

**SMI CSRM**

Centre for Social  
Responsibility in Mining



# Using Participative G.I.S. For Infrastructure Corridor Planning Around Mining Projects: A Case Study From Indonesia

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# Research Team for AIIRA project

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Photo credit: CSRM (newly built road in the lowland of swamp areas in East Kutai)



# Research Background

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- Ineffective and inefficient of infrastructure development can hinder investments and subsequently economic development
- Addressing infrastructure deficiencies has become a top priority of developing countries including Indonesia
- Lack of integrated planning for infrastructure and other sectoral development can trigger conflicts due to:
  - Environmental risks
  - Social risks
  - limit the benefits that can flow to communities
- Better 'Infrastructure corridor' planning can promote sustainable development but there are limited practical methods/tools by which socio-ecological factors can be considered



# Research aim

To develop a GIS-based tool and strategies (e.g. participatory engagement) for mineral infrastructure planning that will strengthen the capacity of government decision-makers to:

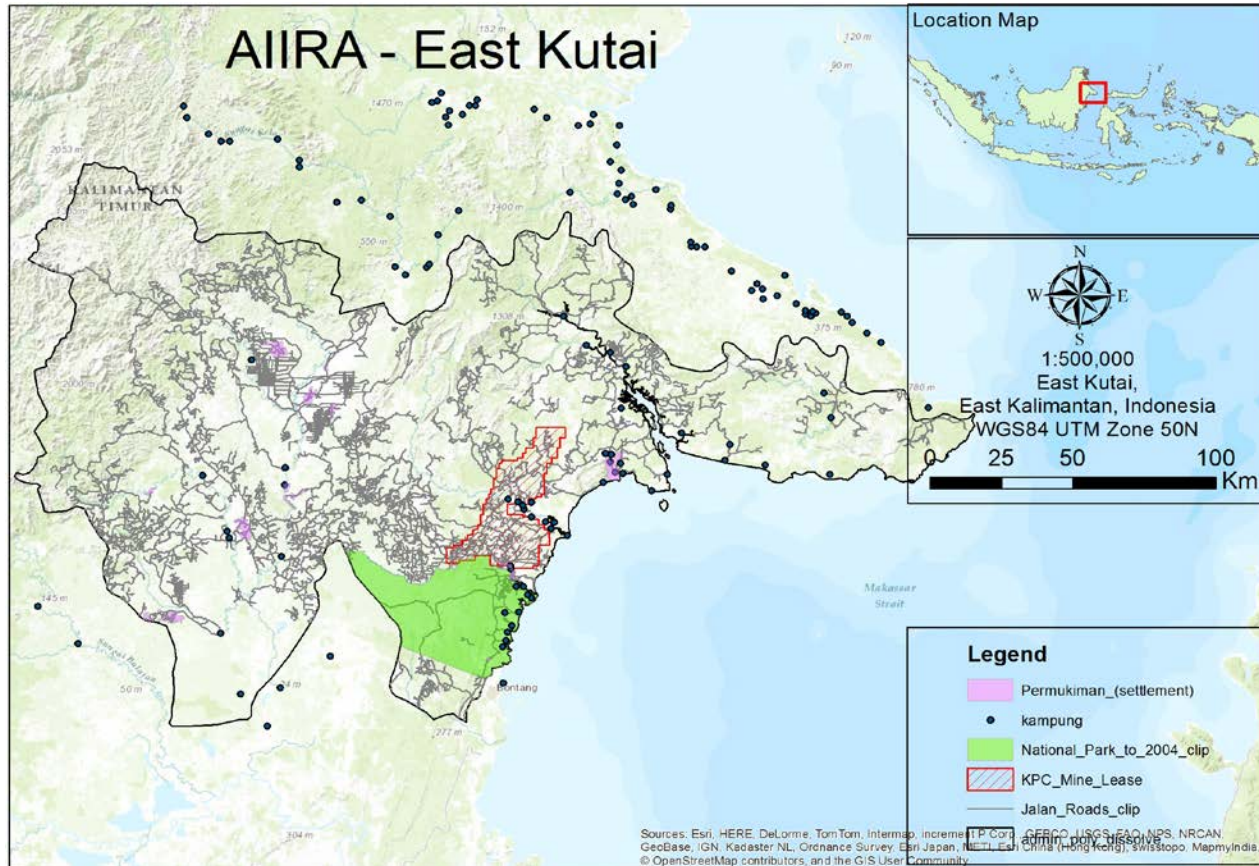
- Consider socio-ecological factors
- Improve coordination amongst different levels of government (vertical) and sectors (horizontal)
- Promote greater community participation

