

Pressure from coastal oil drilling in Norway: lessons for the debate on mining in New Zealand's conservation estate

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Oil production and mining

- Oil output from mature North Sea fields has declined by 50% from its peak in 2001
- It is expected 20% of remaining undiscovered oil reserves are beneath the Lofoten Islands
- Expected revenues from oil & gas in the Lofoten ~ NOK 100 billion (NZ\$ 24 billion)

Mining in New Zealand: coal, gold, iron ore ...

Mandate from the Norwegian Ministry of the Environment

- *”Economic valuation of a pure, productive ocean environment and an intact biodiversity for the Lofoten-Vesteralen Islands”*
- Contribute to the strengthening of the knowledge base with regards to management plans
- *Not* look at the value of lost environmental goods and services



Can (should) we put a monetary value on nature?

- Some argue nature has an 'intrinsic value'
- Many argue the economic framework is inadequate to the task of valuing nature

...how can we possibly value ecological risk or the protection of basic ecosystem functions?

Constanza *et al.* (1997) published an aggregate annual value of 'nature's services' at US\$18-61 trillion

does this make sense???????

A pragmatic perspective ...

“Valuation is fundamental to an action-oriented ecological economics. There is no escape from the phenomenon of opportunity cost in a finite world.” (D. Pearce)

To economists choice cannot be dissociated from valuation
→ choices reveal preferences, i.e. to choose one option in preference to another is to value it more highly!

Potential gains from oil/mining shows there is a real opportunity cost to preserving nature

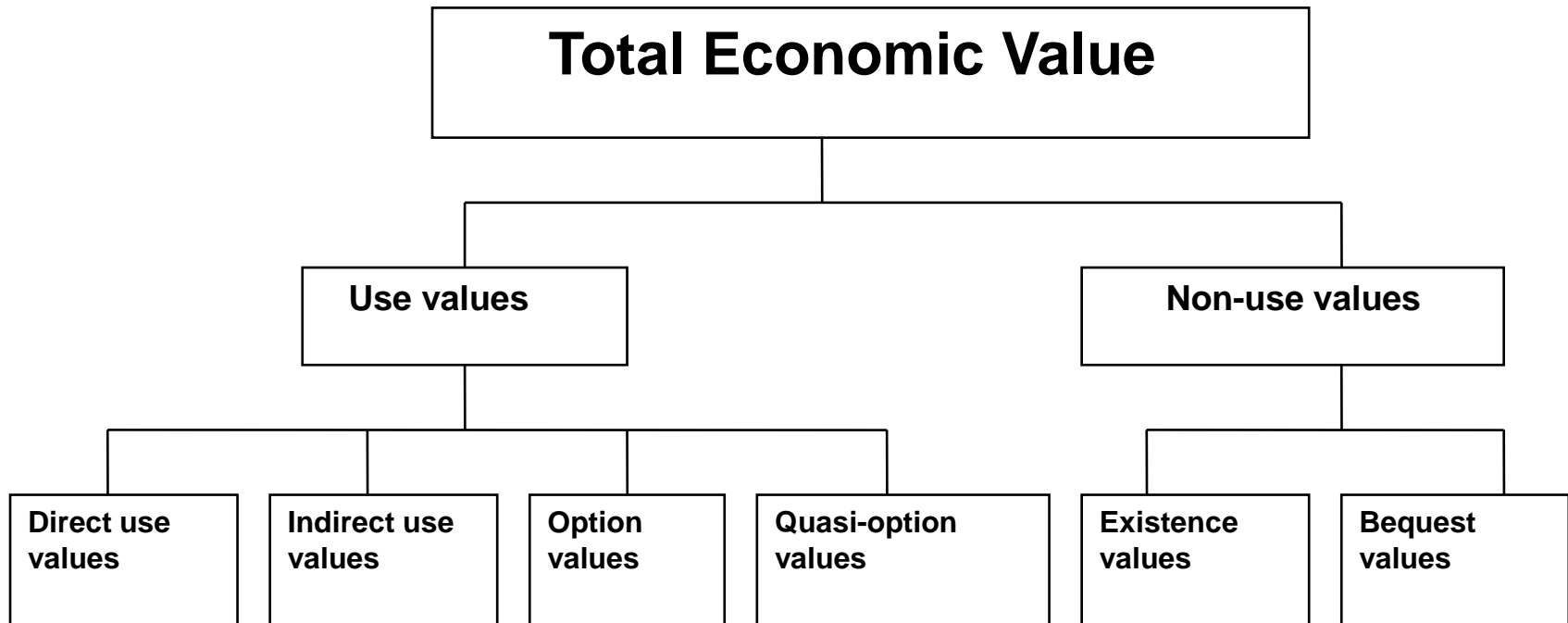
Following David Pearce's paradigm ...

