

UC Irvine

UC Irvine Previously Published Works

Title

Corrigendum: A review of trends and drivers of greenhouse gas emissions by sector from 1990 to 2018 (2021 Environ. Res. Lett. 16 073005)

Permalink

<https://escholarship.org/uc/item/3nn448ks>

Journal

Environmental Research Letters, 17(4)

ISSN

1748-9318

Authors

Lamb, William F
Wiedmann, Thomas
Pongratz, Julia
et al.

Publication Date

2022-04-01

DOI

10.1088/1748-9326/ac5b3c

Copyright Information

This work is made available under the terms of a Creative Commons Attribution-NonCommercial License, available at <https://creativecommons.org/licenses/by-nc/4.0/>

Peer reviewed

CORRIGENDUM • OPEN ACCESS

Corrigendum: A review of trends and drivers of greenhouse gas emissions by sector from 1990 to 2018 (2021 *Environ. Res. Lett.* [16 073005](#))

To cite this article: William F Lamb *et al* 2022 *Environ. Res. Lett.* **17** 049502

View the [article online](#) for updates and enhancements.

You may also like

- [Research campaign: Macroscopic quantum resonators \(MAQRO\)](#)
Rainer Kaltenbaek, Markus Arndt, Markus Aspelmeyer et al.
- [2021 roadmap for sodium-ion batteries](#)
Nuria Tapia-Ruiz, A Robert Armstrong, Hande Alptekin et al.
- [2022 Roadmap on integrated quantum photonics](#)
Galan Moody, Volker J Sorger, Daniel J Blumenthal et al.

ENVIRONMENTAL RESEARCH
LETTERS

CORRIGENDUM

OPEN ACCESS

RECEIVED
21 February 2022ACCEPTED FOR PUBLICATION
7 March 2022PUBLISHED
24 March 2022Original content from
this work may be used
under the terms of the
Creative Commons
Attribution 4.0 licence.Any further distribution
of this work must
maintain attribution to
the author(s) and the title
of the work, journal
citation and DOI.Corrigendum: A review of trends and drivers of greenhouse gas emissions by sector from 1990 to 2018 (2021 *Environ. Res. Lett.* **16** 073005)William F Lamb^{1,2,*} , Thomas Wiedmann³ , Julia Pongratz^{4,5} , Robbie Andrew⁶ , Monica Crippa⁷ , Jos G J Olivier⁸ , Dominik Wiedenhofer⁹ , Giulio Mattioli^{2,10} , Alaa Al Khourdjie¹¹ , Jo House¹² , Shonali Pachauri¹³ , Maria Figueroa¹⁴ , Yamina Saheb¹⁵ , Raphael Slade⁷ , Klaus Hubacek¹⁶ , Laixiang Sun^{17,18,19} , Suzana Kahn Ribeiro²⁰ , Smail Khennas²¹ , Stephane de la Rue du Can²² , Lazarus Chapungu²³ , Steven J Davis²⁴ , Igor Bashmakov²⁵ , Hancheng Dai²⁶ , Shobhakar Dhakal²⁷ , Xianchun Tan²⁸ , Yong Geng²⁹ , Baihe Gu²⁸ and Jan Minx^{1,2}

