



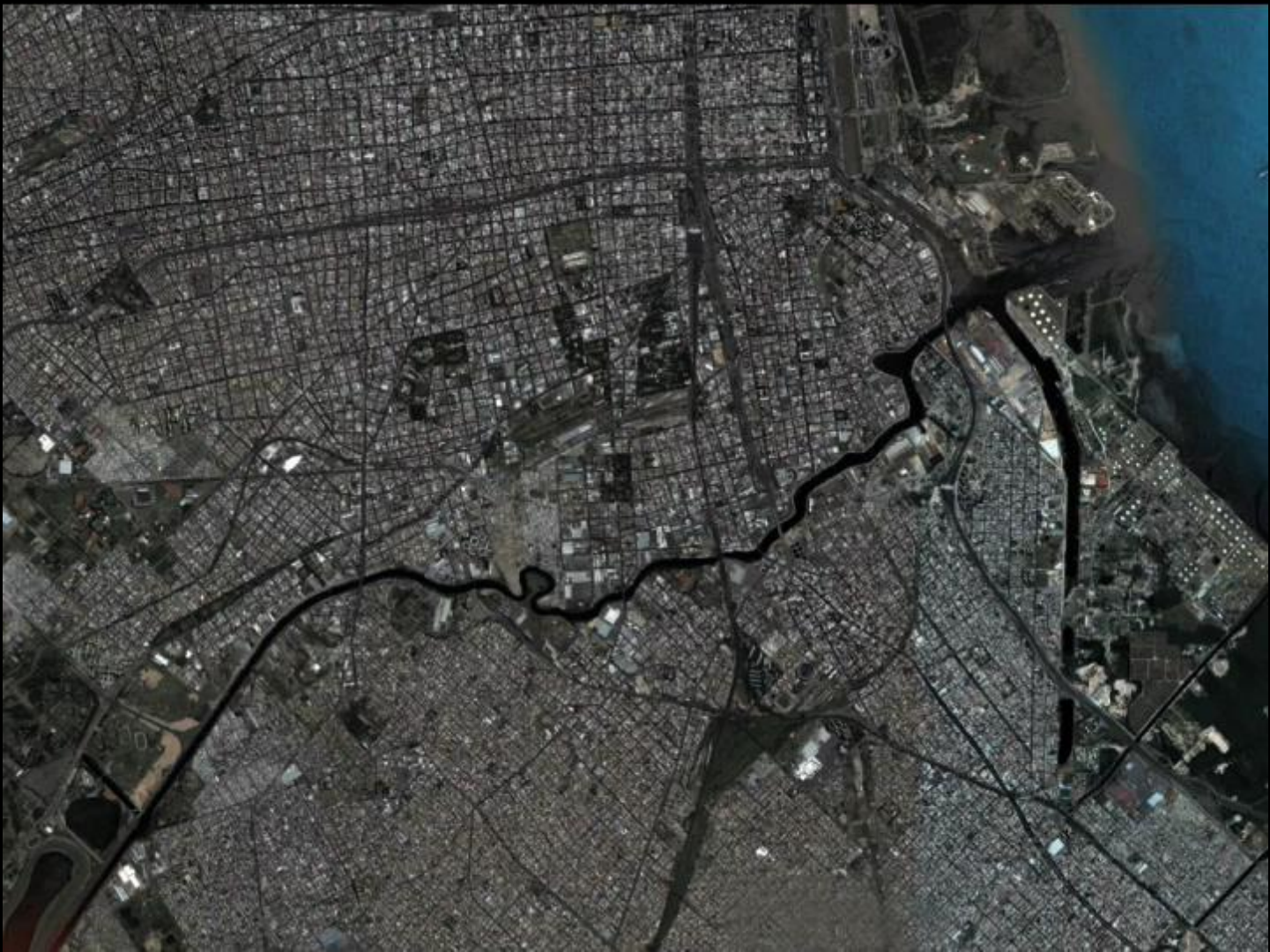
German Sturzenegger

Water and Sanitation Sr. Specialist
Inter-American Development Bank (IDB)
August 2017



SDG 6 – TARGET 6.3

By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of *hazardous* chemicals and materials, **halving the proportion of untreated wastewater** and substantially increasing recycling and safe reuse globally



