



Water Pollution and Public Health

Environmental and Health Impacts of:

- Hydrocarbon contamination
- Heavy metals and PFAS
- Wastewater use in agriculture

Pollution affects health, ecosystems, and economies.

Hydrocarbon Contamination



Main pollutants:

Benzene
Toluene
Volatile organic compounds (VOCs)



Exposure pathways:

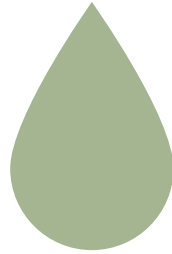
Drinking contaminated water
Contact with polluted soil
Contaminated food and fish



Health effects:

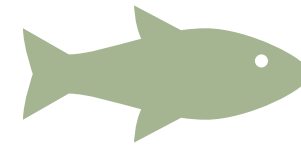
Acute: nausea, headaches, skin irritation
Chronic: liver damage, neurological disorders, cancer

Case Study: Coca River Basin, Ecuador



Key facts:

Oil spills affected Kichwa communities
TPH concentrations reached 1,929 mg/kg
Severe ecosystem degradation



Reported impacts:

Nausea and skin diseases
Loss of fish and biodiversity
Food insecurity and economic losses

Heavy Metals and PFAS



Heavy metals:

Lead
Mercury
Cadmium
Arsenic



PFAS (“Forever Chemicals”):

PFOA
(Perfluorooctanoic acid)
PFOS
(Perfluorooctanesulfonic
acid)



Risks:

Bioaccumulation
Immune and
hormonal disorders
Neurological and
cardiovascular
damage



Wastewater Use in Agriculture

Benefits:

- Lower irrigation costs
- Nutrient supply
- Up to 20% reduction in fertilizer costs

Hidden risks:

- Pathogens and toxic chemicals
- Soil degradation and salinization
- Contaminated crops and groundwater

Economic Consequences



Global estimates:

Air pollution costs:
4–5% of global GDP

Climate-related
costs: 2–10% of
global GDP



Local impacts:

Higher healthcare
costs

Reduced agricultural
productivity

Environmental
remediation
expenses

Economic Underestimation of Environmental Pollution



Key findings:

Environmental pollutants may cost more than 10% of global GDP

Official estimates often underestimate real impacts

Small IQ losses can create massive economic costs



Example:

Lead exposure:

- Official estimate: \$5 billion/year
- More complete estimate: \$1.04 trillion



Subclinical effects also generate major economic losses.

Conclusion

Water pollution is not only an environmental issue. It is also a public health and economic crisis.

Solutions:

- Stronger environmental regulation
- Water treatment technologies
- Monitoring and prevention
- Sustainable resource management