- ¹ Mercator Research Institute on Global Commons and Climate Change, Torgauer Straße 12–15, 4 EUREF Campus #19, 10829 Berlin, Germany
- ² School of Earth and Environment, University of Leeds, LS2 9JT Leeds, United Kingdom
- ³ Sustainability Assessment Program, School of Civil and Environmental Engineering, UNSW Sydney, Sydney, Australia
- ⁴ Max Planck Institute for Meteorology, Bundesstrasse 53, 20146 Hamburg, Germany
- ⁵ Department of Geography, Ludwig-Maximilians-Universität Munich, Luisenstrasse 37, 80333 Munich, Germany
- ⁶ CICERO Center for International Climate Research, Oslo, Norway
- ⁷ European Commission, Joint Research Centre, Ispra, VA, Italy
- ⁸ PBL Netherlands Environmental Assessment Agency, Den Haag, The Netherlands
- ⁹ Institute of Social Ecology, University of Natural Resources and Life Sciences, Schottenfeldgasse 29, 1070 Vienna, Austria
- ¹⁰ Department of Transport Planning, TU Dortmund University, August-Schmidt-Straße 10, 44227 Dortmund, Germany
- ¹¹ Centre for Environmental Policy, Imperial College London, London, United Kingdom
- ¹² School of Geographical Sciences, University of Bristol, University Road, BS8 1SS Bristol, United Kingdom
- ¹³ International Institute for Applied Systems Analysis (IIASA), Schlossplatz 1, 2361 Laxenburg, Austria
- ¹⁴ Department of Management Society and Communication, Copenhagen Business School, Copenhagen, Denmark
- ¹⁵ Openexp, 17 Bd Lefebvre, 75015 Paris, France
- ¹⁶ Integrated Research for Energy, Environment and Society, University of Groningen, 9747AG Groningen, The Netherlands
- ¹⁷ Department of Geographical Sciences, University of Maryland, College Park, MD 20742, United States of America
- ¹⁸ School of Finance and Management, SOAS University of London, WC1H 0XG London, United Kingdom
- ¹⁹ Institute of Blue and Green Development, Weihai Institute of Interdisciplinary Research, Shandong University, Weihai 264209, People's Republic of China
- ²⁰ Federal University of Rio de Janeiro (Universidade Federal do Rio de Janeiro—UFRJ), Transport Engineering Programme (Programa de Engenharia de Transportes—PET), COPPE-UFRJ, Rio de Janeiro, Brazil
- ²¹ Energy and Climate Change Consultant, 25 Troubridge Walk, CV22 7LP Rugby, United Kingdom
- ²² Lawrence Berkeley National Laboratory, 1 Cyclotron Road, Berkeley, CA 94720, United States of America
- ²³ Great Zimbabwe University, School of Natural Sciences, Off Old Great Zimbabwe Road, Box 1235, Masvingo, Zimbabwe
- ²⁴ Department of Earth System Science, University of California, Irvine, CA, United States of America
- ²⁵ Center for Energy Efficiency—XXI, Moscow, Russia
- ²⁶ College of Environmental Sciences and Engineering, Peking University, Beijing, People's Republic of China
- ²⁷ Department of Energy, Environment and Climate Change, School of Environment, Resources and Development, Asian Institute of Technology, Klong Luang, Pathumthani 12120, Thailand
- ²⁸ Institutes of Science and Development, Chinese Academy of Sciences, No. 15, Zhongguancun Beiyitiao, Haidian District, Beijing, People's Republic of China
- ²⁹ School of International and Public Affairs, Shanghai Jiao Tong University, No. 1954 Huashan Road, Shanghai, People's Republic of China

* Author to whom any correspondence should be addressed.

E-mail: lamb@mcc-berlin.net

This corrigendum resolves an error in figure 17 and clarifies the scope of the cement sector in figure 2.

Figure 17 in the original published manuscript depicts a Kaya identity for the agriculture, forestry and other land uses (AFOLU) sector. We unintentionally excluded land-use CO₂ emissions from total greenhouse gas (GHG) emissions in this identity, and depicted only agricultural GHG emissions. The

original published version of figure 17 is shown here, followed by the revised version with land-use CO₂ emissions included. Two components of the identity are affected: GHG emissions and GHG/land area. The land-use CO₂ emissions data used in this paper (the average of three bookkeeping models; Hansis *et al* 2015, Houghton and Nassikas 2017, Gasser *et al* 2020) has a steadily increasing global

