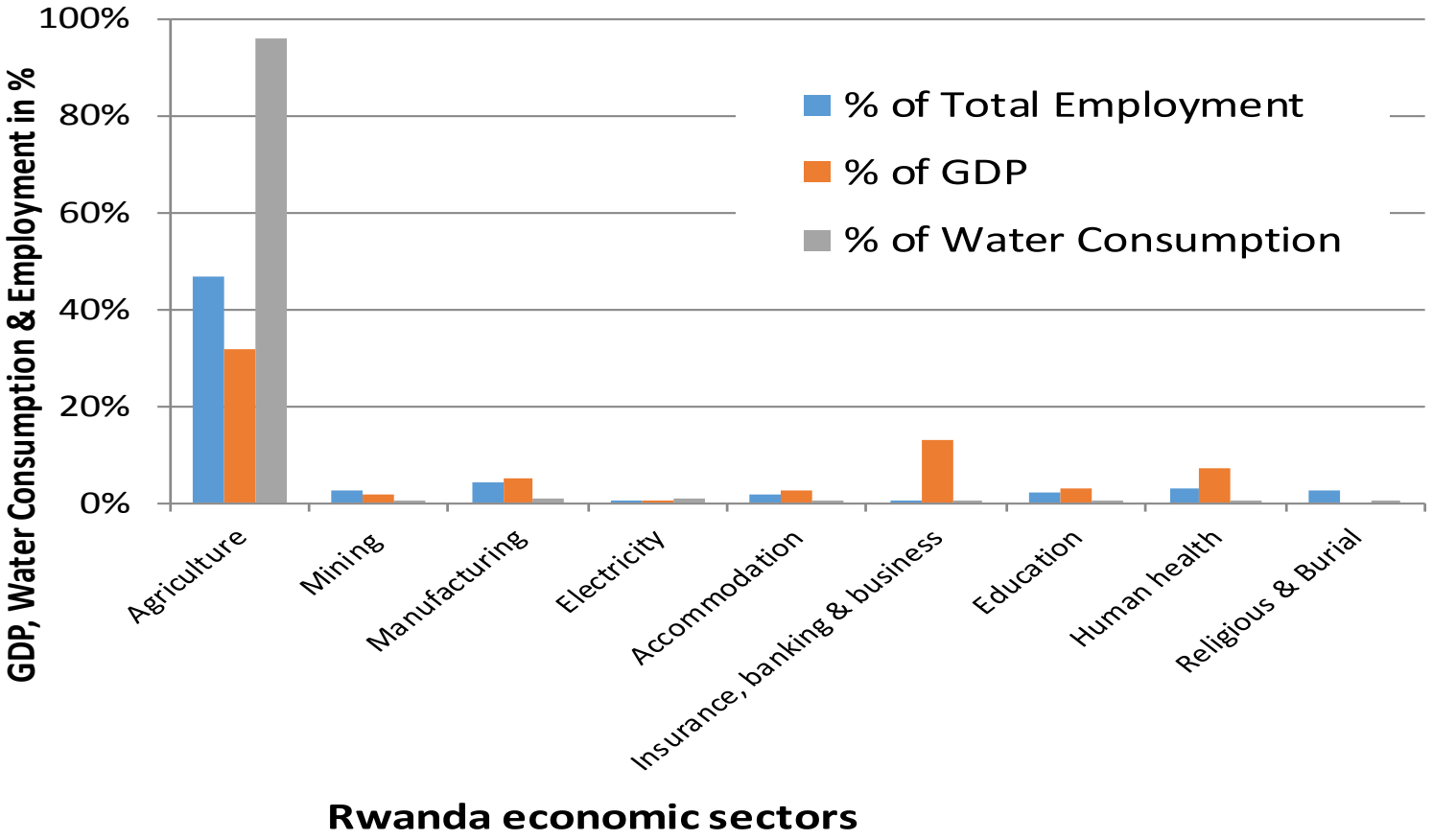
Allow Indicators to be reported to:

- EDPRS-3
- RBM&E
- GDSA
- SDGs (i.e. 6 ‘water management”)

Results on Economic Water Accounts in Rwanda

1. Link Physical Water Accounts to economics in National Accounts
2. Results: use, supply & productivity figures
3. At macro level and by economic sector (ISIC)
4. Integrated indicators to be derived
   - Water productivity
   - Progress in there over time
5. Performance indicators for Public Water Supply Sector

Water Consumption, GDP and Employment (%), 2012



Agriculture created about 3.5% of jobs in formal way but yellow color shows other jobs created by agriculture in inform way in Rwanda is 56% (Labour force statistical table)

