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A Socio-environmental Research Agenda for Andean Peri-urban & Urban Communities

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Consortium for the Study of the Andean Vulnerability Impact Assessment

The Earth Institute
AT COLUMBIA UNIVERSITY

Structure

1. Socio-environmental problems, research contributions and challenges
2. Topics & issues in the Andes
3. Examples of current research projects
4. Conclusions

1. Socio-environmental Problems & Research

- Cities are responsible for up to 70% of global greenhouse gas emissions and global energy prices, among other sources of pollution.
- “Mundane science” (Dove & Kammen 1997) or problem oriented (applied) scientific research for informed public policies, where most people live.

2. Topics, Issues & Andean Cases

- The connectivity of the flora & fauna (urban ecology) and its impact as environmental services on human health.

- Early warning systems & informed regulations:
- Roads, air quality & health impact: monitoring.
- Water quality in peri-urban areas due to extractive industries and in areas without water infrastructure (*e.g.* shanty towns in Lima). River restoration as a social practice (*e.g.* Rimac).

- More on water:
- Less than 30% of wastewater from cities is treated in Peru.
- Water availability in the Andes: monitoring glacier impact and precipitation. PRAA & NSF.

- Monitoring air, sound, soil quality in real time for municipalities and thinking on health issues.

- Early warning systems for extreme events and climate change for agriculture and sub-national governments.

- Earthquakes: zoning, prevention and early warning systems. Kuroiwa & IDB initiative.

- Recycling & informal systems

Photo: Cesar Moran

3. Four Current Research Projects

Fires in Western Amazon: Columbia University

We are examining how social and economic factors, land-use development, ecology, and climate shifts interact to influence fire patterns in Peruvian Amazon.

Lead exposure from soil in Peruvian mining towns: a national assessment supported by two contrasting examples

Alexander van Geen,[a] Carolina Bravo,[b] Vladimir Gil,[c] Shaky Sherpa[d] & Darby Jack[b]

Objective To estimate the population of Peru living in the vicinity of active or former mining operations that could be exposed to lead from contaminated soil

Fig. 1. **The 312 sites[a] with active mining operations or mining legacies associated with lead in soil, Peru, 2009**

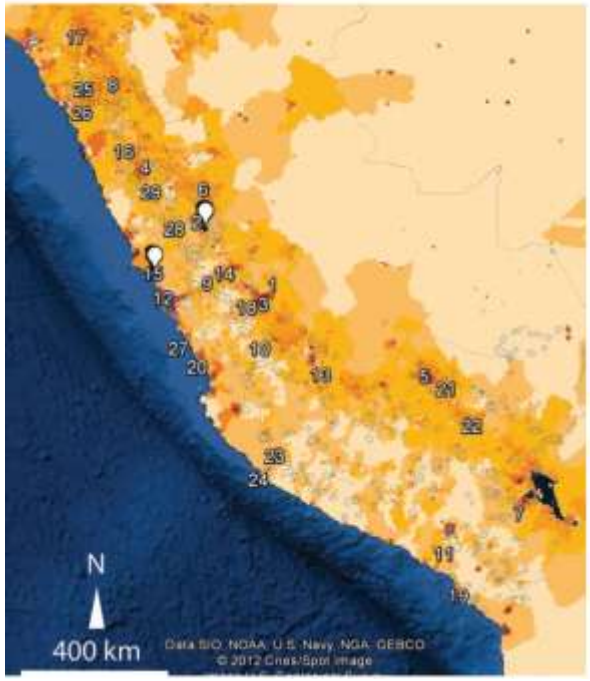


Fig. 2. **Aerial image of the main open-pit mine and surrounding town of Cerro de Pasco, Peru, showing locations where the lead concentration in soil[a] was measured, 2009**

The Ayapoto area mentioned in the main text is located immediately to the west of the open pit.

[a] The coloured markers indicate the concentration of lead in soil: green, ≤ 400 mg/kg; yellow, > 400–1200 mg/kg; red, > 1200–5000 mg/kg; blue, > 5000–10 000 mg/kg; black, > 10 000 mg/kg.

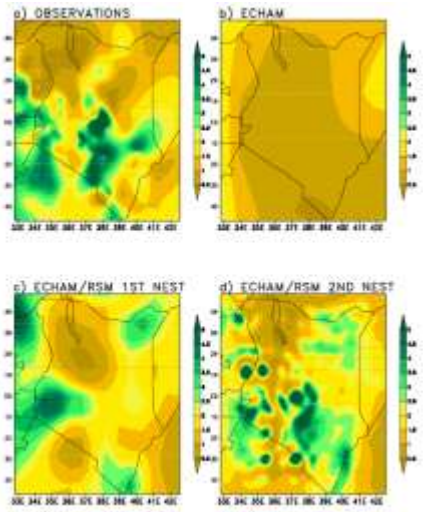
SISTD: Columbia University

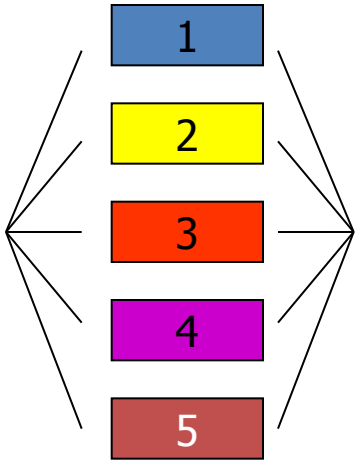
System for Supporting Environmental Decisions

Climate scenarios

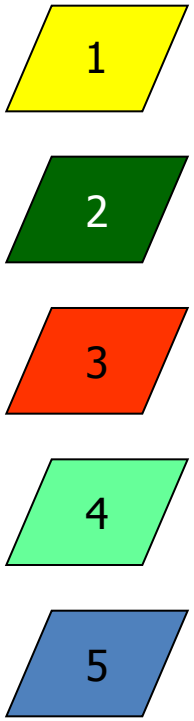
Interventions
- *Technology*
- *Managements*
- *Policies*

Posible outcomes





Simulation models
(Agriculture, Water, Health)



Analysis of alternatives
Posible impacts of different scenarios

Inform planning & decisions

Uncertainties?

Ten Climate Smart Cities: Centre for Low Carbon Futures & UK Universities

- An approach that provides a "city-scale view" that informs city authorities of the multiple opportunities for green growth.
- The programme further enables each participating city to develop the social and economic case for large-scale investment in green growth and effective energy cost and carbon emission reductions across multiple sectors.

4. Conclusions

- There is a un urgency for realistic governmental funding through open contests for dealing with problem oriented questions.
- Alliances with universities and sub-national governments (*e.g.* municipalities) in peri-urban communities and urban communities for applied research.

Thanks