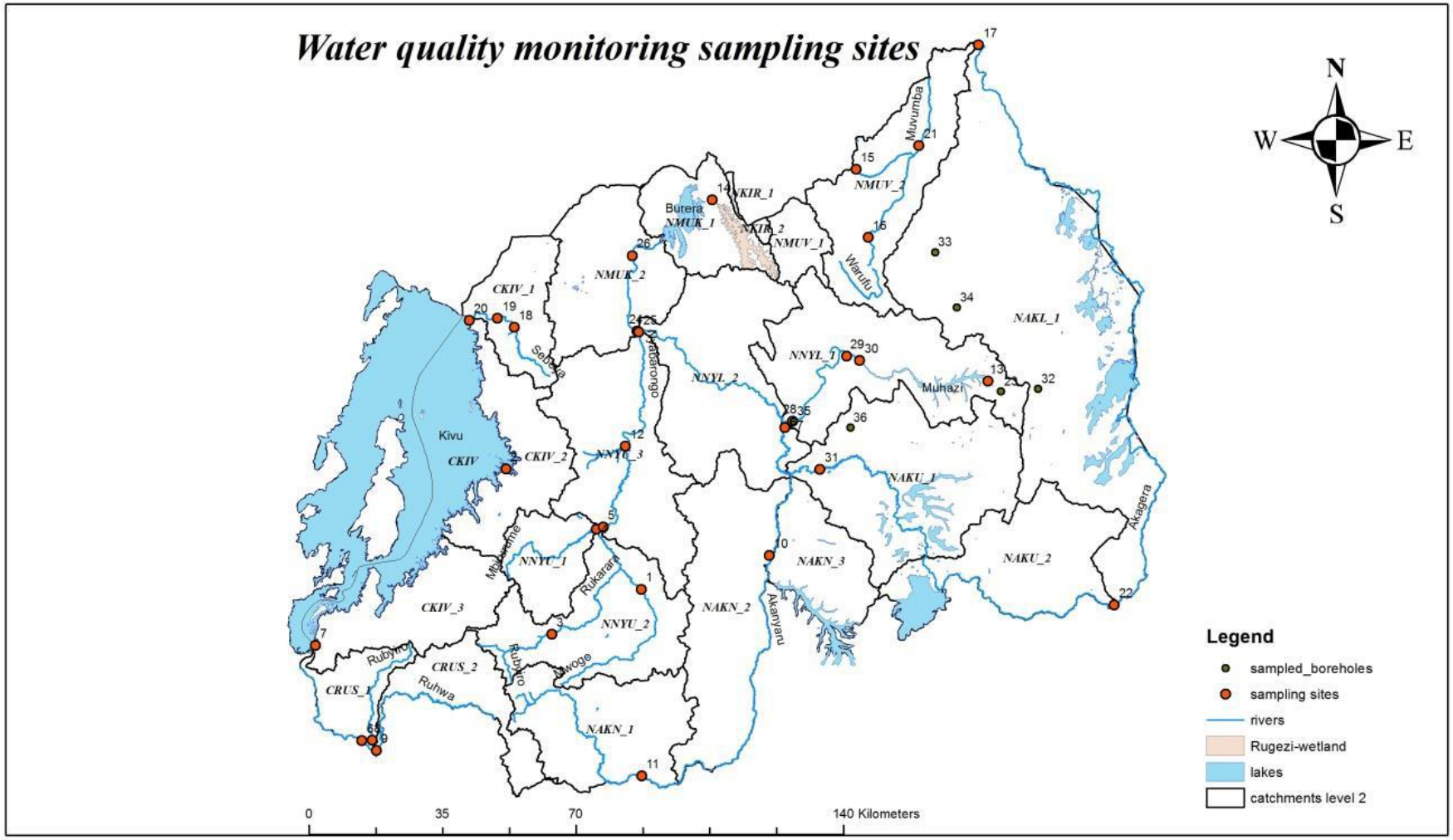
Water quality Current status in nine Catchments



A set of sixteen parameters were selected for this monitoring per site out of 36 sites.

- **Physico-chemical parameters**: Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO), Potential in Hydrogen (pH), Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Turbidity,
- **Nutrients parameters**: Nitrate (NO_3^-), Total Nitrogen (TN), Total Phosphorus (TP), Total Dissolved Inorganic Nitrogen (DIN), Total Dissolved Inorganic Phosphorous (DIP)
- Chloride (Cl^-), Sulfate (SO_4^{2-})
- **Biological parameters**: Faecal coliform (F.C) and *Escherishia coli* (E.Coli).

