

Accepted Manuscript

Economic trade-offs between hydroelectricity production and environmental externalities: A case for local externality mitigation fund

Veeshan Rayamajhee, Aakrit Joshi



PII: S0960-1481(18)30639-6

DOI: [10.1016/j.renene.2018.06.009](https://doi.org/10.1016/j.renene.2018.06.009)

Reference: RENE 10165

To appear in: *Renewable Energy*

Received Date: 8 January 2018

Revised Date: 12 May 2018

Accepted Date: 3 June 2018

Please cite this article as: Rayamajhee V, Joshi A, Economic trade-offs between hydroelectricity production and environmental externalities: A case for local externality mitigation fund, *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.06.009.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Title:

Economic trade-offs between hydroelectricity production and environmental externalities: A case for local externality mitigation fund.

Authors:

Veeshan Rayamajhee (Corresponding Author)
 vrayamajhee@unm.edu;
 Phone: 267-629-9642; Fax: 505-277-9445 (USA)
 Department of Economics
 1 University of New Mexico
 MSC05 3060
 Albuquerque, NM 87131-0001

Aakrit Joshi
 Department of Economics
 1 University of New Mexico
 MSC05 3060
 Albuquerque, NM 87131-0001

Abstract:

Many proposed solutions for mitigating environmental externalities from hydroelectricity generation raise equity concerns and do not adequately address uncertainties and fluctuations in energy production. To balance the disparity caused by locally concentrated negative externalities and nationally or globally dispersed benefits, this study makes a case for the adoption of a locally negotiated endogenous externality mitigation fund (EMF) – one that directly compensates individuals for the specific environmental externality – as a policy alternative to lump-sum taxation and/or indirect measures such as integrating externality costs into energy prices. Using downstream crop damage due to the restricted flow of water as a representative externality, we employ optimal control framework to conduct comparative analyses of exogenous and endogenous EMFs relative to the base case with no EMF. Our findings show that endogenous EMF, when compared to the base case, reduces crop loss by 87.5% with a corresponding energy production trade-off of 11.8%. On the other hand, exogenous EMF, contrary to its purported intent, exacerbates externality by incentivizing the firm to increase production to self-compensate for the payment towards the fund. Results indicate that the endogenizing EMF is preferable because the consequential reduction in energy production is economically outweighed by the externality damages avoided.

Keywords: hydropower economics, environmental damages, externalities, mitigation fund, benefit sharing, crop loss

Download English Version:

<https://daneshyari.com/en/article/6763932>

Download Persian Version:

<https://daneshyari.com/article/6763932>

[Daneshyari.com](https://daneshyari.com)