1. The values of 'nature' or biodiversity have to be *demonstrated* to those who make the decision
2. If these values are found to be significant, a way must be found to *appropriate* them

Key question:

Will the calculation of cost and benefits of preserving nature make a case for conservation?

TEV – Total Economic Value

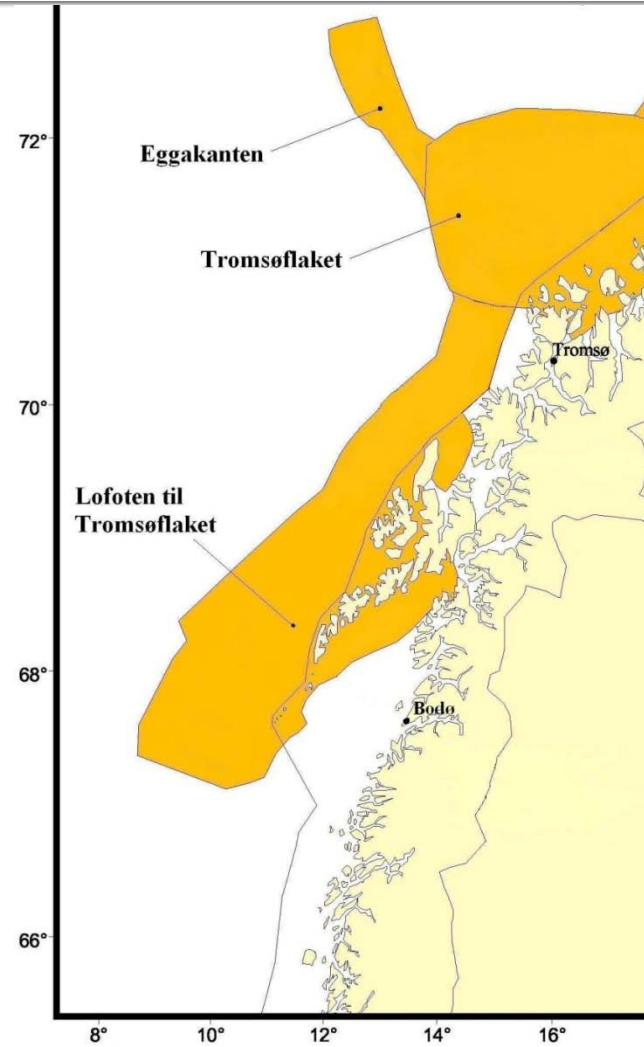
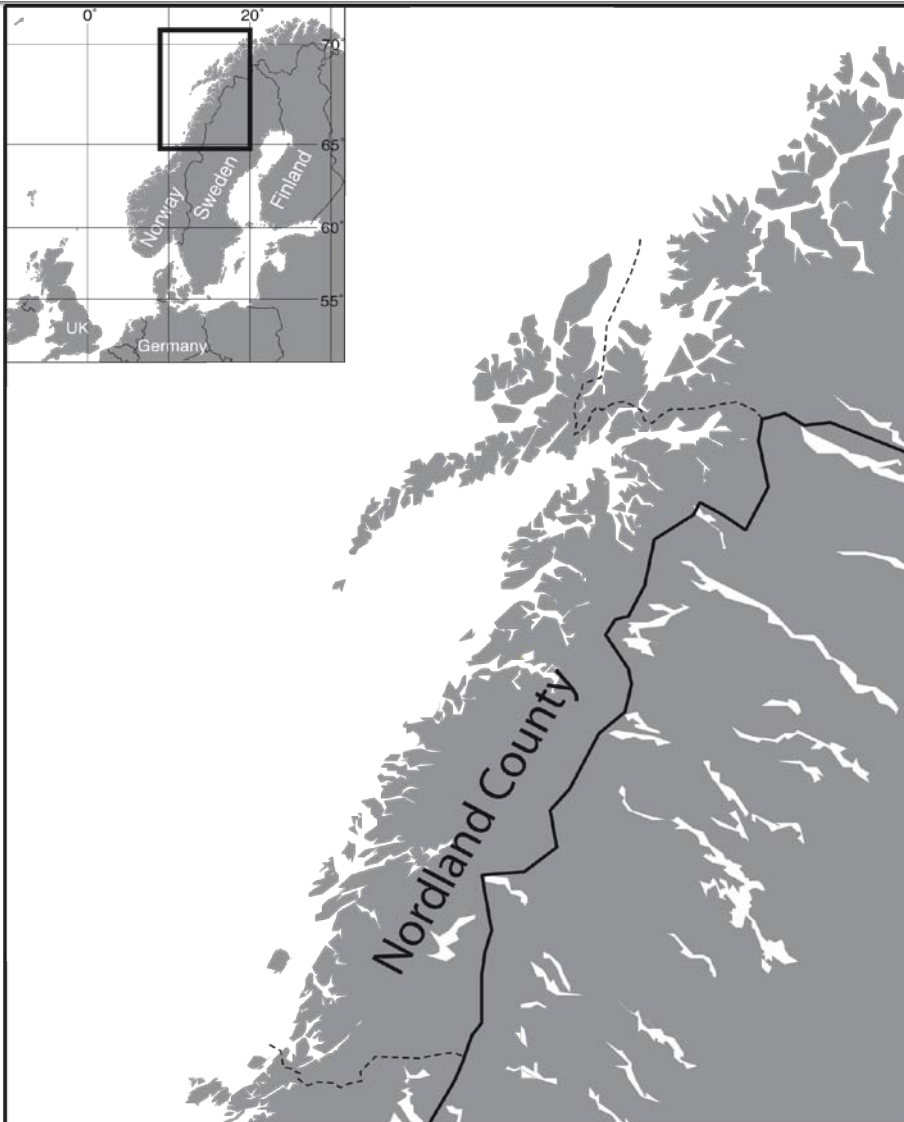