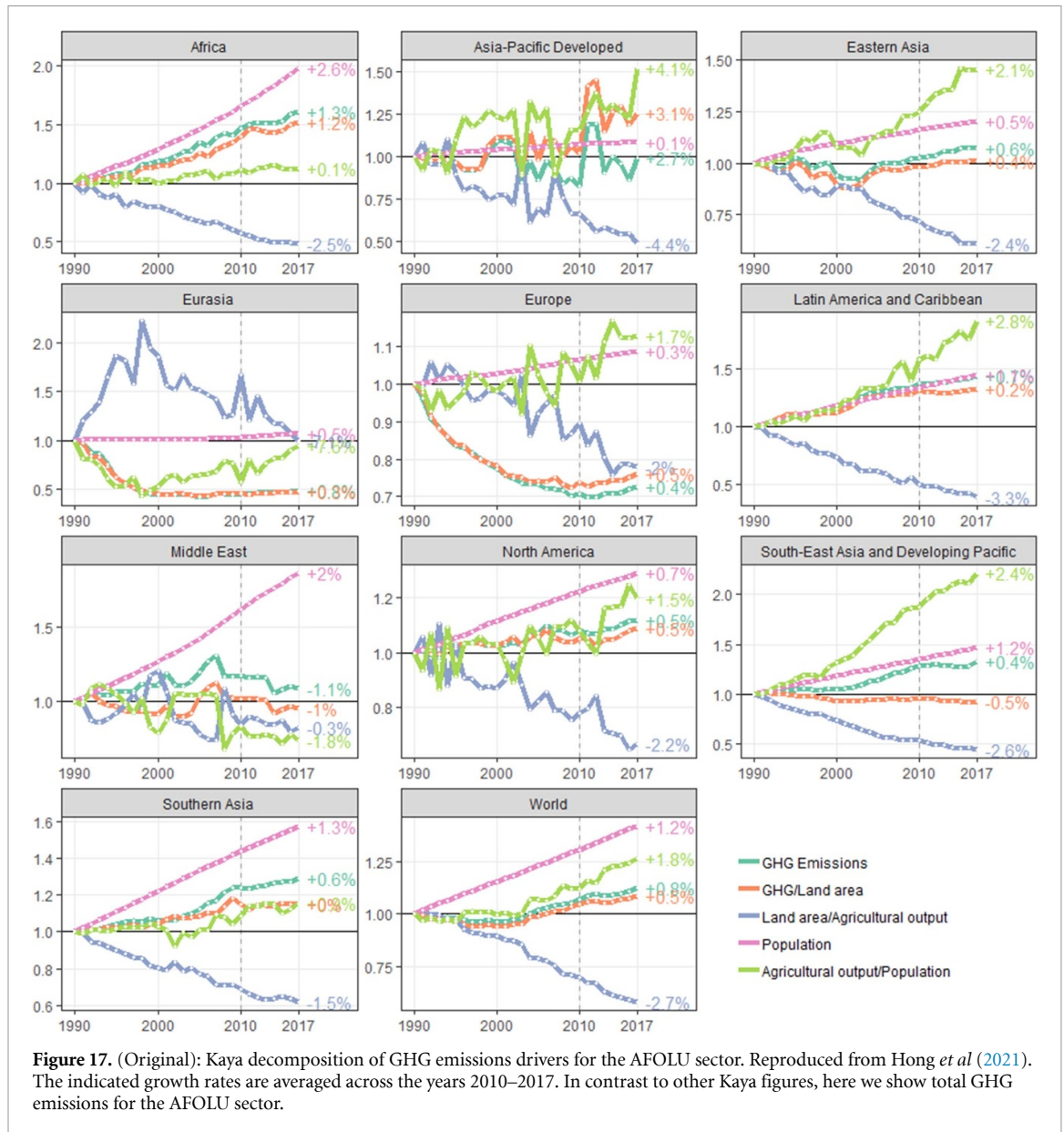
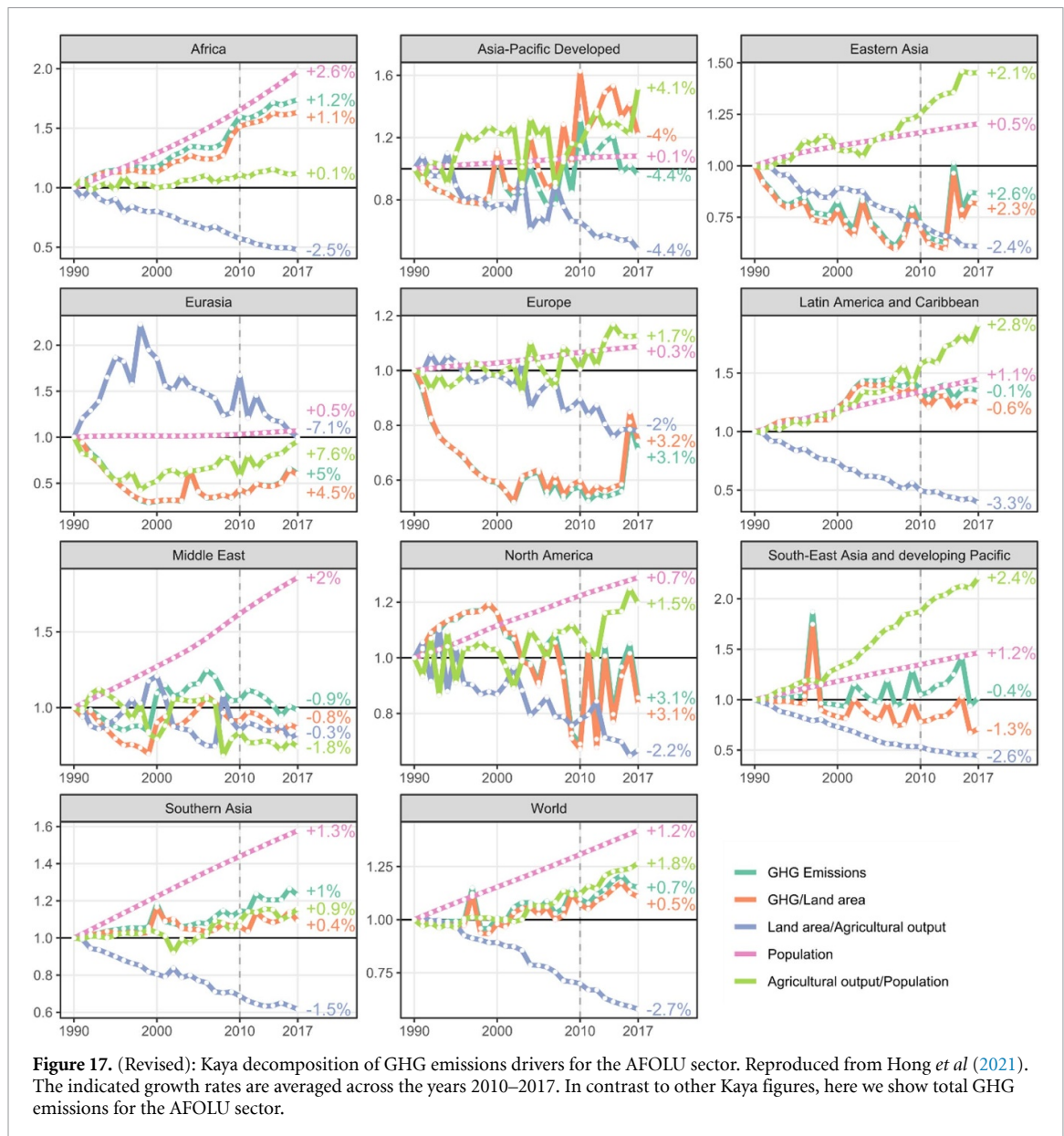


