An aerial photograph showing a landscape heavily impacted by mining. A river with milky, yellowish-brown water flows through the center. The surrounding land is mostly cleared of forest, revealing brown soil and numerous small, irregular pits and mounds of earth, characteristic of small-scale gold mining. Some green trees remain in the foreground and along the riverbanks.

Supporting Public Prosecutors to Value Impacts of Illegal Small-Scale Gold Mining

Pedro Gasparinetti

The Mining Impacts Calculator Tool



Conservation Strategy Fund

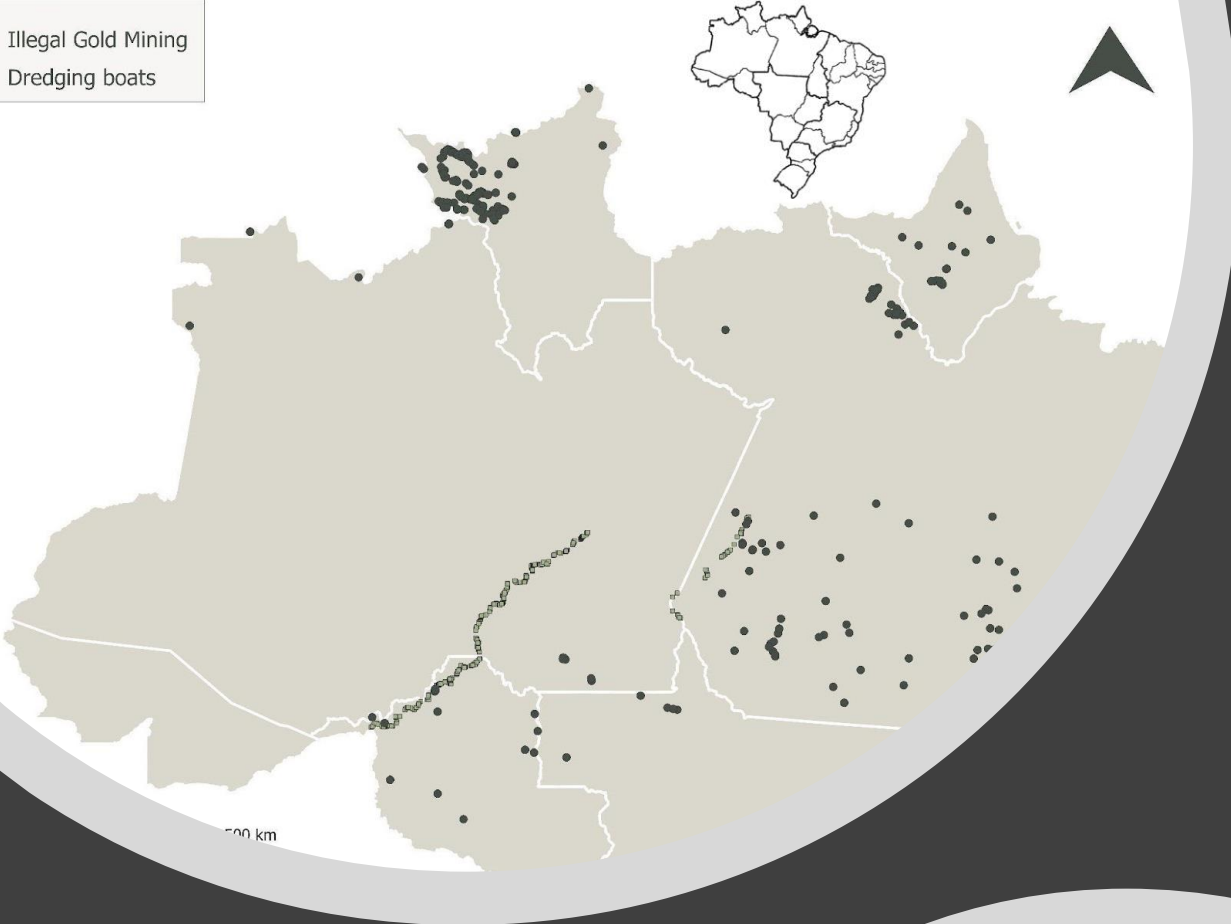
- Design and Evaluation of Environmental Projects and Policies
- Impact assessment of infrastructure projects
- Economic Incentives for Conservation
- Ecosystem Services Valuation

www.conservation-strategy.org



Presentación

- Context
- Objective
- Online Calculator
- Results
- Methodology



Background

- Increase in illegal gold mining in Brazil
- Impacts on the environment and health (mercury)
- Public Prosecutors Office (MPF)
 - Public institution engaged in guaranteeing people's rights

