



water for people
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Profitability of Water Systems Operated by Ayateke in Rulindo and Gicumbi

11.08.2019



OUTLINE

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2. Findings
3. Measures to increase profitability
4. Combined impact of the measures

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INTRODUCTION

- Ayateke and PAAK KAM are the operators of the piped water systems in Rulindo and Gicumbi
- Ayateke in particular claims it cannot turn a net profit and has called for tariffs to be increased
- Water For People built a detailed financial model based on operational & financial performance data shared by the operators
 - Ayateke – data from May 2017 to April 2019
 - PAAK KAM – data from August to October 2019

INTRODUCTION

Financial performance of systems

Average monthly revenue and operating costs (RWF)

	Rulindo (Ayateke)	Gicumbi – Ayateke	Gicumbi – PAAK KAM	Gicumbi – PAAK KAM (reported by firm)
Billed revenue	6,948,279	1,378,715	2,645,509	2,218,287
Private connections	2,280,081	271,458	291,289	291,289
Institutional connections	2,086,165	394,412	157,607	172,825
Public standpoints (PSPs)	2,572,085	700,945	2,107,082	1,664,643
Other connections	10,398	11,900	89,531	89,531
Collected revenue	6,324,753	1,230,245	2,292,167	2,140,491
Private connections	1,865,748	211,030	217,887	217,887
Institutional connections	1,793,262	352,096	125,003	139,024
Public standpoints (PSPs)	2,630,885	658,248	1,869,646	1,703,950
Other connections	34,858	8,871	79,630	79,630
Operating costs	7,353,621	1,437,091	2,063,355	2,063,355
Fuel	333,825	1,739	0	0
Electricity	3,137,983	237,694	884,116	884,116
Staff	2,561,235	797,359	936,673	936,673
Material and maintenance	956,732	231,830	128,500	128,500
Others	363,845	168,469	114,067	114,067
Gross profit – billed revenue	-405,484	-58,376	582,154	154,932
Gross profit – collected revenue	-1,028,869	-206,846	228,812	77,136
Fees	715,658	142,008	272,487	532,563
<i>Redevance royalties</i>	694,814	137,872	264,551	187,525
RRA tax	20,844	4,136	7,937	345,038
Net profit – billed revenue	-1,121,142	-200,383	309,666	-377,631
Net profit – collected revenue	-1,744,527	-348,853	-43,675	Not reported

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FINDINGS

**Systems
formally
operated
by
Ayateke:
Rulindo**

No.	Name (village(s) served)	Type
1	Bitete-Rwahi	Gravity
2	Buramira	Gravity
3	Gakoma	Gravity
4	Gasuro	Gravity
5	Gasama	Gravity
6	Gisoro-Nyundo	Gravity
7	Gatare	Gravity
8	Kigarama	Gravity
9	Kibuye	Gravity
10	Kirambo	Gravity
11	Kirikumuryango	Gravity
12	Kishwi	Gravity
13	Mutagata Gravity	Gravity
14	Mutungo	Gravity
15	Nkombe	Gravity
16	Ntakara	Gravity
17	Ntaruka	Gravity
18	Nyabishengeshi	Gravity

No.	Name (village(s) served)	Type
19	Nyagahondo	Gravity
20	Nyakabizi	Gravity
21	Nyakiriba	Gravity
22	Rusave	Gravity
23	Rushinya-Taba	Gravity
24	Rutare-Nyirangarama	Gravity
25	Rutembe-Mpango-Bushoki	Gravity
26	Rutomvu	Gravity
27	Rwamugaza	Gravity
28	Rwiseke	Gravity
29	Rwambogo	Gravity
30	Kararama	Electrical pumping
31	Ngoma EPS	Electrical pumping
32	Kinywamagana	Electrical pumping
33	Marenge	Electrical pumping
34	Musenge	Electrical pumping
35	Mutagata EPS	Electrical pumping
36	Tare	Electrical pumping

FINDINGS

Systems formally operated by Ayateke: Gicumbi

No.	Name (village(s) served)	Type
1	Byimana-Burimbi	Gravity
2	Cyamuhinda-Kagogo	Gravity
3	Gisiza	Gravity
4	Gitoma	Gravity
5	Bucyazo-Rebero	Gravity
6	Byimana-Ruhondo	Gravity
7	Gatoma	Gravity
8	Jamba-Muko	Turbo
9	Kabakene	Gravity
10	Kagomero	Gravity
11	Kagusa	Gravity
12	Kamutora	Gravity
13	Kanyirabuki-Cyeya	Gravity
14	Kinnyogo-Kaniga	Gravity
15	Kivomo-Rushaki	Gravity
16	Muhondo	Gravity

No.	Name (village(s) served)	Type
17	Nangara	Gravity
18	Nyakeru	Gravity
19	Nyagahanga	Gravity
20	Nyakagezi-Nyabishambi	Gravity
21	Nyamabuye II	Gravity
22	Ruboroga I	Gravity
23	Ruboroga II	Gravity
24	Ruhondo-Mukono-Kanombe	Gravity
25	Rurumbira	Gravity
26	Rusebeya-Mulindi	Gravity
27	Rwangabo-Bwisige	Gravity
28	Rwengwe	Gravity
29	Nyakabingo-Shangasha-Bwisige-Mukarange	Gravity
30	Cyuru-Gisiza	Gravity
31	Kamushure-Bugomba	Gravity

FINDINGS

Systems formally operated by PAAK KAM (Gicumbi)

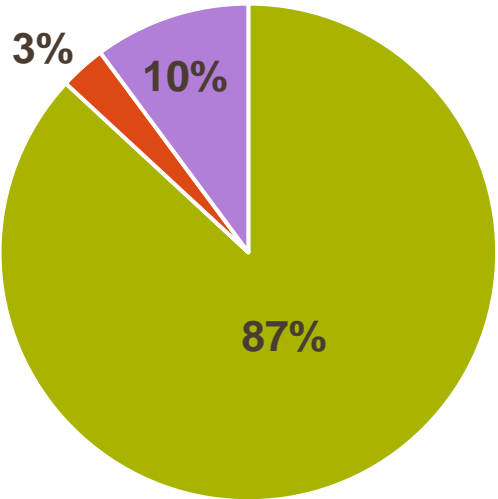
No.	Name (village(s) served)	Type
1	Rwungo-Manyagi	Electrical pumping
2	Nyankenke-Kisaro-Mutete-Zoko	Electrical pumping
3	Murama-Rwamiko-Bukure	Electrical pumping
4	Nyiraruzenga-Maya	Gravity
5	Bureranyana-Tanda	Gravity
6	Gishambashayo-Gatuna	Gravity
7	Gitaba-Mafurebo	Gravity
8	Kigogo	Turbo
9	Rwimbogo-Gaseke	Gravity
10	Bukure-Karagari-Nyanza	Gravity
11	Rutare-Gaseke	Gravity
12	Gacyeri-Rwamiko-Bukure	Gravity
13	Ruhurura-Yaramba	Gravity

No.	Name (village(s) served)	Type
14	Kiriba-Mabare (Kiriba-Mugera-Gatuna)	Gravity
15	Gatoki-Gatuna	Gravity
16	Kamaganga-Mwange	Gravity
17	Kamushenyi-Nyande	Gravity
18	Bulindi-Cyumba	Gravity
19	Rutare	Turbo
20	Rumuli	Gravity
21	Karwanira-Yaramba (Kinishya)	Gravity
22	Museke	Electrical pumping
23	Karushya-Ruzizi (Kareranyana)	Gravity
24	Nyakagezi-Rwesero	Gravity

FINDINGS

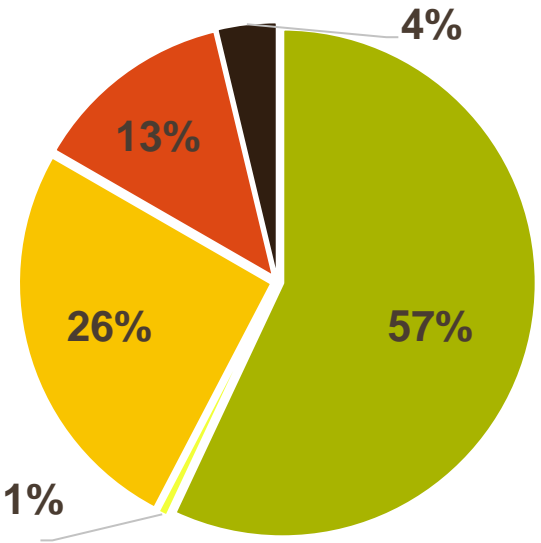
Current functionality status of the water systems in terms of population served