*Photos: CSRM engagement during October 2014 field work*





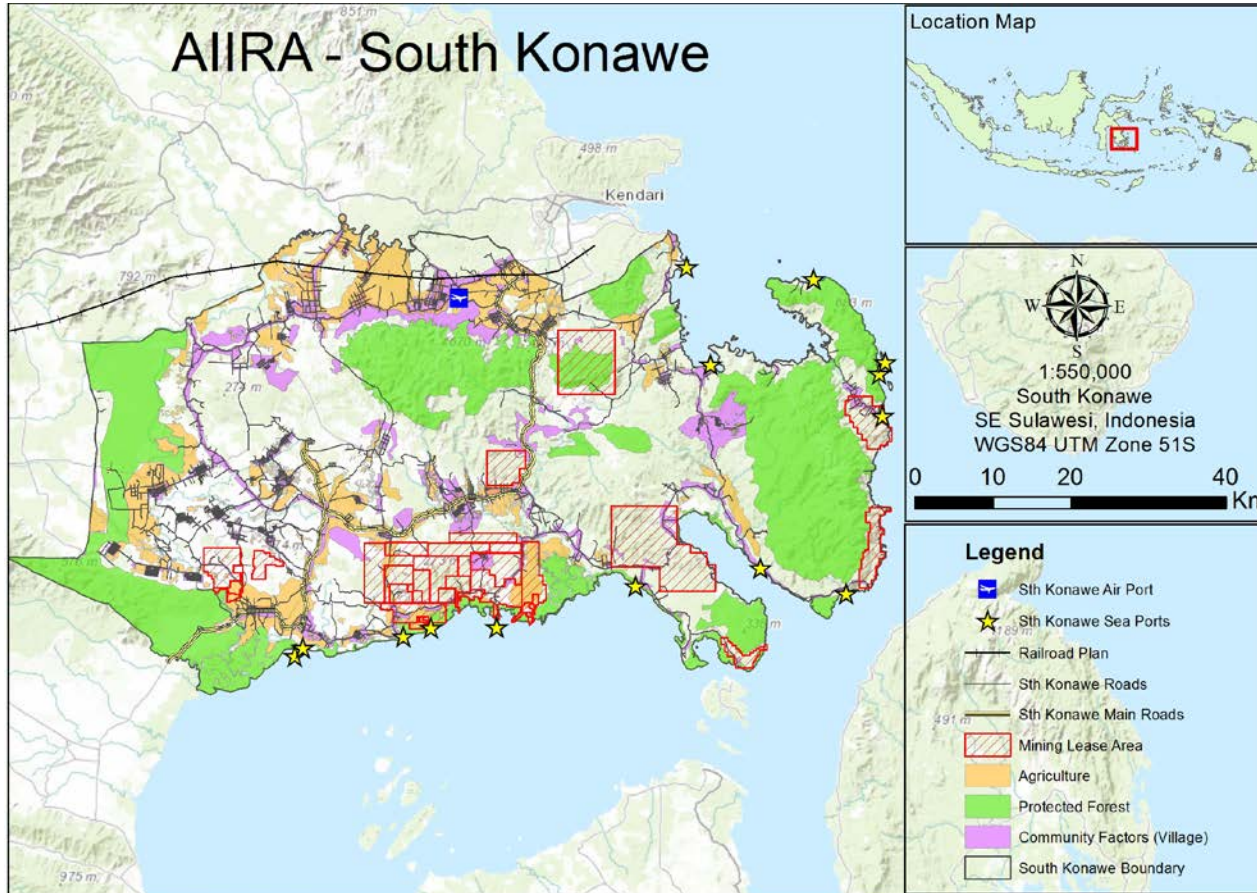
# Case Study 1: East Kutai



- Located in East Kalimantan Province
- Hosts the largest coal mining company in Indonesia (since 1992)
- Impacted a community of 100,000 people
- Mostly mineral infrastructure was developed within the company mine leases
- Contributed to regional infrastructure through CSR investments