Setting fine amounts

- MPF wanted a valuation tool (robust and quick)
 - Challenges:
 - Difficulty to sustain claims in courts
 - Lack of valuation methodology
 - Time consuming



Purpose

- Create a “mining impact calculator tool”
 - Standardized formula with generalized parameters
 - Context → Value
 - Training prosecutors to use it
- Increase Public Prosecutors’ capacity to use economic tools to sustain cases and monetary values claims in courts
 - Reduce arbitrariness in valuation
 - Increase probability of holding offenders accountable for their actions
 - Reduce environmental and health negative effects of gold mining on communities and miners.



Introduction

The impacts calculator is the result of a partnership between CSF and MPF, an analytical and pedagogical tool that describes the impacts of illegal gold mining, their monetary values and the steps for measuring them.

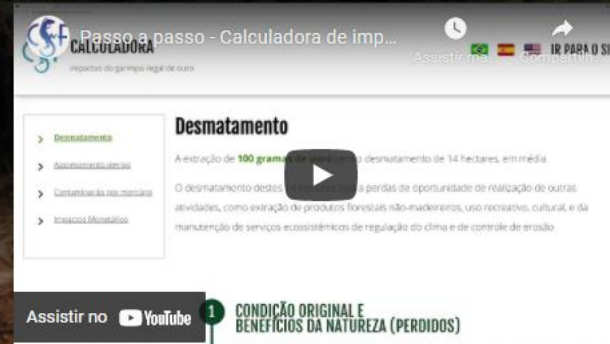


I don't know it

TAKE ME TO THE WALKTHROUGH

I know it already

TAKE ME TO THE SHORT VERSION



VER OUTROS VÍDEOS SOBRE GARIMPO ILEGAL

<http://calculadora.conservation-strategy.org/>

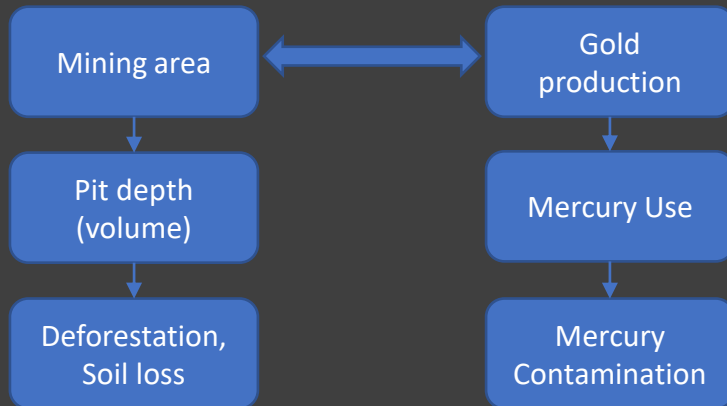
Methodology

- Productivity
- Deforestation
- Soil degradation
- Mercury Contamination



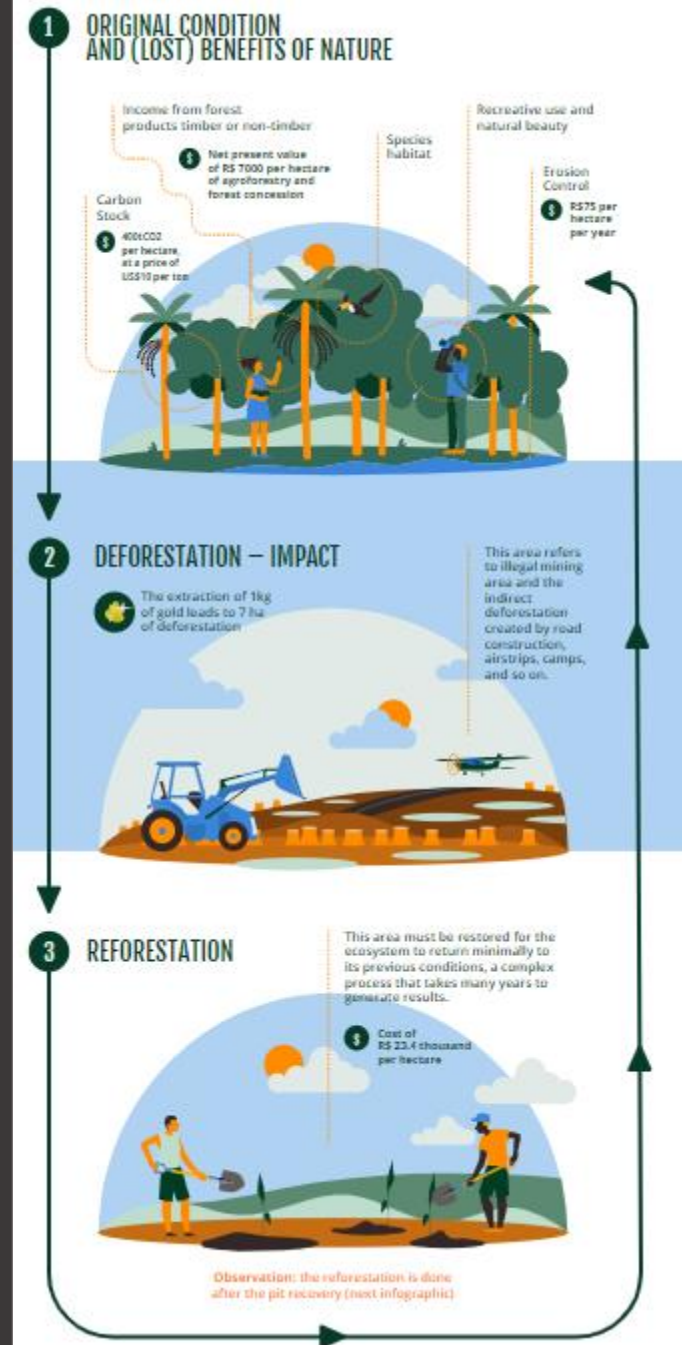
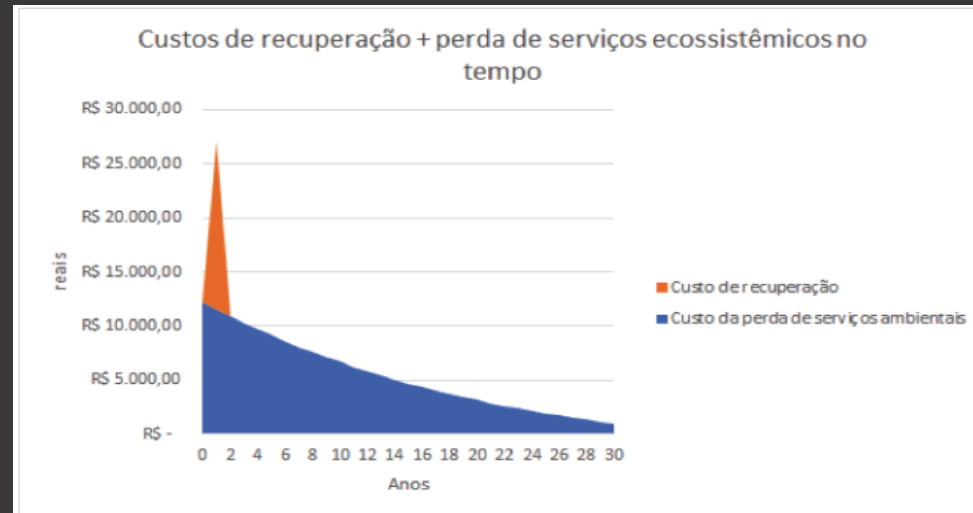
Methodology

- Productivity: Establishes equivalence between:



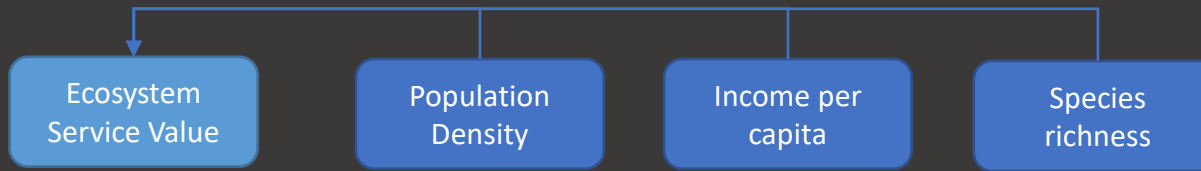
Methodology: Deforestation

- Restoration Cost
 - Official data
 - Adapted by transportation costs
- Opportunity Costs
 - Meta-analysis (ecosystem services)
 - Provision services: Timber forest products & NTFP
 - Climate regulation: Carbon
 - Other: Recreation, habitat and species protection, and water services



