THE CONFLUENCE OF FOOD, FUEL AND FIBRE CHANGING THE FOREST ECONOMIC SECTOR

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THE NEW 5-Fs

- Food
- Fodder
- Fuel
- Fiber
- Feedstock (bio-chemicals, bio-composites, bio-materials)

These 5 Fs are forming the Land Use

DRIVERS OF THE 5-Fs

- Population development
- Economic growth
- Globalization
- Energy availability and security
- Diets
- Food consumption
- Lifestyles
- Climate change
- Institutions and policies
- etc.

THE LAND SUPPLIES

- The 5-Fs
- Nature conservation
- Infrastructures
- Fresh water
- Biodiversity
- Stability of soils
- Sustaining bio-geo-chemical cycles
- Recreation
- Security
- etc.

LAND USE CHANGES

- Land use is the crucial link between human and economic activities, and nature
- Direct land use changes
- Displacement of land use – a migration of activities to another place, causing land use change in other locations (indirect land use change – ILUC)
- Rebound (or take back) effects – response by agents of the economic system to new measures to reduce resource use
  - e.g., measures result in increased economic growth and lower prices but also in increased consumption and use of more land (Jevons' Paradox)

ANALYSIS OF FUTURE LAND USE

- Geographic approaches
  - Study by physical and spatial patterns of land use
- Economic approaches
  - Study the economic integration of production, consumption and trade
- Integrated approaches
  - Study the integration of economic and geographic approaches
- Unfortunately, available tools to study land use change are limited in their abilities

