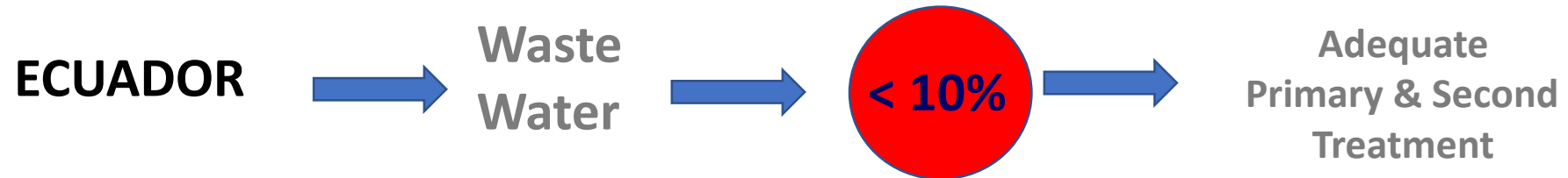


Analysis of Pre-Treatments Performance at WWTP Systems in Cuenca City

Ing. Verónica Rodas, MSc.
October, 01th 2019

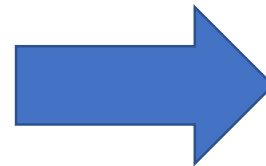
Sanitation in Ecuador



Cuenca City

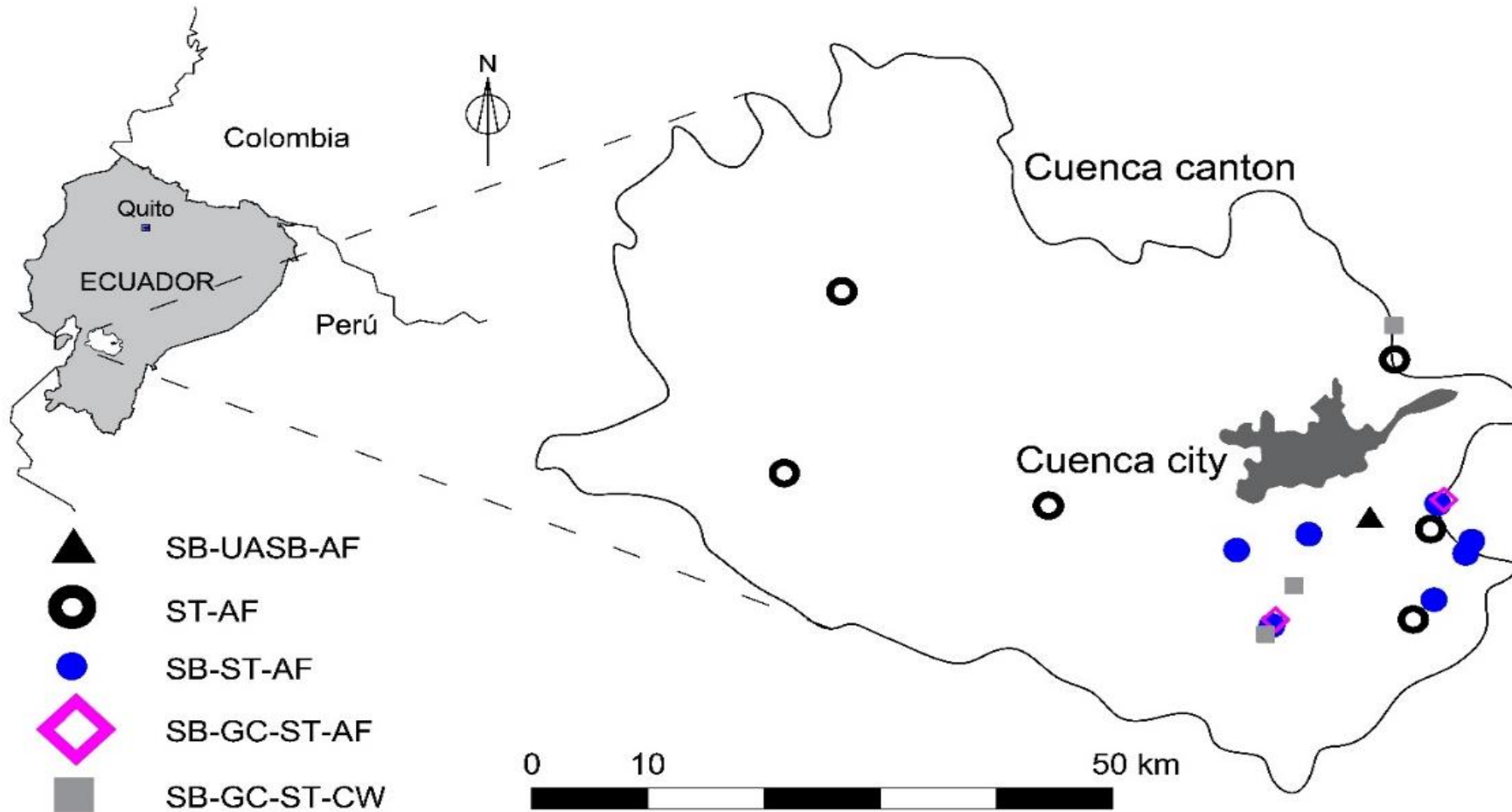
96% (Urban)