Parameters with 100% compliance for compared Natural potable water standards

- Total phosphorus (TP) and Total nitrogen (TN)
- Dissolved Inorganic Nitrogen (DIN)
- Dissolved Inorganic Phosphorus (DIP)
- Nitrate (NO_3^-)
- Electro Conductivity (EC)
- Hydrogen potential (pH)
- Chloride (Cl-), and Sulphate (SO42-)

Parameters found to be out of acceptable range for natural potable water at some sites

- Dissolved oxygen (DO)
- Faecal coliform (F.C)
- Escherichia coli (E. coli)
- Total Suspended Solids (TSS)
- Total Dissolved Solids (TDS)
- Turbidity

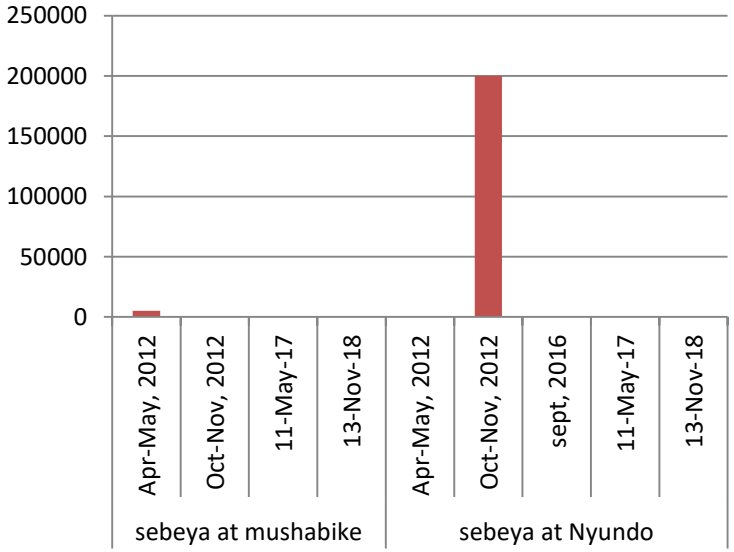
Results of this study

the main concerns in terms of surface water quality in Rwanda are mostly related to :

- the sedimentation /siltation of water bodies mainly due to soil erosion
- the microbiological contamination that can be linked to poor sanitation systems and practices.
- The most critical water bodies in terms of turbidity and microbiological contamination were found to be **Akanyaru** river border to Burundi, **Secoko river** before discharging into Nyabarongo, **Sebeya** river at Musabike, Sebeya river at **Nyundo** station, Akagera at **Kanzenze** bridge and the **Nyabarongo** river before receiving Mukungwa river.

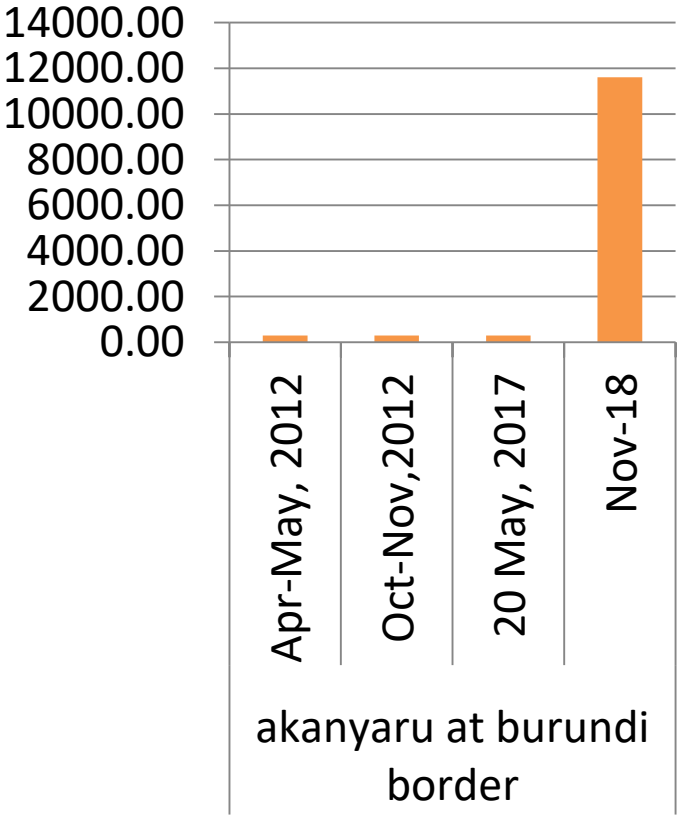
Recommendations on Faecal Coliforms and E-Coli contamination

the best approach to deal with this issue



- in urban areas could be through improved wastewater treatment technology and management
- Relocations of households which are in marshland to prevent from groundwater contamination
- For rural areas the most appropriate approach could be through on-site sanitation systems coupled with education, sensitization and behavior change campaigns on improved sanitation practices

