

# Sustainability and Natural Resource Conflicts



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# Objective

- Reminder of the importance of **qualitative facts within our broader quantitative assessment** of resource criticality
- My position: **if we overlook social side of mineral access then we will not truly understand the level of supply risk**

# Outline

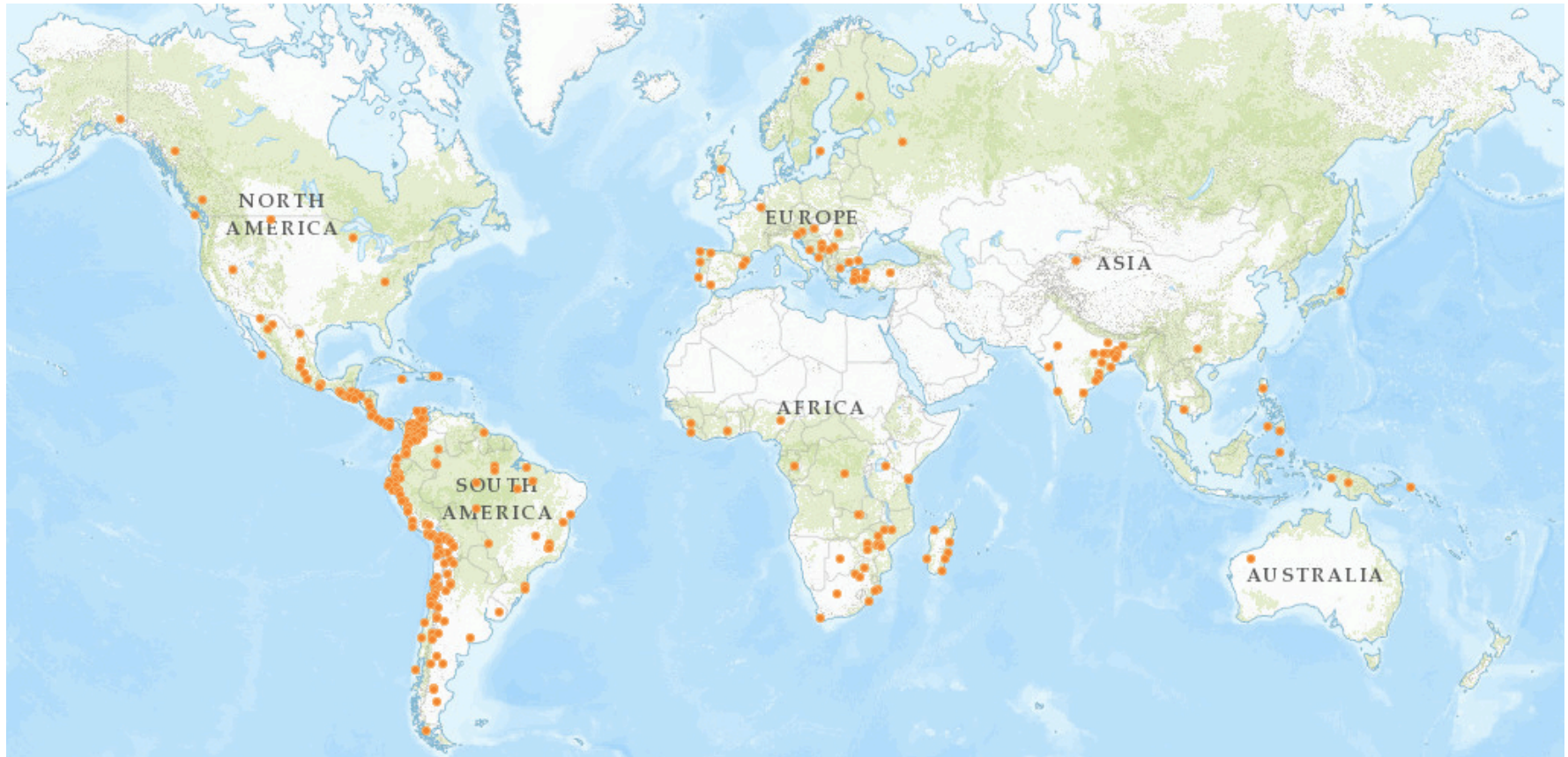
1. **Social factor** in assessing resource criticality
2. **Peru case study:** copper mining
3. **Qualitative research and measures** for assessing social risk to supply
4. **Summary thoughts**





