Water Pollution in Latin America:
Empirical Evidence and Socioeconomic Impacts

Main indicator:

Fecal coliforms (E. coli)

Why Are Fecal Coliforms Important?

- Indicator of fecal contamination
- WHO standard: **0 coliforms per 100 mL** for drinking water
- **Main causes:**
  - Untreated wastewater
  - Urban runoff
  - Agriculture & livestock
  - Industrial discharge
- **Health risks**
  - Diarrheal diseases
  - Gastrointestinal infections
  - Salmonella & Shigella outbreaks

Main Findings in Latin America

Common pattern:

Inadequate sanitation systems

Country	Case	Key Evidence	Impacts
Mexico	Huixtla River (Chiapas)	>2419.6 NMP/100 mL fecal coliforms. Untreated municipal discharge, livestock runoff	High health risk, agricultural contamination
	Valles River (San Luis Potosí)	Urban wastewater, agricultural runoff	Impacts sugarcane production, public health costs
	Santiago River Basin (Jalisco)	Industrial + municipal + agricultural discharge	Severe ecosystem degradation, health risks
Peru	Lake Junín	High BOD_5; Cu and Zn contamination Mining, wastewater discharge	Biodiversity loss, reduced fisheries income
	129 river basins	298,000 m^3/day untreated; ~5% treatment efficiency Untreated wastewater (89 locations)	Widespread contamination, high social cost
Bolivia	La Paz River	14.7M CFU/100 mL total coliforms Untreated domestic sewage	Disease burden, *antibiotic resistance*
El Salvador	Lake Coatepeque	1.8–170 NMP/100 mL coliforms Limited anthropogenic pressure	Currently low risk, future vulnerability
Ecuador	Guayaquil waters	Untreated urban wastewater. 99–100% E. coli removal (macrophytes, 7 days)	Waterborne diseases

MPN: Most Probable Number. A statistical unit used to estimate the density of microorganisms in a liquid sample.

Socioeconomic Impacts

- **Environmental**
  - Loss of biodiversity
  - Ecosystem degradation
  - Reduced water quality
- **Economic**
  - Higher water treatment costs
  - Reduced agricultural productivity
  - Loss of fisheries & income
- **Social & Health**
  - Waterborne diseases
  - Increased public health burden
  - Food safety risks

Conclusion

- **Water pollution in Latin America is:**
  - Structural
  - Regional
  - Economically costly
- **Key solutions**
  - Better sanitation infrastructure
  - Wastewater treatment
  - Nature-based solutions
  - Preventive water management

“Inaction is more expensive than prevention.”