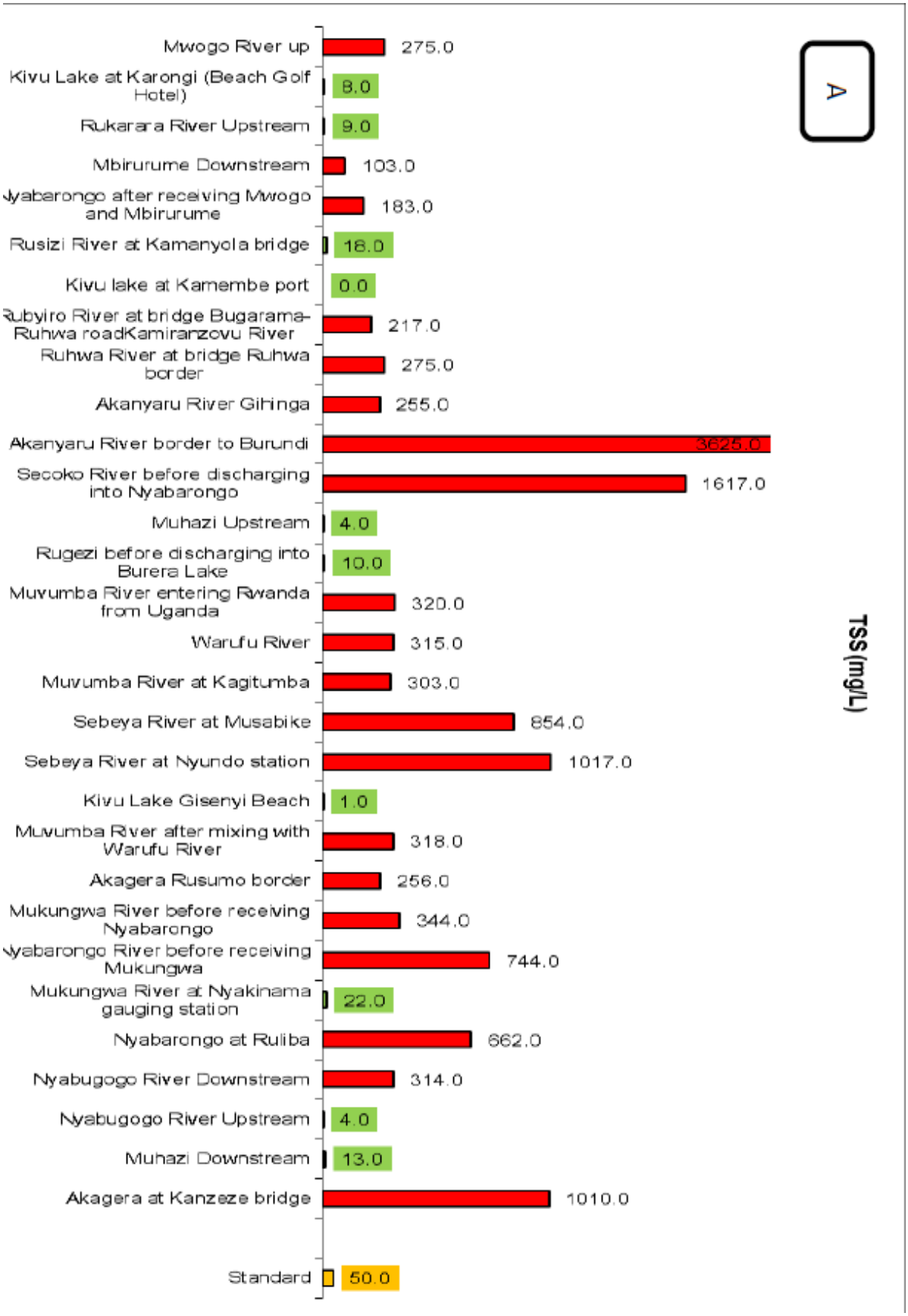
The trends in turbidity of rivers were found to be always correlated to the concentration of Total Suspended Solids (TSS)