LIMA, PERU





ATOTONILCO, MEXICO







EL ALTO, BOLIVA



**SANITATION
WASTEWATER TREATMENT
REVOLUTION**

A MASSIVE REVOLUTION



28%

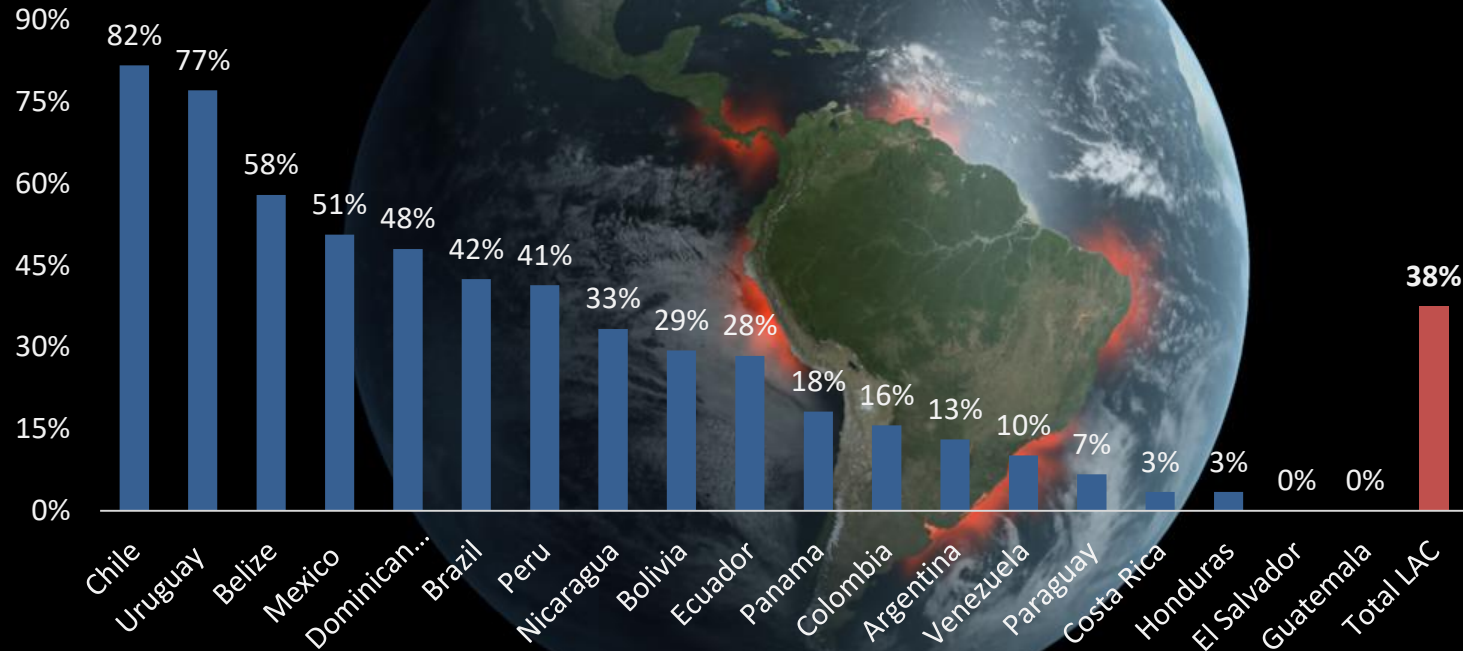
**Collected
wastewater
is treated**

18%

**Generated
wastewater
is treated**

A MASSIVE REVOLUTION

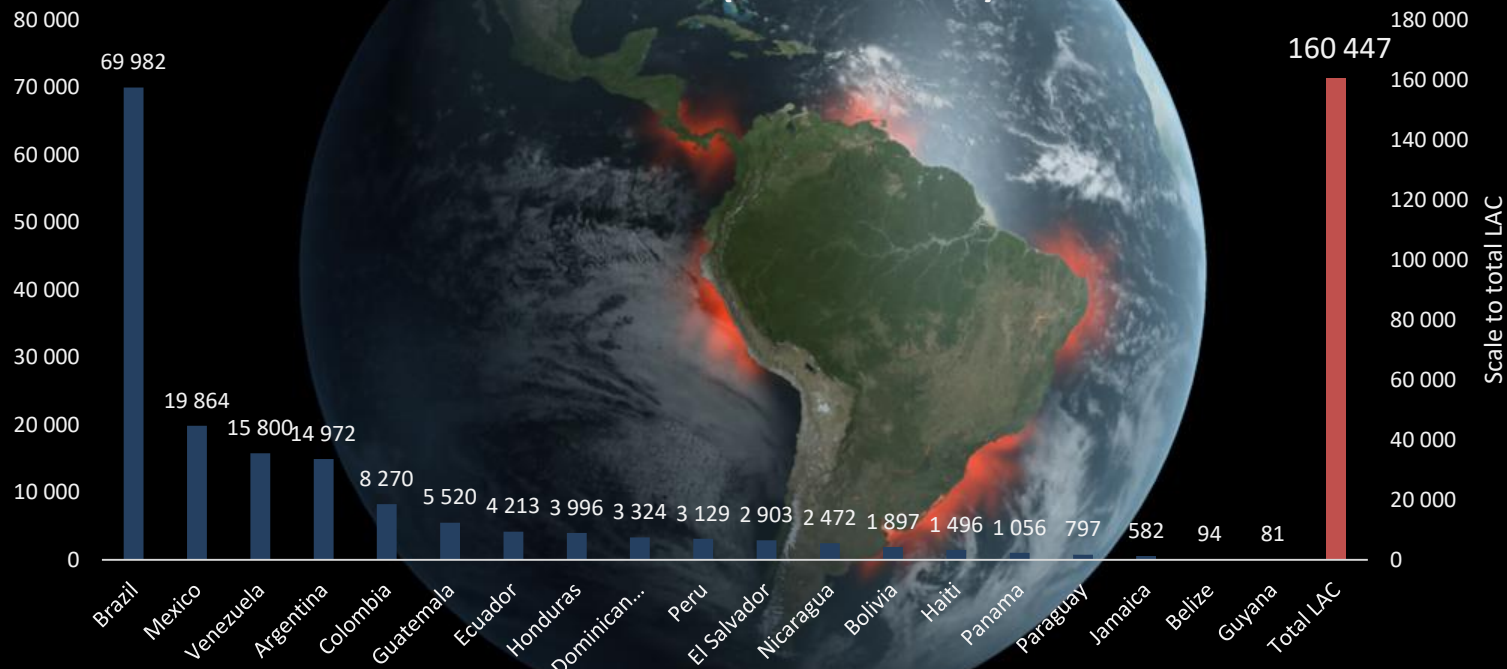
SEWERAGE WITH TREATMENT BY COUNTRY (% URBAN POP)