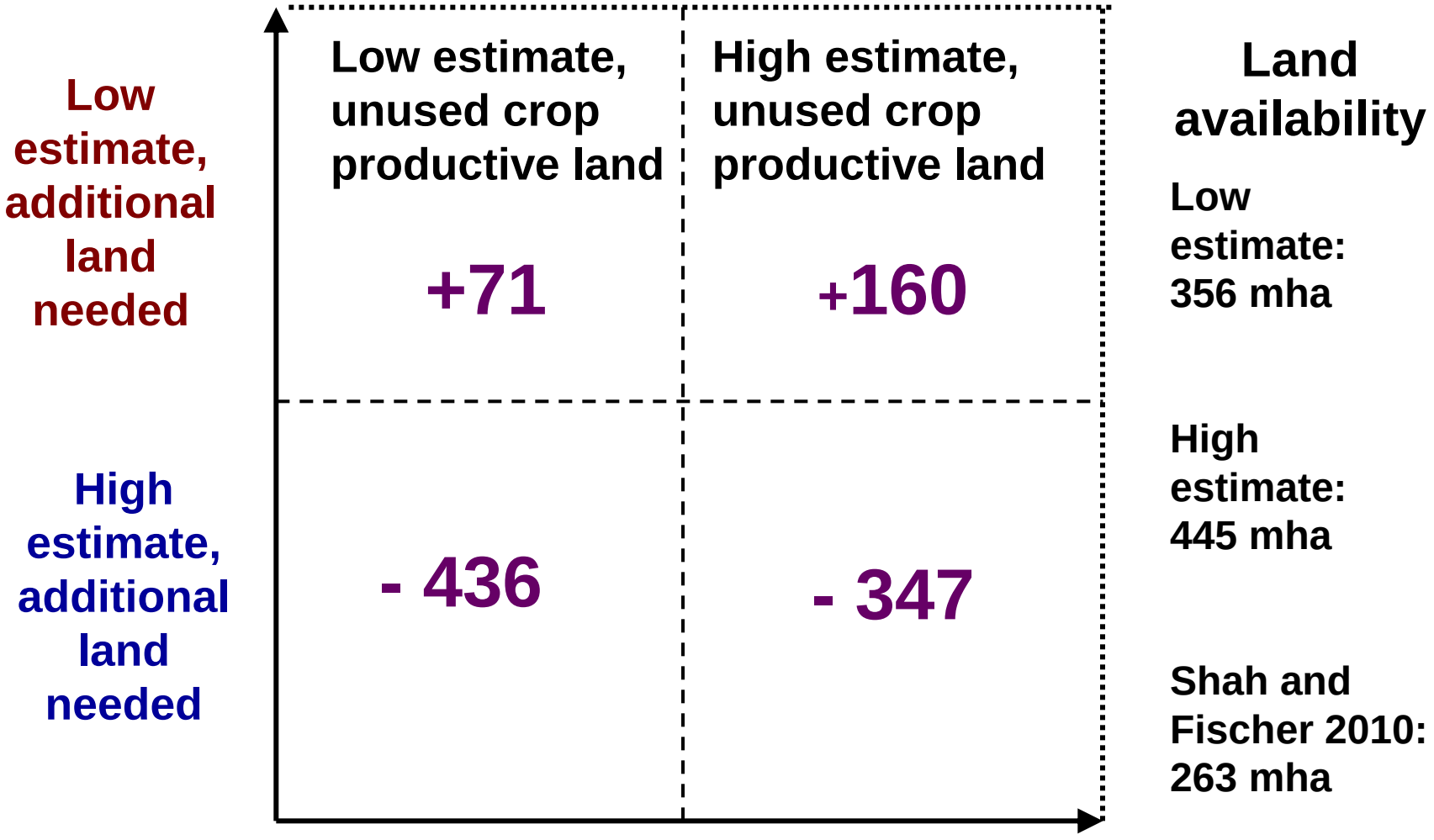
PROJECTED LAND USE FOR 2030

ADDITIONAL LAND NEEDED in Mha

Categories \ Estimates	LOW	HIGH
Additional croplands	81	147
Additional biofuel crops	44	118
Additional grassing land	0	151
Urban expansion	48	100
Industrial forestry expansion	56	109