Alternatives to the utilitarian approach?

- Pluralistic / multi-scalar / multi-criteria method?
- Option and non-use values: issues of irreversibility and patrimony?

How useful are these methods as a decision making tool?

The study area: Lofoten-Vesteralen Islands



The area is identified as especially valuable and vulnerable

- Particularly clean, rich and productive waters
- Key areas of spawning, egg & larval drift for commercially important fish stocks (herring, cod)
- Important for breeding, moulting and wintering of seabirds (lesser black-backed gull, Steller's eider, Atlantic puffin)
- Cold water corals, sponges
- Oldest incumbent fisheries in Norway

TEV values: Goods and services in Lofoten-Vesteralen

Direct use values	Fishing, aquaculture and tourism
Indirect use values	<i>Habitat</i> , nutrient cycling, waste treatment, gas & climate regulation, recreation
<i>Option values</i>¹	<i>Bioprospecting, tourism, research & education</i>
Existence values	Cold water coral, killer whales, sea birds
<i>Bequest values</i>	<i>Cultural values such as the Lofoten fishery, viable coastal communities, etc</i>

¹ We have lumped together option and quasi-option values.

Results: Direct use values

in million Norwegian Kroner, annual and discounted (4%) future value, measured as gross product based on data from 2004, adjusted for inflation to January 2008

Good/Service	Monetary value per year	Present value	Assessment
Tourism	3,714	92,850	Uncertain
Fishery/aquaculture	1,665	41,620	Underestimate
Processing of marine products	965	24,125	Underestimate
TOTAL	6,344	158,595	

Attaching values to indirect and non use values is problematic ...

Much criticism outside and within economics to the use of methods such as

- Contingent valuation methods ("how much are you willing to pay to preserve a rare seabird?")
- Replacement cost method (how much would it cost to restore/replace the environmental service in question?)
- Benefit transfer (transferring values captured at one place and time to environmental goods & services at another place and time)

Results: Indirect use and existence values

in million NOK, annual and discounted (4%) future value, adjusted for inflation to January 2008.

Good/Service	Monetary value per year	Present value	Method and measure	Assessment
Nutrient cycling	253 -15,823	6,329-395,579	Replacement cost	Underestimate
Waste treatment	195	4,875	Replacement cost	Acceptable
Gas and climate regulation	884	22,100	Calculated CO ₂ value of sequestration	Underestimate
Recreation	265-530	6,600-13,200	Transfer benefit	Underestimate
Existence values	353	8,800	Transfer benefit	Underestimate

Discussion

Expected income flow from oil & gas is significant relative to the income flow from existing industries (i.e. Fishing & tourism)

Key question:

how compatible is oil & gas extraction with use and non-use values?

Compatibility implies oil & gas extraction is just an added use value

Non-compatibility implies oil & gas extraction is an opportunity cost

Lessons for the debate on mining in New Zealand's conservation estate

We need an informed debate: do we apply the utilitarian approach (TEV) or do we as a society choose a more pluralistic approach?

If we choose TEV, what type of nature values can be **demonstrated**? What exactly is the **opportunity cost** (i.e. How much is the government expecting to generate in revenue)?

If the demonstrated values of nature are significant, how can we **appropriate** them?