Source: World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF). Progress on Sanitation and Drinking Water 2017. Own Elaboration.

A MASSIVE REVOLUTION

SAFELY MANAGED SANITATION 2015-2029 (US\$ Millions)



Source: The World Bank. The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene.



LAST-MILE CHALLENGE

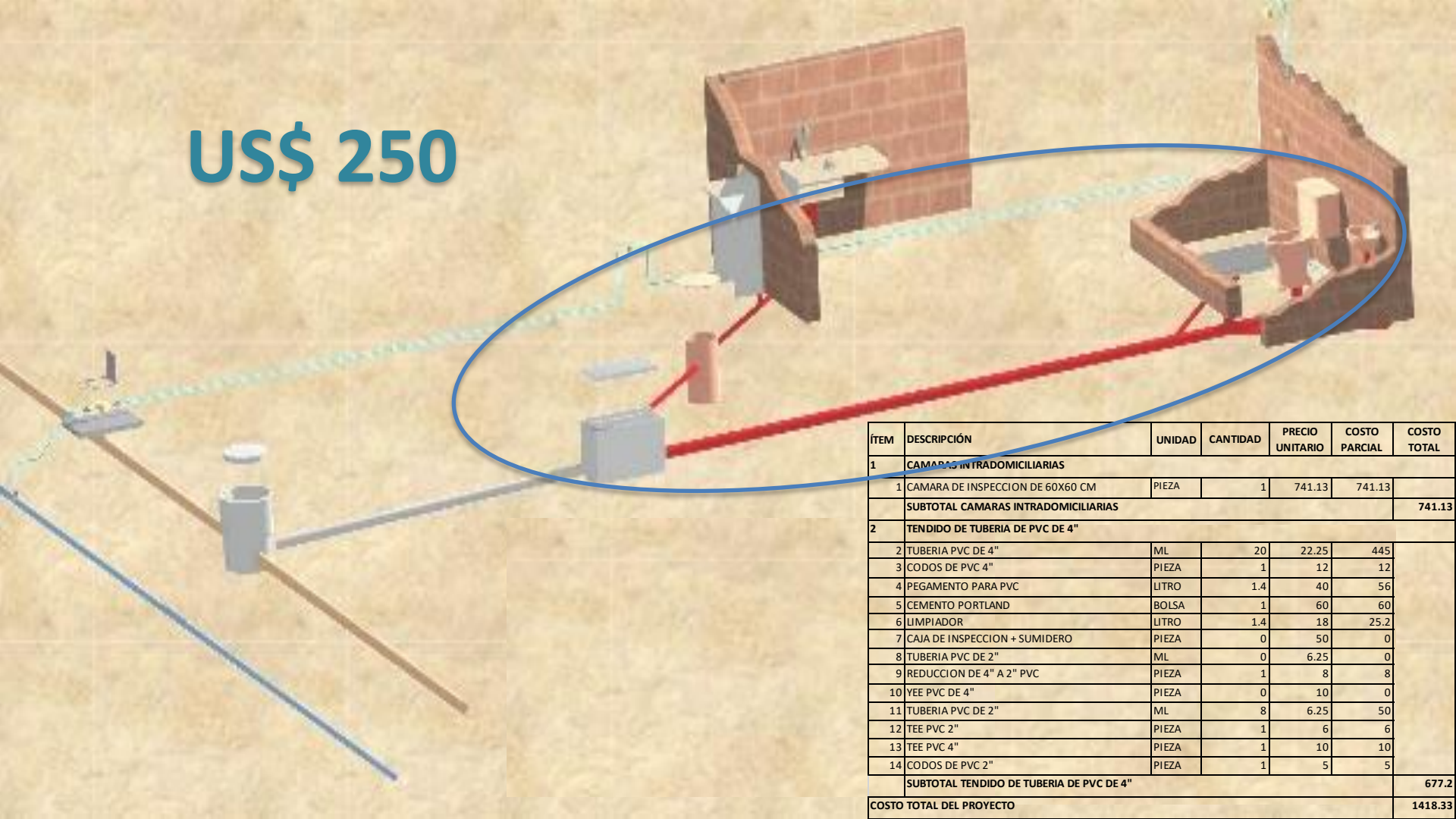


CONNECTION RATE



+ 80 %
URBAN AREAS

US\$ 250



ÍTEM	DESCRIPCIÓN	UNIDAD	CANTIDAD	PRECIO UNITARIO	COSTO PARCIAL	COSTO TOTAL
1	CAMARAS INTRADOMICILIARIAS					
1	CAMARA DE INSPECCION DE 60X60 CM	PIEZA	1	741.13	741.13	
	SUBTOTAL CAMARAS INTRADOMICILIARIAS					741.13
2	TENDIDO DE TUBERIA DE PVC DE 4"					
2	TUBERIA PVC DE 4"	ML	20	22.25	445	
3	CODOS DE PVC 4"	PIEZA	1	12	12	
4	PEGAMENTO PARA PVC	LITRO	1.4	40	56	
5	CEMENTO PORTLAND	BOLSA	1	60	60	
6	LIMPIADOR	LITRO	1.4	18	25.2	
7	CAJA DE INSPECCION + SUMIDERO	PIEZA	0	50	0	
8	TUBERIA PVC DE 2"	ML	0	6.25	0	
9	REDUCCION DE 4" A 2" PVC	PIEZA	1	8	8	
10	YEE PVC DE 4"	PIEZA	0	10	0	
