PACE-NET PLUS

Sub-topic 1: Enhancing environmental consideration in mining while answering societal needs

PACE-NET PLUS
PACIFIC-EUROPE NETWORK FOR SCIENCE, TECHNOLOGY AND INNOVATION

CNRT NICKEL & son environnement

Think Tank on Mining & its Environment
8-9 December 2014 in Auckland
Venue: Auckland University

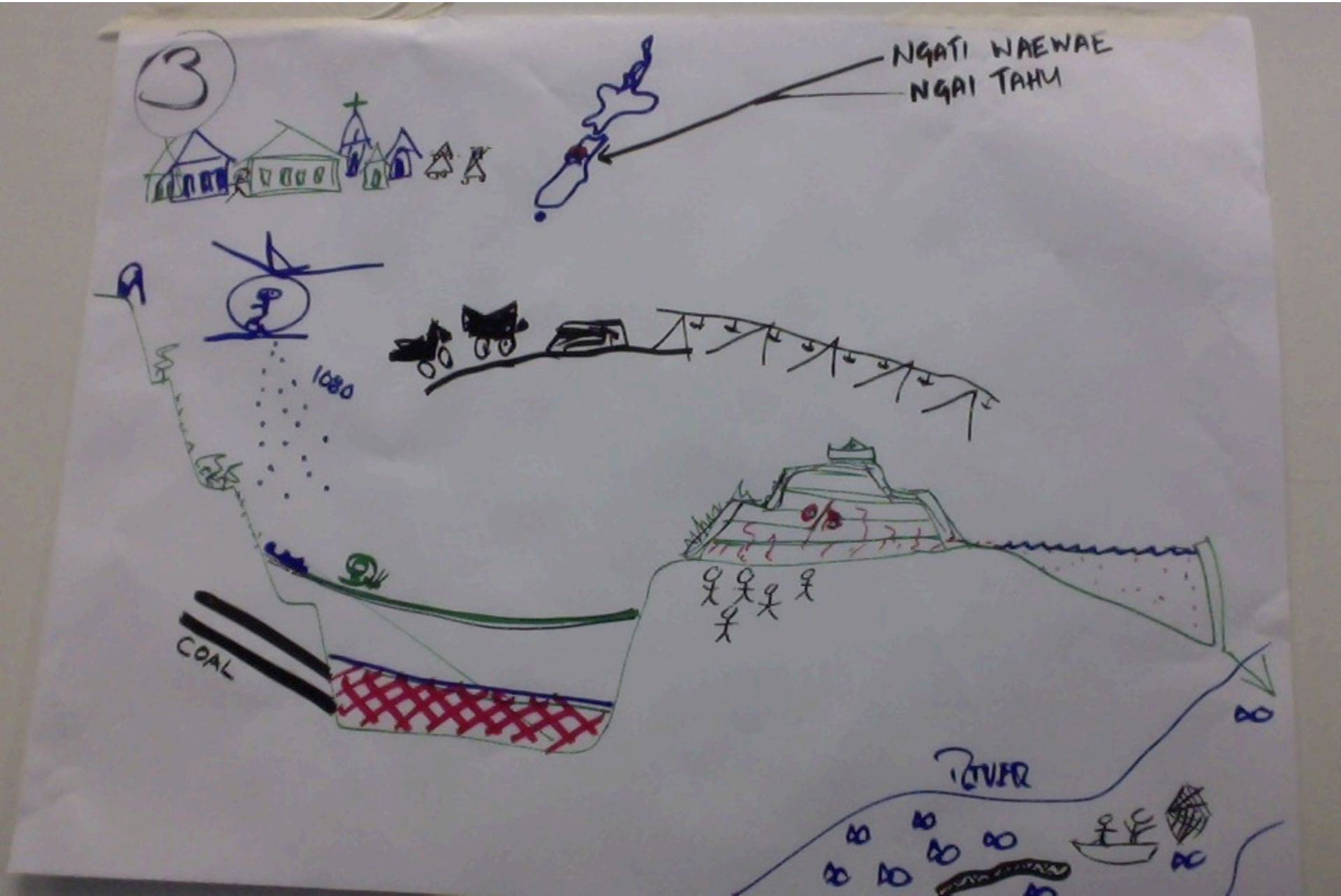
Case study 1
Coal mine in South Island, NZ

- Facts
  - Opencast, high-quality coking coal
  - 10 year lifespan (2nd year now)
  - 6m rain per year

- Benefits
  - Employment for locals
  - Downstream economic value for NZ (supporting infrastructure)

- Potential problems
  - Acid producing overburden = acid mine drainage
    - Can lead to degradation of water, effects fishery
  - Disruption of terrestrial ecosystem
    - Endemic endangered fauna (carnivorous snails, kiwi)
  - Landscape changes
    - Land value for local iwi (indigenous people) affected
  - Coal price drop – mine may not be viable!