Rulindo –
Ayateke



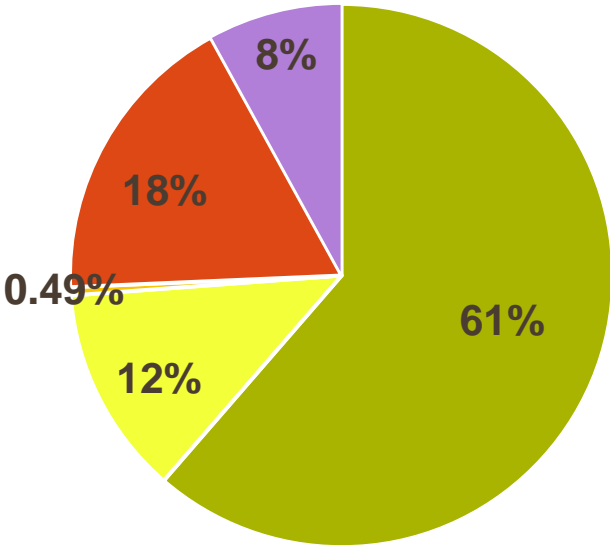
- Functional
- Not functional
- Unclear

Gicumbi –
Ayateke



- Functional
- Partially functional
- Functional but without water meters
- Not functional
- Abandoned

Gicumbi –
PAAK KAM



- Functional
- Partially functional
- Partially functional, without water meters
- Not functional
- Unclear

FINDINGS

Connection billing

EXAMPLE

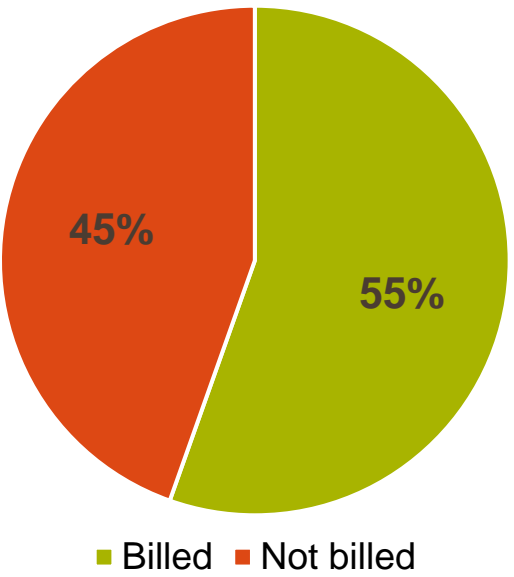
Number of billed private connections between May 2017 and March 2018 in the Mutagata Gravity system (Rulindo)

Month	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
# of billed connections	70	54	55	57	51	70	70	70	46	46	46