11	TUBERIA PVC DE 2"	ML	8	6.25	50	
12	TEE PVC 2"	PIEZA	1	6	6	
13	TEE PVC 4"	PIEZA	1	10	10	
14	CODOS DE PVC 2"	PIEZA	1	5	5	
	SUBTOTAL TENDIDO DE TUBERIA DE PVC DE 4"					677.2
	COSTO TOTAL DEL PROYECTO					1418.33



TECHNICAL

FINANCIAL

HEALTH



SANTA CRUZ, BOLIVIA

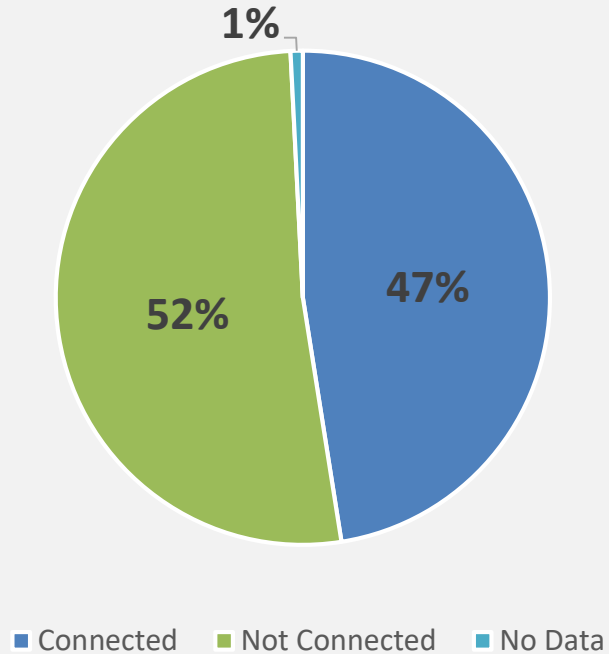
**Increased risk of 24%
diarrhea prevalence
children under 5 years old
presence of exposed sewage
in and around the dwelling**

A realistic rendering of the Earth from space, centered on the Americas. The continents of North and South America are visible in shades of green and brown. The oceans are a deep blue, and white clouds swirl across the surface. A prominent, glowing red-orange ring encircles the Americas, extending from the Arctic region down to the southern tip of South America, suggesting a global environmental or climate challenge. The text "HOW BIG IS THIS CHALLENGE?" is overlaid in white, bold, sans-serif font across the center of the globe.

HOW BIG IS THIS CHALLENGE?

