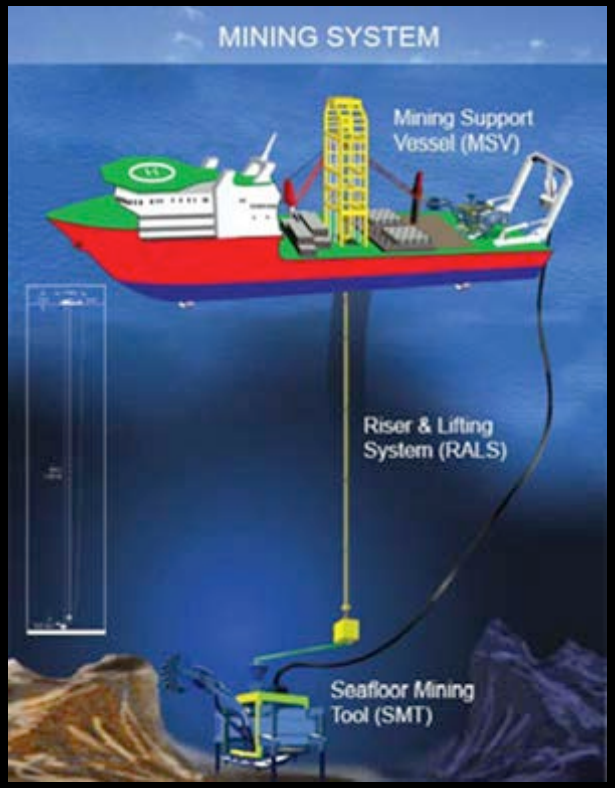
Increasing Knowledge of Social and Environmental Impacts of Deep Sea Mining



Participants from: New Zealand, Fiji, Samoa, New Caledonia, Papua New Guinea, Australia, Cook Islands.

The Deep Ocean (Ramirez-Llodra *et al.*, 2010)

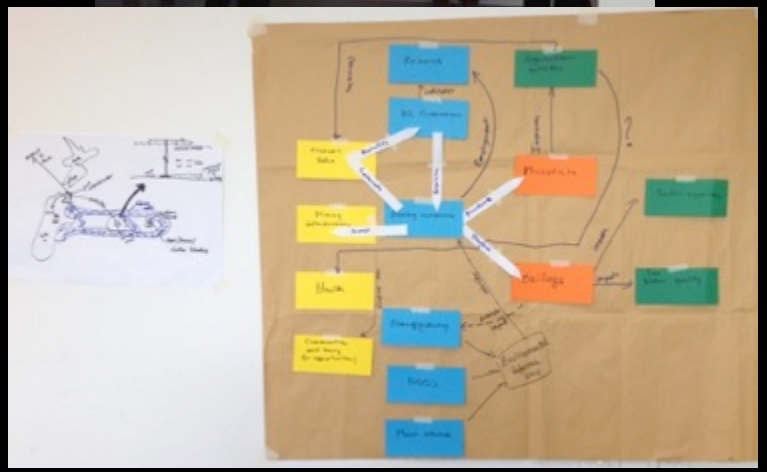
- Largest but least studied environment on Earth.
- Lack of photosynthesis –Chemosynthetic organisms are primary producers
- Ecosystems are amongst to most food limited on the globe, low biomass and productivity (exception upwelling areas)
- Diversity amongst the highest on Earth poleward trend of decreasing diversity
- Communities are characteristically distinct from shallow water communities but are interconnected
- Many species show either gigantism or dwarfism
- Affects of anthropogenic impacts largely unknown
- Understanding of ecosystem services is in its infancy

