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Comments on the Lower Churchill River Hydroelectric Project Economics, Sustainability, and Environmental Concerns

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Outline

- Introduction
- Principle Concerns with Project EIS
- Recommendations
- DeLong Mountain Terminal/Red Dog Mine EIS

Introduction

- Nejem Raheem, Ph.D.
- MA and Ph.D. Environmental and Development Economics, University of New Mexico, USA
- Ass't Prof of Economics, Emerson College, Boston MA
- Past:
  - Senior Lecturer in Economics, Kinship Conservation Fellows, Bellingham, WA
  - Economist, Center for Sustainable Economy,

Past Experience with Benefit Cost Analysis/EIS

- US Army Corps of Engineers proposed DeLong Mtn Terminal Project in Kivalina AK
- US Forest Service critical habitat designations in New Mexico
- US Forest Service Santa Fe, NM municipal watershed fire prevention plan
- Valuation of cultural heritage issues in New Mexico
- All lacked serious consideration of non-

Principle Concerns with Project EIS

Overview

- Drawing mainly from Rudd and Raheem (2009)
- Appropriateness of accounting method
  - Impacts v costs/benefits
  - Estimation of Ecosystem Service values
  - Sustainability issues

Principle concerns with current economic analysis

Accounting Method

- Improper instrument: Impact Analysis (Input/Output model) vs Benefit Cost Analysis
- Publicly funded project with potentially Canada-wide welfare effects should be assessed via Benefit Cost Analysis
- CBA focused on changes in human well-being due to changes in provision of goods or services.
- All these changes are measured in monetary terms.
- All costs and benefits can be compared to

Principle concerns with current economic analysis

Accounting Method

- Improper instrument: impact analysis is essential, but only one component of a proper analysis for a project of this scale
- Impact analysis should be broader than I/O and involve social accounting matrix or be embedded in a computable general equilibrium model
- Need to take account of effects and distribution in a transparent manner

Example from a large infrastructure proposal in boreal regions with native populations: DeLong Mountain Terminal AK

- The US Army Corps of Engineers and AK Ind Development Agency (AIDEA) proposed a major expansion project to the port facilities at the Red Dog Mine in Alaska.
- Corps is required by National Economic Development Accounting to conduct a Benefit Cost Analysis as part of the EIS
- EIS guidelines fall under multiple federal regulations, but NEPA dominates

Example from a large infrastructure proposal in boreal regions with native populations: DeLong Mountain Terminal AK

- Corps ignored the following in its accounting:
- Potential Ecosystem Service impacts to marine mammal populations which would affect local Inupiat Eskimo populations
- Non-market values held by non-local Alaskan residents
- Multiple components of the analysis were insufficient

Example from a large infrastructure proposal in boreal regions with native populations: DeLong Mountain Terminal AK

- Talberth and Raheem (2006) critiques benefit cost analysis by the Corps
- Conducted two original studies to ascertain possible impacts to local (annualized value approx. $250,000) and non-local populations (approx. $3 million/yr)
- We recalculated the benefit cost ratio
  - Original BCR: 1.2/1
  - Range of BCR after re-analysis 0.19-0.73 (do

Example from a large infrastructure proposal in boreal regions with native populations: DeLong Mountain Terminal AK

- The Corps failed to incorporate relevant ecosystem service values, local indigenous effects, other non-market values, opportunity cost values of other investments of the money
- The project was shelved after several iterations of the EIS
- Insufficient economic justification

Issues with current economic analysis

Ecosystem Service Values

- "Failure to include some measure of the value of ES in benefit-cost calculations will implicitly assign them a value of zero" (Heal et al. 2004: 5).
  - Legally acceptable but irresponsible to not include a discussion of the ecosystem service values affected by the project.
  - Project EIS contains extensive biological and ecological analyses of the effects, but these effects are incomparable to other project

Principle concerns with current economic analysis Sustainability

- Internationally accepted standards of sustainability require accounting for social preferences and effects over time
- Requires consideration of biophysical, socioeconomic, and geopolitical effects: at minimum a ‘triple bottom line’ approach
- This requires
  - Discounting at some rate for future values to ascertain effects on future generations
  - In a cost benefit framework
- Current EIS legally acceptable but insufficient under known best standards of considering sustainability
  - See Stern Review Report (2006)

Major Concerns with Project EIS Recommendations

- Canadian law does not compel proponent to conduct a benefit-cost analysis
- In order to capture all the relevant economic effects of the project, the appropriate accounting tool is Benefit Cost Analysis.
- This analysis should include thorough consideration of ecosystem service values affected, distributional issues, uncertainty, the no-action alternative, and should consider the project in totality, including all transmission alternatives
- Needs to use an appropriate discount rate to ascertain effects into the future to consider sustainability from a welfare perspective

Major Concerns with Project EIS

Recommendations/Alternatives

- One option is to use the tool developed by Brown et al. (2009): Integrated Dam Assessment Model (IDAM).
- Visual dam impact assessment tool linked to three impact categories : biophysical, socioeconomic, and geopolitical.
- These are the three “pillars” of sustainability (UN 1993)
- Designed with a cost benefit approach
- Currently being used to examine effects of

Literature cited

- Brown, P. H., D. Tullos, B. Tilt, D. Magee, and A. T. Wolf. In press. Modeling the costs and benefits of dam construction from a multidisciplinary perspective. *Journal of Environmental Management.*
- Heal, G. M., E. B. Barbier, K. J. Boyle, A. P. Covich, S. P. Gloss, C. H. Hershner, J. P. Hoehn, C. M. Pringle, S. Polasky, K. Segerson, and K. Shrader-Frechette 2004. *Valuing Ecosystem Services: Toward Better Environmental Decision-Making. National Academy* Press, Washington, D.C.
- Harrington, W., L. Heinzerling, and R. D. Morgenstern. 2009. What we learned. Pages 215-238 in W. Harrington, L. Heinzerling, and R. D. Morgenstern, editors. *Reforming Regulatory Impact Analysis. Resources for the Future, Washington, D.C.*
- Stern, N. 2006. *The Economics of Climate Change: The Stern Review. Cambridge University* Press.
- Talberth, J., N. Raheem, and M. Starbuck. 2006. A benefit-cost analysis of the Delong Mountain Terminal Project: critique of the Corps' analysis and independent assessment of key parameters. Center for Sustainable Economy and the Northern Alaska Environmental Center, Santa Fe.
- UN Committee on Economic Development. 1993. Agenda 21. New York: United Nations Publications.