Methodology: Deforestation

- Value transfer function (meta-analysis)

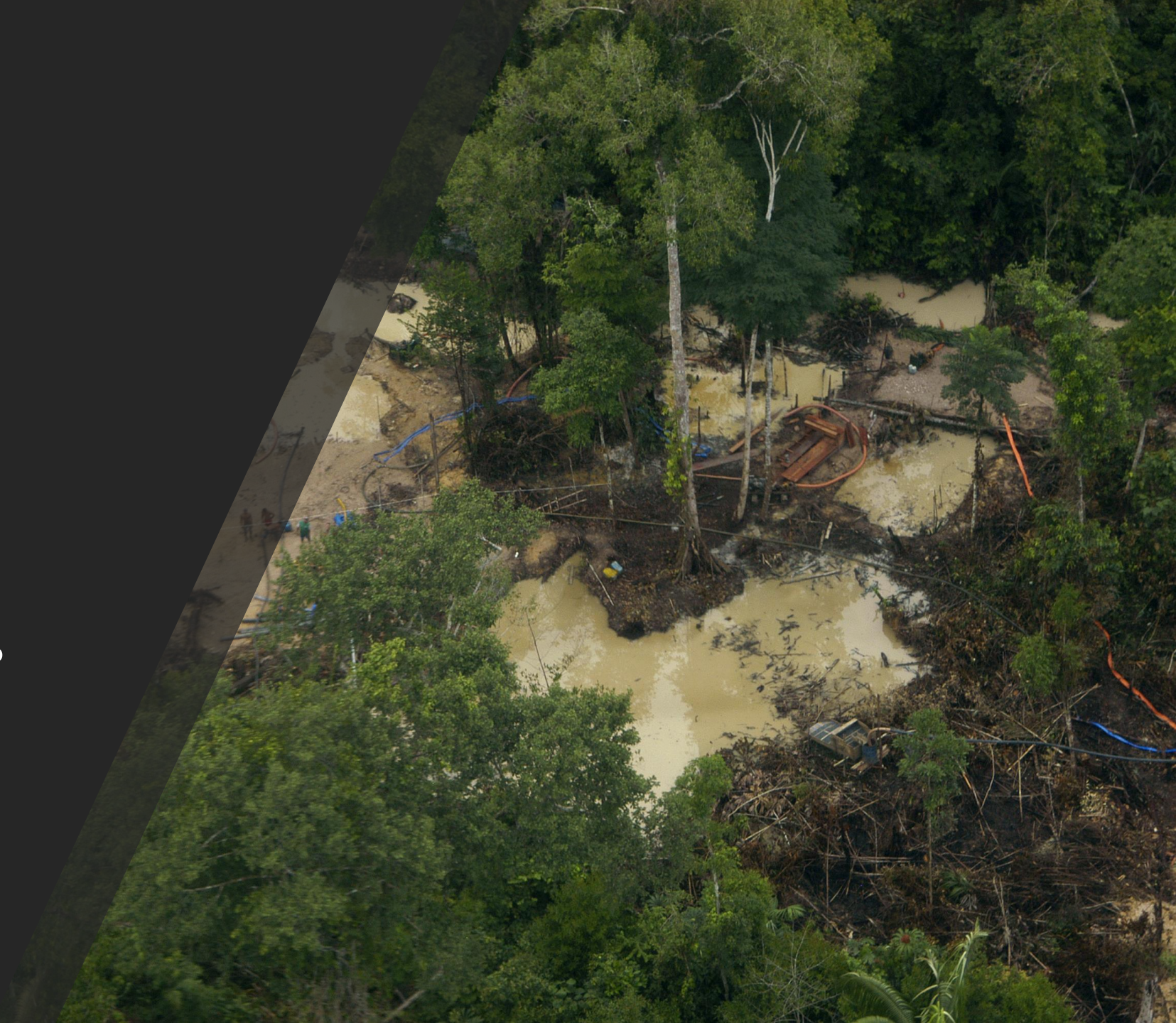


- $ES = \text{EXP} (0.562 * \text{LN} (Dd) + 0.566 * \text{LN} (\text{GDPpc}) + 0.0178 * T + 1.133 * \text{LN} (Sr) - 8.375)$