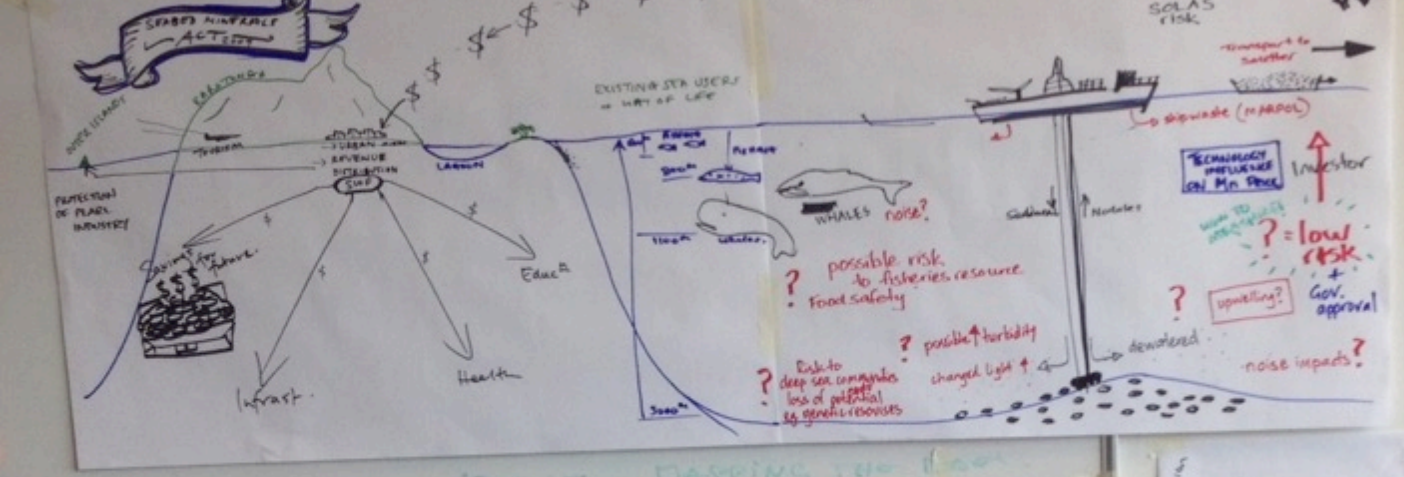
Our Case Studies

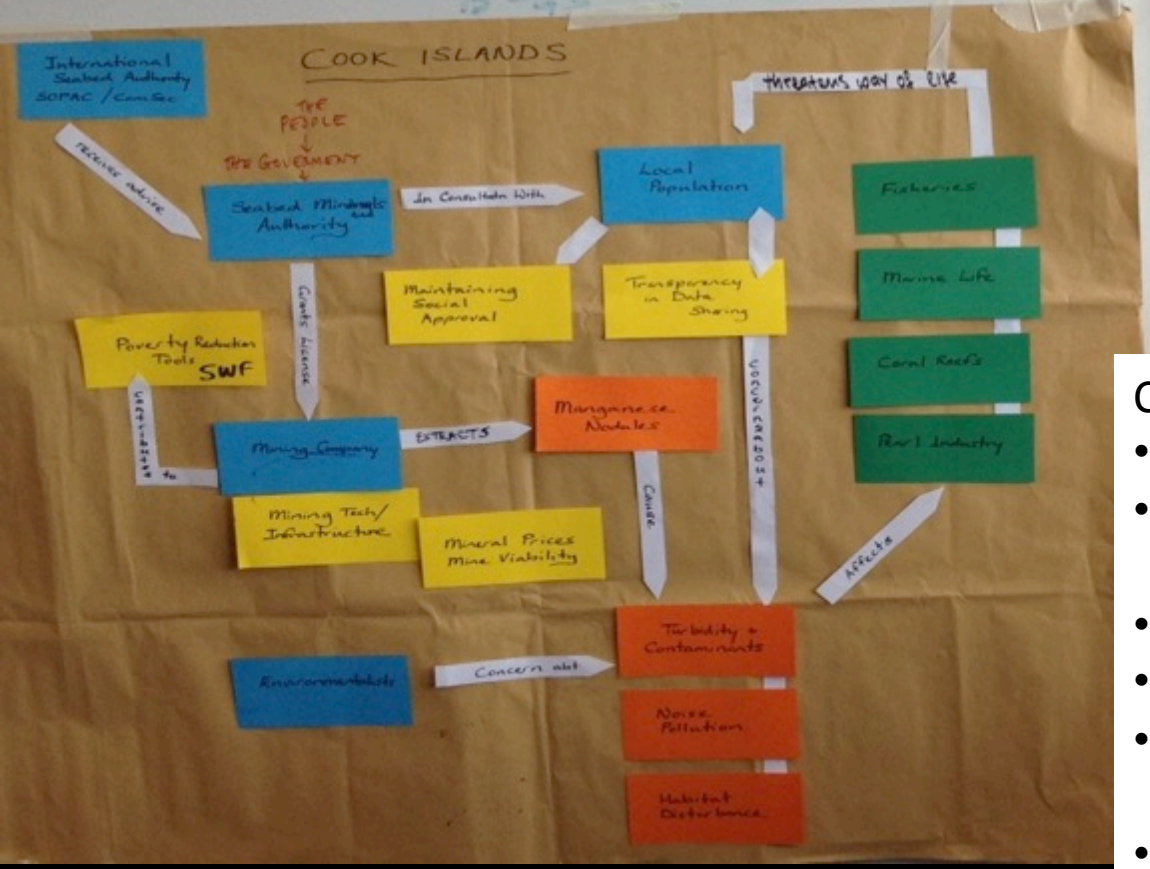
Solwara 1 Project PNG (possibly 2 years for extraction) -Seafloor Massive Sulfides (Cu, Au, Ag, Zn).