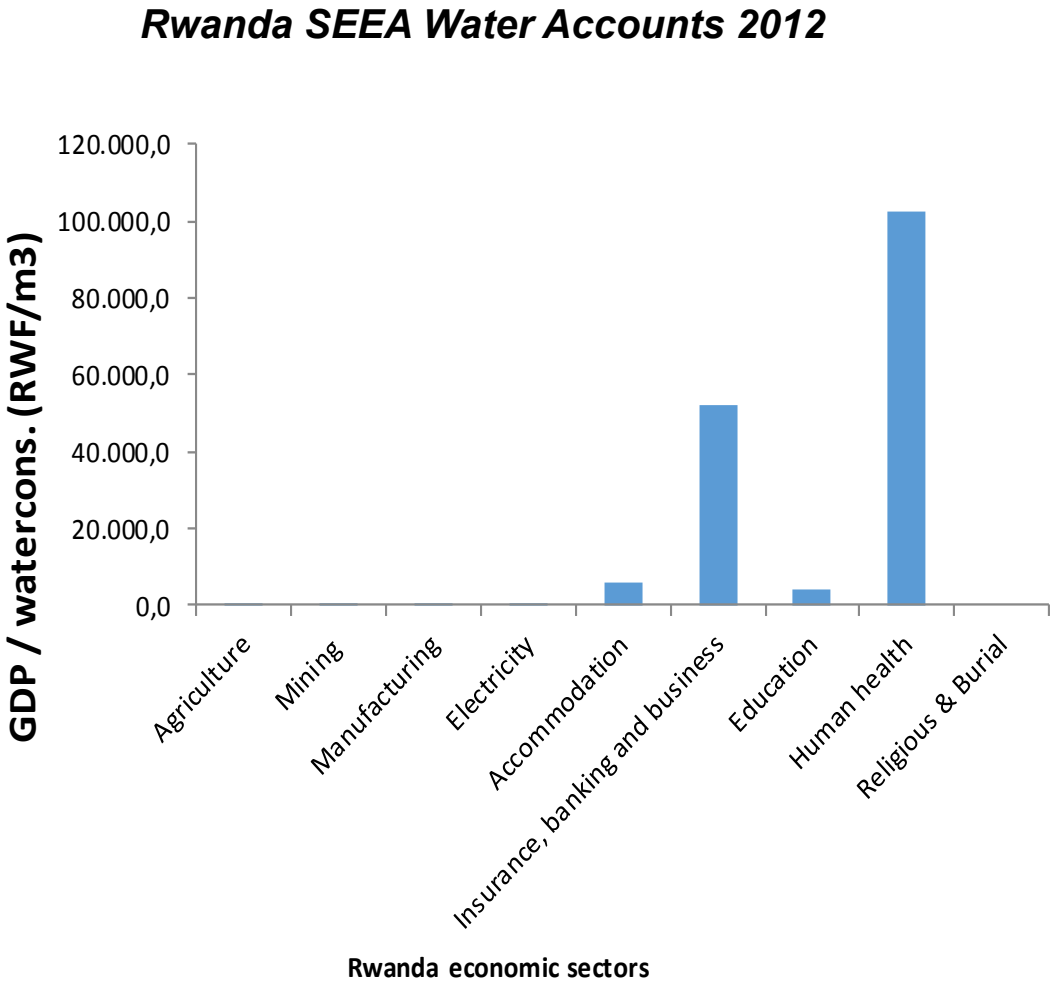
Water Productivity and efficiency (Rwf/m^3)

Performance:

- To monitor performance on water productivity (green & blue water)
- To link water abstractions from the natural environment to economic performance
- Largely by sector
- Time series 2012 – 2015
- Allows to monitor progress over time