## 1. Social Factor

# Mining Conflicts Exist Worldwide



*Source:* Environmental Justice Atlas

## 1. Social Factor

# Natural Resource Conflicts in Literature



*Source:* Google Ngram Viewer

## 1. Social Factor

# Terms

- **Natural resource conflicts** – “disagreements and disputes over access to, and control and use of, natural resources” (FAO 2000)
- **Social conflict** – “process in which the sectors of society, the state or the companies perceive that their objectives, interests, values or needs are contradictory” (Government of Peru 2012)
- **Protest** – “a distinct collective action pursuing an explicit goal by the use of confrontative, disruptive or even violent means” (Rucht and Ohlemacher 1992)

## 1. Social Factor

# Factors in Criticality Assessments

- Criticality matrix based on **restrictions in supply** (X-axis) and **importance in use** (Y-axis)
- **A variety of factors affect supply:**
  - geologic
  - technical
  - economic
  - political
  - environmental
  - social

*Source:* National Research Council (2008)

## 1. Social Factor

# Social Factor Needs Further Elaboration

- “Importance of a **robust understanding of the sourcing** of materials”
- Value in using a **more detailed social indicator**

*Source:* Nansai, et al. (2014)



## 1. Social Factor

# Qualitative Study as a Useful Approach

- “In general, the level of supply risk analysis appears to be mainly driven by the **ease of access to suitable data**”, and is therefore **mostly quantitative**
- A **review of 10 recent studies** that that “characterize the risk qualitatively” mention supply chain interruptions due to:
  - war
  - natural disasters
  - government actions

*Source:* Ermann and Graedel (2011)

## 2. Peru Case Study

# Peru as an Ideal Source of Copper?

Peru is the 2<sup>nd</sup> largest global exporter of copper in the world. Review of factors shows:

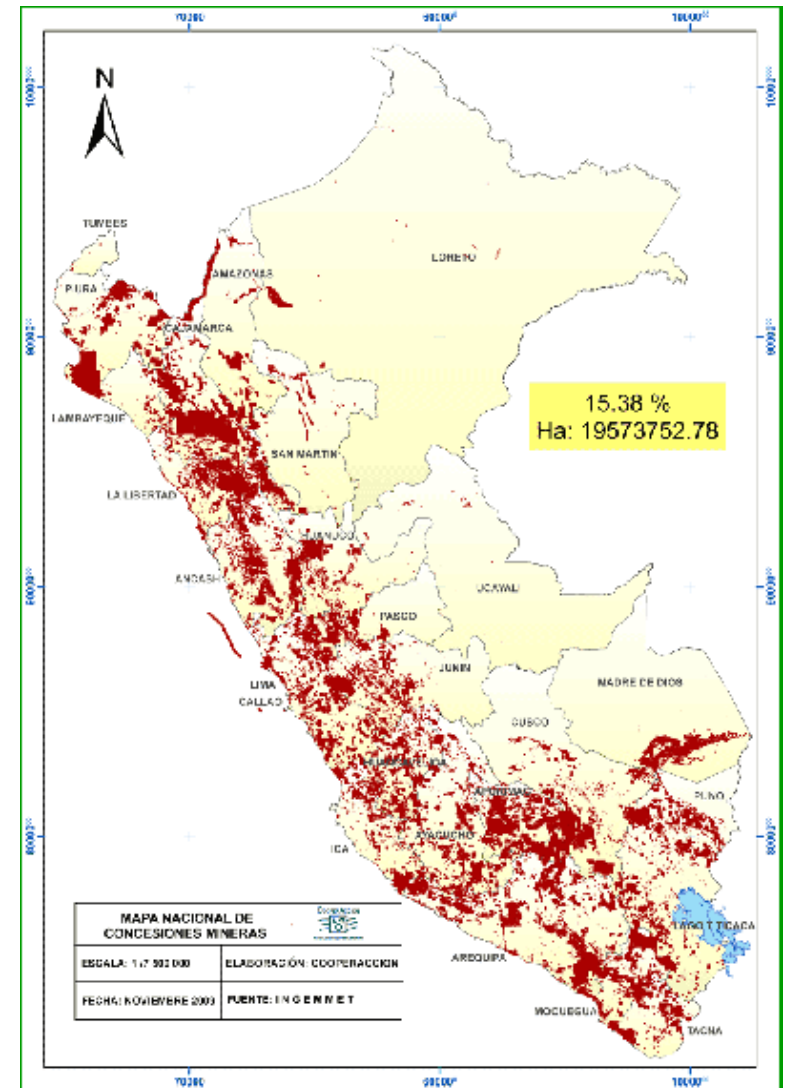
- *Geologic*: rich copper veins
- *Technical*: accessible
- *Economic*: commodities prices make extraction profitable
- *Political*: stable democracy
- *Environmental*: mining not in Amazonian region



