

Bio-Global Project: Priority Areas for Sustainable Bioenergy Production



Klaus J. Hennenberg & Uwe R. Fritsche (Öko-Institut)

Horst Fehrenbach (IFEU)

**2nd Joint International Workshop on
Bioenergy, Biodiversity Mapping and Degraded Lands
from July 7-8, 2009 at UNEP, Paris**

in cooperation with



funded by



“Bio-global“ Project (financed by UBA)

Analytical support and policy development:
scientific methodologies and strategies on
environmental impacts of bioenergy cultivation,
trade, and use

Issues: Direct and indirect GHG from land use
change, biodiversity, water, trade, legal
aspects and **global potential of degraded lands**

Four country studies:

- Brazil (just started)
- China (last phase of work)
- India (starts soon)
- South Africa (last phase of work)

Environmental Research Plan of the Federal Ministry
for Environment, Nature Protection and Nuclear Safety
Interim Report FKZ 37 07 93 100

"Development of strategies and sustainability
standards for the certification of biomass for
international trade"

Sustainable Bioenergy: Current Status and Outlook

Summary of recent results
from the research project

Darmstadt, Heidelberg, March 2009

prepared by:

Uwe R. Fritsche, Klaus J. Hennenberg, Andreas
Hermann, Katja Hünecke, Falk Schulze, Kirsten
Wiegmann

Öko-Institut, Darmstadt Office

Horst Fehrenbach, Elvira Roth, Anna Hennecke,
Jürgen Giegrich

IFEU - Institute for Energy and Environment
Research Heidelberg

Öko-Institut
Darmstadt Office
Rauhe 36
D-64289 Darmstadt
t +49 (0)6151 31 51-0
f +49 (0)6151 31 51-33

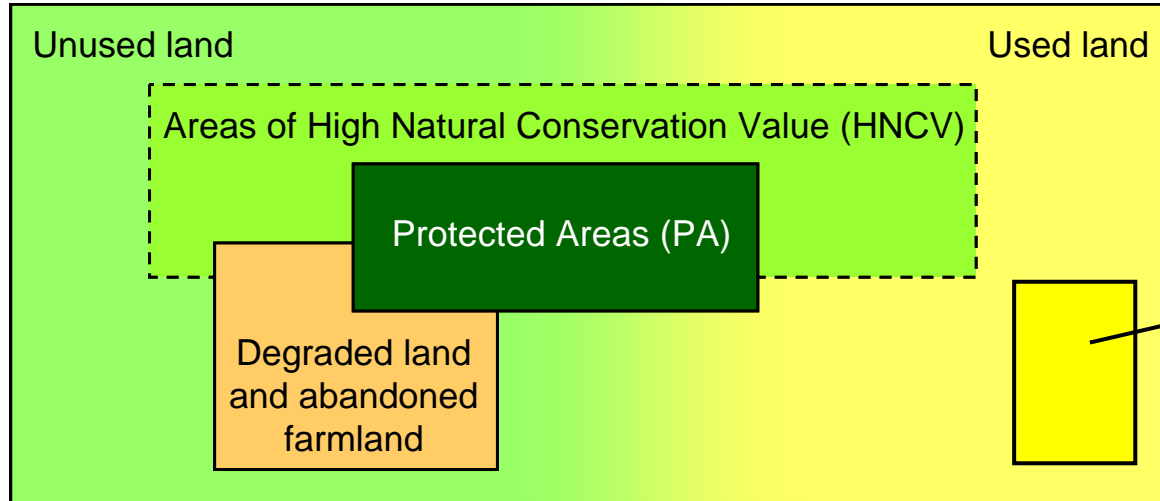
IFEU
Vollmars 3
D-69129 Heidelberg
t +49 (0) 6221 - 4767-0
f +49 (0) 6221 - 4769

www.oeko.de/service/bio
k.hennenberg@oeko.de
u.fritsche@oeko.de

Positive effects:

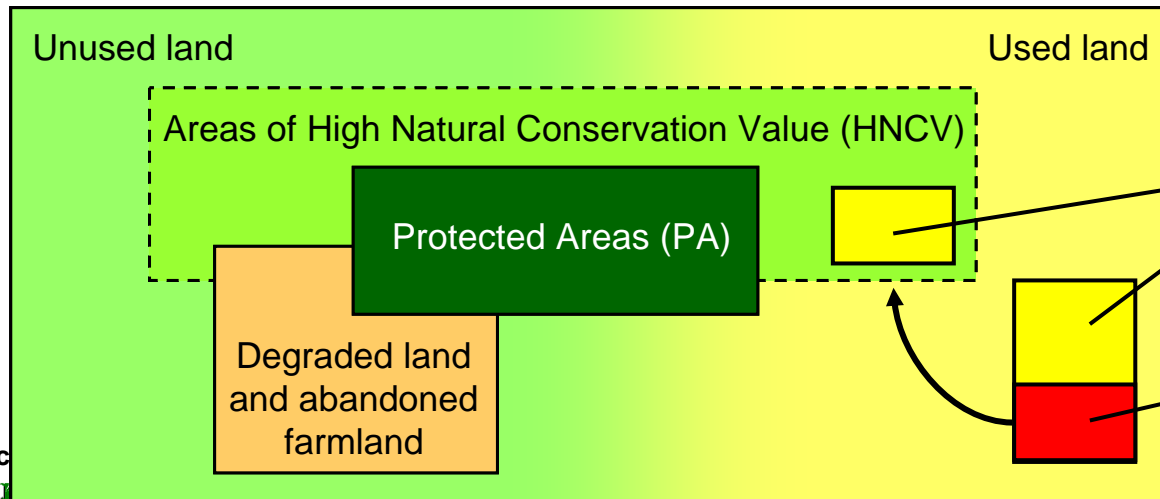
- **avoided indirect effects (esp. GHG, biodiversity)**
→ no land use competition, i.e. no displacement soil carbon