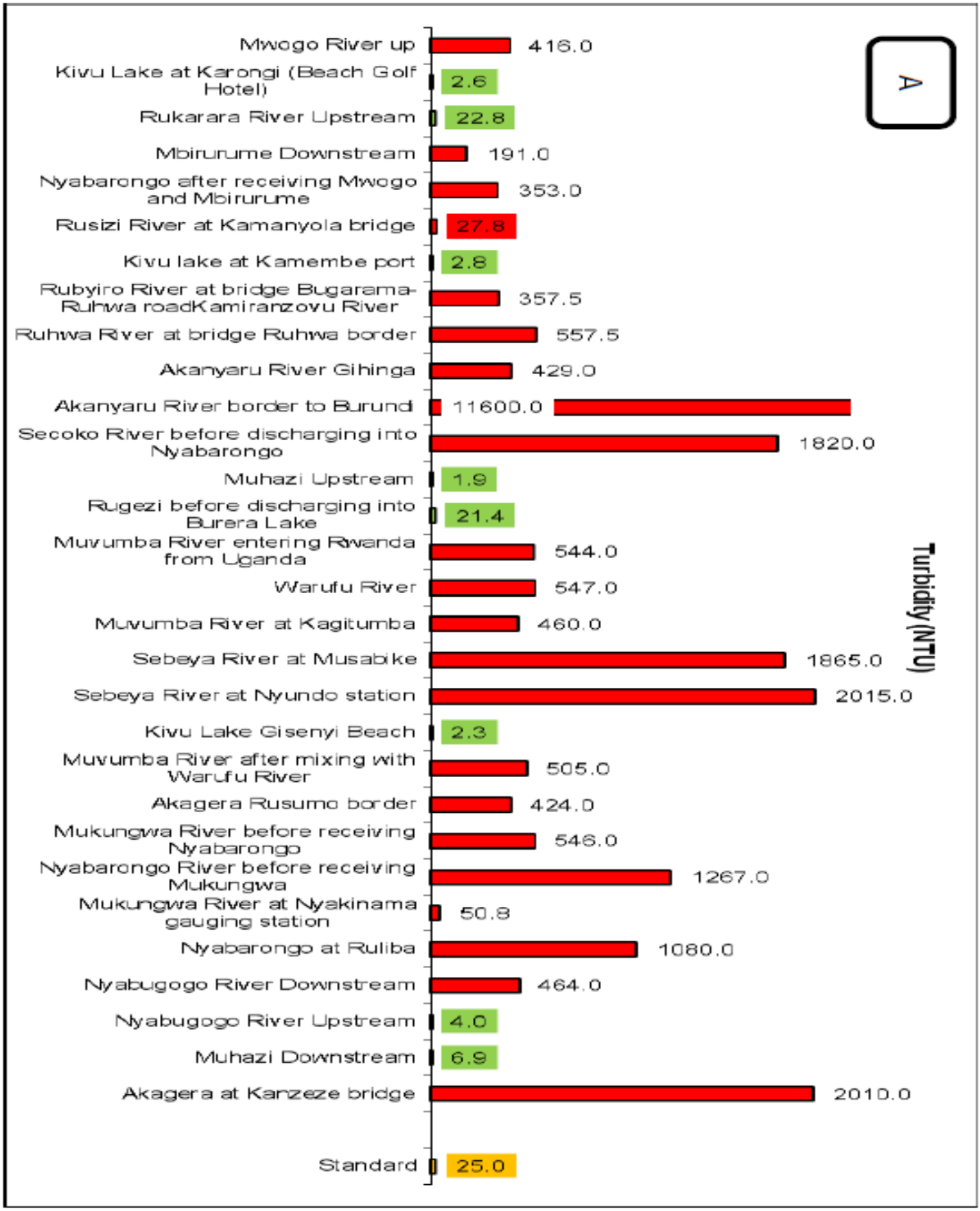


- these rivers catchments are facing intensive agricultural activities and intensive unsustainable mining activities .

❖ Application of soil erosion control measures as proposed to CROM DSS (afforestation,Agroforestry, Radical and Progressive terraces,..)

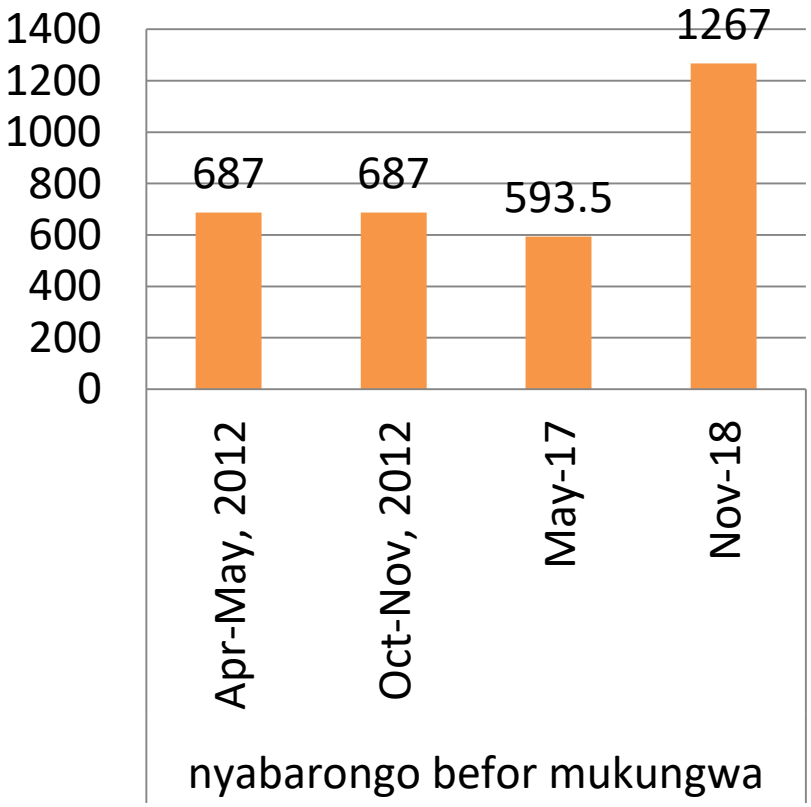
❖For Mining there is a need of regulation enforcement(tailing dams, Restoration of abandoned mining sites)


