

Journal of Environmental Accounting and Management

Editors

Zhifeng Yang

School of Environment
Beijing Normal University
Beijing 100875, China
Fax: +86 10 58800397
Email: zfyang@bnu.edu.cn

Sergio Ulgiati

Department of Science and Technology
Parthenope University of Napoli
Centro Direzionale, Isola C4. 80143 Napoli, Italy
Fax: +39 081 547 6515
Email: sergio.ulgiati@uniparthenope.it

Associate Editors

Mark T. Brown (System analysis)

Department of Environmental Engineering
Sciences
University of Florida.
Gainesville, FL, USA
Fax: 352-392-3624
Email: mtb@ufl.edu

Olga Kordas (Urban system/Smart cities)

Department of Sustainable development,
Environmental science and Engineering
KTH Royal Institute of Technology
Teknikringen 34, S - 100 44 Stockholm, Sweden
Email: olga.kordas@abe.kth.se

Hans Schnitzer (Energy system analysis)

Institute for Process Engineering
Graz University of Technology
Graz, Austria
Fax: 43(0)316-873/7469
Email: hans.schnitzer@tugraz.at

Biagio Giannetti (Cleaner production)

Paulista University
Laboratório de Produção e Meio Ambiente
(LaProMA)
Sao Paulo, Brazil
Email: biafgian@unip.br

Antonino Marvuglia (Computational Sustainability)

Luxembourg Institute of Science and Technology
Environmental Research & Innovation Department
5 avenue des hauts fourneaux
L-4362 Esch sur Alzette - Luxembourg
Email: antonino.marvuglia@list.lu

Walter A. Pengue (Agriculture/Water management)

Universidad Nacional de General Sarmiento
Gepama Fadu UBA
Buenos Aires, Argentina
Emails: wapengue@ungs.edu.ar

Editorial Board

Salvatore Arico

Division of Ecological Sciences
UNESCO, Paris, France
Fax: 33 1 4568 5804
Email: S.Arico@unesco.org

Francesco Cherubini

Dept. of Energy and Process Engineering
Norwegian Univ. of Science and Technology
Trondheim, Norway
Email: francesco.cherubini@ntnu.no

Pier Paolo Franzese

Department of Science and Technology
Parthenope University of Napoli
Centro Direzionale, Isola C4. 80143 Napoli, Italy
Email: pierpaolo.franzese@uniparthenope.it

Feni Agostinho

Paulista University
Laboratório de Produção e Meio Ambiente
(LaProMA)
Rua Dr. Bacelar, 1212, CEP 04026-002, São
Paulo, Brasil
Email: feniagostinho@gmail.com

Liang Dong

Institute of Environmental Sciences
Leiden University
P.O. Box 9518
2333 RA Leiden, the Netherlands
Email: l.dong@cml.leidenuniv.nl

Andrea Genovesi

Logistics and Supply Chain Management
Research Centre
Management School, The University of Sheffield
Room B.063, Conduit Road, Sheffield S10 1FL,
UK.
E-mail: a.genovesi@shef.ac.uk

Bhavik Bakshi

Department of Chemical Engineering
The Ohio State University
Columbus Ohio 43210, USA
Fax: (614)292-3769
Email: bakshi.2@osu.edu

Stefano Dumontet

Department of Environmental Sciences
Parthenope University of Napoli
Centro Direzionale, Isola C4. 80143 Napoli, Italy
Email: Stefano.dumontet@uniparthenope.it

Dabo Guan

School of International Development
University of East Anglia,
St Edmund's College, Cambridge
Email: dabo.guan@uea.ac.uk

Enrico Benetto

Luxembourg Institute of Science and
Technology
ERIN - Environmental Research & Innovation
Department
41, rue du Brill, L-4422 Belvaux
Email: enrico.benetto@list.lu

Juan Jose Cabello Eras

Energy Department
Universidad de la Costa
Colombia
Email: jcabello2@cuc.edu.co

Helmut Haberl

Institute of Social Ecology
Alpen Adria Universität
Vienna, Austria
Email: helmut.haberl@uni-klu.ac.at

Federico M. Butera

Dept. of Building & Environment Science &
Technology (BEST)
Politecnico di Milano, Milano, Italy
Fax: 02-2399-5151
Email: federico.butera@polimi.it

Brian D. Fath

Department of Biological Sciences
Towson University
Towson, MD 21252, USA
Fax: 410-704-2405
Email: bfath@towson.edu

Gordon Huang

Dept. of Environmental Systems Eng.
University of Regina
Regina, Saskatchewan, Canada
Fax: (306) 585-4855,
Email: gordon.huang@uregina.ca

Guoqian Chen

Dept. of Mechanics and Engineering Science
Peking University
Beijing, China
Email: gqchen@pku.edu.cn

Matthias Finkbeiner

Department of Sustainable Engineering Technical
University Berlin, Germany
Fax +49 (0)30 314-21720
Email: matthias.finkbeiner@tu-berlin.de