# Case Study 2: South Konawe

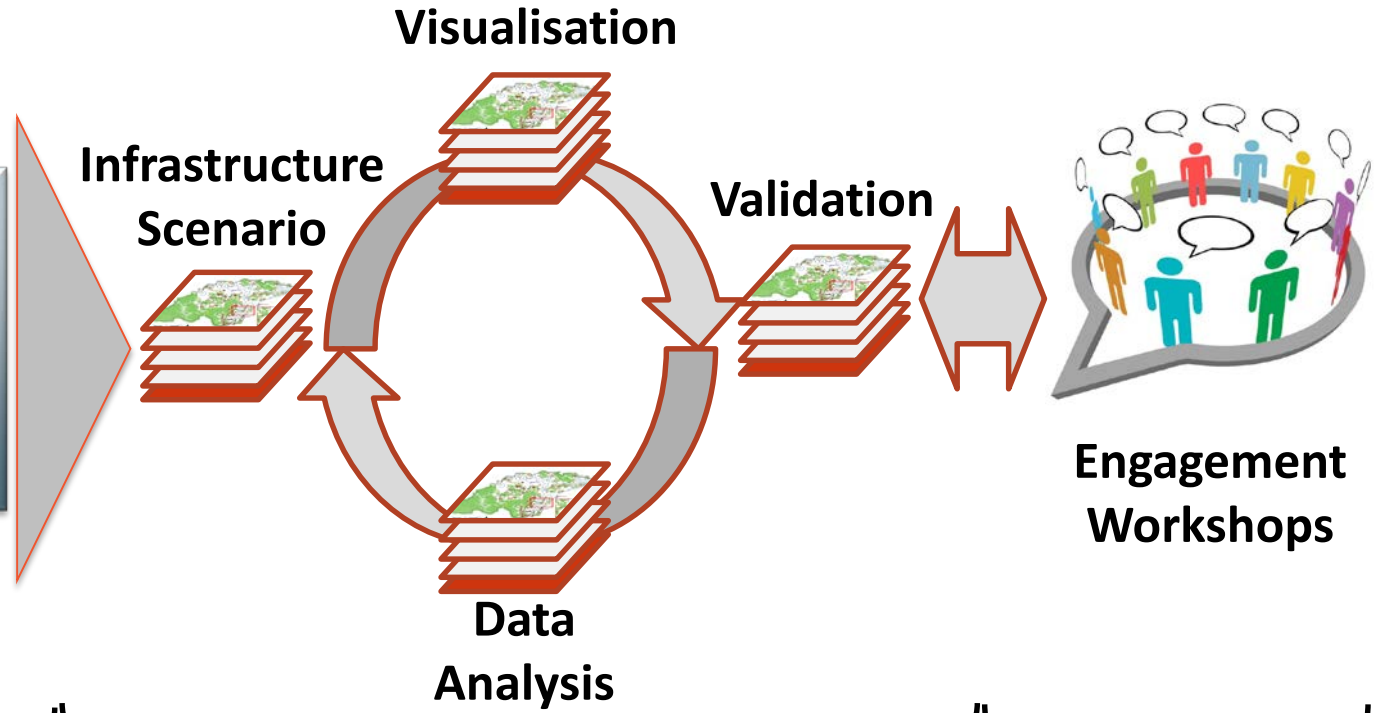


- Located in South East Sulawesi Province
- Medium-small scale nickel mines – with more than 100 mine leases
- Only two companies are operating since the implementation of beneficiation policy
- Poor mineral infrastructure developed without proper planning
- Mixed industries: cocoa, cashew and community livelihoods