Indirect Land Use Change



Traditional crops (food, feed, fiber)

Indirect land use change caused by **displacement**



Traditional crops (food, feed, fiber)

Crops for bioenergy

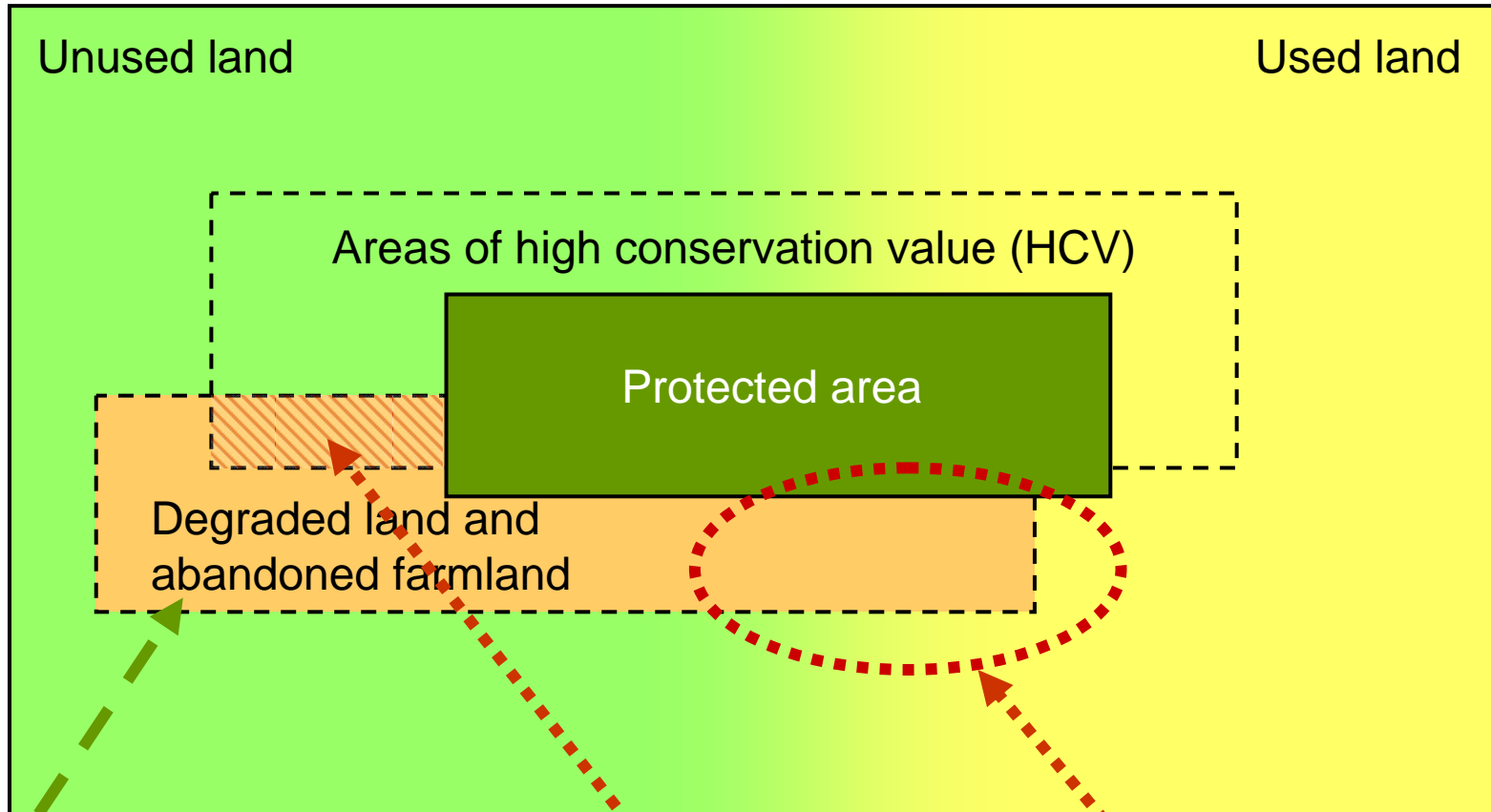
Positive effects:

- **avoided indirect effects (esp. GHG, biodiversity)**
→ no land use competition, i.e. no displacement soil carbon
- soil carbon
- (possibly) biodiversity
- (possibly) soil quality, water retention, reduced erosion
- but: social concerns (land tenure/ownership...)