(Siikamaki et al. 2015)

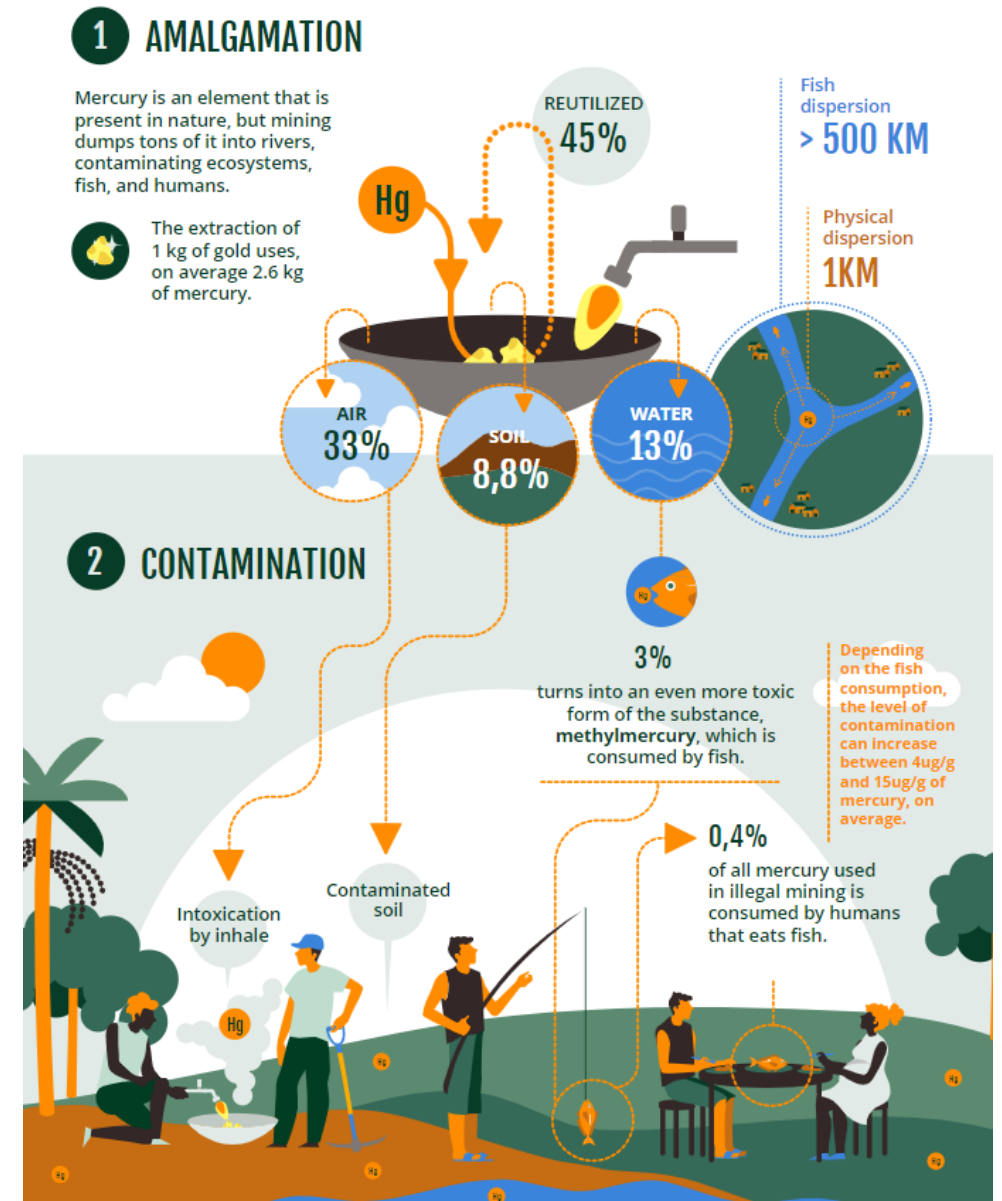
Methodology: Mercury

- Mercury is naturally present in the environment
 - Deforestation also spreads mercury
- How to differentiate sources?
 - How to attribute responsibility from ASGM?