ARGENTINA

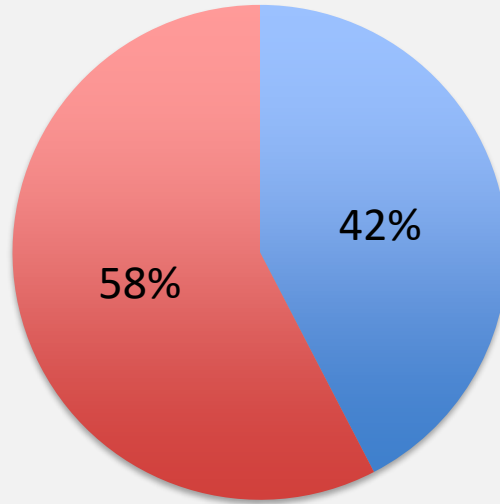
CONNECTION RATE TO SEWER SERVICE (%) *BUENOS AIRES METROPOLITAN AREA*



Source: AySA

MEXICO

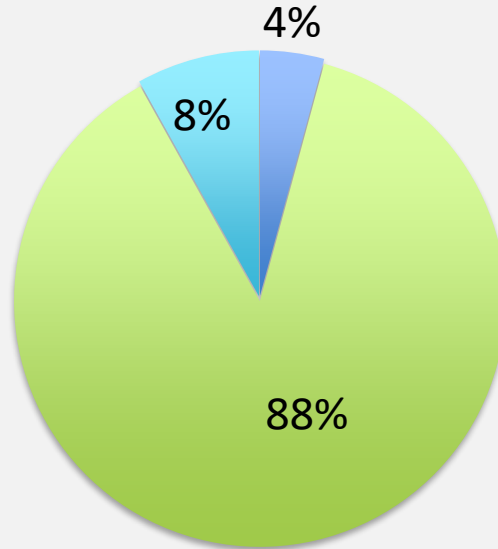
CONNECTION RATE TO SEWER SERVICE (%) ZACATECAS



■ Connected ■ Not Connected**

BRAZIL

CONNECTION RATE TO SEWER SERVICE (%) *NATIONAL*

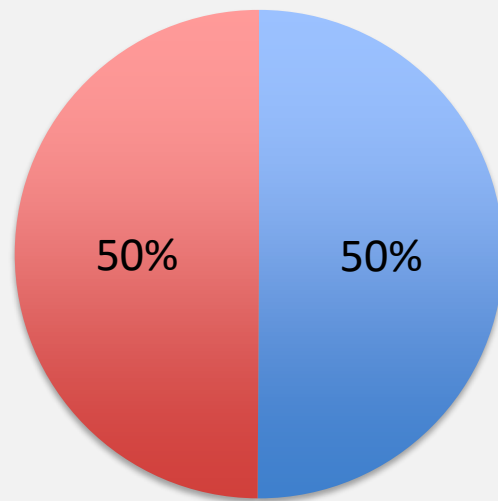


■ Inactive ■ Active ■ Idle*

ECUADOR

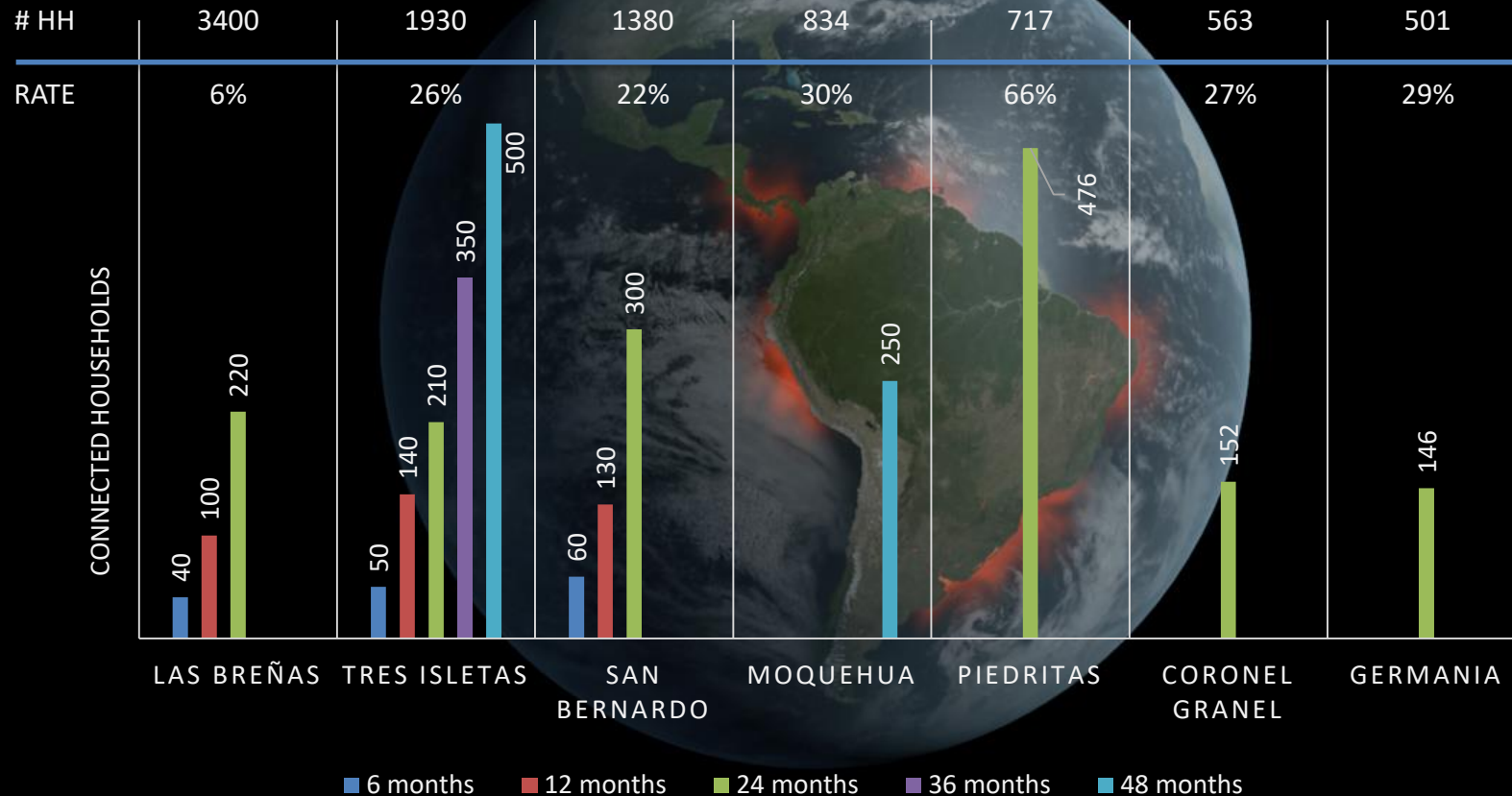
CONNECTION RATE TO SEWER SERVICE (%)