A
Mwogo River up
275.0
Kivu Lake at Karongi (Beach Golf Hotel)
8.0
Rukarara River Upstream
9.0
Mbirurume Downstream
103.0
Nyabarongo after receiving Mwogo and Mbirurume
183.0
Rusizi River at Kamanyola bridge
18.0
Kivu lake at Kamembe port
0.0
Rubyiro River at bridge Bugarama-Ruhwa roadKamiranzovu River
217.0
Ruhwa River at bridge Ruhwa border
275.0
Akanyaru River Gihinga
255.0
Akanyaru River border to Burundi
3625.0
Secoko River before discharging into Nyabarongo
1617.0
Muhazi Upstream
4.0
Rugezi before discharging into Burera Lake
10.0
Muvumba River entering Rwanda from Uganda
320.0
Warufu River
315.0
Muvumba River at Kagitumba
303.0
Sebeya River at Musabike
854.0
Sebeya River at Nyundo station
1017.0
Kivu Lake Gisenyi Beach
1.0
Muvumba River after mixing with Warufu River
318.0
Akagera Rusumo border
256.0
Mukungwa River before receiving Nyabarongo
344.0
Nyabarongo River before receiving Mukungwa
744.0
Mukungwa River at Nyakinama gauging station
22.0
Nyabarongo at Ruliba
662.0
Nyabugogo River Downstream
314.0
Nyabugogo River Upstream
4.0
Muhazi Downstream
13.0
Akagera at Kanzeze bridge
1010.0
Standard
50.0
TSS (mg/L)

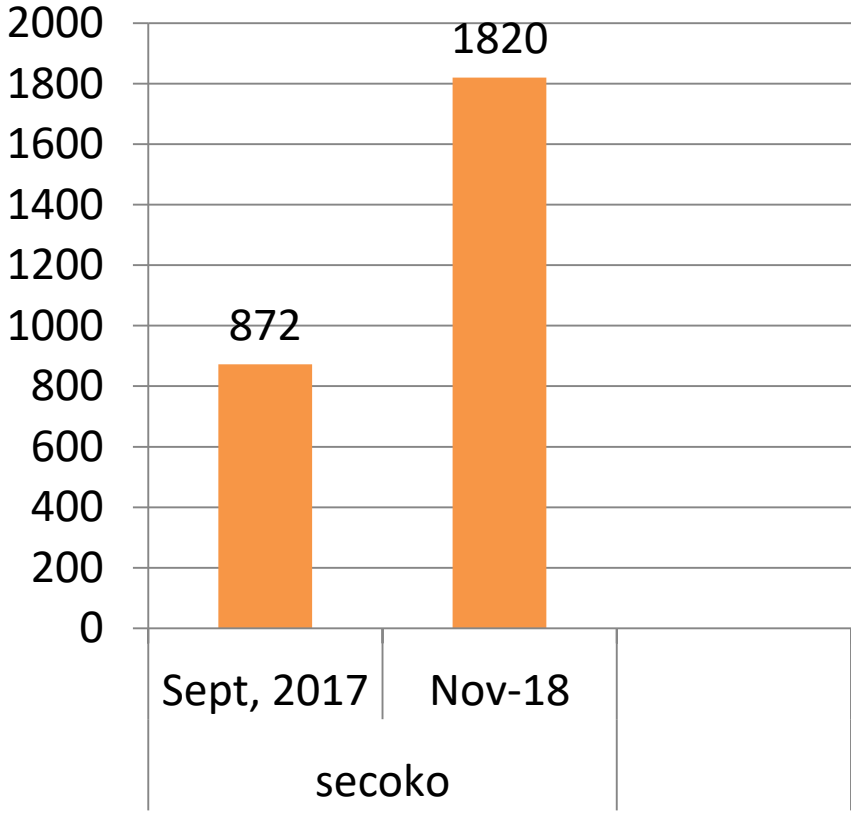

A
Mwogo River up
416.0
Kivu Lake at Karongi (Beach Golf Hotel)
2.6
Rukarara River Upstream
22.8
Mbirurume Downstream
191.0
Nyabarongo after receiving Mwogo and Mbirurume
353.0
Rusizi River at Kamanyola bridge
27.8
Kivu lake at Kamembe port
2.8
Rubyiro River at bridge Bugarama-Ruhwa roadKamiranzovu River
357.5
Ruhwa River at bridge Ruhwa border
557.5
Akanyaru River Gihinga
429.0
Akanyaru River border to Burundi
11600.0
Secoko River before discharging into Nyabarongo
1820.0
Muhazi Upstream
1.9
Rugezi before discharging into Burera Lake
21.4
Muvumba River entering Rwanda from Uganda
544.0
Warufu River
547.0
Muvumba River at Kagitumba
460.0
Sebeya River at Musabike
1865.0
Sebeya River at Nyundo station
2015.0
Kivu Lake Gisenyi Beach
2.3
Muvumba River after mixing with Warufu River
505.0
Akagera Rusumo border
424.0
Mukungwa River before receiving Nyabarongo
546.0
Nyabarongo River before receiving Mukungwa
1267.0
Mukungwa River at Nyakinama gauging station
50.8
Nyabarongo at Ruliba
1080.0
Nyabugogo River Downstream
464.0
Nyabugogo River Upstream
4.0
Muhazi Downstream
6.9
Akagera at Kanzeze bridge
2010.0
Standard
25.0
Turbidity (NTU)