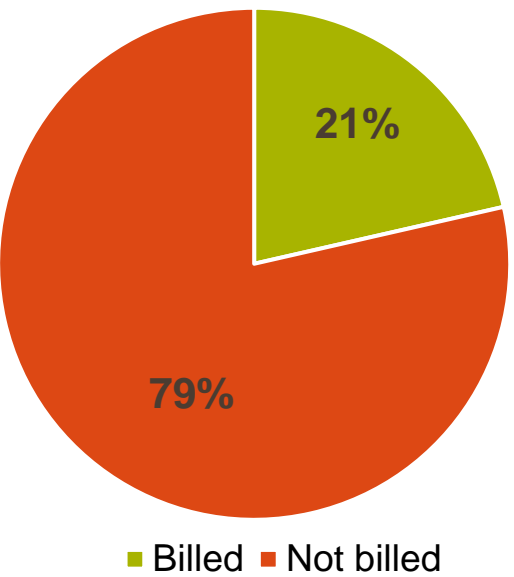
FINDINGS

Average billed vs. not billed connections – private connections

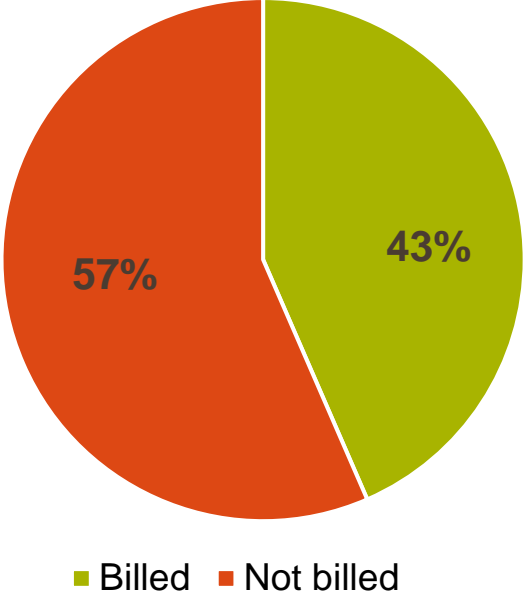
Rulindo – Ayateke



Gicumbi – Ayateke



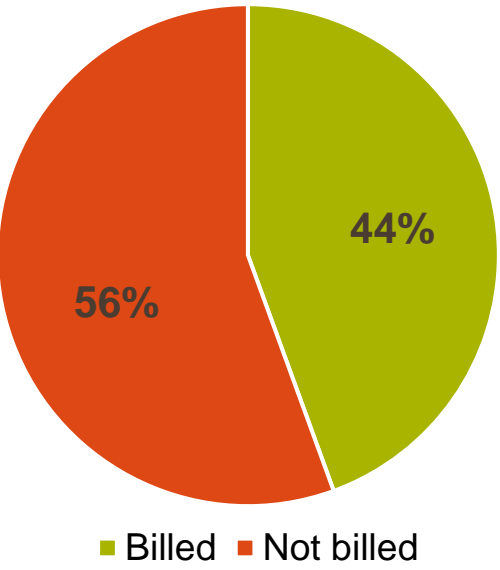
Gicumbi – PAAK KAM



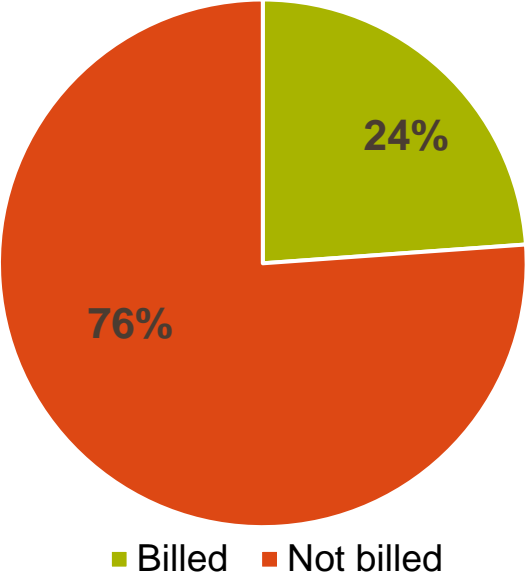
FINDINGS

Average billed vs. not billed connections – institutional connections

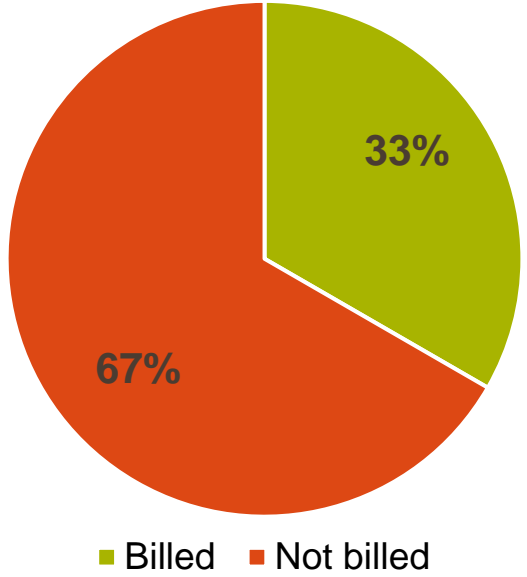
Rulindo – Ayateke



Gicumbi – Ayateke



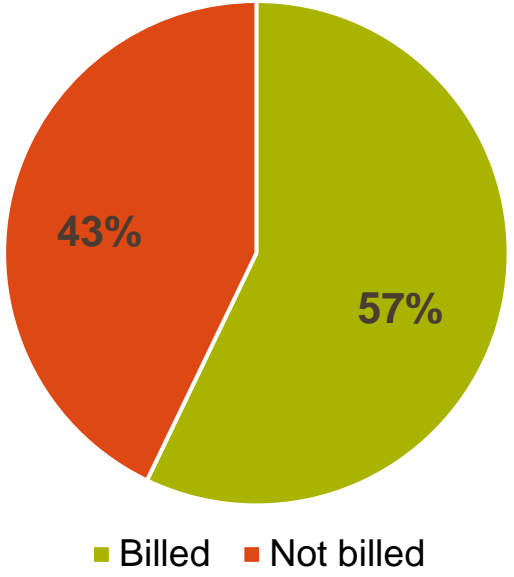
Gicumbi – PAAK KAM



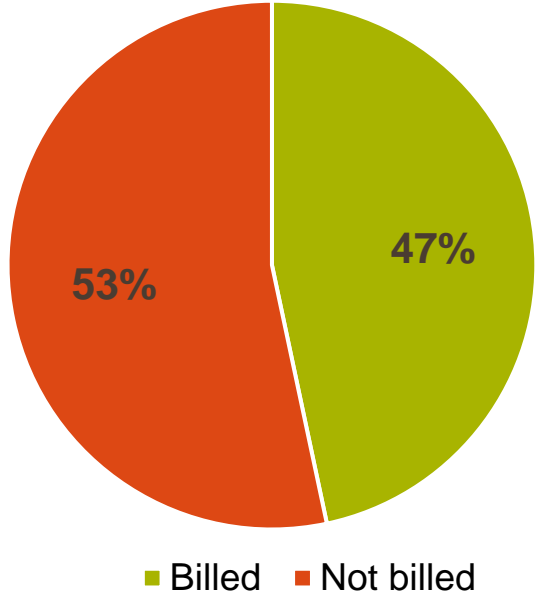
FINDINGS

Average billed vs. not billed connections – PSPs

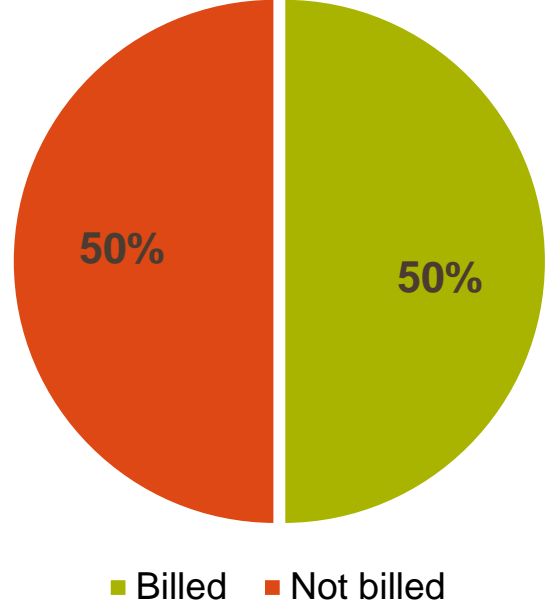
Rulindo – Ayateke



Gicumbi – Ayateke



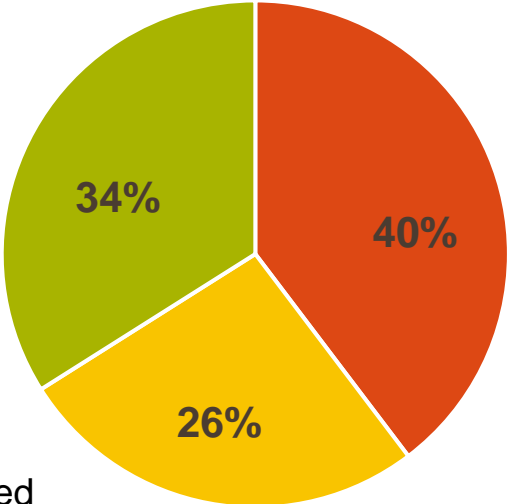
Gicumbi – PAAK KAM



FINDINGS

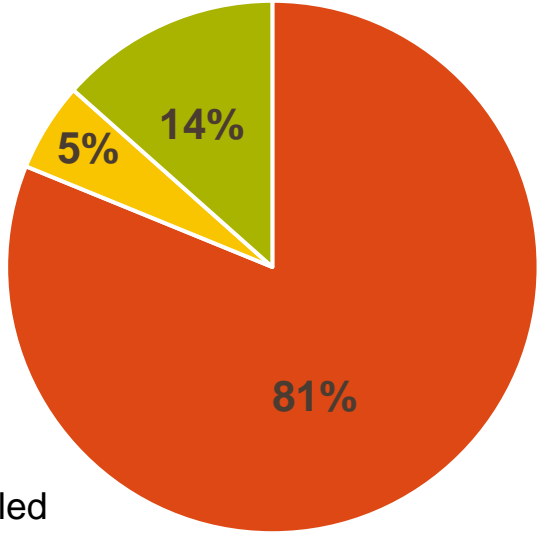
Non-Revenue Water (NRW)

**Rulindo –
Ayateke**



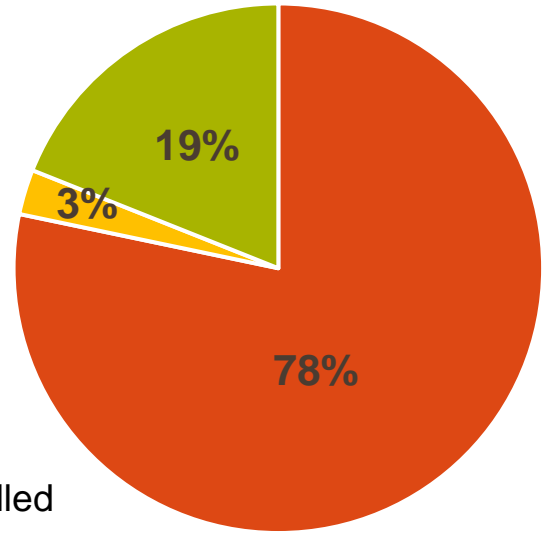
- Not billed
- Billed but not paid
- Revenue water

**Gicumbi –
Ayateke**



- Not billed
- Billed but not paid
- Revenue water

**Gicumbi –
PAAK KAM**



- Not billed
- Billed but not paid
- Revenue water

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- Increase in connection billing rates
- Decrease in NRW
- System metering & rehabilitation + accounting for systems of unclear status

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MEASURES

**Increase in connection billing rates:
Additional avg. monthly revenue collected if billing rates are increased to 90% (RWF)**

Rulindo – Ayateke

SYSTEM	Private connections	Institutional connections	PSPs	SYSTEM	Private connections	Institutional connections	PSPs
Bitete-Rwahi	3,537	0	1,182	Rushinya-Taba	1,256	0	4,815
Buramira	0	0	1,415	Rutare-Nyi'ma	2,553	3,284	0
Gakoma	10,765	0	28,217	Rutomvu	8,273	1,937	8,333
Gisoro-Nyundo	3,706	0	3,948	Rwamugaza	22,082	6,522	12,889
Kigarama	1,461	5,474	454	Rwiseke	18,371	4,226	2,146
Kibuye	2,430	0	1,078	Kararama	13,101	62,146	30,319
Kirikumuryango	29,823	11,631	4,006	Ngoma EPS	1,727	3,688	30,474
Mutagata Gravity	5,175	25,818	4,181	Kinywamagana	66,791	28,143	11,929
Ntaruka	4,565	6,121	4,453	Marenge	35,788	17,551	0
Nyabishengeshi	2,710	0	6,117	Musenge	1,699	23,308	42,336
Nyagahondo	17,341	3,693	1,933	Mutagata EPS	24,633	34,953	14,085
Rusave	1,834	2,128	460	Tare	31,138	39,851	21,322

Total: RWF 827,326 per month

MEASURES

**Increase in connection billing rates:
Additional avg. monthly revenue collected if billing rates are increased to 90% (RWF)**

Gicumbi – Ayateke

SYSTEM	Private connections	Institutional connections	PSPs
Byimana-Burimbi	2,743	0	10,023
Gisiza	10,166	11,722	9,787
Bucyazo-Rebero	10,840	21,416	37,624
Byimana-Ruhondo	96,141	103,882	76,114
Jamba-Muko	25,811	21,833	132,637
Kivomo-Rushaki	42,115	3,508	12,662
Nyamabuye II	46,500	86,206	55,070
Ruboroga II	10,549	328,934	17,118
Ruhondo-Mukono-Kanombe	932	6,034	522
Cyuru-Gisiza	28,950	14,931	125,804
Kamushure-Bugomba	0	0	6,679

Total: RWF 1,357,253 per month

MEASURES

**Increase in connection billing rates:
Additional avg. monthly revenue collected if billing rates are increased to 90% (RWF)**

Gicumbi – PAAK KAM

SYSTEM	Private connections	Institutional connections	PSPs
Rwungo-Manyagiro	76,015	8,069	251,774
Nyankenke-Kisaro-Mutete-Zoko	71,274	0	28,631
Murama-Rwamiko-Bukure	47,056	15,981	19,652
Nyiraruzenga-Maya	6,372	392	1,580
Bureranyana-Tanda	6,193	0	2,362
Gishambashayo-Gatuna	6,129	3,102	1,389
Rwimbogo-Gaseke	0	0	-1,786
Bukure-Karagari-Nyanza	17,330	0	4,476
Gacyeri-Rwamiko-Bukure	7,062	0	0
Kiriba-Mabare	8,065	454	1,568
Kamaganga-Mwange	0	0	2,383
Kamushenyi-Nyande	370	0	7,253