GUAYAQUIL METROPOLITAN AREA



■ Conected ■ Not connected**

CONNECTION RATE IN BUENOS AIRES

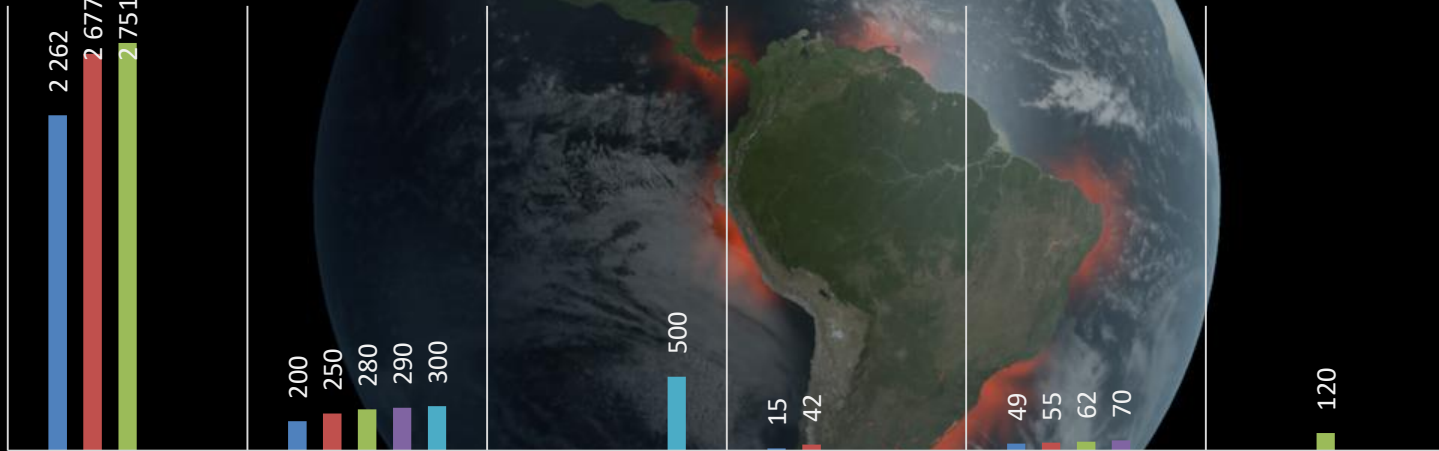


CONNECTION RATE IN ZACATECAS

HH 4.268 2.000 1.635 385 327 280

RATE 64% 15% 31% 11% 21% 43%

CONNECTED HOUSEHOLDS



ZACATECAS
(14 PROJECTS)