Wesley W. Ingwersen

Sustainable Technology Division
National Risk Management Research
Laboratory, US EPA
Cincinnati, OH 45268, USA
Email: Ingwersen.Wesley@epamail.epa.gov

Continued on the back materials

Journal of Environmental Accounting and Management

Volume 7, Issue 4, December 2019

Editors
Zhifeng Yang
Sergio Ulgiati



L&H Scientific Publishing, LLC, USA

Publication Information

Journal of Environmental Accounting and Management (ISSN 2325-6192 (print), eISSN 2325-6206 (online), CN 10-1358/X) is published quarterly (March, June, September, and December) by L & H Scientific Publishing, LLC, P.O. Box 99, Glen Carbon, IL62034, USA. Subscription prices are available upon request from the publisher or from this journal website. Subscriptions are accepted on a prepaid basis only and entered on a calendar year basis. Issues are sent by standard mail (Surface in North America, air delivery outside North America). Priority rates are available upon request. Claims for missing issues should be made within six months of the date of dispatch.

Changes of Address

Send address changes to L&H Scientific Publishing, LLC, P.O. Box 99, Glen Carbon, IL62034, USA. Changes of address must be received at L&H Scientific Publishing eight weeks before they are effective.

Authors Inquiries

For inquiries relative to the submission including electronic submission where available, please visit journal website or contact journal Editors-in-Chief.

Advertising Information

If you are interested in advertising or other commercial opportunities, please email via lhscientificpublishing@gmail.com and your enquiry will be handled as soon as possible.

© 2019 L&H Scientific Publishing, LLC. All rights reserved

L&H Scientific Publishing, LLC requires the authors to sign a Journal Copyright Transfer Agreement for all articles published in L&H Scientific. The Copyright Transfer Agreement is an agreement under which the author retains copyright in the work but grants L & H Scientific Publishing LLC the sole and exclusive right and license to publish the full legal term of copyright.

Authors are responsible for obtaining permission from copyright holders for reproducing any illustrations, tables, figures or lengthy quotations published somewhere previously.

For authorization to photocopy materials for internal or personal use under those circumstances not falling within the fair use provisions of Copyright Act, requests for reprints and translations should be addressed to the permission office of L&H Scientific Publishing, LLC via lhscientificpublishing@gmail.com or call: +1-618-402-2267. Permission of the Publisher and payment of a fee are required for all other photocopying, including multiple or systematic copying, copying for advertising or promotional purposes, resale, and forms of document delivery. Special rates are available for educational institutions to make photocopies for non-profit educational classroom use.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the publisher is required for resale or distribution outside the institution.

Permission of the Publisher is required to store or use electronically any materials contained in this journal, including any entire or partial article, please contact the publisher for advice. Otherwise, no part of this publication can be reproduced, stored in a retrieval systems or transmitted in any form or by means, electronic, mechanical, photocopying, recording or without prior written permission of the Publisher.

Disclaimer

The authors, editors and publisher will not accept any legal responsibility for any errors or omissions that may be made in this publication. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed in USA on acid-free paper.

Aims and Scope

The peer-reviewed journal publishes original research results in the field of environmental and ecological science with focus on applications to the sustainable management of natural, human-dominated, and man-made ecosystems. The aim of the journal is to provide a place for a rapid exchange of new ideas and concepts for scientists and engineers in the fields of environmental accounting, human and systems ecology, and environmental management. Manuscripts on environmental accounting and managements are solicited, including: mathematical modeling; computational and management techniques in environmental, ecological, energy and information science; environmental technology and engineering; human managed ecosystems such as agricultural, urban, coastal, riparian, and wetland ecosystems. Topics of interest include, but not limited to:

- Environmental and ecological economics, environmental accounting, environmental impact assessment, ecosystem service assessment, energy and resource use, social factors and management.
- Modeling in environmental conservation and restoration, eco-hydrology and water resources management, ecological process and pattern, climate change effects, environmental engineering and technology.
- Planning and management in human dimension-institutions and patterns for socio-economic systems, industrial ecology, ecological informatics, landscape design, and urban planning.
- Environmental policy, legislation, and innovations with environmental and strategic impact assessment, project appraisal and auditing, and environmental protection.

No length limitations for contributions are set, but only concisely written manuscripts are considered for publication. Brief papers can be published on the basis of Technical Notes. Discussions of previous published papers are welcome.

Peer Review

Journal of Environmental Accounting and Management adopts the traditional blind-review policy in which the reviewers' names are concealed for submission author(s). Each submitted manuscript is reviewed by at least two expert referees in the related research field.

Manuscript Submission Guidelines

Author(s) should submit manuscript(s) via the website: <https://www.editorialmanager.com/JEAM/Default.aspx>. For any questions, author(s) can directly contact one of Editors. Manuscript preparation should follow the sample papers and journal manuscript templates (word file or Latex files), which can be downloaded from the website: <https://lhscientificpublishing.com/Journals/JEAM-Default.aspx>

Proofs and Electronic Offprints

Authors will receive a PDF proof of their articles and, on publication, electronic offprints of the article.