## 2. Peru Case Study

# However, the Social Factor Reveals Risk

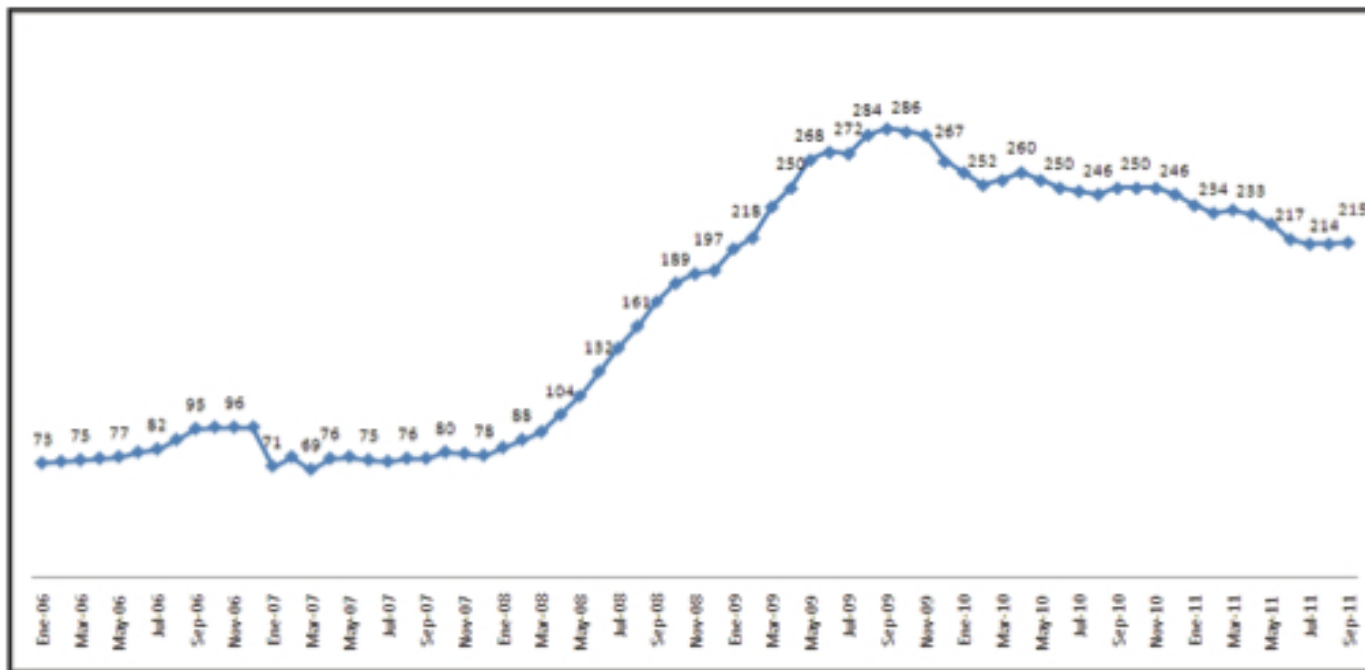
- Mining concessions cover more than 15% of all land area
- More than half of local communities are affected by mining