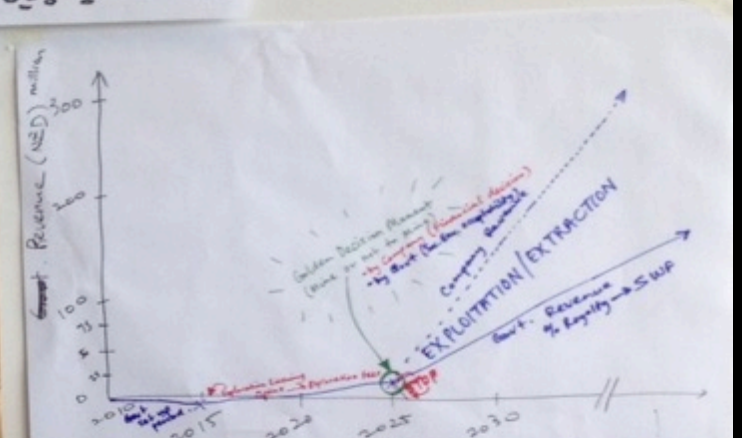
Cook Islands –Developing approaches to exploit Mg deposits

Chatham Rise Phosphate (CRP –New Zealand)







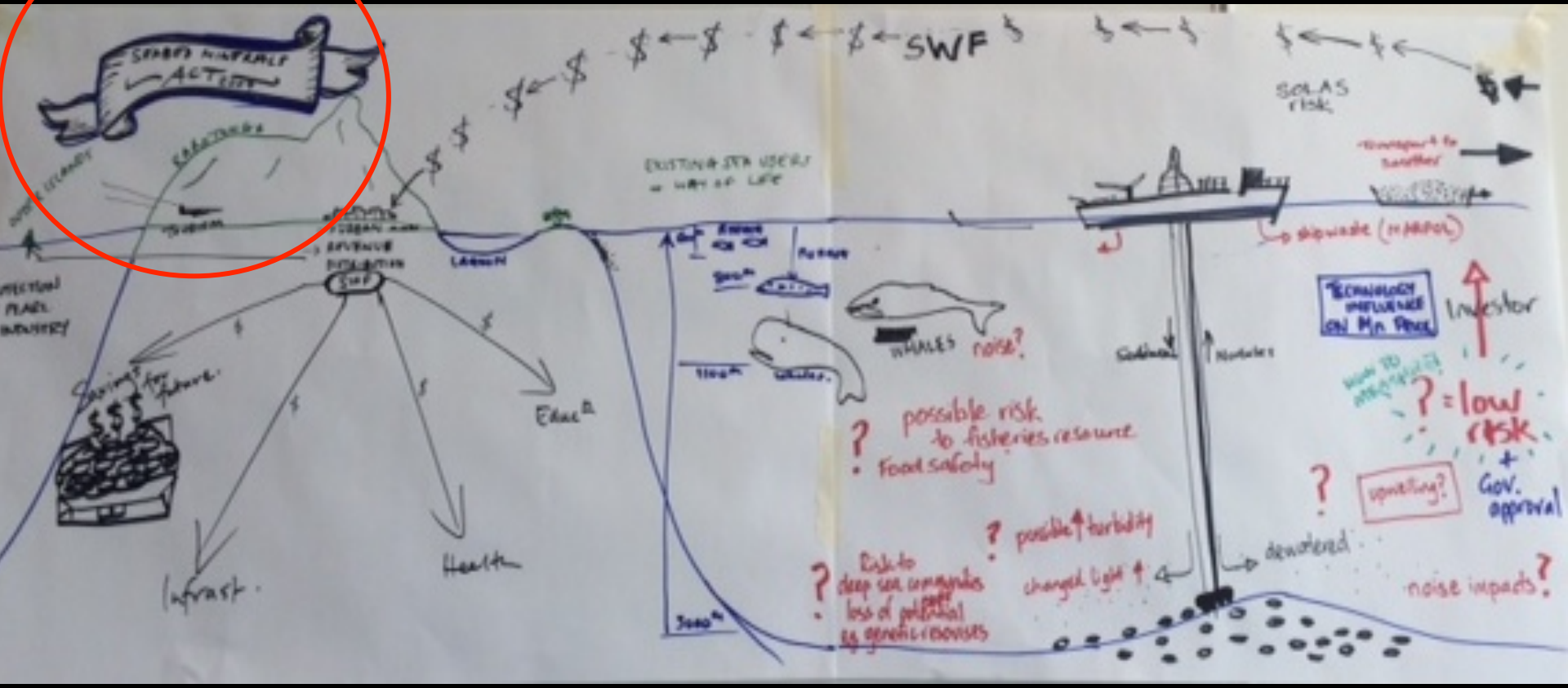


CONTEXT

- No immediate rush (tech limited)
- Within 1 year licencing will commence
- Multi-generation careers
- Biodiversity relatively low
- Open and transparent approach to benefit the country
- Social acceptance damaged if SP see impact at other location