Total: RWF 593,148 per month

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- Increase in connection billing rates
- **Decrease in NRW**
- System metering and rehabilitation + accounting for systems of unclear status

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MEASURES

Decrease in NRW:

Savings in energy costs if physical NRW (water losses) is reduced to 10% (RWF)

Rulindo – Ayateke

SYSTEM	Fuel	Electricity
Kararama	3,099	29,127
Ngoma EPS	14,412	135,471
Kinywamagana	7,839	73,688
Marenge	10,506	98,756
Musenge	-3,996	-37,559
Mutagata EPS	48,109	452,225
Tare	14,024	131,829

Total: RWF 977,259 per month

MEASURES

Decrease in NRW:

Savings in energy costs if physical NRW (water losses) is reduced to 10% (RWF)

Gicumbi – PAAK KAM

SYSTEM	Electricity
Rwungo-Manyagiro	112,019
Nyankenke-Kisaro-Mutete-Zoko	42,238
Murama-Rwamiko-Bukure	507,281

Total: RWF 661,538 per month

MEASURES

Decrease in NRW:

Additional avg. monthly revenue collected if commercial NRW is reduced to 10% (RWF)

Rulindo – Ayateke

SYSTEM	Private connections	Institutional connections	PSPs	SYSTEM	Private connections	Institutional connections	PSPs
Bitete-Rwahi	4,872	3,382	0	Rushinya-Taba	4,952	2,356	2,603
Buramira	100	0	553	Rutare-Nyi'ma	14,483	1,262	0
Gakoma	0	0	0	Rutomvu	4,221	8,429	1,980
Gisoro-Nyundo	0	128	0	Rwamugaza	0	11,870	0
Kigarama	0	0	675	Rwiseke	0	8,841	0
Kibuye	8,296	28	228	Kararama	10,146	0	0
Kirikumuryango	3,482	2,714	0	Ngoma EPS	884	2,851	0
Mutagata Gravity	1,973	0	0	Kinywamagana	44,137	4,521	0
Ntaruka	12,598	4,553	0	Marengo	23,568	0	0
Nyabishengeshi	13,270	1,083	140	Musenge	10,814	0	1,441
Nyagahondo	11,659	15,162	1,904	Mutagata EPS	91,676	0	0
Rusave	6,201	5,346	0	Tare	2,034	24,509	0

Total: RWF 375,925 per month

MEASURES

Decrease in NRW:

Additional avg. monthly revenue collected if commercial NRW is reduced to 10% (RWF)

Gicumbi – Ayateke

SYSTEM	Private connections	Institutional connections	PSPs
Byimana-Burimbi	946	0	0
Gisiza	0	378	0
Bucyazo-Rebero	8,258	8,363	0
Byimana-Ruhondo	0	2,530	0
Jamba-Muko	9,170	39,700	0
Kivomo-Rushaki	64,450	2,622	3,152
Nyamabuye II	33,357	212	0
Ruboroga II	2,362	0	0
Ruhondo-Mukono-Kanombe	4,040	0	29
Cyuru-Gisiza	0	7,707	0
Kamushure-Bugomba	100	65	0

Total: **RWF 187,444** per month

MEASURES

Decrease in NRW:

Additional avg. monthly revenue collected if commercial NRW is reduced to 10% (RWF)

Gicumbi – PAAK KAM

SYSTEM	Private connections	Institutional connections	PSPs
Rwungo-Manyagiro	0	0	0
Nyankenke-Kisaro-Mutete-Zoko	56,206	0	0
Murama-Rwamiko-Bukure	0	8,409	70,476
Nyiraruzenga-Maya	0	2,188	2,267
Gishambashayo-Gatuna	0	8,504	4,674
Rwimbogo-Gaseke	19,479	2,879	1,050
Bukure-Karagari-Nyanza	12,002	0	0
Gacyeri-Rwamiko-Bukure	7,296	0	13,494

Total: **RWF 208,923** per month

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- Increase in connection billing rates
- Decrease in NRW
- System metering and rehabilitation + accounting for systems of unclear status

4. Combined impact of the measures

MEASURES

**System metering and rehabilitation + accounting for systems of unclear status:
Additional avg. monthly revenue collected if systems are rehab'ed & accounted for (RWF)**

Rulindo – Ayateke

SYSTEMS	Status	Private connections	Institutional connections	PSPs
Gasuro	Not functional	3,247	0	0
Gasama	Unclear	7,576	0	5,476
Gatare	Not functional	10,823	5,474	5,476
Kirambo	Not functional	49,786	27,369	54,764
Kishwi	Unclear	49,786	27,369	54,764
Mutungo	Unclear	8,658	5,474	10,953
Nkombe	Unclear	49,786	27,369	54,764
Ntakara	Unclear	49,786	27,369	54,764
Nyakabizi	Unclear	21,646	10,947	27,382
Nyakiriba	Unclear	11,905	5,474	10,953
Rutembe-Mpango-Bushoki	Unclear	10,823	5,474	16,429
Rwambogo	Unclear	10,823	5,474	5,476

Total: RWF 733,639 per month

MEASURES

**System metering and rehabilitation + accounting for systems of unclear status:
Additional avg. monthly revenue collected if systems are metered (RWF)**

Gicumbi – Ayateke

SYSTEMS	Status	Private connections	Institutional connections	PSPs
Cyamuhinda-Kagogo	Not metered	62,773	36,748	91,863
Gatoma	Not metered	14,267	73,496	86,760
Kabakene	Not metered	14,267	18,374	15,311
Kamutura	Not metered	14,267	18,374	10,207
Kanyirabuki-Cyeya	Not metered	65,627	18,374	40,828
Muhondo	Not metered	19,973	36,748	45,932
Nangara	Not metered	14,267	55,122	20,414
Nyakeru	Not metered	14,267	18,374	30,621
Nyagahanga	Not metered	14,267	18,374	25,518
Rurumbira	Not metered	5,707	36,748	15,311
Rusebeya-Mulindi	Not metered	65,627	18,374	71,449
Rwangabo-Bwisige	Not metered	5,707	55,122	76,553
Rwengwe	Not metered	31,387	110,244	30,621

Total: RWF 1,418,256 per month

MEASURES

**System metering and rehabilitation + accounting for systems of unclear status:
Additional avg. monthly revenue collected if systems are rehab'ed (RWF)**

Gicumbi – Ayateke

SYSTEMS	Status	Private connections	Institutional connections	PSPs
Gitoma	Not functional	11,413	18,374	30,621
Kagomero	Not functional	8,560	0	15,311
Kagusa	Not functional	65,627	18,374	25,518
Nyakagezi-Nyabishambi	Not functional	65,627	91,870	71,449
Nyakabingo-Shangasha-Bwisige-Mukarange	Not functional	65,627	91,870	71,449

Total: RWF 651,688 per month

MEASURES

**System metering and rehabilitation + accounting for systems of unclear status:
Additional avg. monthly revenue collected if systems are rehab'ed, metered & accounted for (RWF)**

Gicumbi – PAAK KAM

SYSTEMS	Status	Private connections	Institutional connections	PSPs
Bulindi-Cyumba	Not functional	25,177	12,782	56,201
Rutare	Not functional	25,177	12,782	56,201
Rumuli	Not functional	25,177	12,782	56,201
Karwanira-Yaramba	Not functional	0	12,782	12,489
Museke	Not functional	90,690	13,014	351,537
Rutare-Gaseke	Not metered	3,147	6,391	24,978
Gitaba-Mafurebo	Unclear	0	6,391	18,734
Kigogo	Unclear	6,294	12,782	31,223
Ruhurura-Yaramba	Unclear	12,589	6,391	31,223
Gatoki-Gatuna	Unclear	0	0	24,978
Karushya-Ruzizi	Unclear	0	0	6,245
Nyakagezi-Rwesero	Unclear	25,177	12,782	56,201

