



# REDD and agriculture: some key issues

Maryanne Grieg-Gran  
maryanne@iied.org

Forests, agriculture and climate change:  
implications for REDD  
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# Why agriculture is key to REDD

- ❑ Agriculture is a major driver of deforestation
- ❑ Landholders benefit more from clearing forests for agriculture than from keeping them standing
- ❑ Returns to agriculture in forest land are often low
- ❑ Paying compensation for avoiding deforestation could be cost-effective mitigation



## **REDD aims to constrain expansion of cultivated area when:**

- Population is set to increase by 37%
- Growth in incomes will:
  - increase food demand
  - shift diets to meat, increasing feed demand
- Climate change will affect productivity
- Biofuels adds to demand



# What might happen?

- **REDD won't work for mitigation** - too much leakage of deforestation
- **REDD won't work for development** – food prices forced up threatening food security (but good for some farmers)

**Much depends on agricultural demand and supply to 2050 and the measures that accompany REDD programmes**





# How important is the REDD land constraint?

- ❑ IPCC 4AR: agricultural land increased by 13 mn ha per year 1961-2001
  - ❑ 6 mn ha of forest land and 7 mn ha of other land converted each year
- ❑ Will REDD encourage leakage?
  - ❑ Increased deforestation in countries/areas not participating
  - ❑ Limited evidence – studies of restrictions on timber production suggest high leakage



# Agricultural demand outlook

- ❑ **Commodity 'gloom' before 2007**
  - ❑ Eg: real world prices of cereals declined 30% between 1982 and 1997 (IFPRI)
- ❑ **Commodity boom 2007/8 and bust 2009**
  - ❑ domestic food prices in early 2009 still high e.g. in Sub-Saharan Africa (FAO 2009)
- ❑ **>70% increase in demand to 2050**
  - ❑ growing population (9 bn in 2050), income, and urbanisation
  - ❑ **Increase in demand for non-food agricultural products**



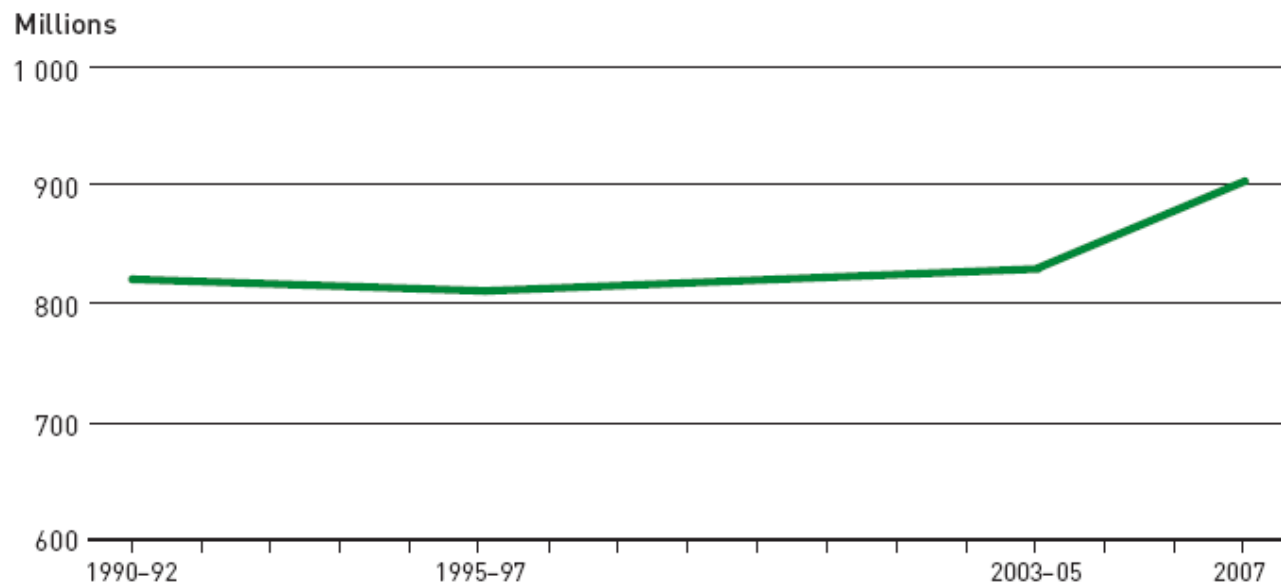
# Agricultural demand

- FAO projections food demand 2005-2050 in developing countries (Bruinsma 2009)
  - 100% increase in value of food production
  - 61% increase in cereal production (volume)
  - 132% increase in meat production



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### Numbers of undernourished people in the developing world, 1990-92 to 2007



Source: FAO.





# How will demand be met?

- **Expand cultivated area:**
  - clear forests and other natural vegetation
- **Increase agricultural productivity**
  - Yields,
  - cropping intensity,

**1961-2001: increase in food availability and decline in agricultural land per capita**



# Scenarios

- No increase in productivity:
  - Additional 600 mn ha needed by 2050 in developing countries
  - 13 million ha per year
- No expansion of arable land
  - Productivity needs to increase at 1.07% per year in developing countries



# Agricultural productivity trends

- ❑ **USDA - Grains and oilseeds**
  - ❑ Declining annual yield growth rates
    - ❑ 2% 1970 -1990
    - ❑ 1.1% 1990-2007
    - ❑ <1% over next 10 years
- ❑ **IPCC 4AR** – land productivity will increase but at declining rate
  - ❑ Declining technical progress
  - ❑ Greater use of marginal land
- ❑ But do yield growth declines reflect reduced support?



# Pressure on land from biofuels

- ❑ Land requirement depends on:
  - ❑ future policy mandates
  - ❑ Oil prices
  - ❑ Progress with 2<sup>nd</sup> generation technologies
- ❑ **By 2050: 16-36 million ha needed** Fischer (2009)
- ❑ **Assuming no diversion of food production:**
  - ❑ 24-54 million ha by 2050
  - ❑ 0.5 to 1 million ha per year





# Impact of climate change

- ❑ Reduced yields in seasonally dry and tropical regions – even with 1-2°C
  - ❑ Food insecure regions eg: SSA most likely to be affected
- ❑ Some predict improvements in short term (up to 2030) for some crops
- ❑ Increased frequency of droughts and floods
- ❑ But much uncertainty



## Perverse effects of productivity improvement

- ❑ **REDD cost-effectiveness** - May increase the returns to agriculture and hence to deforestation
  - ❑ Depends whether it increases labour and capital requirements (Angelsen and Kaimowitz 1999)
- ❑ **Mitigation** - May increase emissions from agriculture
  - ❑ Fertilisers and energy use
- ❑ **Co-benefits** – Development, biodiversity
  - ❑ Intensification may disadvantage small farmers
  - ❑ Monoculture, pesticides



## Conclusions

Whether or not agriculture is included in the Post-Kyoto framework:

- The effectiveness of REDD for both mitigation and development is closely linked with what happens in agriculture.
- REDD policies and strategies at both international and national levels may therefore need to look beyond the forestry sector and give attention to agriculture.



# Thank you!

Maryanne Grieg-Gran

International Institute for  
Environment and Development

3, Endsleigh Street

London WC1H 0DD

Email: [maryanne@iied.org](mailto:maryanne@iied.org)

[www.iied.org](http://www.iied.org)