75% (Rural)



etapa

Municipal Institution in charge of
water supply and sanitation
services



SB: Screen Bars; GC: Grit Chamber; SP: Septic Tank; AF: Anaerobic Filter; CW: Constructed Wetland; UASB: Upflow anaerobic sludge blanket

Workers



Problems in the Operation & Management



Quillopungo



Cementerio

- Deficiencies in design & construction
- Periodical Cleaning, frequently clogged by sand and gravels



Septic tank

Real Cost

- Economic assessment for future scenarios
- Financial potential to replace the overloading plants & adopt a management plant

Summary & Efficiency of organic load removal from the WWTPs from 2015 to October 2017

Systems	Configuration	Discharge [l/s]	BOD ₅ [mg/l]	COD [mg/l]	Pt [mg/l]	SS [mg/l]	#mant/ month
Acchayacu	RE-FS-FA	3.69	35%	25%	23%	75%	2
Cementerio	RE-GC_FS-FA	0.29	72%	65%	33%	97%	3
Octavio C.	RE-GC_FS-HA	0.96	73%	84%		100%	1
Quillopungo	RE-UARE-FA	1.45	65%	65%	46%	99%	5
Tutupali	RE-FS-FA	1.45	43%	41%	21%	98%	3
San Pedro	RE-FS-FA	0.24	71%	69%	44%	96%	2
Guabo	FS-FA	0.58	67%	72%	29%	100%	2
Churuguzo	RE-GC_FS-HA	7.17	76%	65%	50%	97%	4

RESULTS

The efficiency of removal of organic load from the WWTPs from November 2017 to July 2018

System	BOD ₅ [mg/l]	COD [mg/l]	SS [mg/l]
Achayacu	53%	33%	90%
Cementerio	78%	69%	99%
Octavio C	85%	83%	100%
Quillopungo	61%	51%	100%
Tutupali	82%	74%	80%
San Pedro	87%	78%	98%
Guabo	77%	68%	100%
Churuguzo	70%	75%	97%

CONCLUSION

The use of a septic tank for the pre-treatment of wastewater also makes other secondary treatment systems (anaerobic filter, wetlands) more efficient.

It was possible to reach better removal percentages (COD and BOD₅) and early stabilization of the up-flow anaerobic filters, controlling the amount of floating and suspended solids in the primary treatment units.

The operation and maintenance tasks were optimized, reducing the need for constant washing, and instead of performing flow control tasks and monitoring hydraulic operation.

All the improvements to the WWTP of Quillopungo have not yet been carried out, due to the fact that in studies carried out other actions are recommended, which will be carried out in a second phase.

Thanks for your attention ¿Questions?



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V. Rodas, J. Larriva, A. Alvarado (2019) Analysis of Pre-Treatments Performance
at WWTP Systems in Cuenca City