Bioenergy production and sustainable development: science base for policy-making remains limited

Bioenergy production and sustainable development: science base for policy-making remains limited

The possibility of using bioenergy as a climate change mitigation measure has sparked a discussion of whether and how bioenergy production contributes to sustainable development. We undertook a systematic review of the scientific literature to illuminate this relationship and found a limited scientific basis for policy-making. Our results indicate that knowledge on the sustainable development impacts of bioenergy production is concentrated in a few well-studied countries, focuses on environmental and economic impacts, and mostly relates to dedicated agricultural biomass plantations. The scope and methodological approaches in studies differ widely and only a small share of the studies sufficiently reports on context and/or baseline conditions, which makes it difficult to get a general understanding of the attribution of impacts. Nevertheless we identified regional patterns of positive or negative impacts for all categories – environmental, economic, institutional, social and technological. In general, economic and technological impacts were more frequently reported as positive, while social and environmental impacts were more frequently reported as negative (with the exception of impacts on direct substitution of GHG emission from fossil fuel). More focused and transparent research is needed to validate these patterns and develop a strong science underpinning for establishing policies and governance agreements that prevent/mitigate negative and promote positive impacts from bioenergy production.

General information
Publication status: Published
Organisations: Department of Management Engineering, Systems Analysis, DTU Climate Centre, Swiss Federal Institute of Technology Zurich, Foundation for Global Sustainability, Chalmers University of Technology, Autonomous University of Barcelona, Technical University of Berlin, University of Klagenfurt, Murdoch University, Western University, Stockholm Environment Institute, Potsdam Institute for Climate Impact Research, climate-babel Switzerland, Universidade Federal do Rio de Janeiro, Swiss Federal Laboratories for Materials Science and Technology (Empa), University of Aberdeen, KU Leuven, University of Gothenburg
Pages: 541–556
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: GCB Bioenergy
Volume: 9
Issue number: 3
ISSN (Print): 1757-1693
Ratings:
Scopus rating (2017): CiteScore 5.01 SJR 1.816 SNIP 1.542
Web of Science (2017): Impact factor 5.415
Web of Science (2017): Indexed yes
Original language: English
Electronic versions:
Bioenergy_production_and_sustainable_development.pdf. Embargo ended: 06/01/2017
DOIs: 10.1111/gcbb.12338
Source: FindIt
Source ID: 2290154523
Research output: Contribution to journal › Journal article – Annual report year: 2016 › Research › peer-review