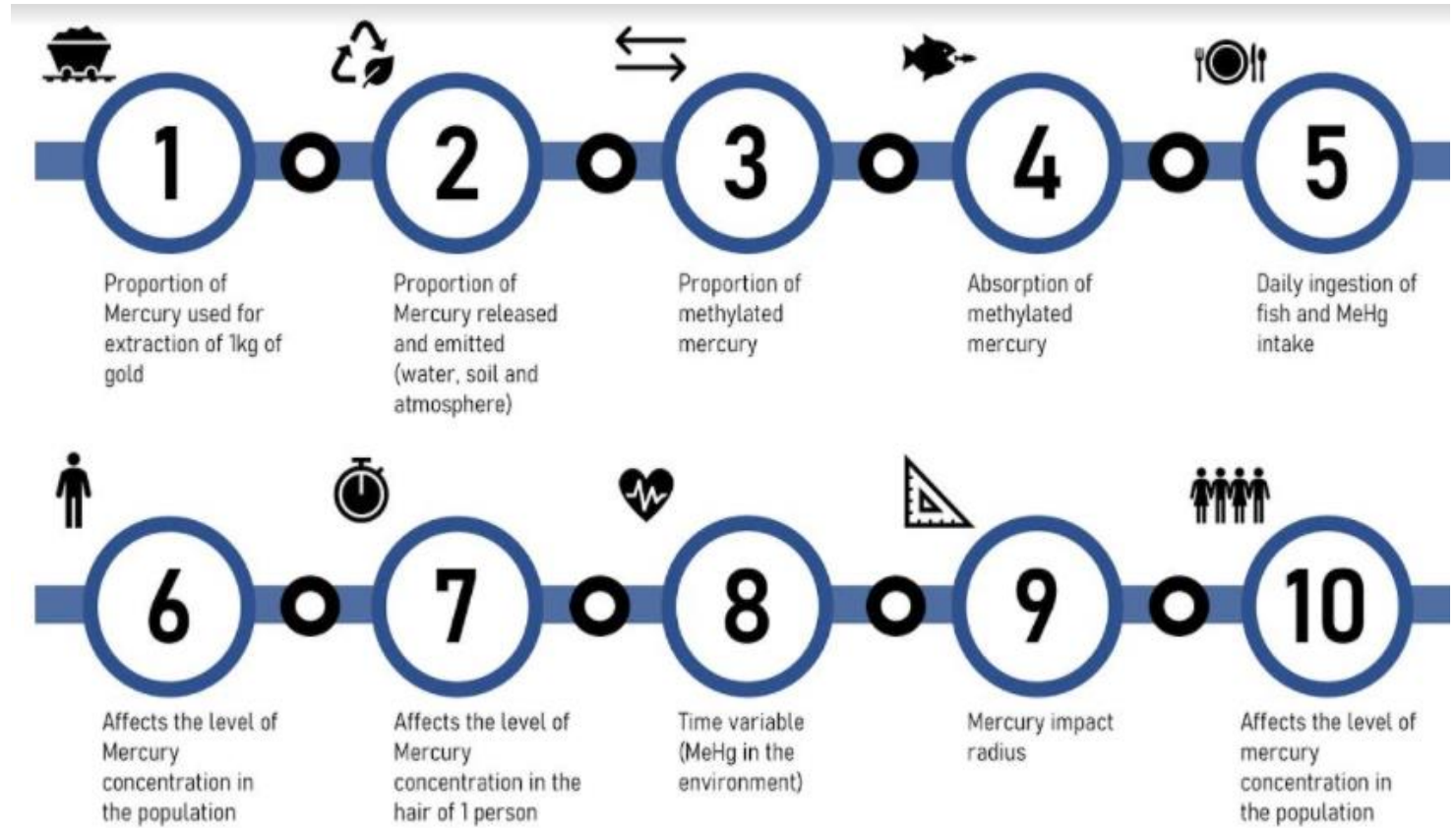
Methodology: Mercury

- “Metal mercury” becomes “organic mercury”
- Fishes get contaminated and spread it
- People eat fish and get contaminated