Resource Person: Paul Lynch

Cook Island Case study



Active community discussions at this stage Youth, Community leaders,

Members of community are part of the decision making. Seabed Minerals Authority

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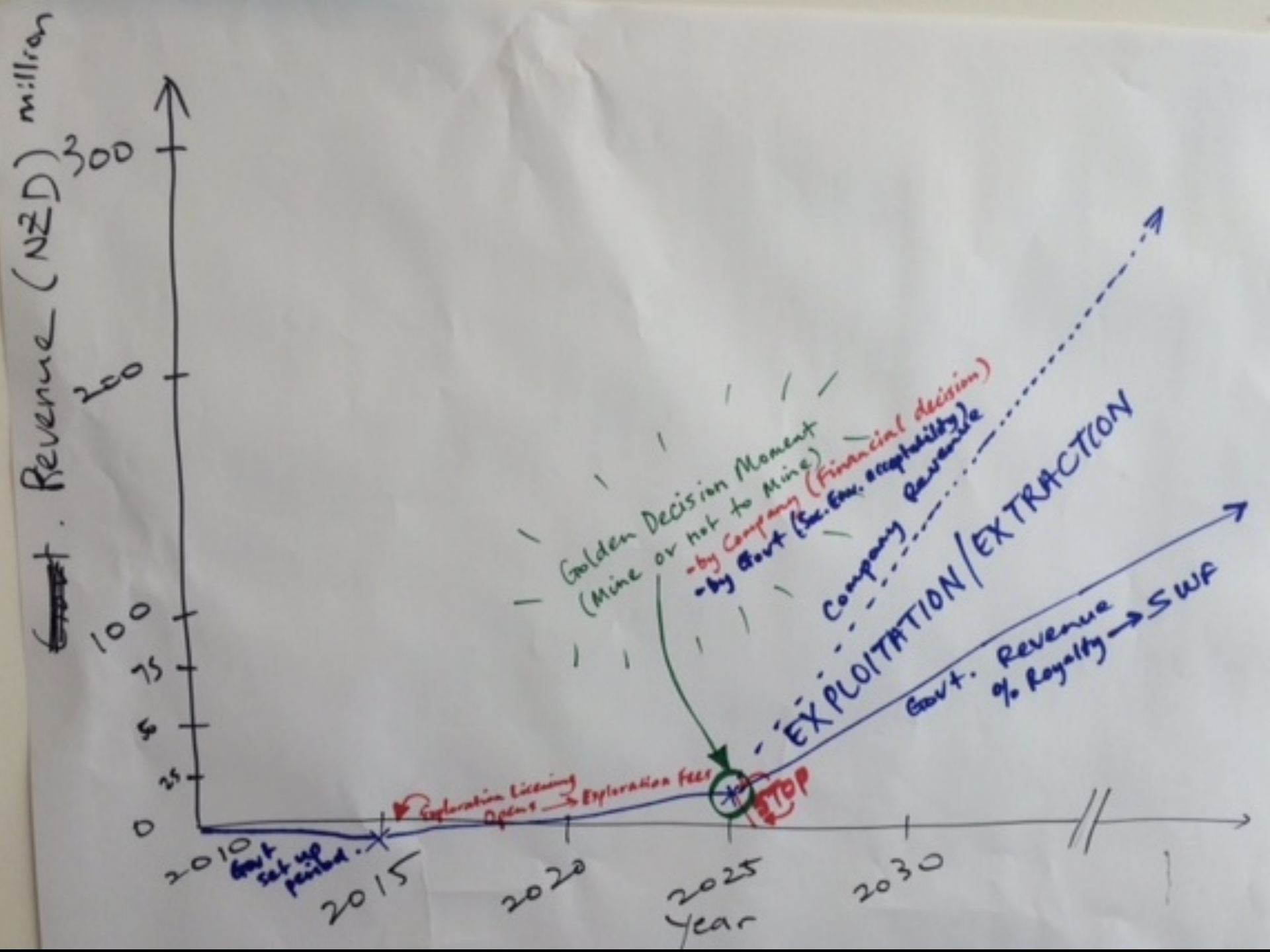

Govt. Revenue (NZD) millions
300
200
100
75
50
25
0
2010
Govt set up period
2015
2020
2025
2030
Year
Exploration Licensing Options → Exploration Fees
Golden Decision Moment
(Mine or not to Mine)
-by Company (Financial decision)
-by Govt (Soc. Env. acceptability)
STOP
Company Revenue
EXPLOITATION/EXTRACTION
Govt. Revenue
% Royalty → SWF

What is working well?

Are we learning something?

- 7 -Understanding social impact is part of the process
- 7 -Recognising the importance of science and problems and gaps
- 5 -Transparency/information sharing collaboration and partnership
- 4 -Sustainability is a prerequisite for activity
- 4 -Development of policy and law
- 1 -Community engagement/stakeholder consultation
- Cook Is SWF
- Acceptance of the need to mine