Expansion of protected areas	26	80
Land lost to land degradation	30	87
TOTAL	285	792

Source: Lambin and Meyfroidt, 2011

LAND BALANCE IN 2030 IN Mha WITHOUT DEFORESTATION



Source: Modified from Lambin and Meyfroidt, 2011

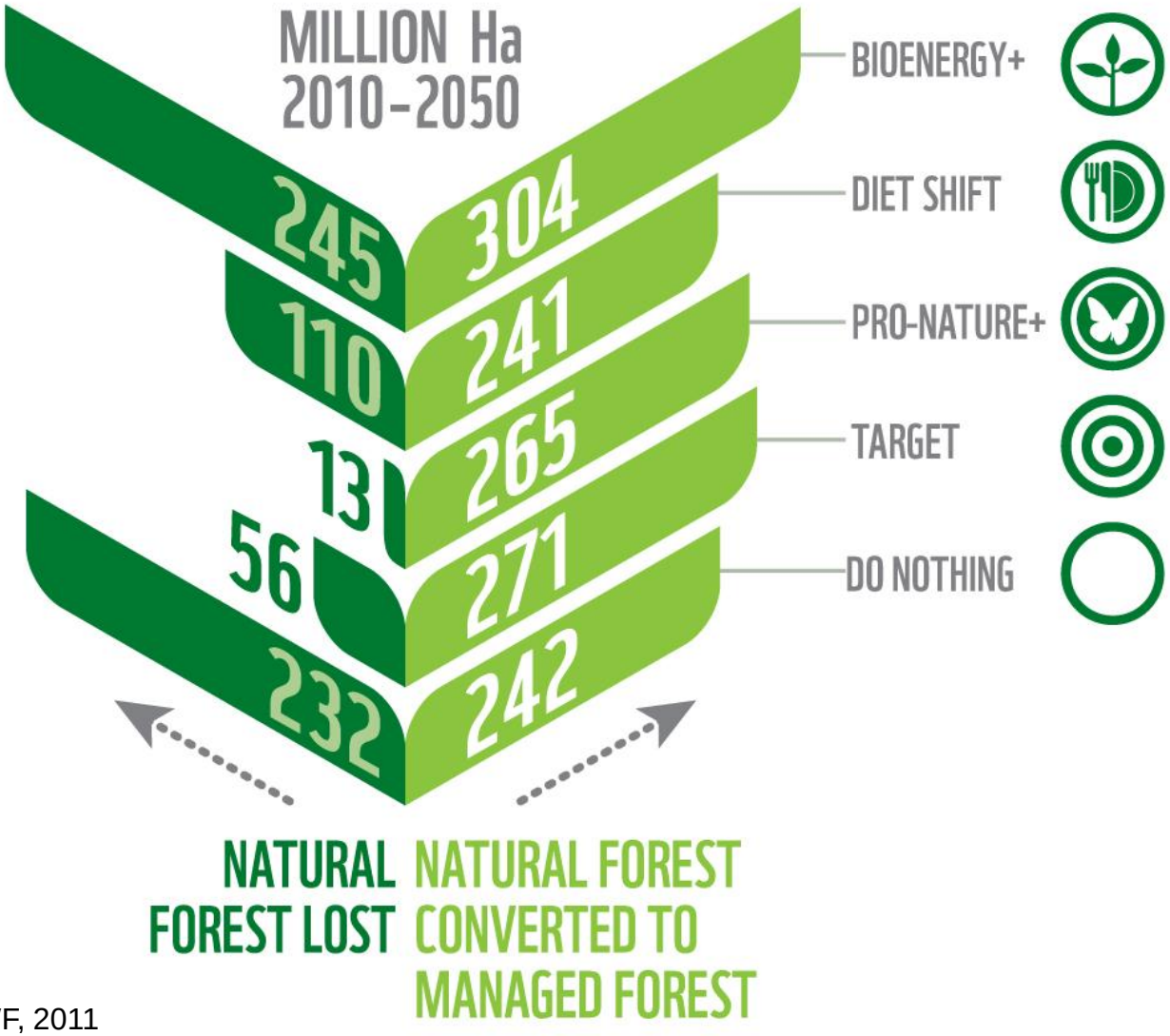
LAND BALANCE IN 2030 IN Mha WITH DEFORESTATION