Open Access

After manuscripts acceptance, author(s) have a right to request the accepted manuscripts published by L&H Scientific publishing with open access, and the author(s) have a responsibility to paying the open access publication fee with US\$60 per page. The copyright is still held by the Publisher. Without any request of the open access publication, the accepted manuscripts are assumed to be published traditionally.

Continued from insider front cover

Christine Jasch

Vienna Institute for Environmental Management
and Economics, IÖW
Rechte Wienzeile 19/10
A-1040 Vienna, AUSTRIA
Email: jasch.christine@ioew.at

Christer Jonasson

Department of Earth Sciences
Uppsala University
Sweden
Fax: +46 920 22 84 11
Email: christer.jonasson@ans.polar.se

Dan L. Johnson

Department of Geography
University of Lethbridge
Alberta, Canada
Fax: (403) 332-4039
Email: dan.johnson@uleth.ca

Gang Liu

Department of Chemical Engineering
University of Southern Denmark
Frederiksborgvej 399 P.O. Box 358
Email: gli@kbnm.sdu.dk

Noam Lior

Dept. of Mech. Eng. & Applied Mech.
University of Pennsylvania
Philadelphia, PA 19104, USA
Fax: +1-215 573 6334
Email: lior@seas.upenn.edu

Velazquez Luis

Department of Industrial Engineering
Universidad de Sonora (Unison)
Mexico
Email: Luis_Velazquez@uml.edu

David Maradan

Department of Economics
University of Geneva
Genève, Switzerland
Fax: (+4122) 705-8293
Email: maradan@ecosys.com

Paolo Masoni

The LCA and Ecodesign Laboratory
ENEA
via Martiri di Monte Sole, 4
40129 Bologna, Italy
Email: paolo.masoni@enea.it

Managing Editors

Gengyuan Liu

School of Environment
Beijing Normal University
Beijing 100875, China
Email: liugengyuan@bnu.edu.cn

Antonio Messineo

Department of Engineering and Architecture
University of Enna Kore
Enna, Italy
Fax: +39 0935 536391
Email: antonio.messineo@unikore.it

Andrzej Nienartowicz

Institute of Ecology and Protection of the
Environment
Nicolaus Copernicus University
Torun, Poland
Email: anienart@umk.pl

Shen Qu

School for Environment and Sustainability
University of Michigan
3548 Dana Building, 440 Church Street, Ann Arbor
MI 48109-1041 USA
Email: shenquin@umich.edu

Marco Rauegi

Dept of Mechanical Engineering and Mathematical
Sciences,
Oxford Brookes University
Wheatley, UK
Email: marco.rauegi@brookes.ac.uk

B. Sudhakara Reddy

Indira Gandhi Institute of Development
Research
Goregaon, Mumbai, INDIA
Fax: 022 2840 2752
Email: sreddy@igidr.ac.in

Maddalena Ripa

Institute of Environmental Sciences and
Technologies (ICTA)
Autonomous University of Barcelona
Email: maddalena.ripa@uab.cat

Joseph A. Tainter

Department of Environment and Society
Utah State University
Logan, UT 84322, USA
Email: Joseph.Tainter@usu.edu

David R. Tilley

Dept. of Environmental Science and Tech.
University of Maryland,
College Park, MD 20742, USA
Fax: (301) 405-8027
Email: dtalley@umd.edu

Silvio Viglia

Department of Science and Technology
Parthenope University of Napoli
Centro Direzionale, Isola C4. 80143 Napoli, Italy
Email: silvio.viglia@uniparthenope.it

Alicia Valero

Department of Mechanical Engineering
University of Zaragoza
Zaragoza, SPAIN
Fax: +34 976 732 078
Email: aliciavd@unizar.es

Cecilia M. Villas Bôas de Almeida

Dept. of Production Engineering
Paulista University
Rua Doutor Bacelar 1212
Sao Paulo 04026-002, Brazil
Email: cmvbag@unip.br

Yutao Wang

Department of Environmental Science &
Engineering
Fudan University
Handan Road 220, Shanghai 200433, China
Email: yutaowang@fudan.edu.cn

Mathis Wackernagel

Global Footprint Network
312 Clay Street, Suite 300
Oakland, CA 94607-3510, USA
Email: mathis@footprintnetwork.org

Ming Xu

School for Environment and Sustainability
University of Michigan
3006 Dana Building, 440 Church Street, Ann
Arbor
MI 48109-1041 USA
Email: mingxu@umich.edu

Maochao Yan

Institute of Geographical Science and Natural
Resource Research
China Agricultural University
Beijing 100094, China
Email: yanmc@igsnr.ac.cn

Maciej Zalewski

Department of Applied Ecology
University of Lodz
Poland
Fax: (+48) 42 665 58 19
Email: m.zalewski@erce.unesco.lodz.pl

Xiaoling Zhang

Department of Public Policy
City University of Hong Kong
Hong Kong, China
Fax: (+852) 3442-0413
Email: xiaoling.zhang@cityu.edu.hk

Qiao Xu

School of Environment
Beijing Normal University
Beijing 100875, China
Email: ilqq527@126.com