# Research Methodology

- International benchmarking
- Social surveys, workshops and in-depth interviews



Identifying Socio-ecological factors and preferences

Developing a GIS based tool

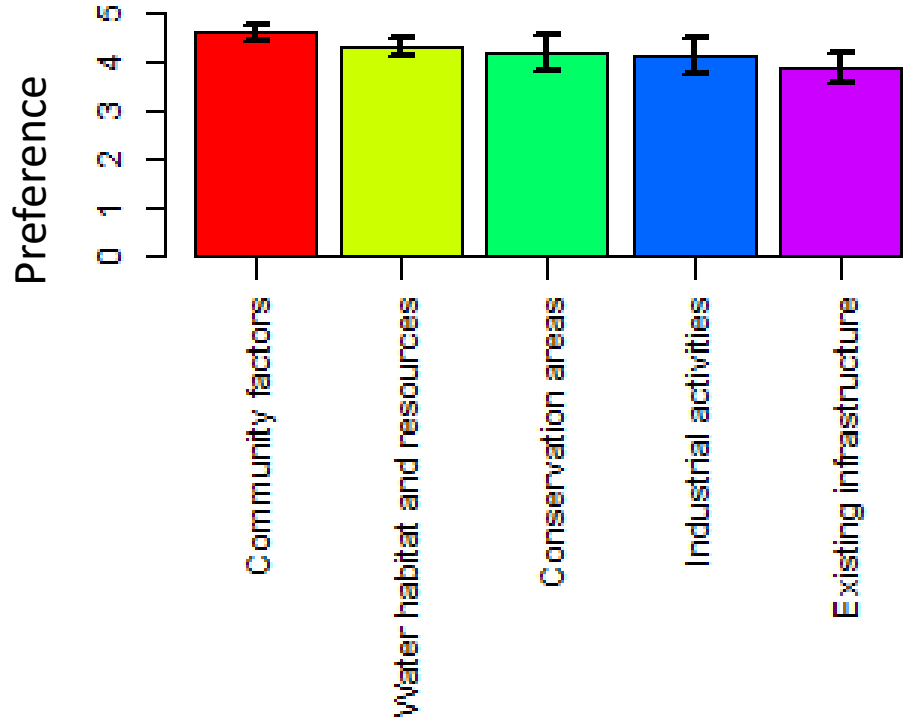
Developing strategies for Participatory decision making