Total: RWF 1,048,520 per month

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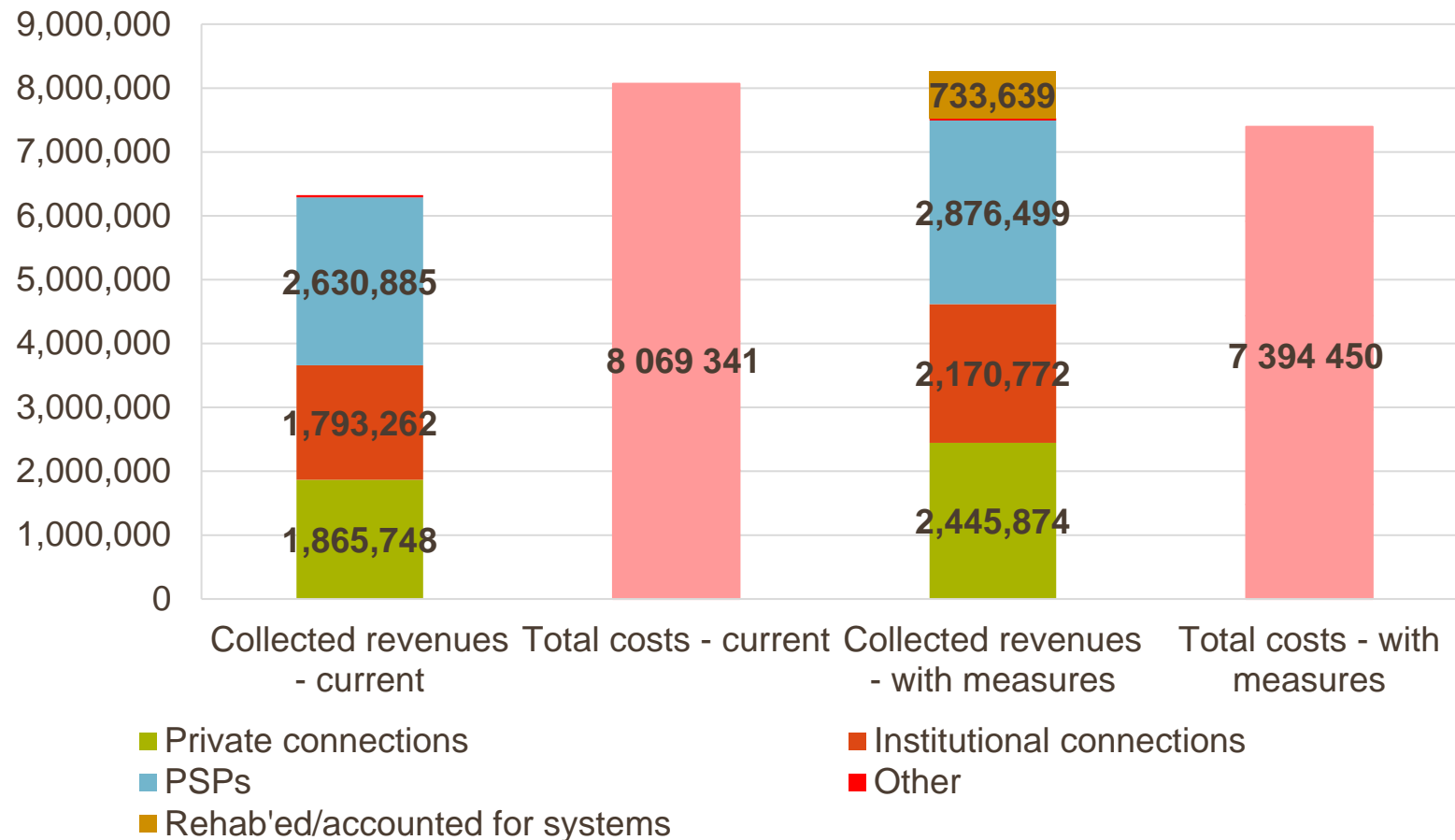
- Increase in connection billing rates
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4. Combined impact of the measures

COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures (RWF)

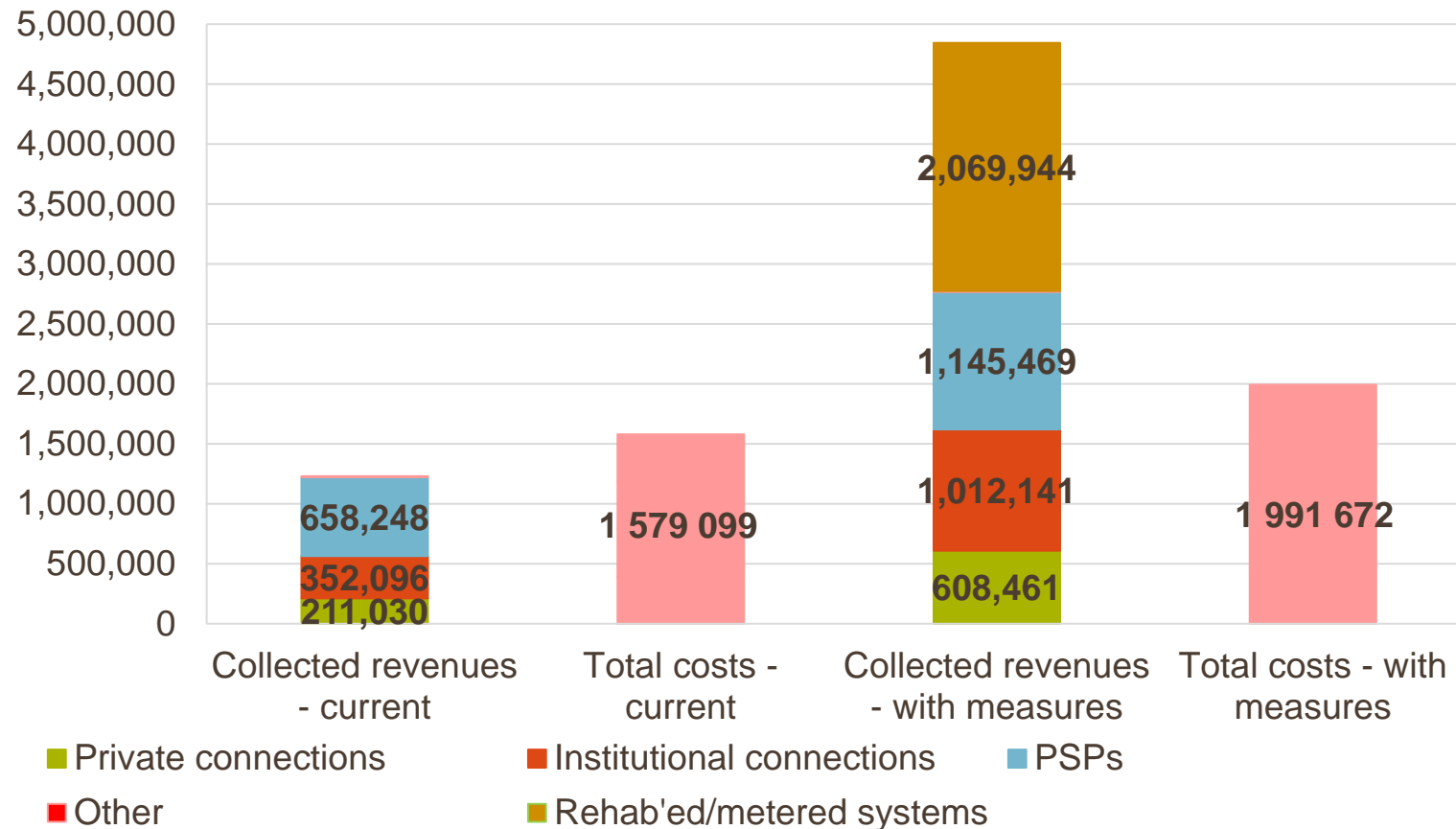
Rulindo – Ayateke



COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures (RWF)