Turbidity Variation in Nyabarongo Upper

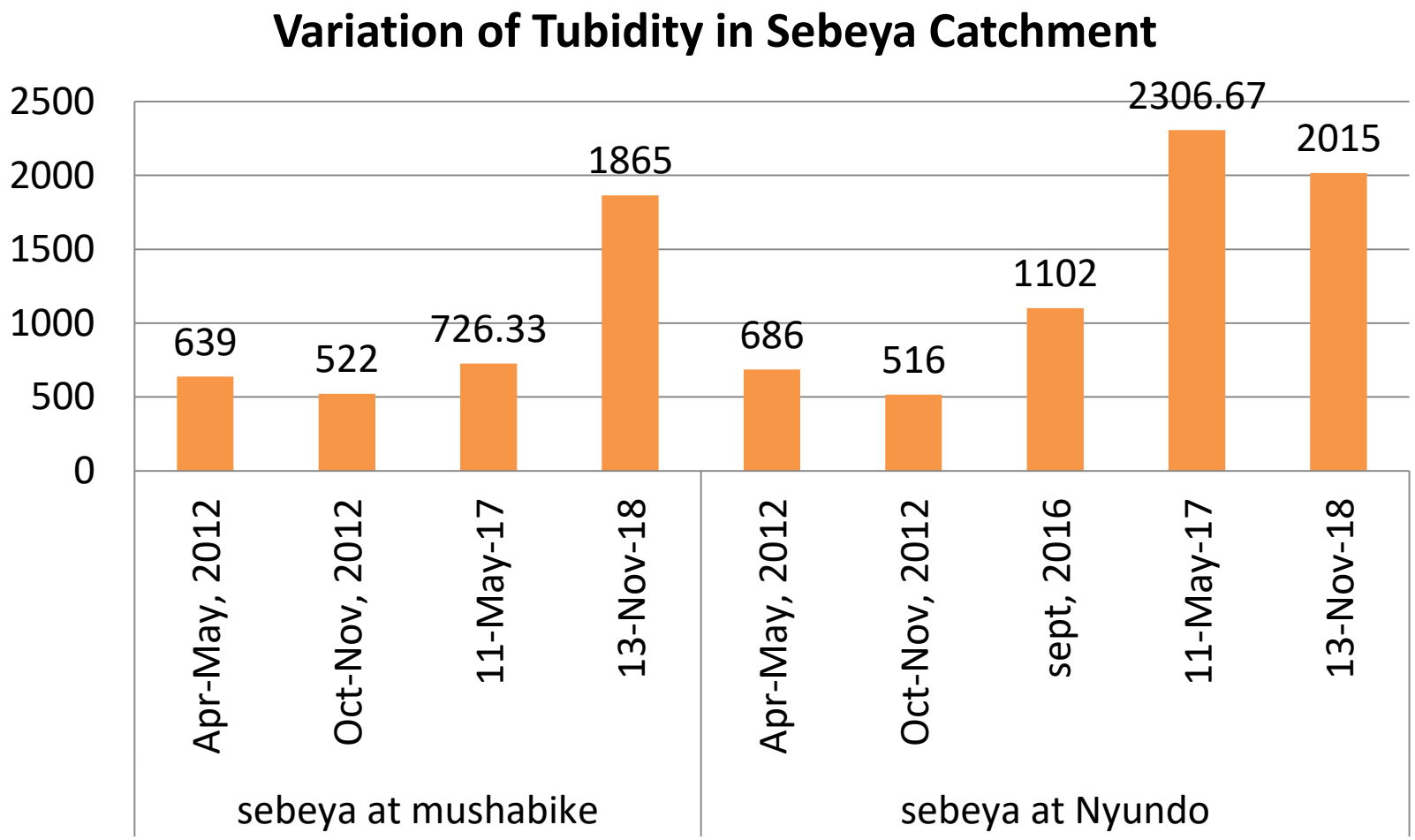
Nyabarongo River

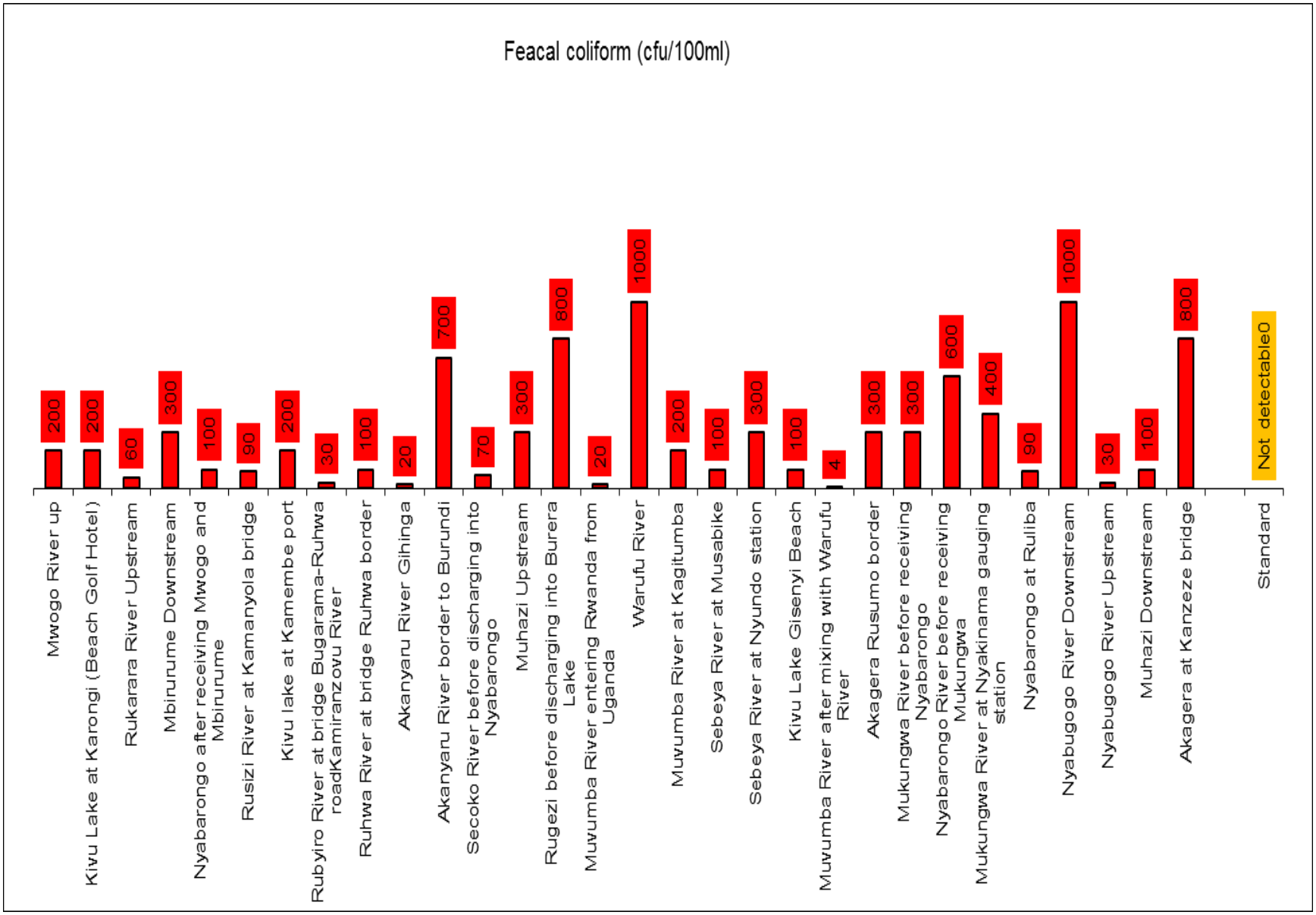


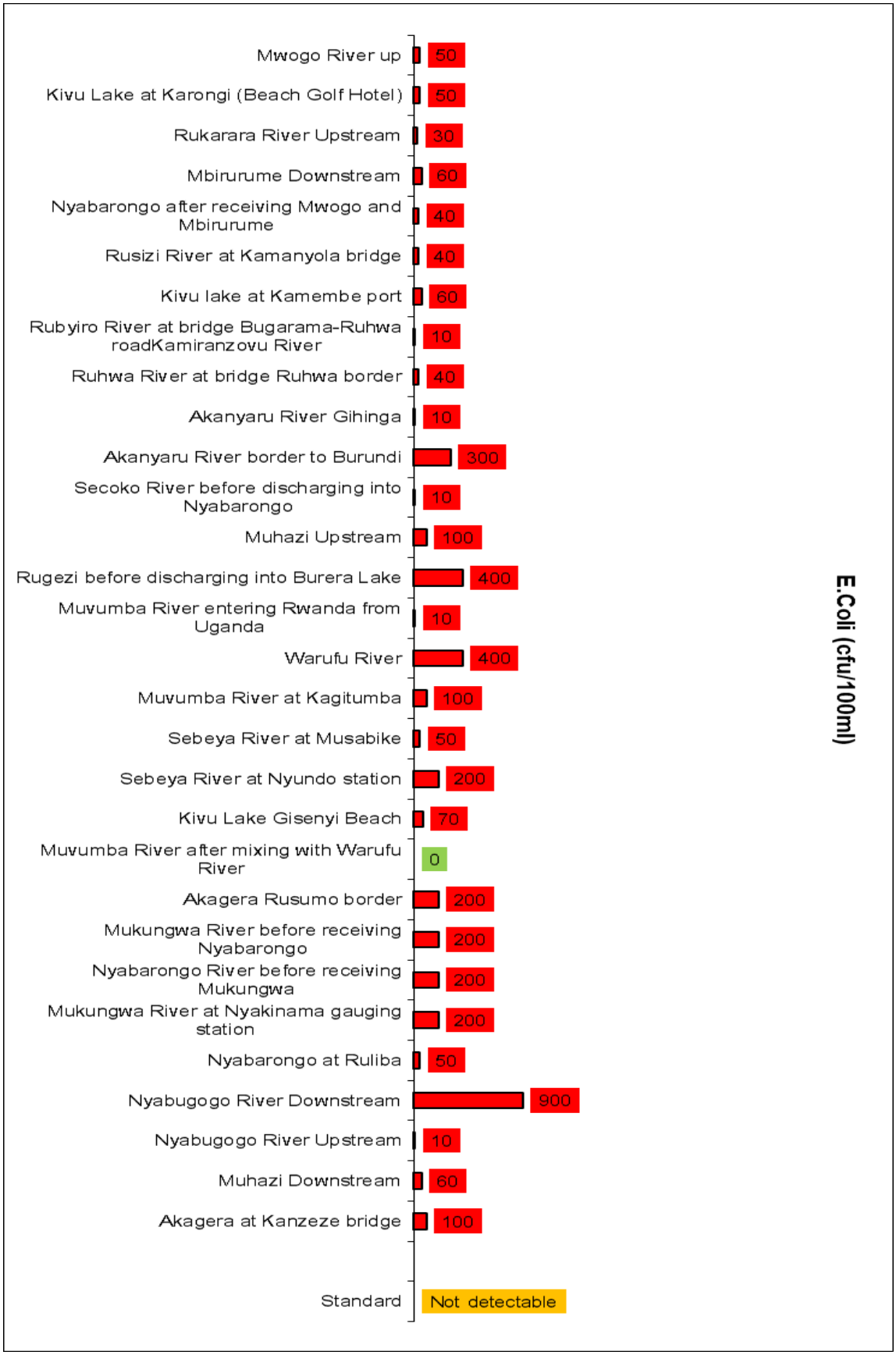
Secoko River



Turbidity Variation in Sebeya Sub Catchment




Feacal coliform (cfu/100ml)
Mwogo River up
200
Kivu Lake at Karongi (Beach Golf Hotel)
200
Rukarara River Upstream
60
Mbirurume Downstream
300
Nyabarongo after receiving Mwogo and Mbirurume
100
Rusizi River at Kamanyola bridge
90
Kivu lake at Kamembe port
200
Rubyiro River at bridge Bugarama-Ruhwa roadKamiranzovu River
30
Ruhwa River at bridge Ruhwa border
100
Akanyaru River Gihinga
20
Akanyaru River border to Burundi
700
Secoko River before discharging into Nyabarongo
70
Muhazi Upstream
300
Rugezi before discharging into Burera Lake
800
Muvumba River entering Rwanda from Uganda