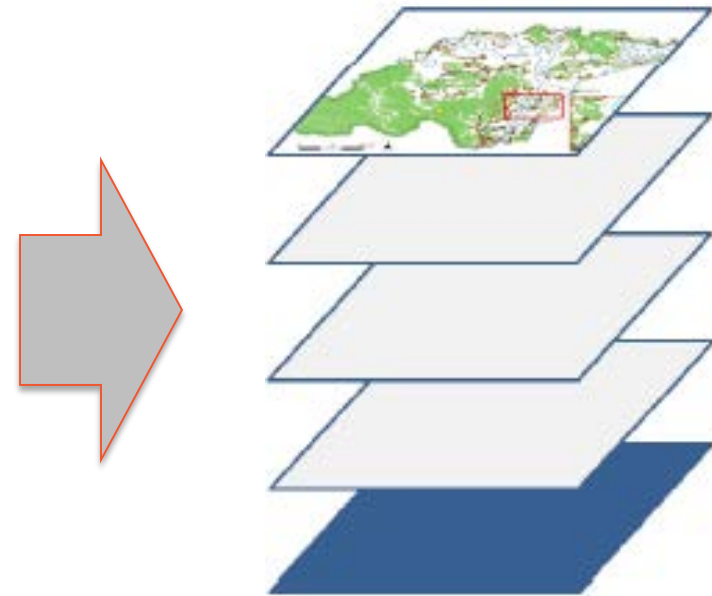


# Preferred factors for infrastructure planning

Mean factor values



Spatial data

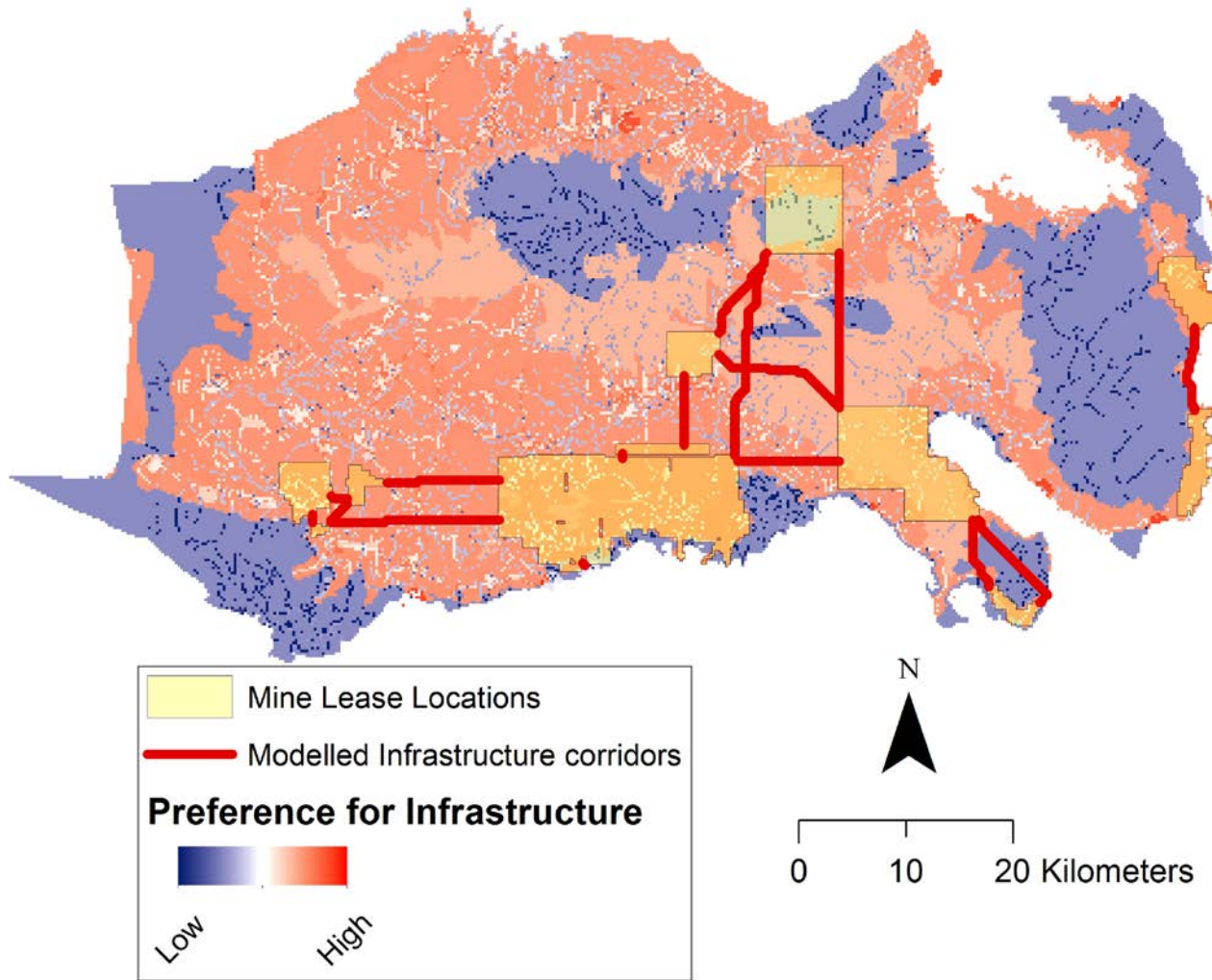


- Socio-ecological factors composed of multiple sub-factors representing preference for infrastructure identified through surveys.
- Spatial data representing each factor weighted by survey values combined to produce cost-surface.





# Modelling infrastructure with least-cost paths



- Infrastructure modelled as least-cost paths avoiding areas of low preference.



# Next steps

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- Refining the GIS modeling and tool
- Developing strategies for participatory decision making model
- Developing strategies for geo-spatial data governance and management
- Mainstreaming this tool through regulatory guidelines