MIXTLA DE
ALTAMIRANO

ARROYO SECO

COMONDÚ

TELETA DEL
VOLCAN

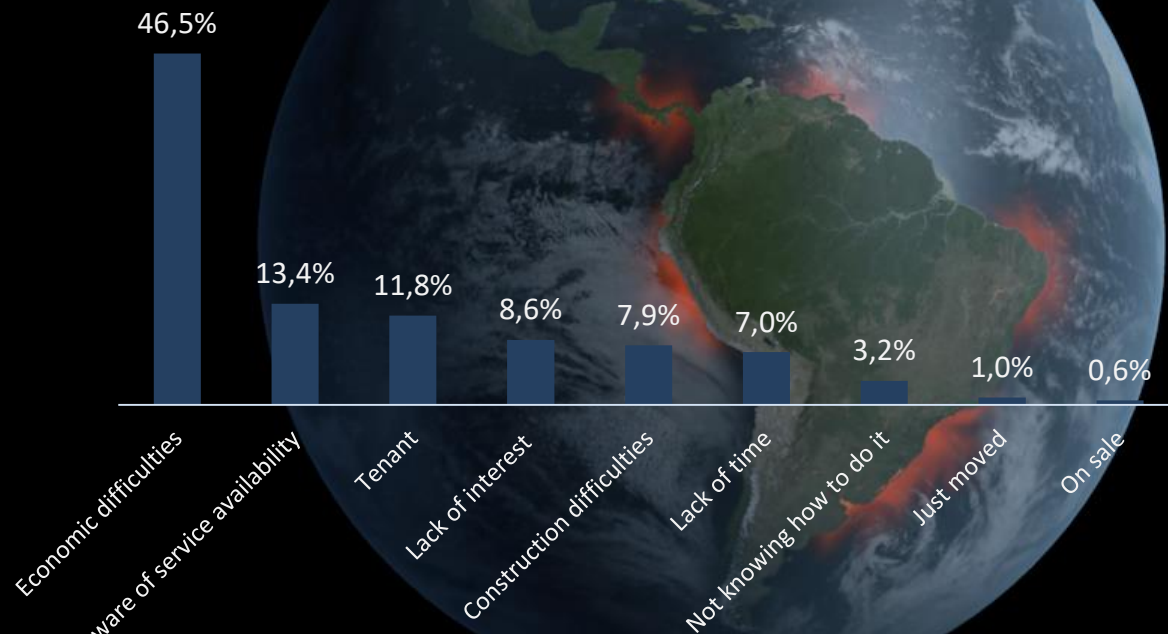
LINARES

■ 6 months ■ 12 months ■ 24 months ■ 36 months ■ 48 months

BARRIERS TO CONNECTIVITY

ARGENTINA

REASONS FOR NOT CONNECTING (%)

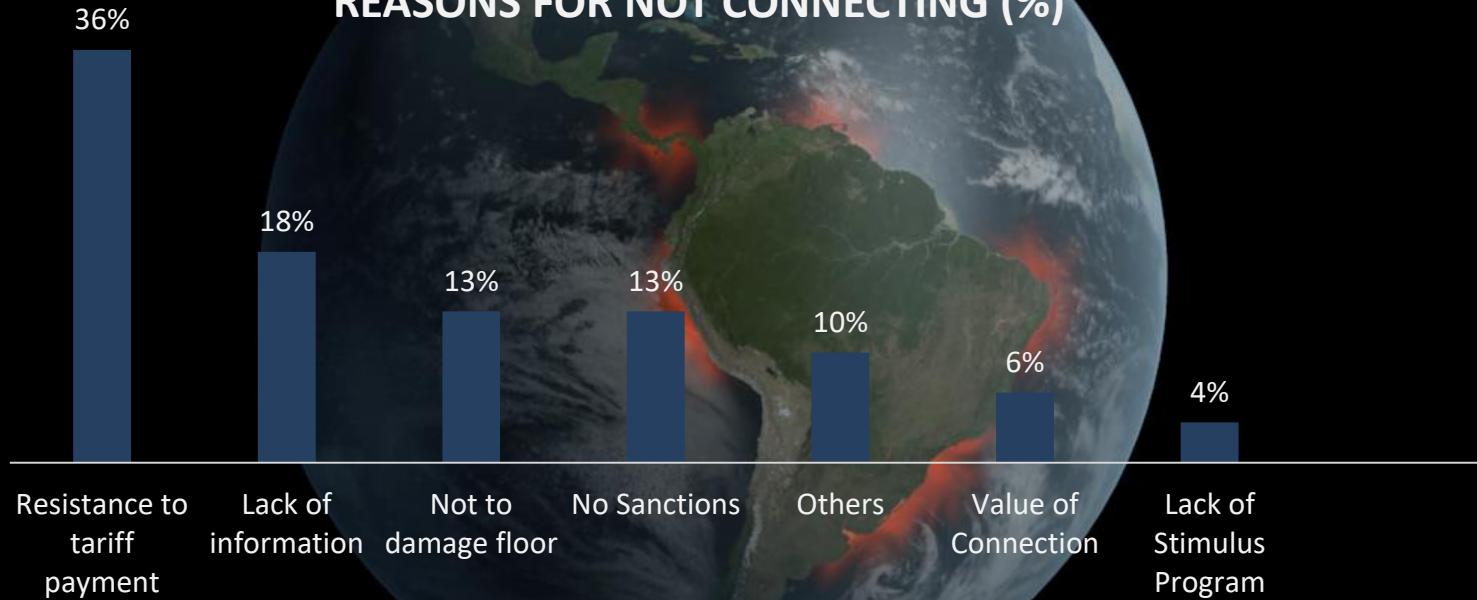


Source: AySA

BARRIERS TO CONNECTIVITY

BRAZIL

REASONS FOR NOT CONNECTING (%)



Source: Coordenação de Saneamento Básico. Ociosidade das Redes de Esgotamento Sanitário no Brasil. 2015

DEMAND-SIDE BARRIERS

- **FINANCIAL/LIQUIDITY CONSTRAINTS**
- **INFORMATIONAL/KNOWLEDGE CONSTRAINTS**
- **BEHAVIORAL CONSTRAINTS**



INSTITUTIONAL/SOCIAL BARRIERS

- **LEGAL CONSTRAINTS**
- **BUREAUCRATIC CONSTRAINTS**
- **COLLECTIVE ACTION CONSTRAINTS**



FINANCIAL/LIQUIDITY CONSTRAINTS

- **Up-front connection costs could be substantial**
- **Financial incentives (transfers, subsidies, credits) can relieve liquidity constraints**



BEHAVIORAL CONSTRAINTS




- ***TIME PREFERENCES AND PRESENT BIAS:*** People overweight present gains versus long term gains. People stick to current solutions (status quo bias)
- **LIMITED ATTENTION/DELIBERATION COSTS:** Small amounts of time/effort may be sufficient to deter people from making a decision

INSTITUTIONAL/SOCIAL BARRIERS

A stylized image of the Earth, showing the continents and oceans. A red glow highlights the Americas, particularly the United States and Mexico. The background is black.