Images: R.Pyle

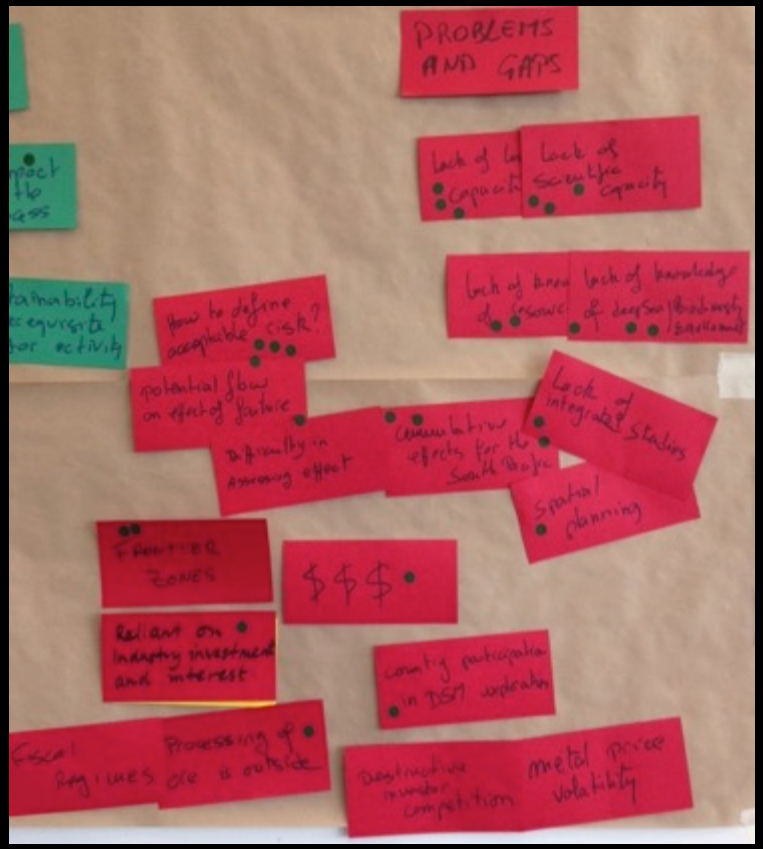
Problems and Gaps (Similar between case studies)

- 6 -Lack of capacity
- 5 -Lack of knowledge of resources and biodiversity resources
- 5 -How to define acceptable risk /potential flow on effect of failure
- 2 -Frontier zone investment and research
- 2 -Lack of integrated studies
- 2 -Cumulative effects for the South Pacific
- 1 -High cost exploration and mining
- 1 -Spatial planning
- 1 -Country participation in DSM exploration
- 1 -Processing of ore out side region

Images: R.Pyle

Other highlighted problems and gaps

- Fiscal aim of DSM
- Destructive investor competition (country competes to get investment)
- Metal price volatility (linked to technology advancement and timing)
- Reliant on Industry investment and interests



Priorities for research

- 7 -Ecosystemic knowledge before exploitation
- 7 -Collecting baseline information on biodiversity etc. and understanding system variability
- 5 -Social engagement/ participation processes
- 3 -Marine spatial planning
- Capacity building for locals and train the trainer programs

Image: R.Pyle

Other identified priorities

- Tools to assess toxicological impacts on locally relevant species
- Metallurgical studies of DSP
- Synthesis of available information to help government decisions
- Scientific studies on the impacts of DSM on fisheries
- Long term monitoring of the environment
- Research on appropriate fiscal regime for DSM
- Specific policy for DSM
- Cost benefit analyses for DSM
- Investigate biodiversity offsets
- Economic modelling for community outcomes
- Who funds research?

Technology and Innovation

- 8 -Habitat mapping and biodiversity data collection processes (improved systems required)
- 6 -Processes of extraction to minimise impacts
- 3 -Specific regulation
- 4 -Risk assessment tools for deep water and tropical ecosystems
- 3 -Regional coalition
- 2 -More collaboration between technology developers
- 2 -Plume minimising technology
- Deep marine monitoring equipment
- Establishment of school of excellence for DSM
- Low cost and environmental clean technology
- Automation of taxonomy identification