	Low estimate	**High** estimate
Deforestation of natural forests	152	303

	Low estimate unused productive land	**High** estimate unused productive land
Low estimate on additional land needed and **low** deforestation	+ 223	+ 312
High estimate on additional land needed and **low** deforestation	-133	- 44
High estimate on additional land needed and **high** deforestation	- 284	- 195

Source: Modified from Lambin and Meyfroidt, 2011

LAND USE CHANGE 2050



Source: IIASA and WWF, 2011

GLC-2000

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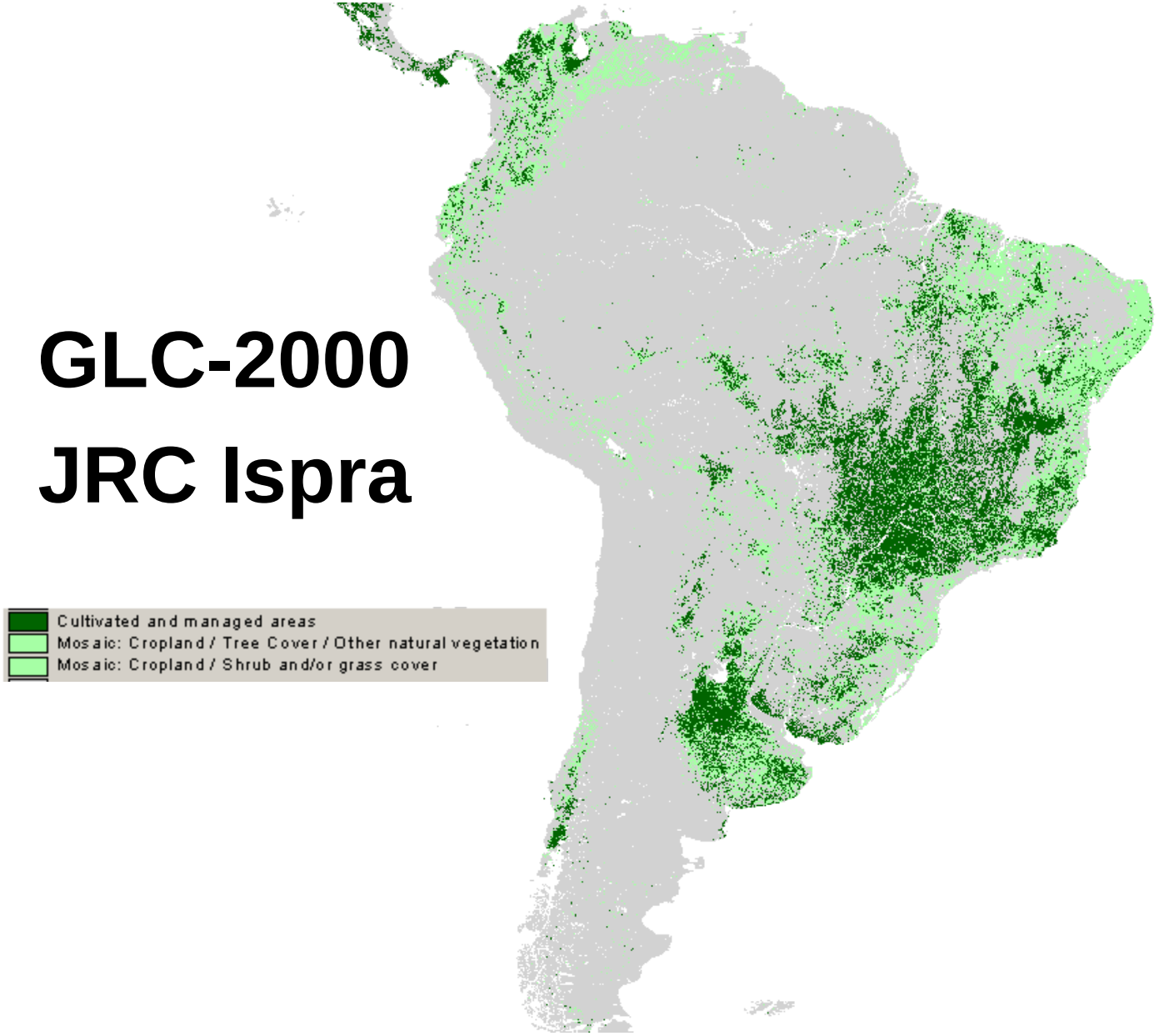