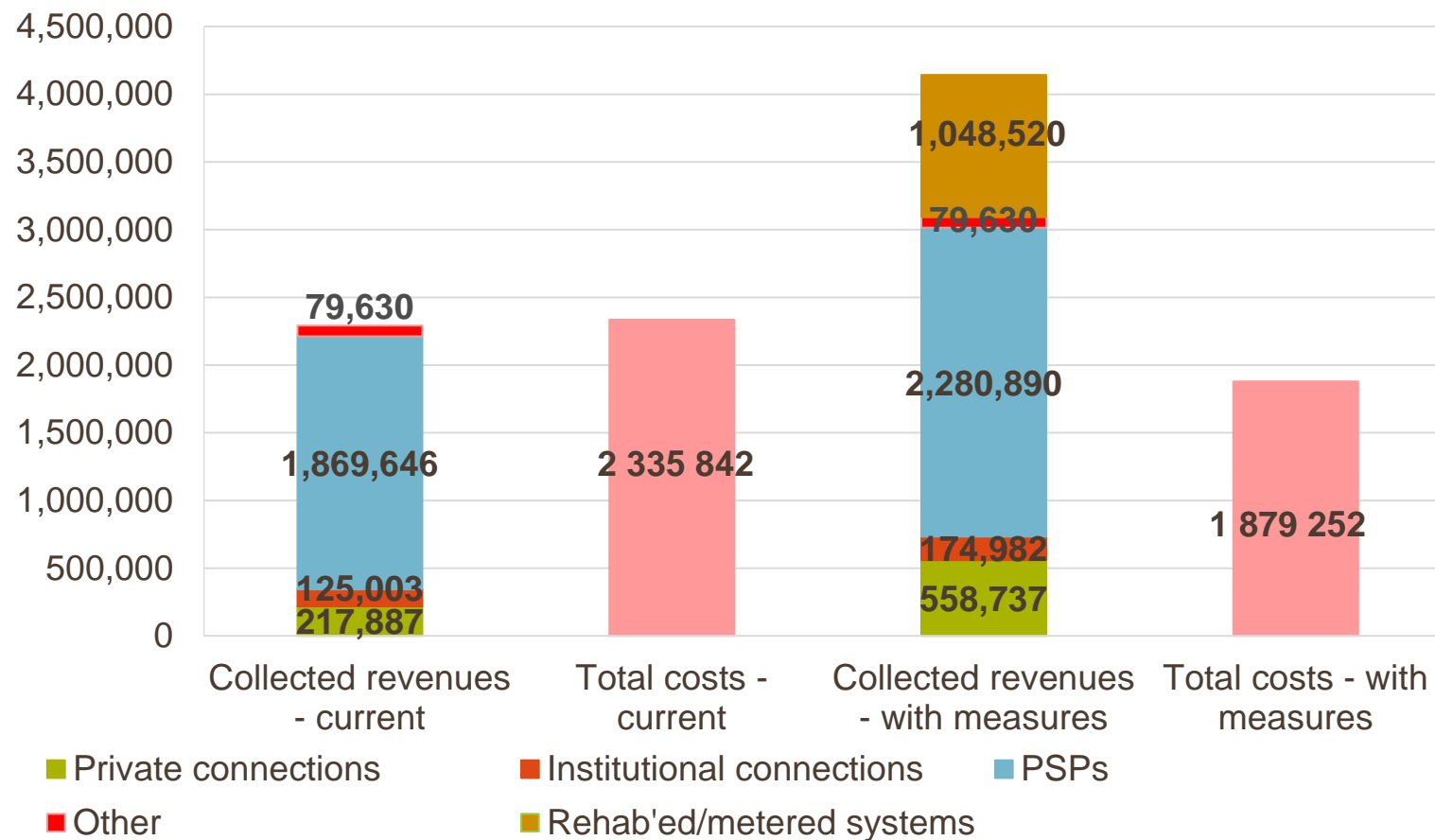
Gicumbi – Ayateke



COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures (RWF)

Gicumbi – PAAK KAM



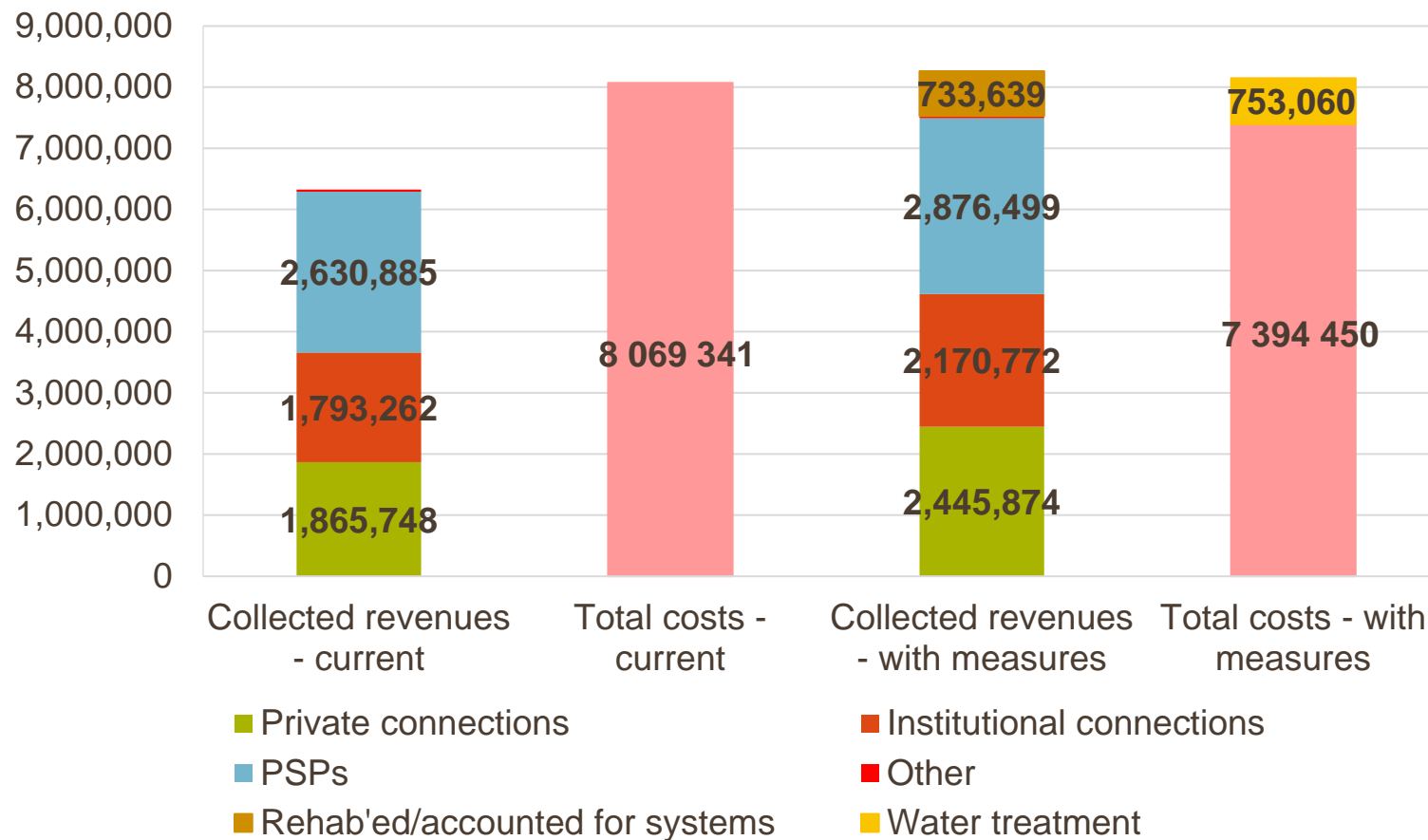
COMBINED IMPACT OF THE MEASURES

- **What about water treatment?**
 - It's a requirement from RURA
- **Cost to operator of treating water supplied**
 - Cost of chemical (Chlorine 65) for disinfection – RWF 4.7/m³ (estimate based on suppliers' quotes)
 - Cost of daily residual free chlorine measuring – RWF 18,000 per water system (based on JICA data)

COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures + water treatment (RWF)