20
Warufu River
1000
Muvumba River at Kagitumba
200
Sebeya River at Musabike
100
Sebeya River at Nyundo station
300
Kivu Lake Gisenyi Beach
100
Muvumba River after mixing with Warufu River
4
Akagera Rusumo border
300
Mukungwa River before receiving Nyabarongo
300
Nyabarongo River before receiving Mukungwa
600
Mukungwa River at Nyakinama gauging station
400
Nyabarongo at Ruliba
90
Nyabugogo River Downstream
1000
Nyabugogo River Upstream
30
Muhazi Downstream
100
Akagera at Kanzeze bridge
800
Standard
Not detectable0


Mwogo River up
50
Kivu Lake at Karongi (Beach Golf Hotel)
50
Rukarara River Upstream
30
Mbirurume Downstream
60
Nyabarongo after receiving Mwogo and Mbirurume
40
Rusizi River at Kamanyola bridge
40
Kivu lake at Kamembe port
60
Rubyiro River at bridge Bugarama-Ruhwa roadKamiranzovu River
10
Ruhwa River at bridge Ruhwa border
40
Akanyaru River Gihinga
10
Akanyaru River border to Burundi
300
Secoko River before discharging into Nyabarongo
10
Muhazi Upstream
100
Rugezi before discharging into Burera Lake
400
Muvumba River entering Rwanda from Uganda
10
Warufu River
400
Muvumba River at Kagitumba
100
Sebeya River at Musabike
50
Sebeya River at Nyundo station
200
Kivu Lake Gisenyi Beach
70
Muvumba River after mixing with Warufu River
0
Akagera Rusumo border
200
Mukungwa River before receiving Nyabarongo
200
Nyabarongo River before receiving Mukungwa
200
Mukungwa River at Nyakinama gauging station
200
Nyabarongo at Ruliba
50
Nyabugogo River Downstream
900
Nyabugogo River Upstream
10
Muhazi Downstream
60
Akagera at Kanzeze bridge
100
Standard
Not detectable
E.Coli (cfu/100ml)