Figure 17. (Original): Kaya decomposition of GHG emissions drivers for the AFOLU sector. Reproduced from Hong *et al* (2021). The indicated growth rates are averaged across the years 2010–2017. In contrast to other Kaya figures, here we show total GHG emissions for the AFOLU sector.

average trend, but relatively large regional year to year fluctuations. As such, the global average Kaya identity for the AFOLU sector depicted in the ‘World’ panel is largely unaffected by the change, with a small reduction of 0.1 percentage points in the average annual growth rate of GHG emissions from 2010 to 2017. In contrast, regional growth rates, and in some cases the signs, for the GHG emissions and GHG/land area Kaya factors are affected. Since the text does not dir-

ectly refer to the Kaya factors in this figure, no other changes besides substituting the figure are necessary for this correction.

Finally, in figure 2 of the original manuscript, we clarify that cement emissions are process only, a point that was mistakenly omitted: ‘Note that cement refers to process emissions only, as a lack of data prevents the full reallocation of indirect emissions to this sector.’



ORCID iDs

William F Lamb <https://orcid.org/0000-0003-3273-7878>

Thomas Wiedmann <https://orcid.org/0000-0002-6395-8887>

Dominik Wiedenhofer <https://orcid.org/0000-0001-7418-3477>

Shonali Pachauri <https://orcid.org/0000-0001-8138-3178>

Maria Figueroa <https://orcid.org/0000-0001-6590-7269>

Raphael Slade <https://orcid.org/0000-0002-5297-4224>

Klaus Hubacek <https://orcid.org/0000-0003-2561-6090>

Laixiang Sun <https://orcid.org/0000-0002-7784-7942>

Hancheng Dai <https://orcid.org/0000-0003-4251-4707>

Jan Minx <https://orcid.org/0000-0002-2862-0178>

References

- Gasser T, Crepin L, Quilcaille Y, Houghton R A, Ciais P and Obersteiner M 2020 Historical CO₂ emissions from land use and land cover change and their uncertainty *Biogeosciences* **17** 4075–101
- Hansis E, Davis S J and Pongratz J 2015 Relevance of methodological choices for accounting of land use change carbon fluxes *Glob. Biogeochem. Cycles* **29** 1230–46
- Hong C, Burney J A, Pongratz J, Nabel J E M S, Mueller N D, Jackson R B and Davis S J 2021 Global and regional drivers of land-use emissions 1961–2017 *Nature* **589** 554–61
- Houghton R A and Nassikas A A 2017 Global and regional fluxes of carbon from land use and land cover change 1850–2015 *Glob. Biogeochem. Cycles* **31** 456–72