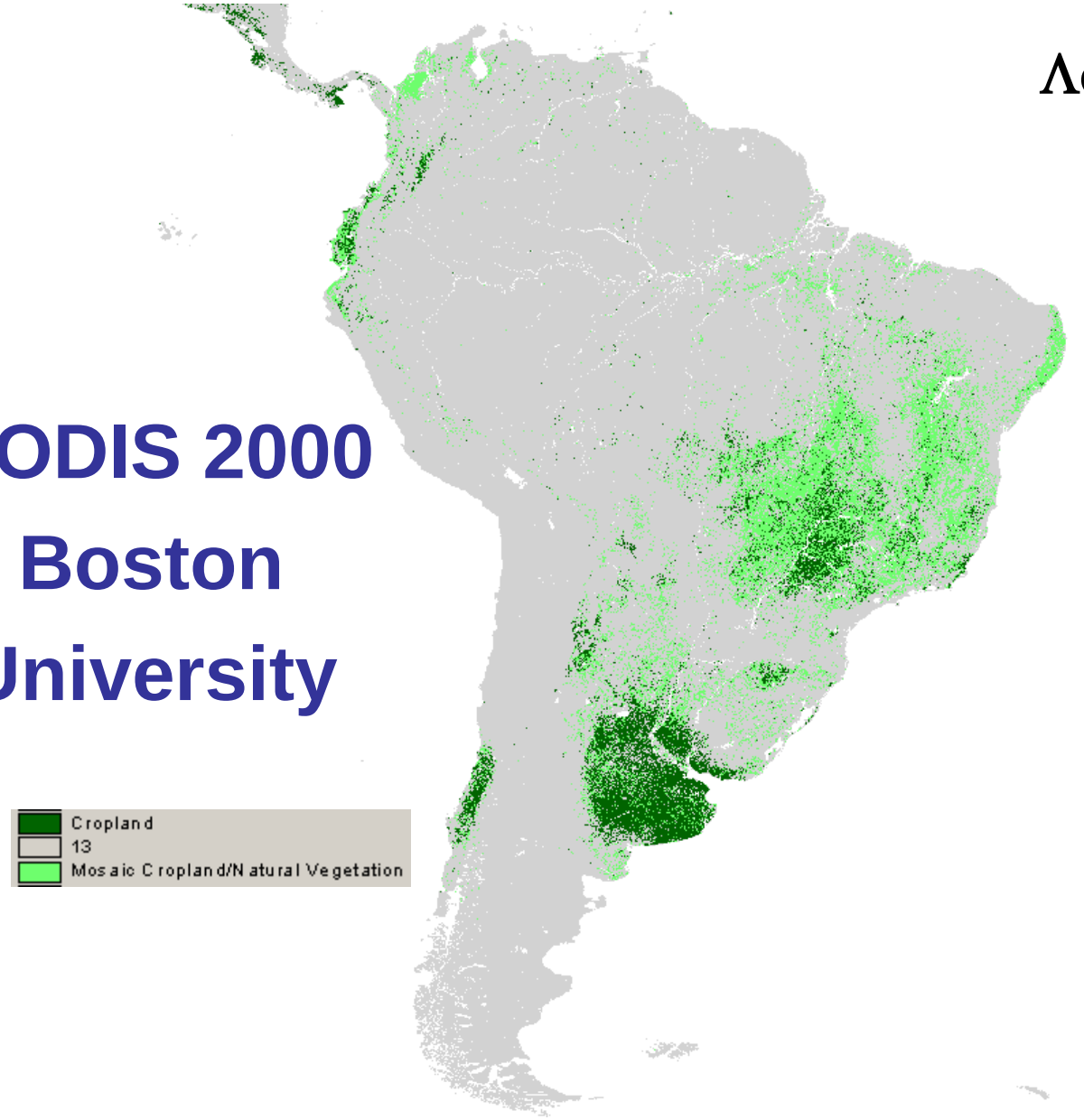

MODIS 2000 Boston University

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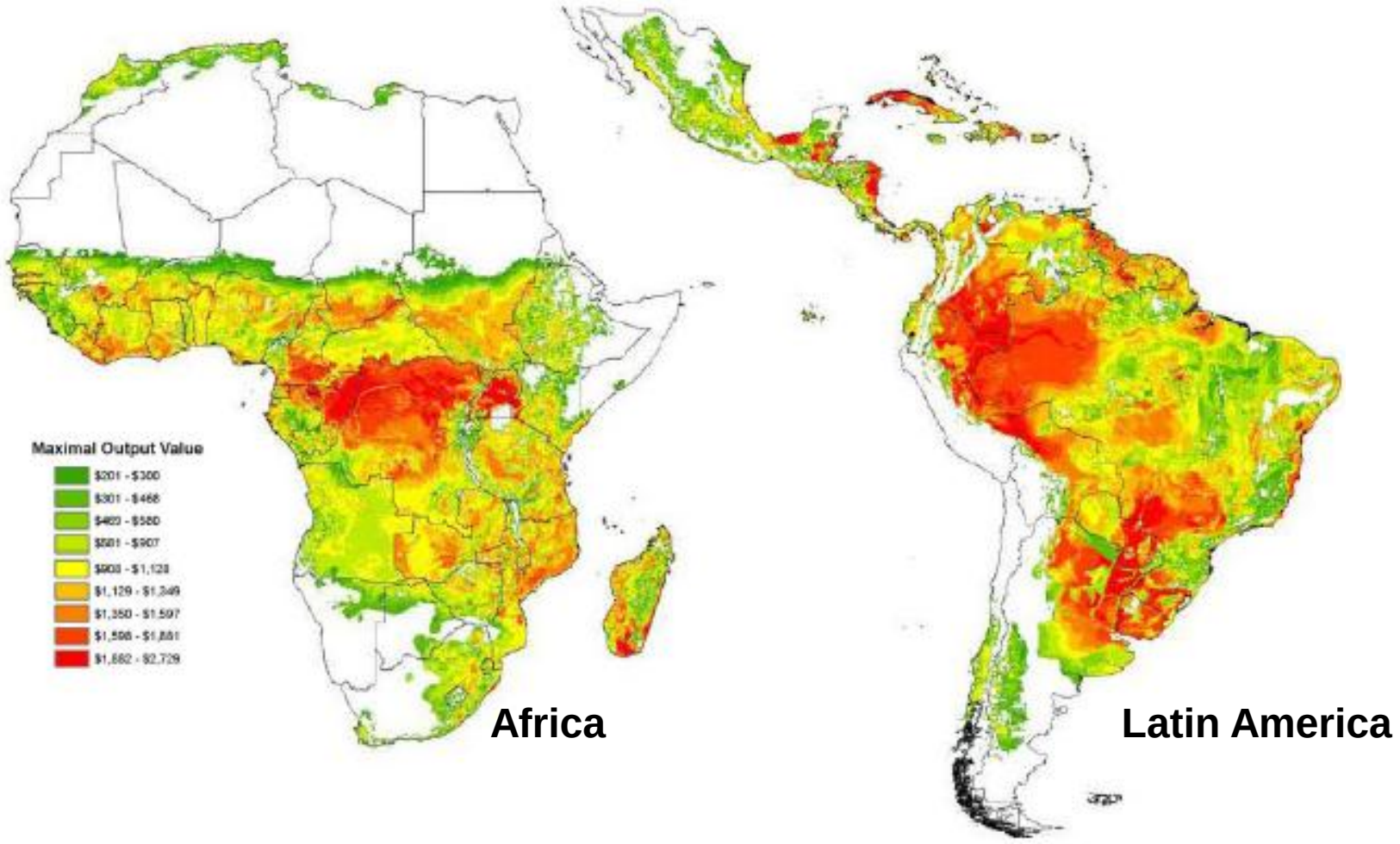
+/– 50%