## 2. Peru Case Study

# Social Conflicts Triple in Two Years

## Number of Protests, Bi-monthly (2006 – 2011)

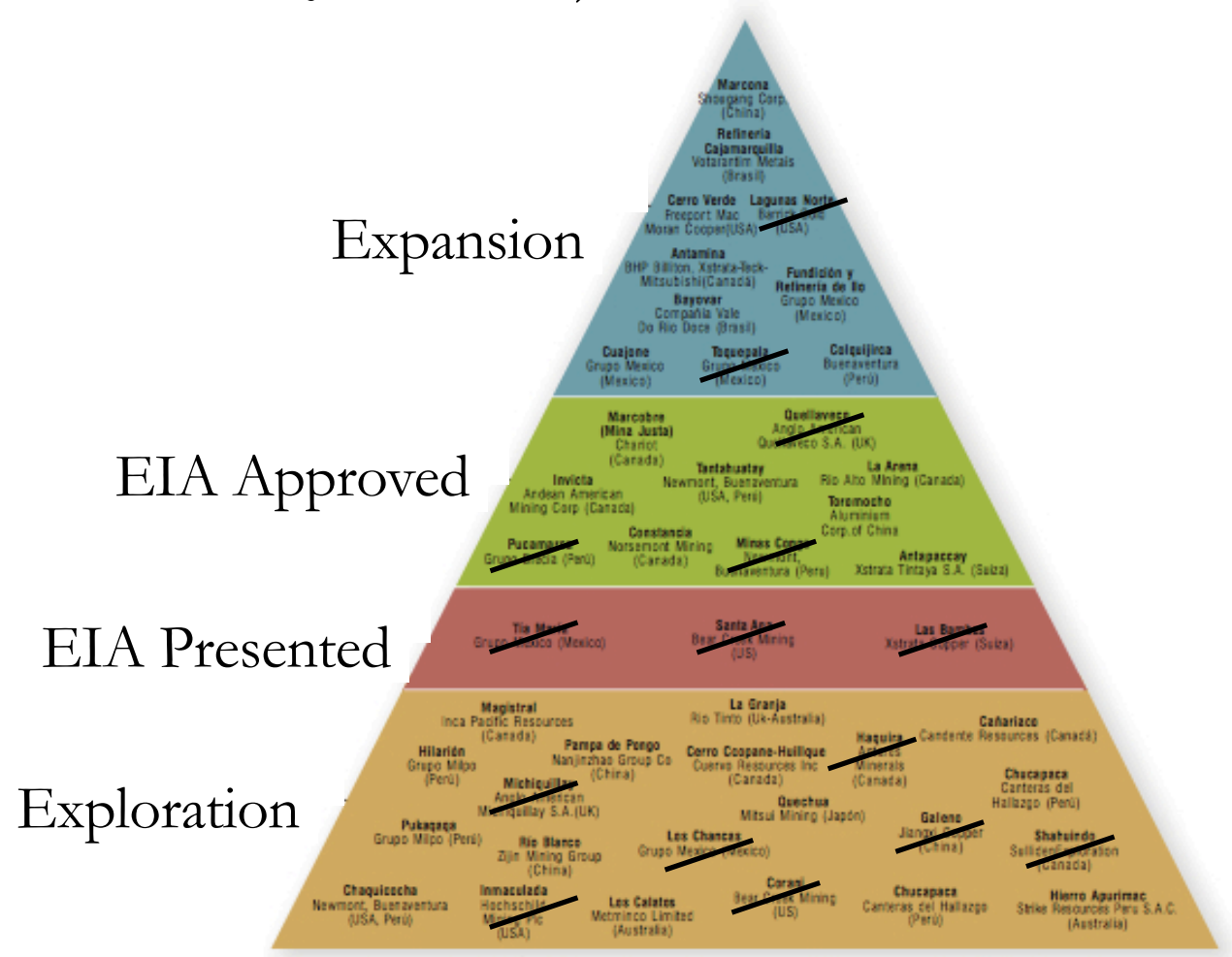


*Source:* Peruvian Ombudsman: “Violence in Social Conflicts” (March 2012)

## 2. Peru Case Study

# Social Conflict Delays Projects

- 40% of Peru's projects are affected by social conflicts
- \$21 billion in delayed investments



Source: McKinsey (2013)

Source: Ministry of Energy and Mines Project (2011)



## 2. Peru Case Study

# Case Study Comparison in Peru

Mine: Tía María

Company: Southern  
Peru Copper  
Corporation

Region: Arequipa

**Protest**



Mine: Quellaveco

Company: Anglo  
American

Region: Moquegua

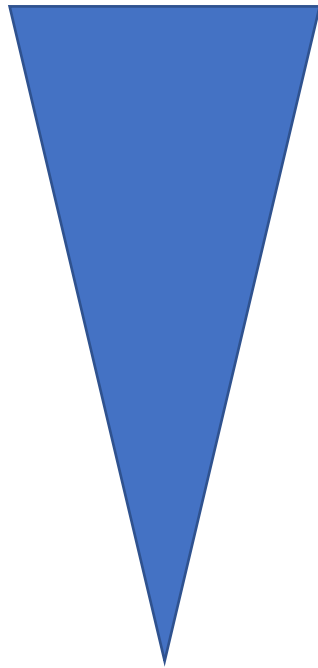
**Negotiation**

**Research Question: Why is there protest in some cases and not others?**

### 3. Qualitative Methods

# Key Difference in Methodologies

*Quantitative*

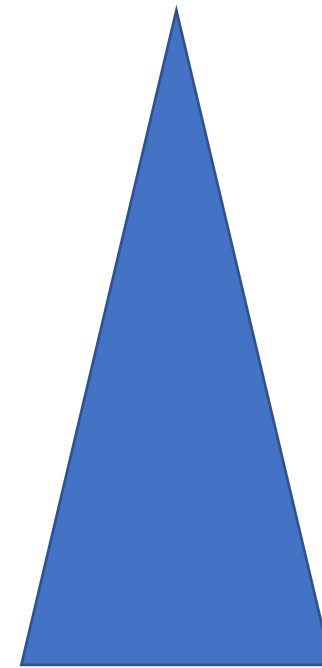


**Deductive**

(from general to specific)

