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# **Human Health Risk Assessment by Mercury Exposure in SSGM: a Study Case in Brazil**

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# **SUMMARY**

## **•PART I-**

### **•HUMAN HEALTH RISK ASSESSMENT: Conceptual Model**



## **•PART II**

### **•EPIDEMIOLOGICAL STUDY AT SSGM IN BRAZIL**

**(São Chico SSGM at Tapajós SSGM  
Reservoir, Para State, Brazil)**



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# HUMAN HEALTH RISK ASSESSMENT (USEPA, 1989) 4 basic steps

**Source of Pollutant/ Environmental Concern**



**Human Exposure**



**Toxicity values**



**Risk or Hazard Characterization**



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- 1- HOW is SSGM a source of mercury to the environment?**
- 2- Which are the mercury CHEMICAL FORMS involved in distinct steps of SSGM processing?**
- 3- Which are the EXPOSURE kinds involved when it comes SSGM? Occupational vs Environmental exposure or both.**
- 4- What are about cumulative risks considering biological VULNERABILITY (additional health problems) of SSGM communities?**



# SSGM AS A SOURCE OF Hg TO THE ENVIRONMENT: 37% of the anthropogenic mercury (UNEP)

**Au:Hg  
1:2.5**





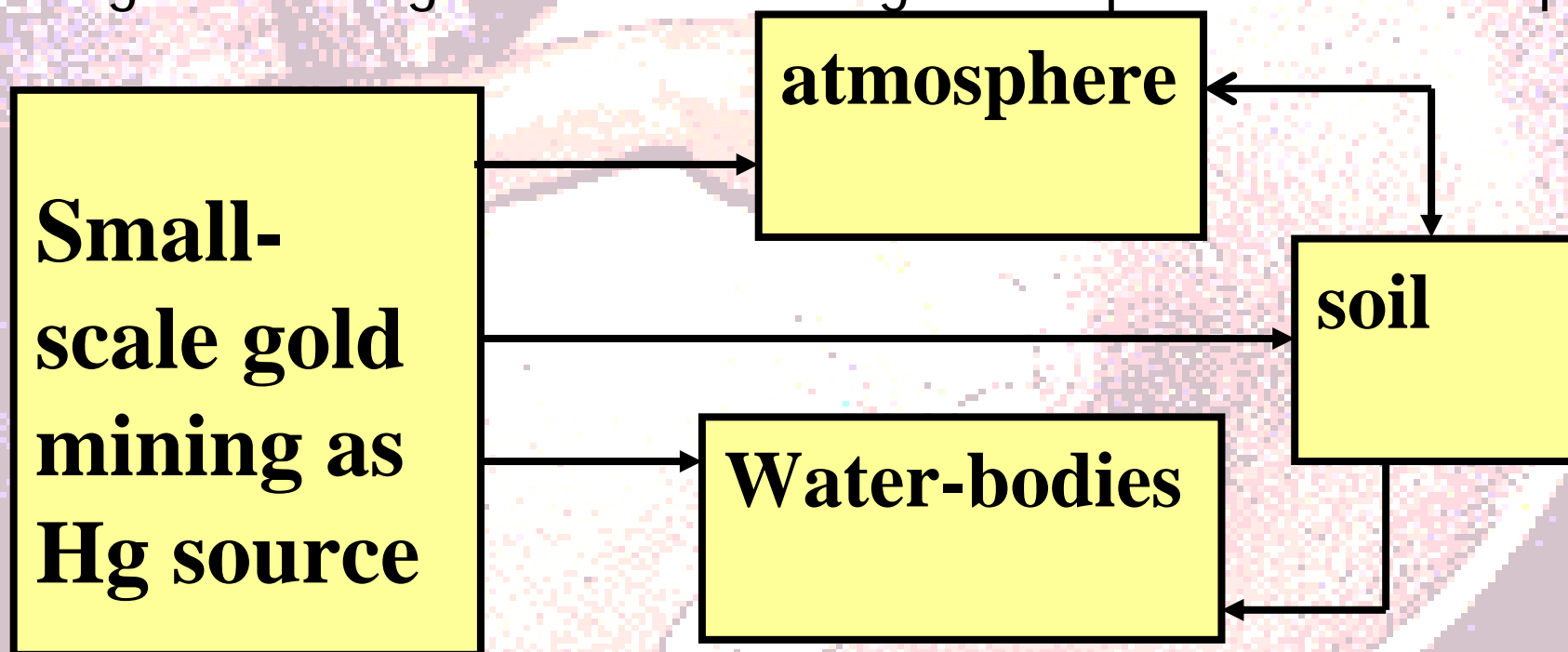
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## **SSGM as Hg source to the environment:**

waste discharge: tailing ponds or directly in waterbodies

Primary gold ore: Hg associated to Cyanide

Amalgam burning: in the field or gold shops to the atmosphere





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Hg chemical forms, environmental compartments,  
exposure pathways, tissues absorption and  
adverse effects

are interconnected and show RELATIONSHIPS.

What does it means?

Integration of Hg biogeochemical cycle in the  
environment with toxicokinetics (the biological  
fate) and toxicodynamics (the adverse effects)  
of Hg in the human bodies.



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