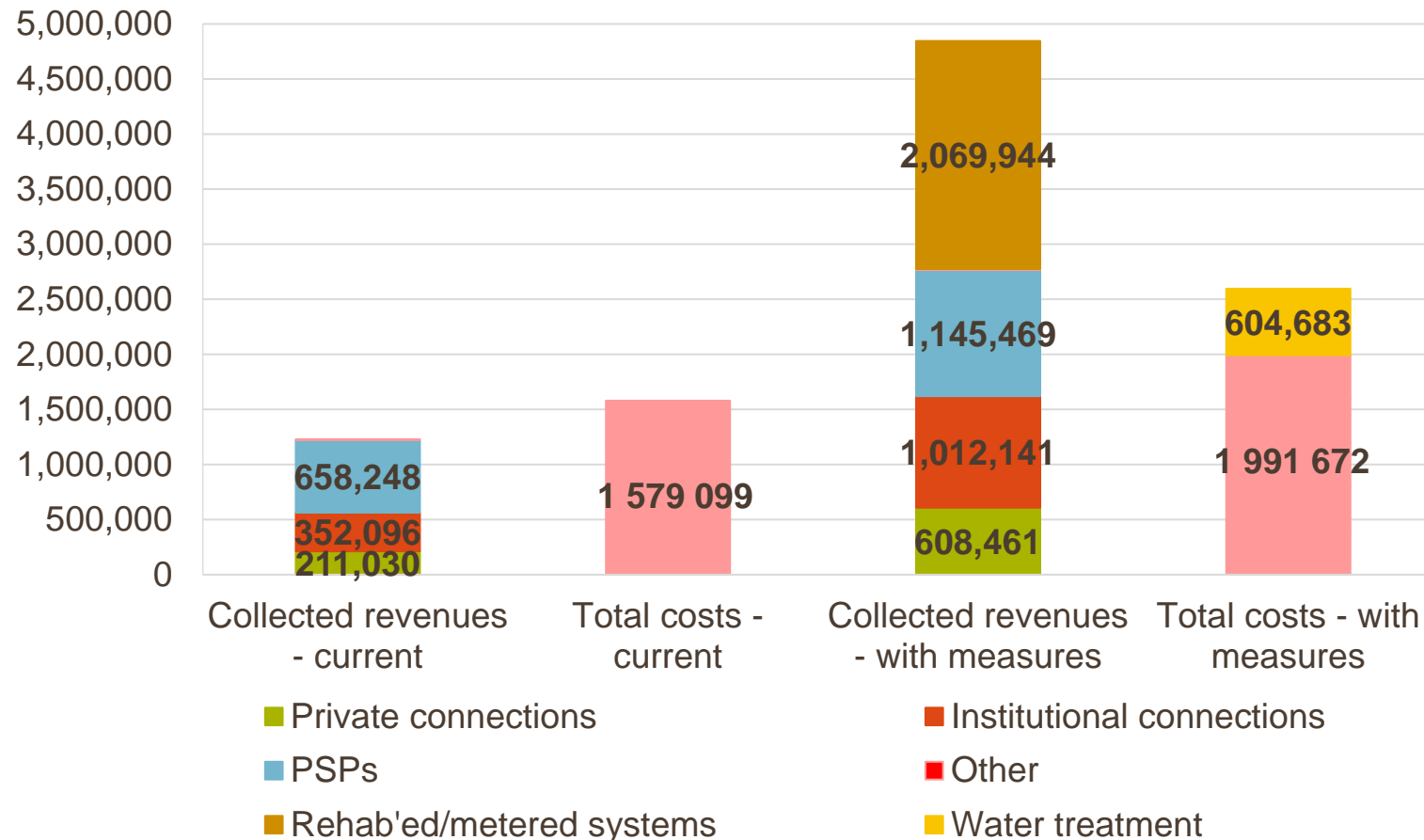
Rulindo – Ayateke



COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures + water treatment (RWF)

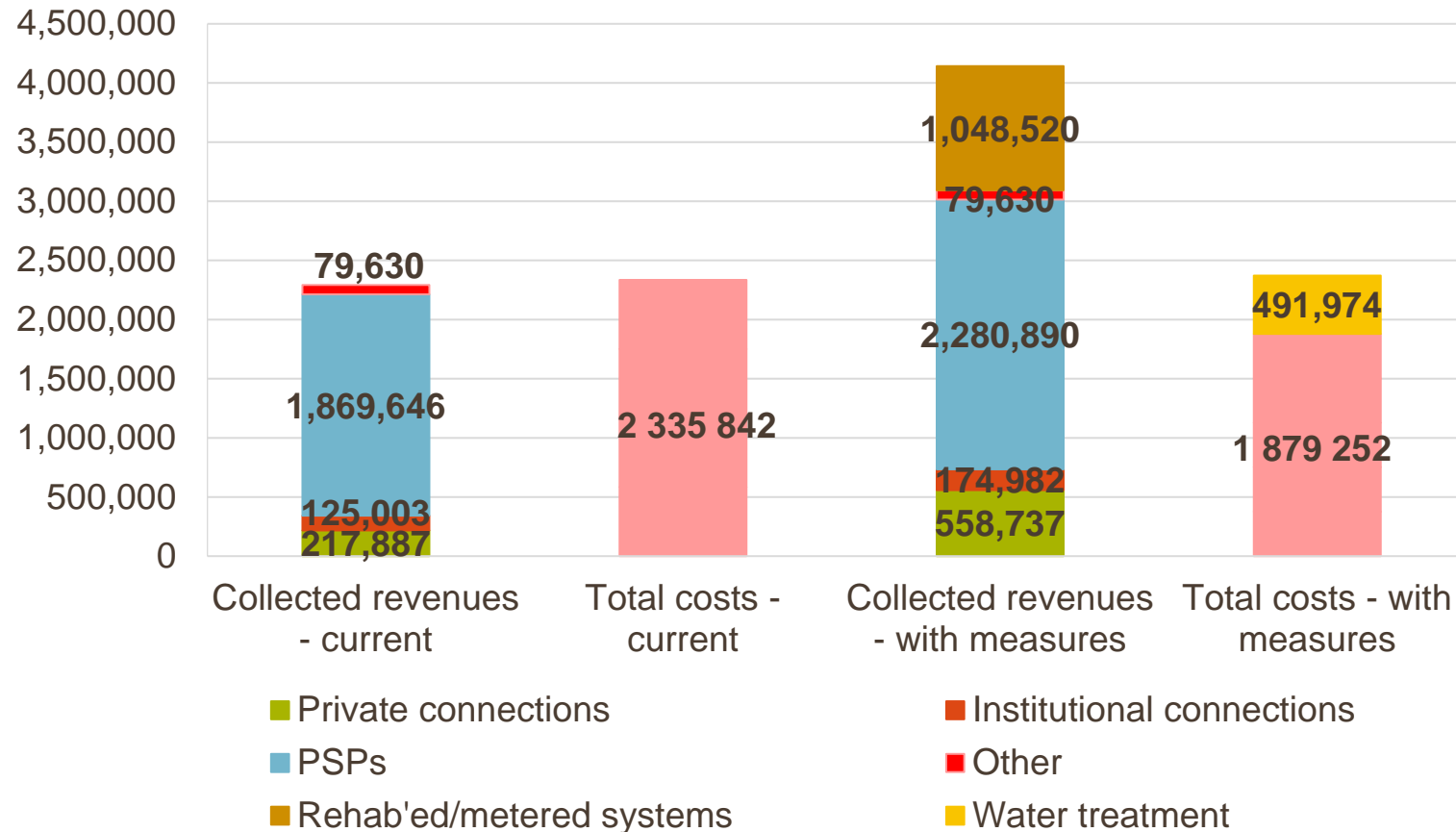
Gicumbi – Ayateke



COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures (RWF)

Gicumbi – PAAK KAM



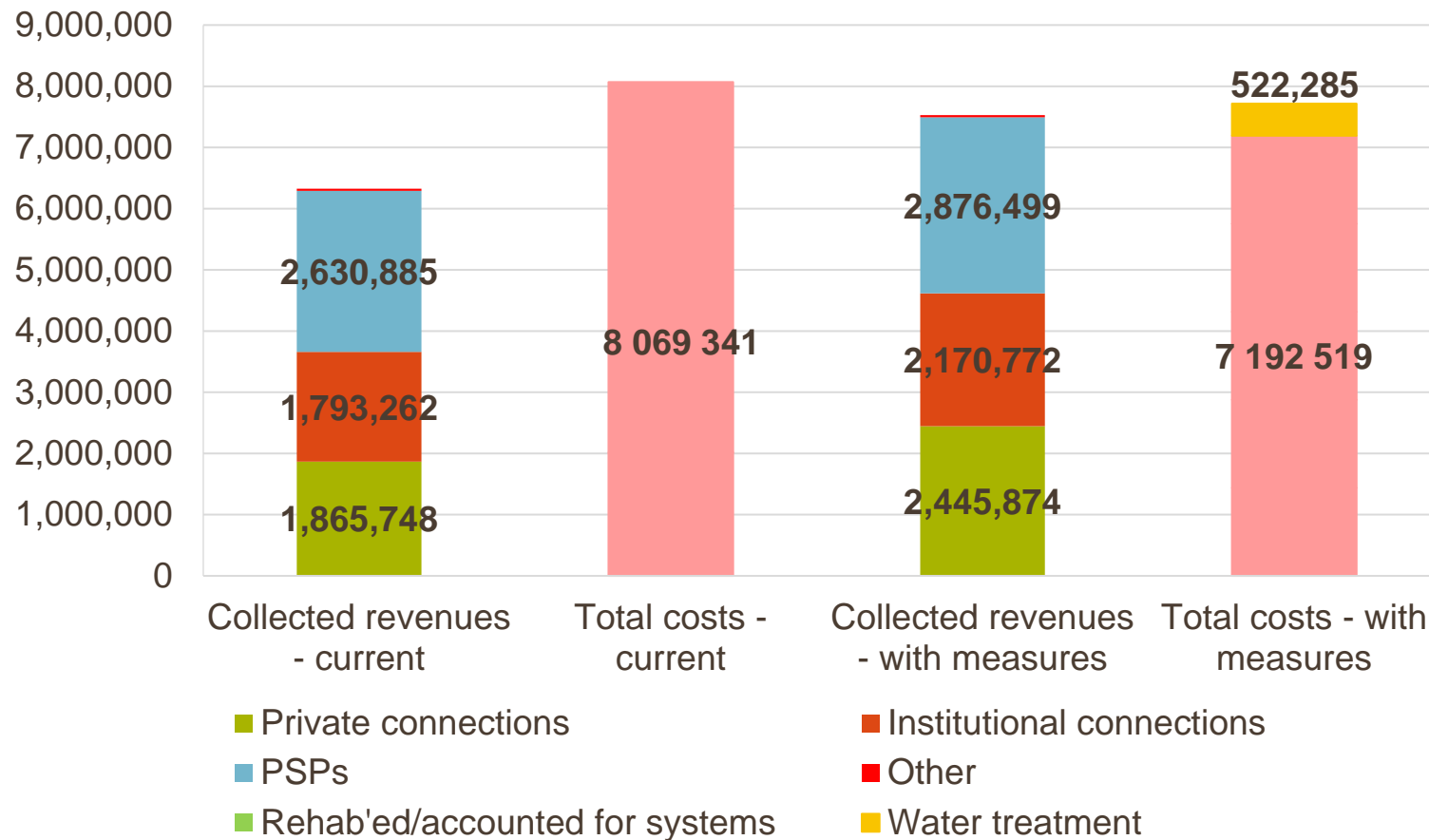
COMBINED IMPACT OF THE MEASURES

- **But... some of the proposed measures can be implemented in the short-term but others only in the mid-term**
- **Short-term**
 - Increase in connection billing rates
 - Decrease in NRW
- **Mid-term**
 - Metering of non-metered systems in Gicumbi
 - Rehabilitation of non-functional systems

COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with short-term measures (RWF)

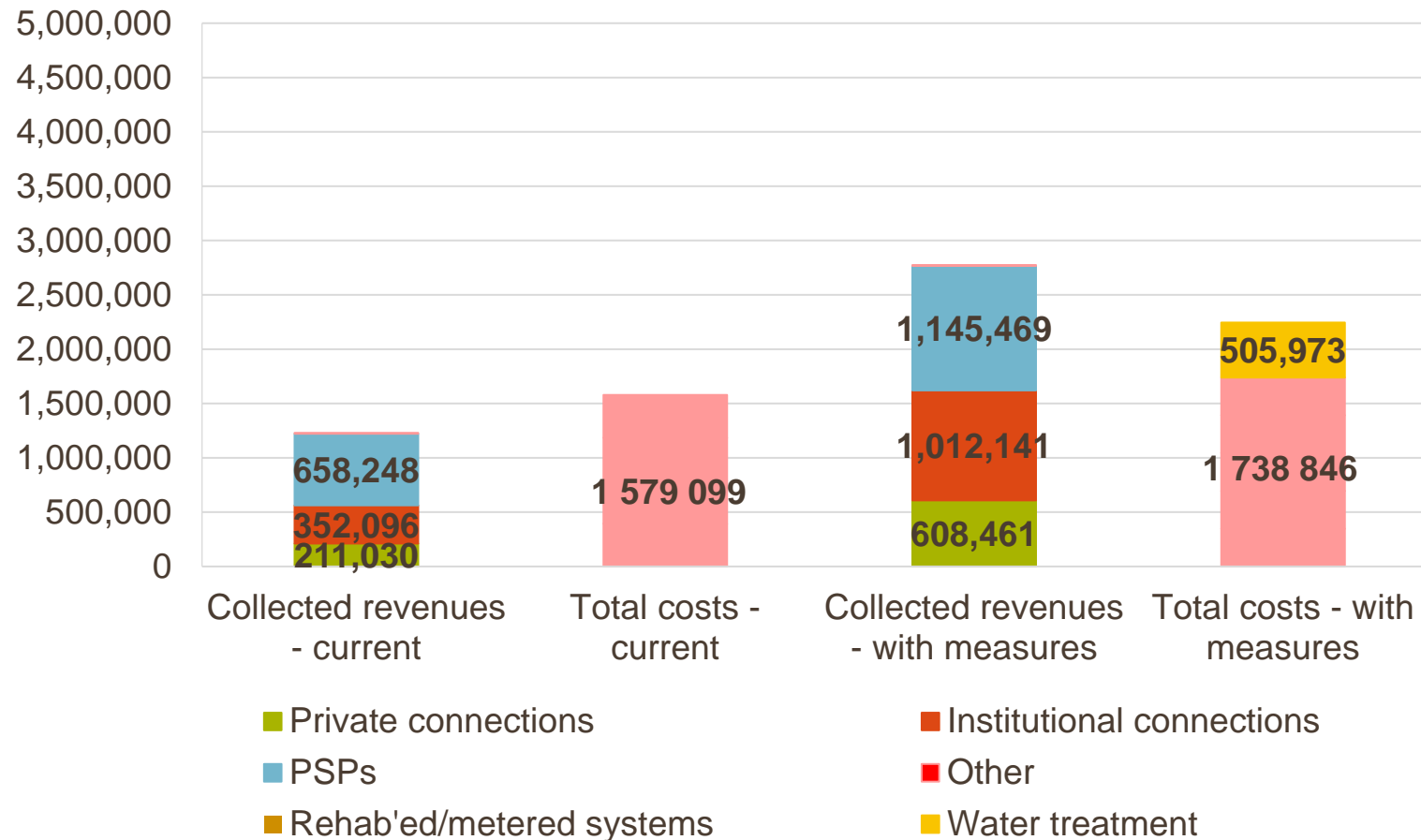
Rulindo – Ayateke



COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with short-term measures (RWF)

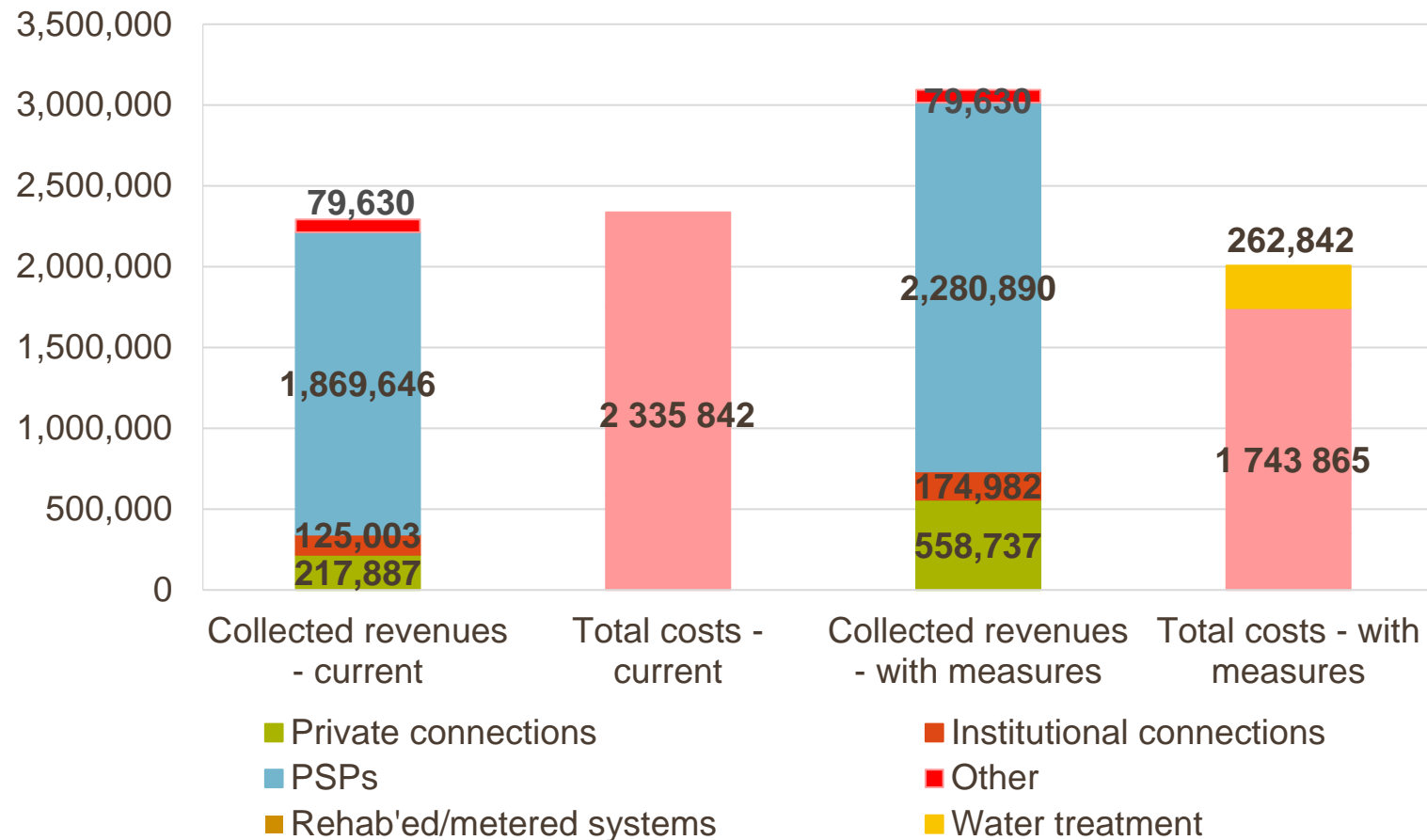
Gicumbi – Ayateke



COMBINED IMPACT OF THE MEASURES

Revenues and costs – currently vs. with measures (RWF)

Gicumbi – PAAK KAM



COMBINED IMPACT OF THE MEASURES

- **Overall finding: only scenario where an operator makes a loss is in Rulindo (Ayateke) if water treatment is introduced before all measures are implemented**
- **Can be avoided if all measures (incl. mid-term) are implemented before water treatment is demanded of the operator**



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