*Qualitative*

Theory  
Hypothesis  
Pattern  
Observation

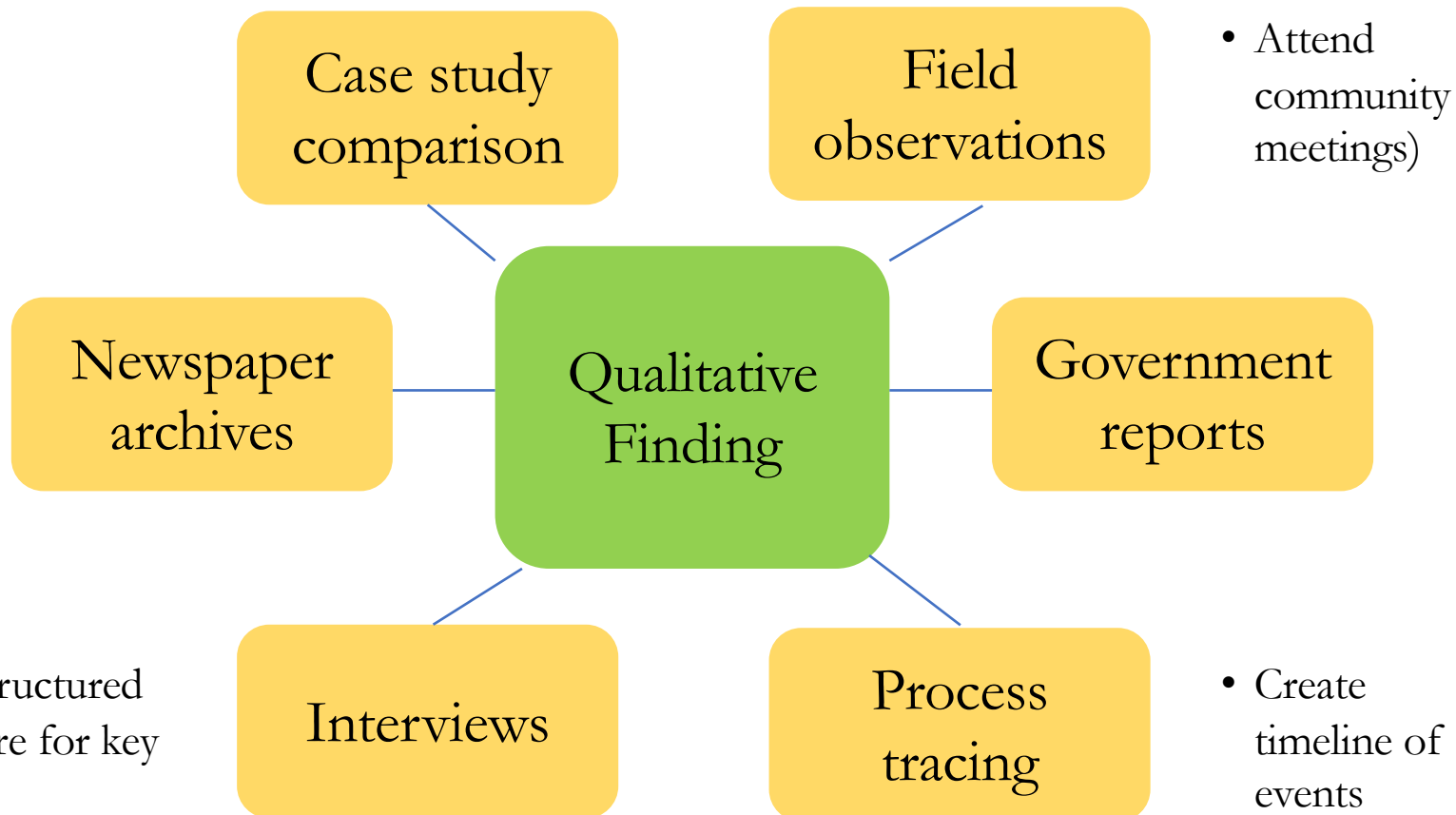


**Inductive**

(from specific to general)