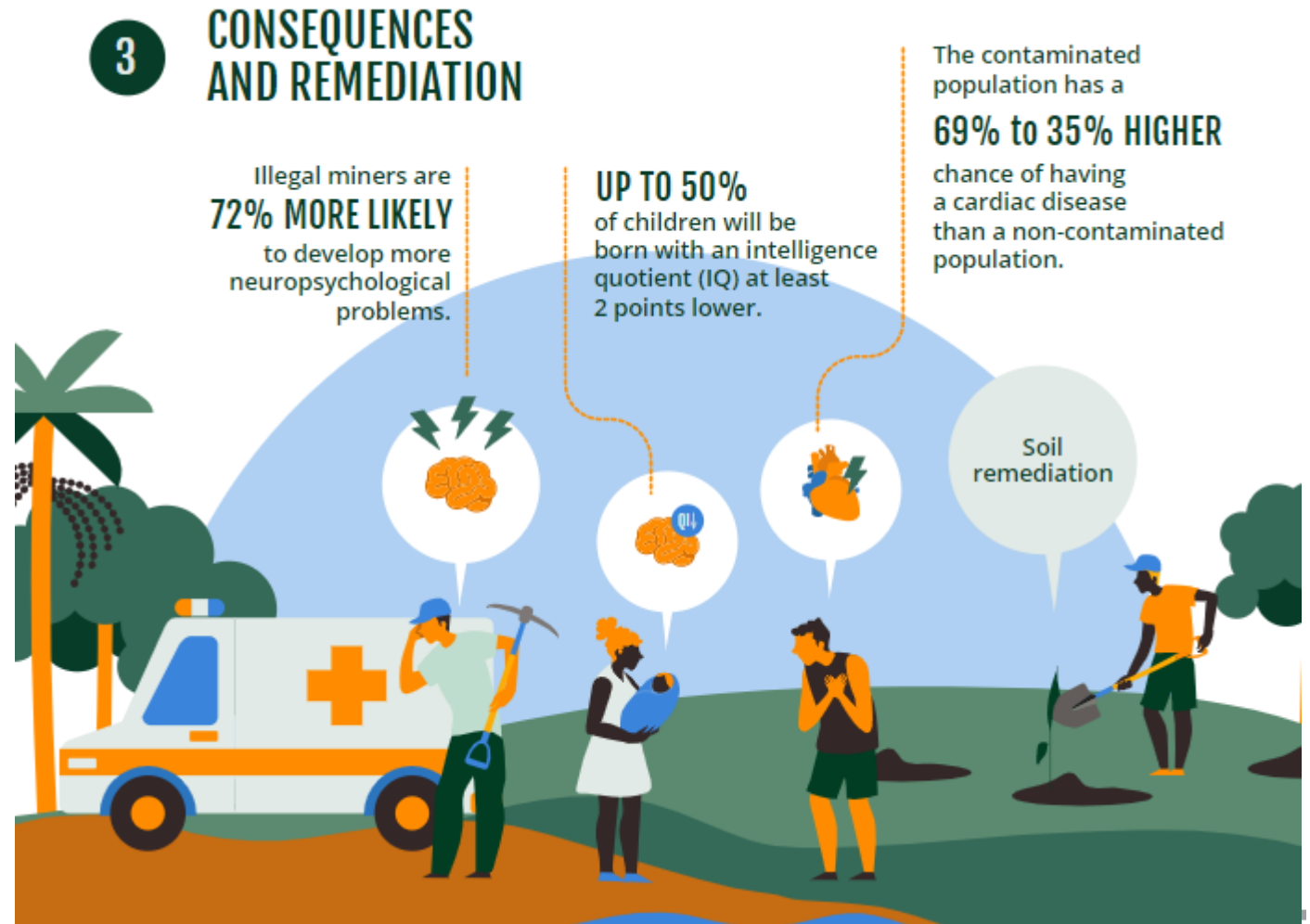
Methodology: Mercury

- Link (additional) mercury use and expected average health outcomes



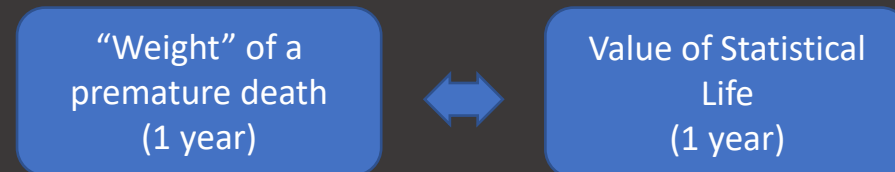
Methodology: Mercury

- Health effects
 - Neuropsychological problems
 - Mental retardation
 - Heart disease (IQ loss)



Methodology: Mercury

- Health indicator: Disability-adjusted life Years (DALY) (0-1)
- Economic indicator: Value of Statistical Life (VSL) (\$)
- Using VSL to value DALY





