

# EROVA Ecosystem Services Impact Assessment Tool

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## Why the tool?

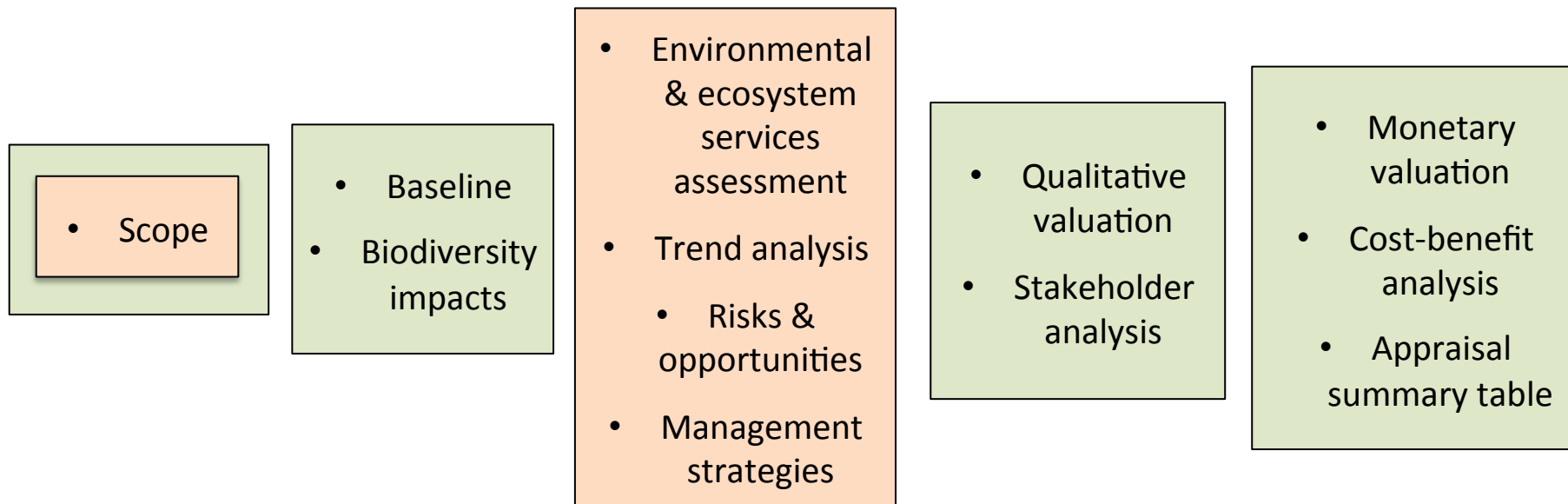
- Antofagasta Minerals' (AMSA) vision:
  - 'create environmental value' at mining sites
- 2012 Biodiversity & Ecosystem Services Guideline:
  - 'net positive impact' on biodiversity in carrying out mining activities
- IFC PS6 requirements:
  - 'no net loss' and 'net gain'
  - ecosystem services assessment

**HOW DO YOU MEASURE THESE?**

## The EROVA tool

- The Environmental Risk, Opportunity and Valuation Assessment (EROVA) tool
  - Flexible Excel based framework tool
  - To ‘account for natural capital’ in business decision-making
  - Currently covers:
    - ‘living’ natural capital (i.e. biodiversity & ecosystem services)
    - ‘non-living’ natural capital (e.g. minerals & fossils)
    - other environmental impacts (e.g. air emissions & waste)
  - Plans to include social impact valuations too
  - Developed by Sustain Value in conjunction with Antofagasta

## How it works?



Steps in the EROVA Tool



Based on WRI's Ecosystem Services Review

Based on WBCSD's Guide to Corporate Ecosystem Valuation

## Applications to date

- Piloted in mining operations
  - One qualitative
  - One through to valuation
- Mine related conservation
  - Conchali lagoon
  - A potential conservation site



## Conchali Lagoon Case Study

- 1997: Purchased by Minera Los Pelambres (MLP)
- 2000/04: Designated a Nature Sanctuary & Ramsar site
- 2006: 'Centro Andronico Luksic Abaroa' visitor centre built
- **Scope:** Assess environmental values generated by restored coastal lagoon and visitor centre



# ‘Environmental & ecosystem services’ Assessment’ output

- Builds on WRI tool
- In addition to ecosystem services, includes:
  - Non-living natural capital
  - Other relevant environmental impacts