δισαγρεεμεντ

WHERE IS THE CONVERSION VALUE TO AGRICULTURE? US$/ha



Source: Don Roberts, CIBC World Markets Inc., 2010; Fischer G and Shah M, 2010.

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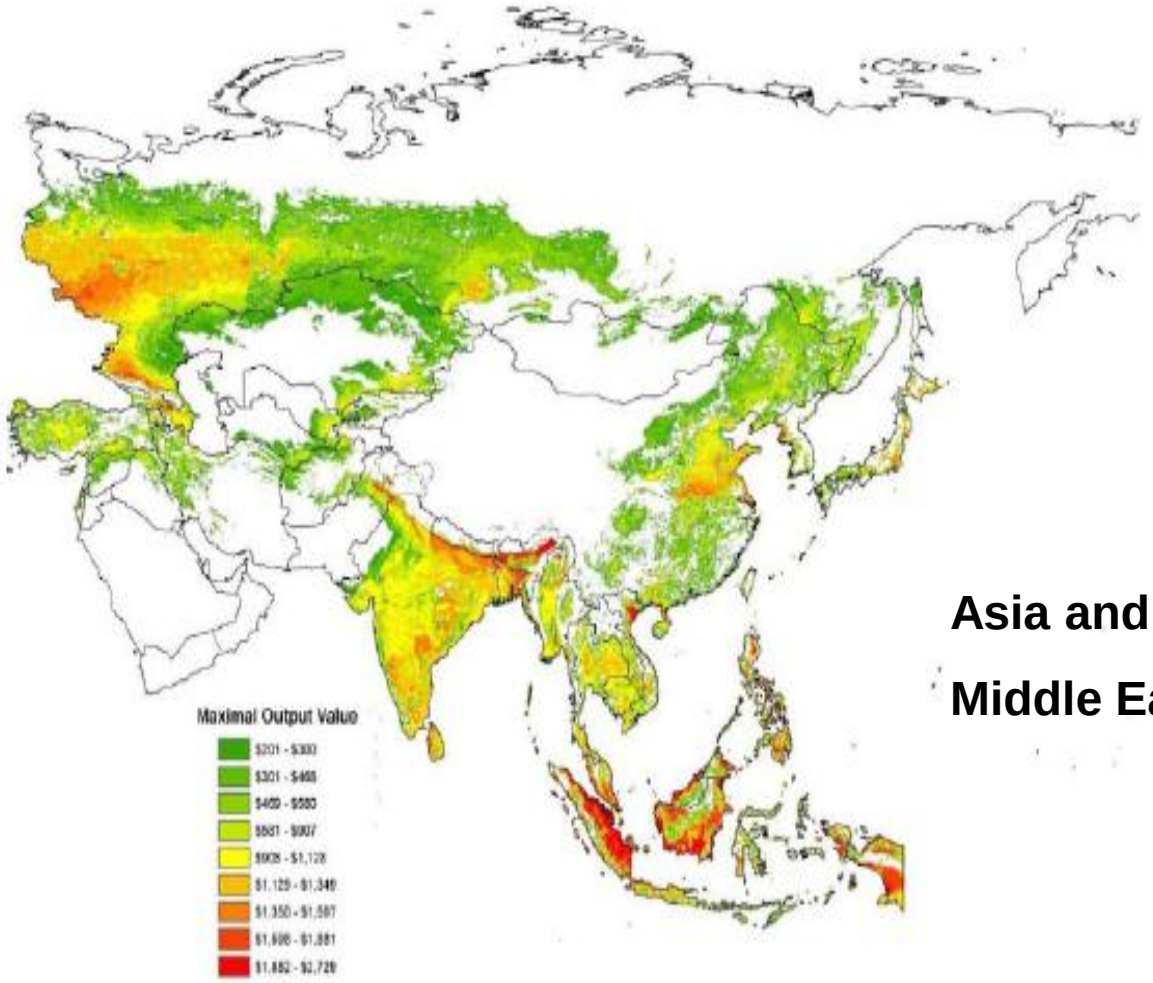

Asia and Middle East

Source: Don Roberts, CIBC World Markets Inc., 2010; Fischer G and Shah M, 2010.