### 3. Qualitative Methods

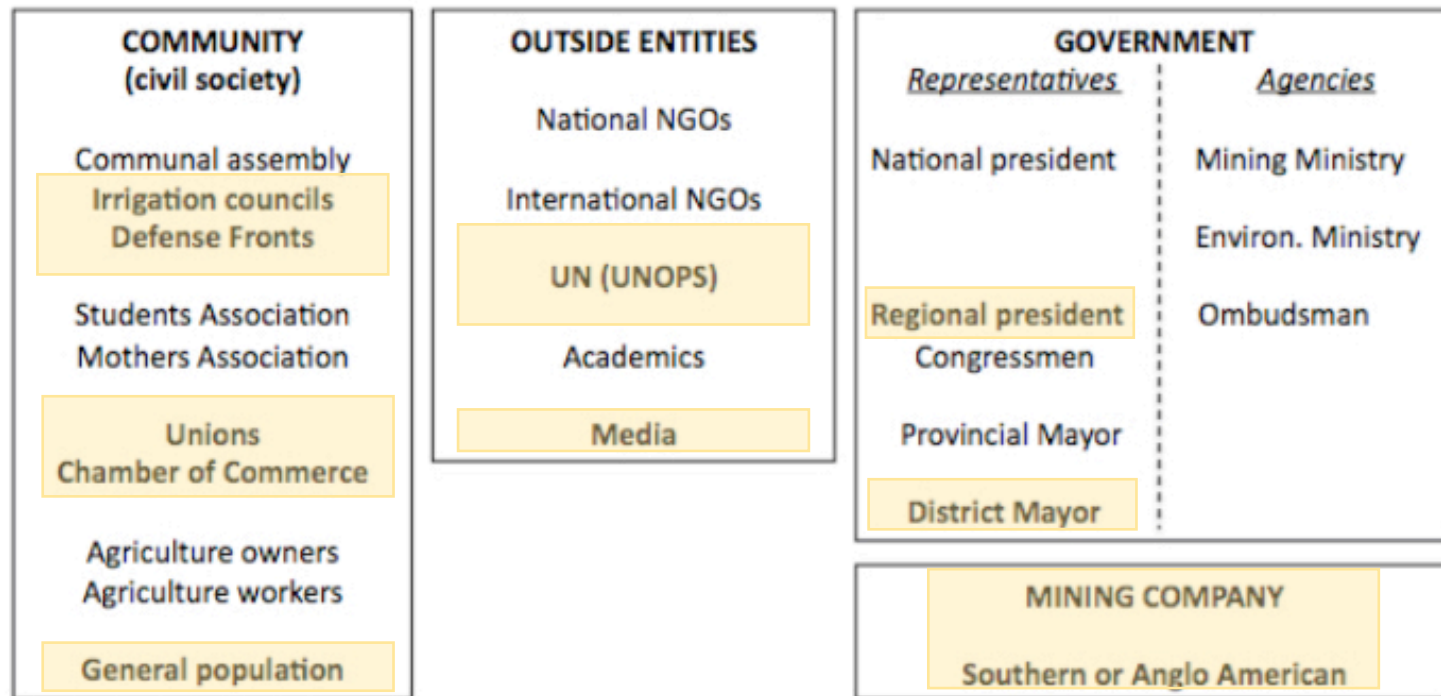
# Means of Arriving at a Qualitative Findings



- Use semi-structured questionnaire for key informants
- Coding and qualitative analysis, using HyperRESEARCH

### 3. Qualitative Methods

# Key Informant (Stakeholder) Interviews



### 3. Qualitative Methods

# Analyze Transcripts and Code Responses

The screenshot displays the HyperRESEARCH software interface, which is used for qualitative data analysis. The interface is divided into several panes:

- Case Filter:** Shows 94 of 94 cases, with a filter set to 'Cuba.Hernan'.
- Code Book:** Lists 79 codes and 8 groups. The 'Areq Moq differences' code is selected.
- Code List:** A table listing various codes with their source, type, and position. The 'Areq Moq differences' code is highlighted.
- Transcript:** Shows a source file 'Cuba.Hernan.10.22.13.txt'. The text is annotated with code names like 'Population size', 'Reg govt views desire', 'Areq Moq differences', 'Dialogue process', 'Dist prov govt views de', 'Local leaders agenda v', and 'Reg govt views desire'. A question mark icon is visible next to the 'Areq Moq differences' annotation.
- Code Filter:** Shows 49 of 49 codes, with 'View Annotation' and 'View Source' checked.
- Annotation:** A text box containing the description for the 'Areq Moq differences' code: 'Basically he is saying that there are social and unpredictable elements to the conflicts.'
- Font Settings:** A small window for adjusting font settings.
- Display Codes In Context:** A checkbox that is checked, showing the code annotations in the transcript.



### 3. Qualitative Methods

EIA = Environmental  
Impact  
Assessment

# Timeline of Social Conflict

Year	Context	Tía María Protest Events
2009	<p>July: Mining Ministry publishes Southern's first EIA            August: Attempt to publicly present EIA            September: Referendum held, with great majority rejecting the mine            December: Scheduled EIA presentation postponed</p>	<p>August: Protest (15 injured)            October: March announced (but no evidence it takes place)</p>
2010	<p><b>February: Southern submits revised version of EIA</b>            May: Mining Ministry statement calling for halt of Tía María  <b>August: Southern produces new EIA to respond to concerns over water</b></p>	<p>January: March (1,000+ people in capital); Protest (4 locals and 7 police injured)  <b>April: 1<sup>st</sup> strike (1,000+ people, 7 days)</b>            September: Protest (~40 people); March (1,000+ people) against Quellaveco  <b>November: 2<sup>nd</sup> strike (4 days, 1,000+ people, 19 injured, 9 detained, meeting interrupted)</b></p>
2011	<p>January: Guillén reelected as regional president            March: UNOPS report on Southern's EIA            April: Mining Ministry suspends Tía María and removes it from list of development projects;</p>	<p>March: March (~3,000 people travel to capital.            March-April: <b>3<sup>rd</sup> strike (5,000+ people, 19 days, 3 killed, dozens injured, damaged property)</b></p>