Negative Effects:

- Higher costs due to restoration, lower yields, infrastructure overheads (access!)
- restricted choice of cropping systems (mainly: perennials)

Degraded & Abandoned Land



Cultivating bioenergy:
no displacement, more
organic C in soils, ...

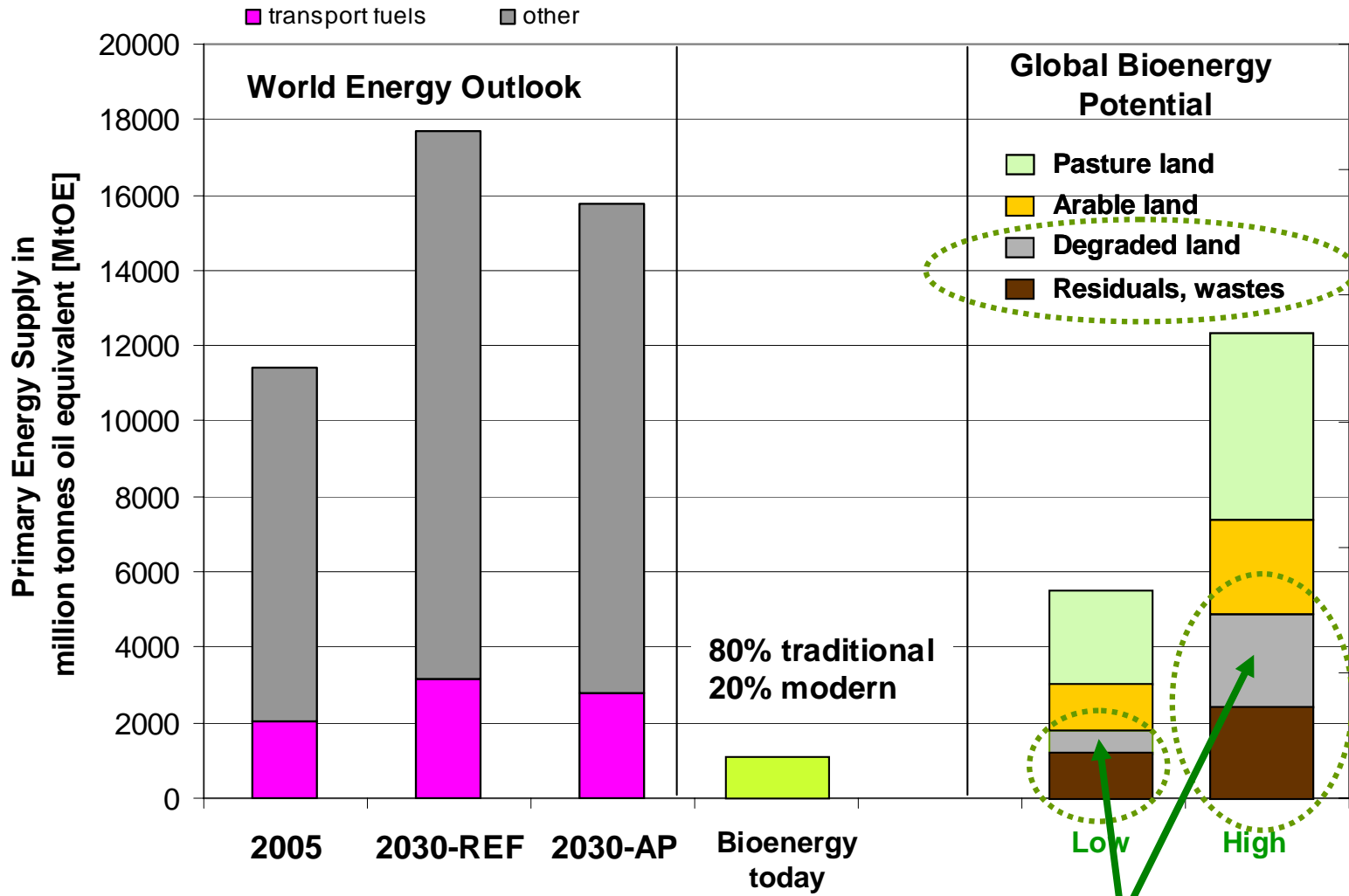
**Risk for biodiversity
if not properly mapped**

**Risk of displacing local
(subsistence) land use**

in cooperation with



Global Bioenergy Potentials



Where to go?

A. Top-down analysis (global and national data)

- identify focus regions with a high amount of potential priority areas:
- High amounts of degraded and abandoned land
 - Mapping out areas worth protecting
 - Mapping out areas of high carbon stock

B. Bottom-up analysis (ground truth at site level)

- Control and refining of site selection:
- Refining / controlling degradation and land-use status
 - Refining areas worth protecting
 - Refining / controlling of carbon stock
 - Identification of suitable cultivation systems and extraction rates