- Solutions
  - Acid-producing rocks placed under groundwater in mine pit to prevent oxidation
  - Acid-producing rocks in managed dumps – alkalinity addition, compaction
  - Residual acid mine drainage treated
  - Comprehensive rehabilitation
    - Direct vegetation transfer
    - Snail collection and re-establishment
    - Kiwi collection and re-establishment
  - Compensation (offsets) for disruption to ecosystem
    - Predator control elsewhere
  - Bond established and reviewed annually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NGATI WAEWAE
NGAI TAHU
1080
COAL
RIVER

Careful removal of vegetation
Snails and all

Placed in nursery
Stored until closure

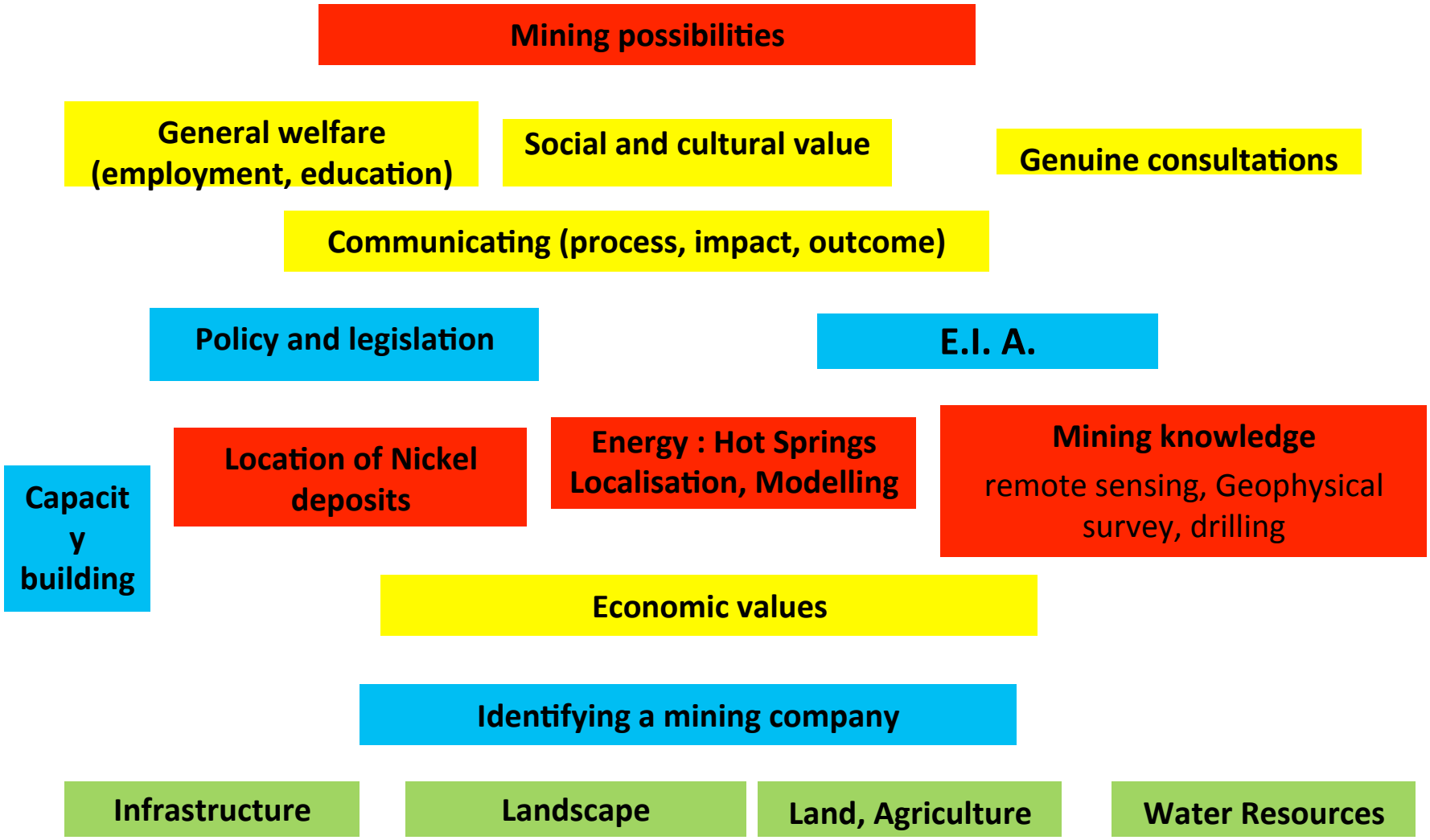
DVT (direct vegetation transfer)

Water treatment and discharge

Take home messages

- Effective communication between community and mining company
- Good multidisciplinary baseline data
  - Water chemistry
  - Snails, kiwi, fish (whitebait)
- Good environmental monitoring established
- Development of new technologies
  - mussel shell bioreactors for AMD treatment
- Bond set up if walk away
  - Intense media attention

Pre-Exploration Case study



Must be trans-disciplinary collector wisdom

PROBLEMS + GAPS

- **Absence** of genuine consultations, understanding and local capacities

clash of values, lack of genuine consultations, traditional culture and economy

- **Lack** of knowledge and awareness from the communities

geological resources, climate changes, impact**s**

WORKING WELL

- **Clear + Strong policy** regulations

case in NZ coal mining case study

- **Integrated decisions** between **local communities and mining industry/science**

involving populations, integrating citizen science and traditional knowledge, landowners, …

RESEARCH PRIORITIES

- **Cross-disciplinary** baseline-data

Map multiple values: social cultural, human , environmental

Global 3 dimensional-time approach integrating mineral exploration and impact evolution

- **Efficient** framework for **dialogue** between miners and communities

study communication effectiveness, preparing local societies and culture for the impact (positive/negative) of mining operations

INNOVATION + TECHNICAL PRIORITIES

- **Multidisciplinary** approaches

Multidisciplinary modelling/approaches (mine, environment, society), Collaboration between research institutions

- **New environmentally** sustainable technologies

Non destructive exploration techniques, Prevent environment, Cheaper and more effective remediation technologies, Environmental friendly, …