### 3. Qualitative Methods

# Quantifying Protest

- Data often comes in forms that are quantitative but overly narrow, or qualitative but “always **hard to convert reliably into meaningful numbers**” (Tilly 1978)
- Identifying and **operationalizing protest events**, e.g. demonstrations, riots (Lichbach 1985; Arce and Bellinger 2007)
- **Measure of “magnitude of collective action”**, using a formula of “intensity x size x duration”, and then summation (Sugimoto 1973; Tilly 1978)

### 3. Qualitative Methods

## Formula for “Magnitude Score”

( [Existence of protest + People] ) (Duration) + Damage

*(A) Existence of protest*

1 = a protest, 0 if no protest

*(B) People*

1 = 1,000+ people, 2 = 2,000+ people, 3 = 5,000+

*(C) Duration*

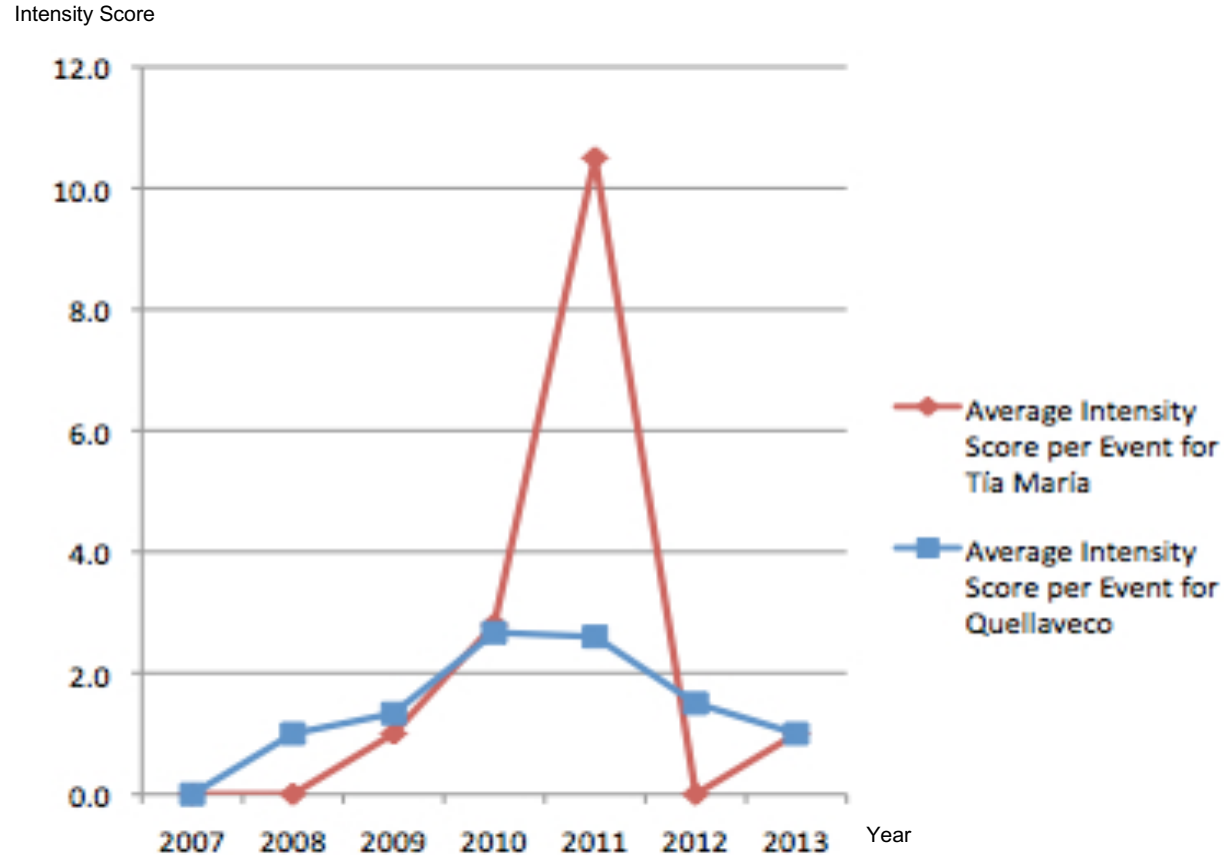
1 = 1 day, 2 = 2 to 6 days, 3 = a week+, 4 = two weeks+

