

# Opportunities and Challenges of Bioenergy and Biodiversity

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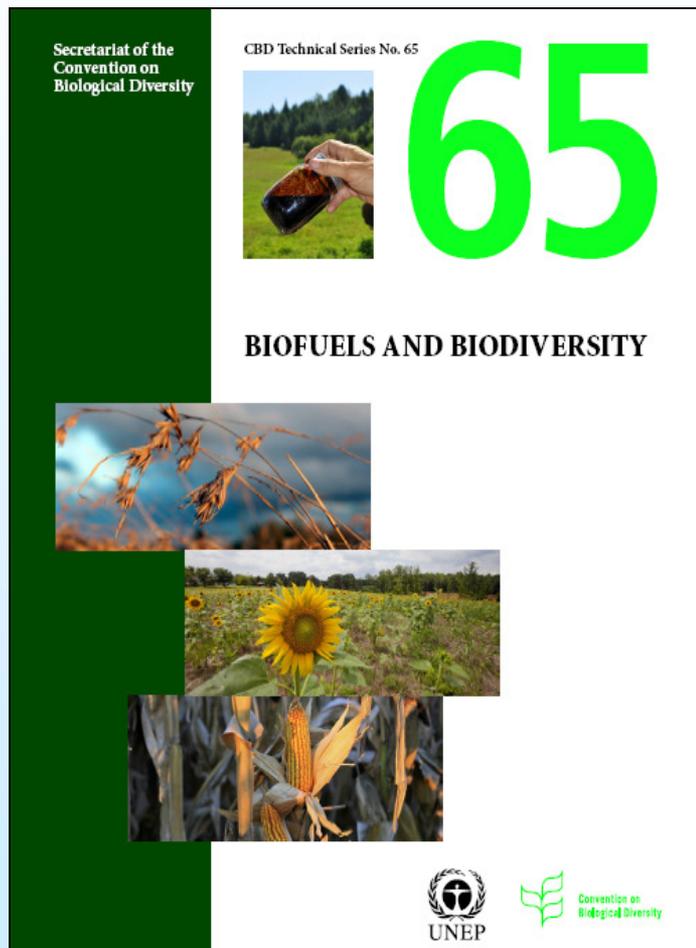
Montreal, Canada



# Biofuels and the CBD

- COP agreed that:
  - Biofuels to be considered under three pillars of sustainable development (social, economic and environment)
    - Not an independent issue
  - Biofuels production and use to be sustainable with regards to biodiversity
  - Requested policies and activities to promote the positive and minimize the negative impacts of biofuels on biodiversity
    - Secretariat to review approaches to achieve this and identify gaps

# Summary of gaps etc. identified so far and tools and approaches available:



Presented to SBSTTA-16

Published in CBD Technical Series 65

Available at: <http://www.cbd.int/doc/publications/cbd-ts-65-en.pdf>

Tools and Approaches for sustainable use  
made available at: <http://www.cbd.int/agro/biofuels/tools.shtml>

# Main impact pathways for effects of biofuels on biodiversity:

- Invasive Alien Species (including GMOs)
- Synthetic biology (risks)
- Impact of unsustainable use:
  - Land, water, chemicals
  - On-farm and off-farm impacts (e.g. pollution)
  - Greenhouse gas emissions re. climate change (+ve or –ve)
- Socio-economic impacts (+ve or –ve)
  - Where derived from changes in biodiversity
- Land use change
  - All of these are similar to pathways for any agricultural activity

# Difficulties in assessment:

- Very diverse biofuel production and use systems
- Polarised views in the literature
  - Available publications can support almost any view on biofuels
  - Our assessments limited to more credible published sources and case-studies submitted by Parties and recognised impartial agencies
- Interlinkages between biofuels and social, economic and environment pillars of sustainable development very complex
  - Boundaries of topics difficult to define
    - E.g. increasing efficiency of biofuel production can translate into reduced impacts on biodiversity
      - practically all efforts for the GBEP qualify as biodiversity related

# Some key conclusions:

- **Land-use change from increased biofuel production:**
  - increases risks of biodiversity and ecosystem services and (currently, globally) is causing net increases in greenhouse gas emissions
    - There are exceptions
- **Direct land use change more easily addressed**
  - E.g. avoid conversion of natural habitat or “high conservation value areas”
- **Indirect land-use change remains the key unresolved biodiversity-related issue**, including for the assessment of life-cycle analysis for greenhouse gases.
- **The development of biofuels has been largely driven by Governments, primarily in developed countries, through mandates, targets, subsidies and various other incentives**
  - But the main impacts of this are in developing countries
- **Biofuels need to be assessed more holistically under a broader framework of sustainable energy consumption and production**
- **Energy security, not climate change, is often the major driver of policies**
  - Probably not yet fully assessed in terms of trade-offs between energy, food, environment (especially water) security

# Some approaches to mitigate impacts:

- **Some tools and approaches to address biodiversity impacts are available on the CBD website (as previously noted)**
- **Cooperative initiatives to build consensus on solutions/approaches**
  - Notably, for example, the GBEP
- **Using degraded lands:**
  - may alleviate some land use pressures and may mitigate greenhouse gas emissions
  - but problematic
    - Lack of definitions
    - Many degraded lands have high biodiversity value and other uses (e.g by local communities)
    - competition for degraded lands (therefore displaces other land uses – causes iLUC)
    - will probably not fill a high percentage of the world's energy demands.
- **Some possibilities for small-scale integrated food/energy systems on farms, and using waste products**
  - But:
    - Life-cycle analysis of some waste products suggests problems with long-term carbon debts (e.g. using brushwood from forests)
    - Opportunities for using agricultural wastes over-optimistic
      - Especially for “waste cellulose” because farming needs to increase organic carbon in soils to address sustainable food security

# Addressing indirect impacts (displacement effects)

- Sustainable intensification of other farming practices
  - Create “space” for biofuels
  - Offers potential (in theory) of producing energy and food without increasing pressures on resources
    - Case study – Brazil
  - Problem is that (globally) sustainable intensification of other crops/uses is not happening fast enough
    - The trend is one of decreasing yields
    - In particular a global trend in degradation of soil health and productivity

# More holistic assessments/policies required:

- The issue is one of scale
  - Innovative and sensible approaches can be found at small scales
    - But problems up-scaling due to cumulative impacts
- Biofuels sustainability cannot be achieved (at any significant scale) without sustainability in other land use sectors
  - The issue is one of “mass balance” (arithmetic) there is simply not enough land and other resources to meet significant energy and food demands simultaneously under business as usual
- We need a broader solutions for, sustainable land use
  - Biofuels issues are the same as for other crops/production systems
    - Why single out biofuels?
  - Opportunity to apply the good work regarding addressing biofuels sustainability to other farming systems