Environmental parameter	Dependence	Impact	
<b>Provisioning Services</b>			
Livestock	✓	○	-
Capture fisheries	✓	○	+
Wild foods	✓	●	-
Energy from water	●	✓	✓
Freshwater (water)	●	✓	✓
<b>Regulating Services</b>			
Maintenance of air quality		○	+
Global climate regulation	○	●	+
Regional/local climate regulation	✓	?	
Regulation of water timing and flows	●	✓	✓
Erosion control	✓	●	+
Water purification and waste treatment	✓	●	+
Pollination	✓	?	+
Natural hazard mitigation	✓	●	+
<b>Cultural Services</b>			
Recreation and ecotourism	✓	●	+
Biodiversity conservation (ethical, spiritual, non-use)	✓	●	+
Education, research and inspiration	✓	●	+
<b>Supporting Services</b>			
Habitat & species support (e.g. nursery, refuge & feeding)	✓	●	+
<b>Non-living Natural Capital</b>			
Archaeology/historic	✓	●	+
Modern cultural assets (e.g. arts & crafts)	✓	●	+
Geology (rocks & minerals)	✓	●	+
Landscape	✓	●	+/-
<b>Other Environmental Impacts</b>			
Vehicle movements	✓	●	-
Non-hazardous waste	✓	○	-

**Key**

- High
- Medium
- Low
- + Positive impact
- Negative impact
- ? Don't know



## Risk & opportunities - Example findings

- Company risks - Mainly reputational
  - Reduced freshwater flow & quality in lagoon
  - Invasive species - ‘apple snail’ damaging lagoon
- Company opportunities - Mainly reputational
  - To enhance recreation (e.g. boardwalks & advertising)
  - To enhance local arts & crafts
  - Potential for biodiversity offset credits?

## Environmental valuation

- Key values identified and valued:
  - Recreation
  - Conservation/ 'non-use' values
  - Several regulating services (carbon sequestration, water purification, erosion control)
  - Habitat support (e.g. offshore fisheries)
- Initial ballpark 'value transfer' approach
- Enhanced by a 'willingness to pay' questionnaire survey

## ‘Willingness to pay’ surveys



Before purchase - 1995



Similar view - 2013

- Visitor survey
- General public
- Passers by

# Appraisal summary table

Environmental parameter	Relative Value	Annual value (US\$/year)	Present value (US\$ over 25 yrs)
<b>Provisioning services</b>			
Livestock	-1		
Wild foods	-1		
<b>Regulating Services</b>			
Maintenance of air quality	1	12,250	226,302
Global climate regulation	4	117,000	2,161,412
Erosion control	1	12,582	232,436
Water purification and waste treatment	4	1,202,000	22,205,277
Pollination	1		
Natural hazard mitigation	4	97,290	1,797,297
<b>Cultural Services</b>			
Recreation and ecotourism	4	166,724	3,811,920
Biodiversity conservation (ethical, spiritual, non-use)	16	5,110,607	94,411,347
Education, research and inspiration	9		
<b>Supporting Services</b>			
Habitat & species support (e.g. nursery, refuge & feeding)	4	687,950	12,708,919
<b>Non-living Natural Capital</b>			
Archaeology/historic	4	1,277,652	23,602,837
Modern cultural assets (e.g. arts & crafts)	4	1,277,652	23,602,837
Geology (rocks & minerals)	9	2,874,716	53,106,383
Landscape (non-use)	9	2,874,716	53,106,383
Landscape (passers by)		83,702	1,501,232
<b>Other Environmental Impacts</b>			
GHG emissions	-1		
Vehicle movements	-1		
Non-hazardous waste	-1		
<b>SUM (of columns)</b>	<b>69.0</b>	15,792,403	294,730,617

- Relative value = +69
- US\$ 16 million/year
- 85% = non-use value
- 9% = regulating services
- 4% = habitat support
- 1% = recreational value

Values based on the visitor WTP survey
Values based on general public WTP survey
Values based on passer by WTP survey

## Conclusions

- Antofagasta's work at Conchali generates considerable benefits
- EROVA helps to identify, quantify and compare a broad range of environmental impacts
- It helps capture IFC PS6 relevant information
- The 'Valuation' approach adds a lens for decision-making
- An evolving tool that assists various company decisions
- EROVA Natural Capital Group establish

See:



## EROVA can be used to assess:

1. Project alternatives
2. Ecosystem services
3. Significance of environmental impacts
4. Appropriate levels of mitigation
5. Extent of 'net positive' impacts
6. Value of opportunities and risks
7. Distribution & extent of stakeholder impacts
  - At different levels:
    - Overall project
    - Project components
    - Specific mitigation measures