# Journal of Environmental Accounting and Management

Dumitru Baleanu

Cankaya University

**Raffaele Giordano** 

Council (IRSA-CNR)

Leila Niamir

Ping Wang

EUREF Campus 19

Lanzhou University

Torgauer Straße 12-15

10829 Berlin, Germany

Email: niamir@mcc-berlin.net

Gansu Province 730000, China

E-mail: wping@lzu.edu.cn

Viale Francesco de Blasio 5

Email: raffaele.giordano@cnr.it

Mercator Research Institute on Global

Commons and Climate Change (MCC)

College of Civil Engineering and Mechanics

70132 Bari, Puglia, Italy

Ankara, 06790, Turkey

Department of Mathematics

Email: dumitru.baleanu@gmail.com

Water Research Institute - National Research

# Editors

#### António Mendes Lopes

Department of Mechanical Engineering University of Porto Rua Dr. Roberto Frias, 4200-465 Porto, Portugal Email: <u>aml@fe.up.pt</u>

# **Associate Editors**

# Martin Agelin-Chaab

Automotive, Mechanical and Manufacturing Engineering University of Ontario Institute of Technology, Oshawa, Ontario, Canada Email: martin.agelin-chaab@uoit.ca

#### Andrea Genovese

(Logistics and Supply Chain Management) Sheffield University Management School The University of Sheffield Room B.063, Conduit Road Sheffield S10 1FL, UK Email: a.genovese@shef.ac.uk

#### Antonino Marvuglia

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

#### Dimitri Volchenkov

Mathematics & Statistics Texas Tech University 1108 Memorial Circle, Lubbock, TX 79409, USA Email: dr.volchenkov@gmail.com

#### Yuhong Zeng

School of Water Resources and Hydropower Engineering Wuhan University Wuhan, Hubei 430072, China Email: yhzeng@whu.edu.cn

#### **Editorial Board**

#### 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 Jiazhong Zhang

School of Energy and Power Engineering Xi'an Jiaotong University Xi'an, Shaanxi Province 710049, China Email: jzzhang@mail.xjtu.edu.cn

#### Yoshihiro Deguchi

College of Engineering University of Tokushima Tokushima 770-8501, Japan E-mail: ydeguchi@tokushima-u.ac.jp

#### Lennart Marien

Climate Service Center Germany (GERICS) Helmholtz-Zentrum Geesthacht Fischertwiete 1 D-20095 Hamburg, Germany Email: lennart.marien@hzg.de

#### Carla M.A. Pinto

School of Engineering, Polytechnic of Porto Rua António Bernardino de Almeida, 431 4249-015 Porto, Portugal Email: cap@isep.ipp.pt

#### Siyuan Xing

Department of Mechanical Engineering California Polytechnic State University San Luis, Obispo, CA, 93401, USA Email: siyuanxing9132@gmail.com

# Shengli Cao

School of Energy and Power Engineering Xi'an Jiaotong University Shaanxi Province 710049, China Email: csl1993@stu.xjtu.edu.cn

#### Catia Cialani

School of Technology and Business Studies, Economics Unit, Dalarna University 791 88 Falun, Sweden Email: cci@du.se

# Journal of Environmental Accounting and Management

Volume 11, Issue 1, March 2023

Editors Antonio M Lopes Jiazhong Zhang



# **Publication Information**

Journal of Environmental Accounting and Management (ISSN 2325-6192 (print), eISSN 2325-6206 (online)) is published quarterly (March, June, September, and December) by L & H Scientific Publishing, LLC, 25 Glen Ed Professional Park, 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, 25 Glen ED Professional Park, 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.

# © 2023 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 lhscientific publishing@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 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

This peer-reviewed Journal publishes original research results in the field of environmental, ecological and climate science, with focus on sustainable management of natural, human-dominated, and man-made ecosystems through appropriate resource use, quality assessment and recovery, as well as on climate change impact assessment, adaptation and mitigation. The aim of the Journal is to provide a place for a deep exchange of new ideas and concepts in the fields of climate and environmental accounting, management and policy making, as well as human and systems ecology and nonlinear dynamics of complex socionatural systems. Manuscripts on climate and environmental accounting and managements are solicited, including: mathematical modeling and quantitative methods; computational and management techniques in climate, 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 are not limited to:

- Climate, environmental, ecological and resource economics, environmental accounting (life cycle assessment, emergy, footprints, etc), emissions inventory, environmental impact assessment, ecosystem services and natural capital assessment, energy and resource use, social factors and impacts, circular economy.
- Modeling in environmental conservation and restoration, eco-hydrology and water resources management, ecological processes and patterns, climate change effects, environmental engineering and technology. Integrated assessment modelling. Land use modelling with climate and environmental applications. Earth system modelling.
- Modelling nonlinear dynamics of complex socio-natural systems. Inter-and transdisciplinary modelling methods and tools.
- Co-production of models with stakeholders. Participatory modelling.
- Quantitative methods and data analysis to inform decision-making on climate and environmental problems. Big data, artificial intelligence, machine learning. Applications of geoinformation systems. Decision-support systems and tools.
- Planning and management in human dimension-institutions and patterns for socio-economic systems, industrial ecology, ecological informatics, landscape design, and urban metabolism and planning.
- Green engineering, green design, green manufacturing, green materials, experimental sustainability.
- Climate and environmental policy, legislation, and innovations with environmental and strategic impact assessment, project appraisal and auditing, and environmental protection.
- Impact assessment of climate change, climate adaptation and mitigation, climate services.