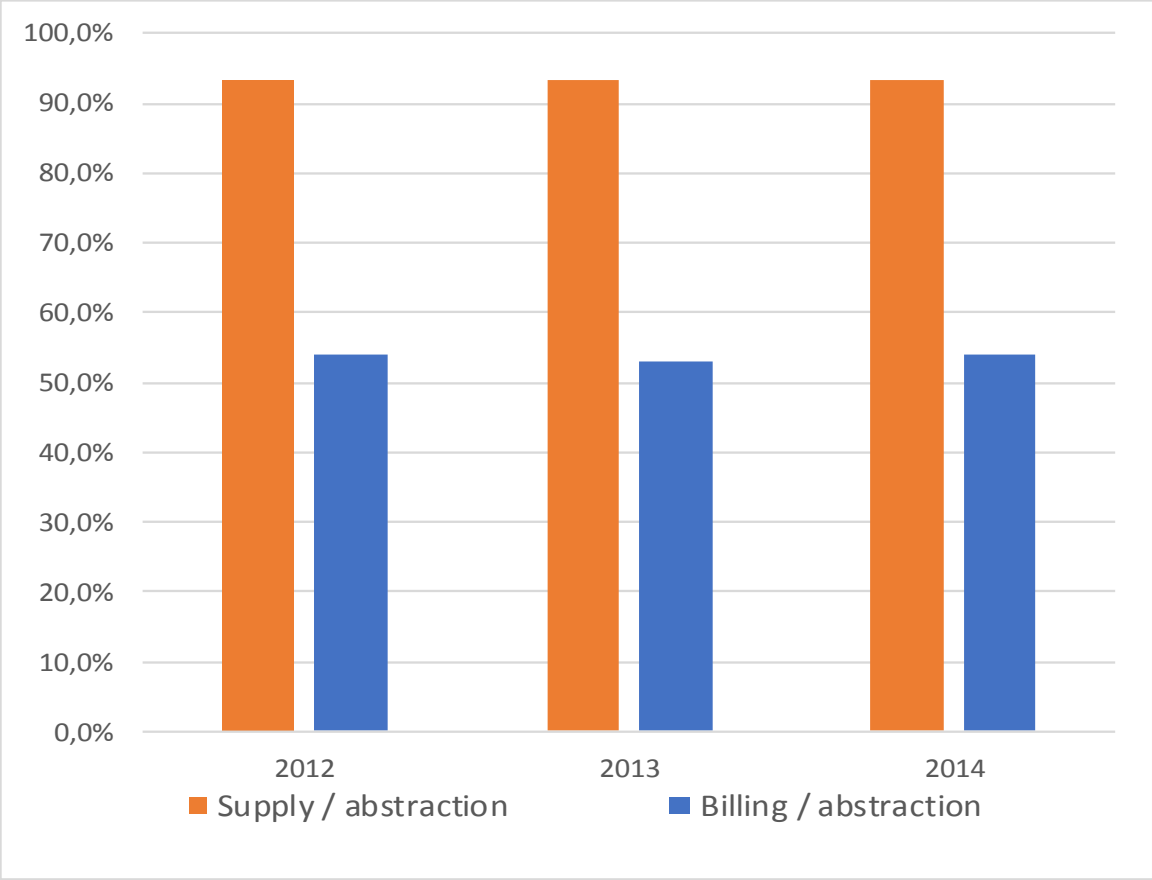
Possible Uses:

- Can inform policy makers regarding the **performance and allocation of water** across sectors
- Inform on **contribution to economic performance, employment**
- **Indicates where water efficiency can be improved**
- **Inform on how Water Tariff can be Reviewed**



Water supply sector performance (1), efficiency

- Monitors efficiency in both:
  - Water physical terms
  - Economic terms
- Supply to abstraction ratio
- Shows efficiency
- Cost recovery
- Identification of options for improvements:
  - Per supplier
  - Progress over time



Source: WASAC data on water supply

Renewable Water Resources, availability per capita

Status of **Total Renewable Water Resources (TRWR)** availability per capita (**m^3**/Ca/yr)

	2012 (NWRMP)	2012	2013	2014	2015
NWRMP	670				
Rwanda (NCA results)		1137	986	1105	1023

Index (m^3 per capita)	Category/Condition
>1,700	No Stress
1,000-1,700	Stress
500-1,000	Scarcity
<500	Absolute Scarcity

Indicator:
From water Accounts
Scale: Falkenmark

Policy implication

- Indicators for EDPRS-3, SDGs, RBM&E, GDSA derivable from the Water Accounts (& National Accounts) ;
- NISR and UR researchers invited to do analysis, research and publish out of the available detailed Water Accounts data;
- Use for assessing levels and priorities for Water Use Fees Scheme ;
- Preference to extend the SEEA Water Accounts Rwanda to:
  - Compilation for the 9 catchments
  - Water Emission Accounts
  - Water quality Accounts
- Public water supply towards extension of access & supply, efficiency decrease non revenue water improve on non-cost recovery tariff ; inform on how Water Tariff can be reviewed; and
- Further connect institutions and let anyone benefit from the accounts compiled and continue collecting required data for compiling water accounts. continuously.

Way forward and Programme Sustainability

- Build Rwanda Water Accounts (version 2) considering all economic sectors
- Collect additional data, next to data from Ministries, agencies, NISR, meteo, etc. also and at district level (30*)
- Build SEEA Water Accounts at catchment Level 1 (9*), depending on data and financial availability;
- Possible institutional setup for sustainability, Water Accounts Unit?
- Include NCA Programme under Rwanda Institutional Framework .


Thank you for your attention
Questions / Suggestions?
Rwanda, 16th Feb 2017