Economic Results

ASGM Social Cost is at least 2x greater
than Private Benefits

Project Results

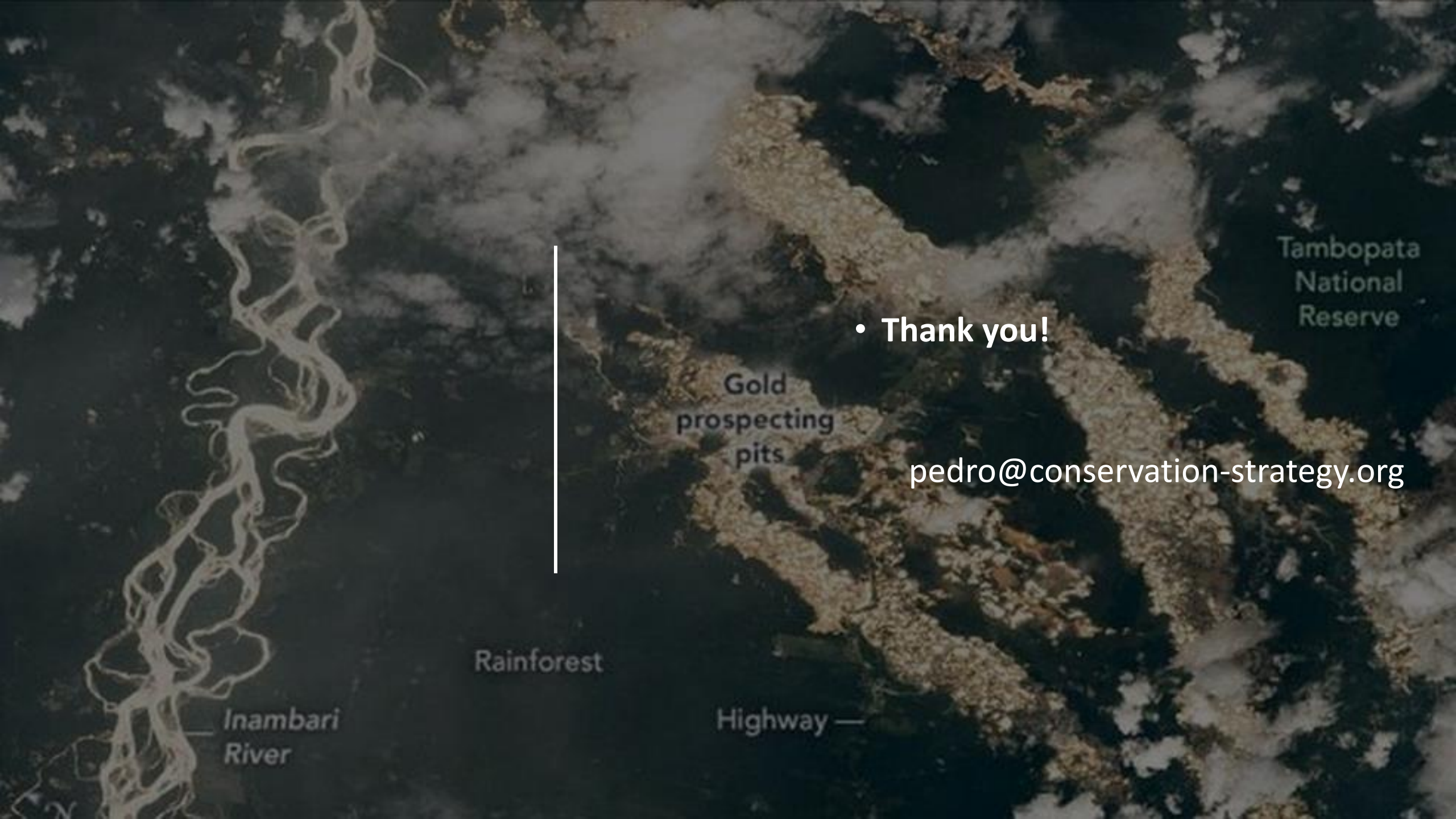
- Public Prosecutors
 - Incorporated it as official methodology
- Federal Police
 - Will use the tool to sustain a case in the Brazilian Supreme Court
- Other countries
 - Planning processes and investment in law enforcement



Next Steps

- Adapting calculator to other countries and contexts
- Potential: Other types of damages
 - Oil spills, pesticides impacts, etc





Tambopata
National
Reserve

• Thank you!

Gold
prospecting
pits

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Rainforest

Inambari
River

Highway —