- ***LEGAL CONSTRAINTS:*** Insecure property rights or titling discourages from investing
- ***COLLECTIVE ACTION CONSTRAINTS:*** migration/heterogeneity (new urban settlements) may hinder collective action
- ***BUREAUCRATIC CONSTRAINTS.*** Perception of administrative hurdles discourages service adoption

A construction site in Bolivia showing a large trench being dug. A large orange pipe is laid along the left side of the trench. Several workers in blue shirts and orange hard hats are working in the trench. One worker in the foreground is using a shovel to dig. In the background, there are buildings and a yellow excavator. The text "REVEALED PREFERENCE FOR CONNECTION STUDY BOLIVIA" is overlaid on the image.

**REVEALED PREFERENCE
FOR CONNECTION STUDY
*BOLIVIA***

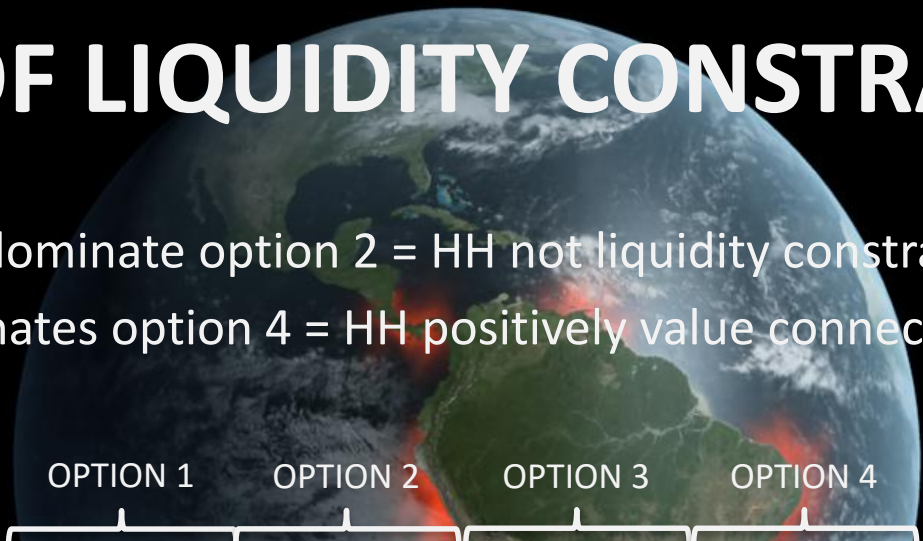
TEST OF LIQUIDITY CONSTRAINTS

A satellite-style image of Earth, showing the Americas in the center. The image has a dark, almost black background, and the Earth is depicted with realistic colors of blue oceans, green and brown landmasses, and white clouds. A prominent red glow or heat map overlay is visible, particularly concentrated over the Americas and parts of the surrounding oceans, suggesting a focus on these regions.

- Reduce demand-side barriers through subsidies and information
- Incentives for connection offered to 650 HH with no intra-household connection but access to sewer networks (outside dwelling)
 - **Option 1:** Take subsidized up-front payment (40%)
 - **Option 2:** Take subsidized credit (24 months repay)
 - **Option 3:** Self-connection
 - **Option 4:** Remain unconnected

TEST OF LIQUIDITY CONSTRAINTS

- If options 1 & 3 dominate option 2 = HH not liquidity constrained
- If option 2 dominates option 4 = HH positively value connection



CITY	OPTION 1 UPFRONT PAY	OPTION 2 CREDIT	OPTION 3 SELF-CONN.	OPTION 4 NON-CONN.	TOTAL
La Guardia	22%	41%	16%	21%	100%
Cuatro Cañadas	23%	32%	32%	12%	100%
TOTAL	22%	36%	26%	16%	100%

TEST OF LIQUIDITY CONSTRAINTS



Results:

- 48% of households not liquidity constrained (cash + self conn.)
- 36% of households liquidity constrained (credit)
- 16% of households with negative preference for sanitation connection (not conn.)

CONCLUSIONS



- Infrastructure **investments** should be complemented with **interventions** to **promote connectivity**
- Enforcement through **fin**es or **penalties** are **not effective**
- **Credits** and **subsidies** can reduce liquidity constraints
- **Information** can reduce biases
- **Behavior change strategies** such as encouragements (i.e conditional cash transfers) can reduce constraints



Thank you!
@BIDagua
blogs.iadb.org/agua