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 Options**

After manuscripts were accepted, 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. The copyright is still held by the Publisher, but the open access permission is given to the author(s) as follows. Without any request of the open access publication, the accepted manuscripts are assumed to be published traditionally. This journal offers authors two choices to publish their research.

- *Open access:* Articles are freely available to both subscribers and the wider public with permitted reuse. An open access publication fee is payable by authors or their research funder.
- Subscription: Articles are made available to subscribers through our access programs. No open access publication fee.

L&H scientific does offer alternative open access publishing options in accordance with funding body requirements. Your publication choice will have no effect on the peer review process or acceptance of your submission.

# **Open Access Articles**

# • User rights

All articles published gold open access will be immediately and permanently free for everyone to read and download. We offer authors a choice of user licenses, which define the permitted reuse of articles. We are continuously working with our author communities to select the best choice of license options, currently being defined for this journal as follows:

*Creative Commons Attribution* (CC BY): lets others distribute and copy the article, to create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), to include in a collective work (such as an anthology), to text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

*Creative Commons Attribution-NonCommercial-NoDerivs* (CC BY-NC-ND): for non-commercial purposes, lets others distribute and copy the article, and to include in a collective work (such as an anthology), as long as they credit the author(s) and provided they do not alter or modify the article.

# • Open access publication fee

To provide open access, this journal has a publication fee which needs to be met by the authors or their research funders for each article published open access. The open access publication fee for this journal is USD 100 per page, excluding taxes.

# **Self-archiving Policy**

Authors can share their research in a variety of different ways. The author(s) can also self-archive their author manuscript immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications.

An author is entitled to post the accepted manuscript in their institution's repository and make this public after an embargo period (known as self-archiving). The embargo period for this journal can be found below.

Without the L&H permission, the published journal article cannot be shared publicly, such as, on ResearchGate or Academia.edu, to ensure the sustainability of peer-reviewed research in journal publications.

*Embargo period*: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before a manuscript becomes available for free to the public. This is called an embargo period and it begins from the date the article is formally published online in its final and fully citable form.

This journal has an embargo period of 24 months and the embargo period for the USA is 12 months.

#### Continued from inside front cover

Chido Hermes Chihobo Combustion Research Laboratory Department of Fuels and Energy Chinhoyi University of Science and Technology P Bag 7724, Zimbabwe Email: chihobo@gmail.com

# **Christine Fürst**

Institute for Geosciences and Geography Dept. Sustainable Landscape Development Martin Luther University Halle-Wittenberg Von-Seckendorff-Platz 4 06120 Halle, Germany E-mail: christine.fuerst@geo.uni-halle.de

#### **Renato Passaro**

University of Naples Parthenope Department of Engineering Centro Direzionale di Napoli, Isola C4, Office 506 South 80143 Naples (ITALY) Email: renato.passaro@uniparthenope.it

#### Hansong Tang

Department of Civil Engineering The City College of New York 160 Convent Avenue New York, NY 10031 Email: htang@ccny.cuny.edu

# Maciej Zalewski

European Regional Centre for Ecohydrology Polish Academy of Sciences UNESCO Chair on Ecohydrology and of Applied Ecology University of Lodz, Poland Email: m.zalewski@erce.unesco.lodz.pl Luca Coscieme Research Program Manager Hot or Cool Institute Berlin, Germany Email: lucaaq@gmail.com

# Francesco Gonella

Department of Molecular Sciences and Nanosystems Università Ca' Foscari Venezia Email: gonella@unive.it

#### Sergey Prants

Pacific Oceanological Institute of the Russian Academy of Sciences 43 Baltiiskaya St. 690041 Vladivostok, Russia Email: prants@poi.dvo.ru

#### Alicia Valero

Department of Mechanical Engineering University of Zaragoza Zaragoza, SPAIN Email: aliciavd@unizar.es

# **Xiaojing Zheng**

School of Mechatronics Engineering Xidian University Shaanxi Province 710071China Email: xjzheng@lzu.edu.cn

#### Continued on back materials

#### **Pier Paolo Franzese**

Department of Science and Technology Parthenope University of Naples Via F. Petrarca n. 80, (80123) Naples, Italy Email: pierpaolo.franzese@uniparthenope. it

#### **Gordon Huang**

Dept. of Environmental Systems Eng. University of Regina Regina, Saskatchewan, S4S 0A2 Canada Email: gordon.huang@uregina.ca

#### Marco Raugei

Faculty of Technology, Design and Environment Oxford Brookes University Wheatley Campus Wheatley, Oxford UK, OX33 1HX Email: marco.raugei@brookes.ac.uk

#### Chunxiao Xu

School of Aerospace Engineering Tsinghua University Beijing 100084, China Email: xucx@tsinghua.edu.cn

# Amalia Zucaro

Department for Sustainability Division Resource Efficency Laboratory Technologies for the Reuse, Recycling, Recovery and Valorisation of Waste and Materials Email: amalia.zucaro@enea.it