*(D) Damage*

2 = take over building or property destroyed

### 3. Qualitative Methods

# Comparing Magnitude Intensity



**Tía María = protest**  
**Quellaveco = negotiation**

## 4. Summary Thoughts

# Differences in Cases With(out) Protest

- **Local history** (of mining)
- **Livelihoods** and economic opportunity
- **Leaders** in Defense Councils
- Position of **Regional government**
- **Access to resources**, e.g. media, or supplies for protestors
- **Company approach** and engagement with community
- Approved **Environmental Impact Assessment**



## 4. Summary Thoughts

# Varying Reasons for Supply Disruption

- **Physical**, e.g. labor strike, protest, road blockage leads to delays in extraction and transportation
- **Administrative**, e.g. government decides to revoke permission for mining
- **Reputational**, e.g. media coverage of water contamination, violence (injuries and death) affects the public image of mining companies

## 4. Summary Thoughts

# Timing of the Qualitative Measurement

Measurement after  
conflict ends  
(*my research*)

Reports,  
newspapers

+

Timeline

↓  
Quantification of  
social protest

Measurement as  
conflict takes place  
(*social factor*)

Media  
coverage

+

Interviews

↓  
Occurrence of  
social protest

## 4. Summary Thoughts

# Considerations for Qualitative Methods

### *Difficulties*

- **Lack of hard numbers** and databases may appear less reliable
- **Analysis can take time**, with need to understand context (main actors, company actions, historical timeline) and build local trust

### *Strengths*

- Developing qualitative facts at a **sub-national level of analysis** can increase understanding of the reality
- **New ideas and observations** may arise from the research

## 4. Summary Thoughts

# Considerations for Study of Social Factors

1. **Interaction:** Consider how social aspects affect the other factors (e.g. social elements alter political leaders)
2. **Level of Analysis:** Data sources that capture social risk likely need to be gathered at the sub-national level
3. **Time Horizon:** Potential rapid onset of protests make awareness of them (e.g. “early warning system”) important
4. **Duration:** in some cases social conflicts last years and even a decade or more
5. **Integration:** value in combining quantitative with qualitative research

# Questions, Comments, and Discussion



### 3. Qualitative Methods

## Definition of Social Conflict

- My research: basically interchangeable with “protests”, and these protest actions serve as a useful indicator of mobilization
- Rucht and Ohlemacher (1992): “a protest event is defined as a distinct collective action pursuing an explicit goal by the use of confrontative, disruptive or even violent means”
- Peruvian government (Ombudsman): “a social conflict is a complex process in which the sectors of society, the state or the companies perceive that their objectives, interests, values or needs are contradictory”

### 3. Qualitative Methods

## Difficulty in Quantifying Protests

- Tilly (1978) states that data often comes in forms that are quantitative but overly narrow, or qualitative but “always hard to convert reliably into meaningful numbers”
- Kolb (2007): “it is quite tricky to operationalize and measure the strength of a social movement for empirical research”

### 3. Qualitative Methods

## Number of Protests

- Lichbach (1985): “protest is operationally defined as the aggregation of **seven types of events**” e.g. “protest demonstrations, protest met by police violence, demonstrations turned into riots, riots, political strikes, student strikes, and other forms of protest”
- Arce and Bellinger (2007): “**event counts** representing the annual number of politically motivated antigovernment demonstrations and political riots involving more than one hundred citizens”

### 3. Qualitative Methods

## Magnitude of Protest

- Muñoz and Guinjoan (2013): “the **intensity of the mobilization** efforts ... is measured by two variables: The number of volunteers who participated in the organization of the referendum as a percentage of the rest of the population”
- Tilly (1978) measures “magnitude of collective action” in reference to Sugimoto (1973), who used a formula of “intensity x size x duration”, and later “computed the magnitude of the event as a whole by summing the magnitudes of all its action phases”
- Tarrow (1995) says “the magnitude of sustained contentious collective action (and not the presence of an organized group) is ... the strongest indicator of the presence of a social movement

### 3. Qualitative Methods

## Data Sources and Calculation (1)

- Peru's Ombudsman publishes monthly reports on social conflicts, providing detail on protests and negotiation related to mining.
- Archive of newspaper articles from 2010 through 2012 at the office of LABOR, supplemented by Internet searches for additional media reports covering 2007 to 2012 more broadly
- Together, the descriptions generated information on the number of protesters, the duration of the action, as well as reports on the destruction or takeover of property