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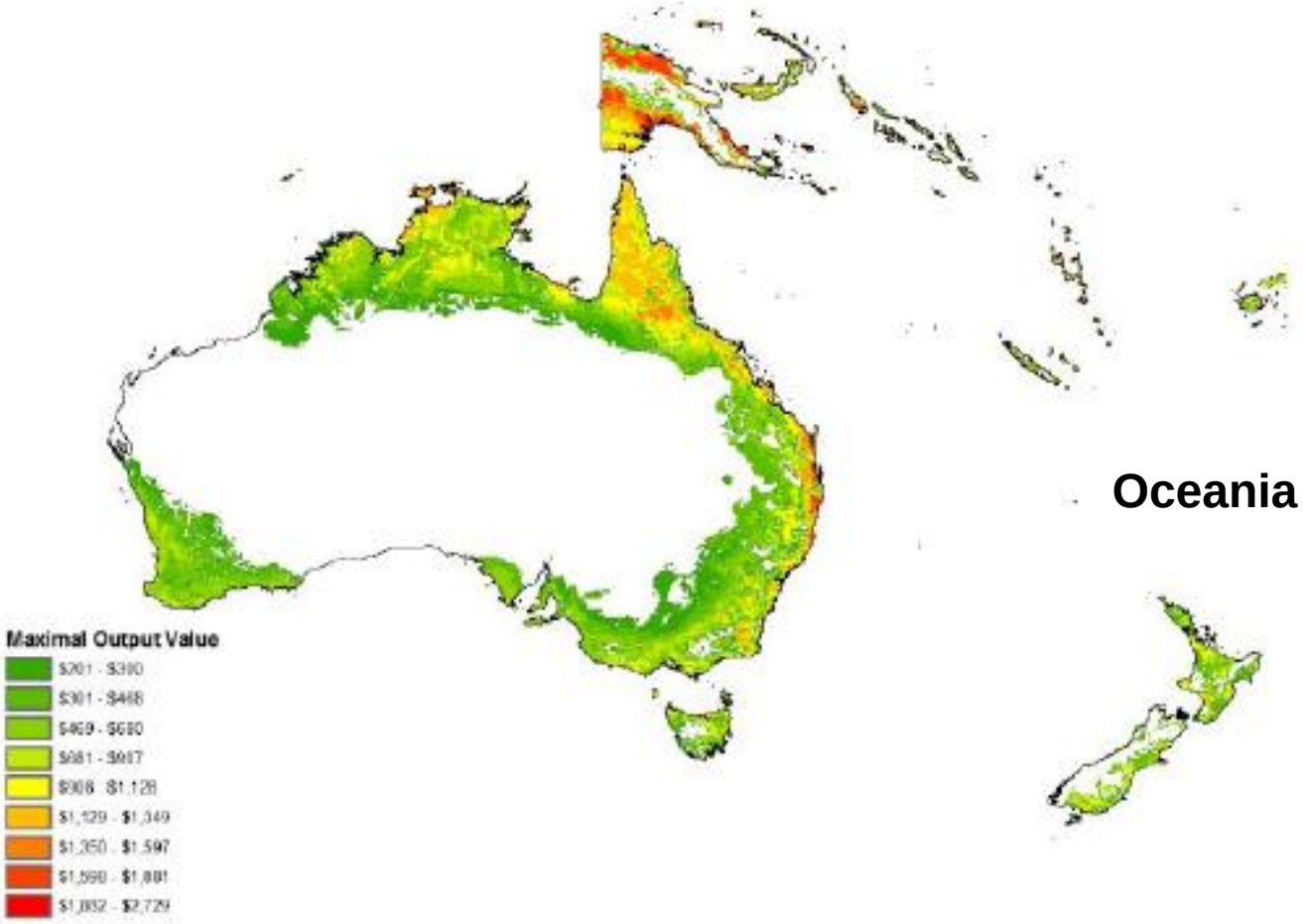

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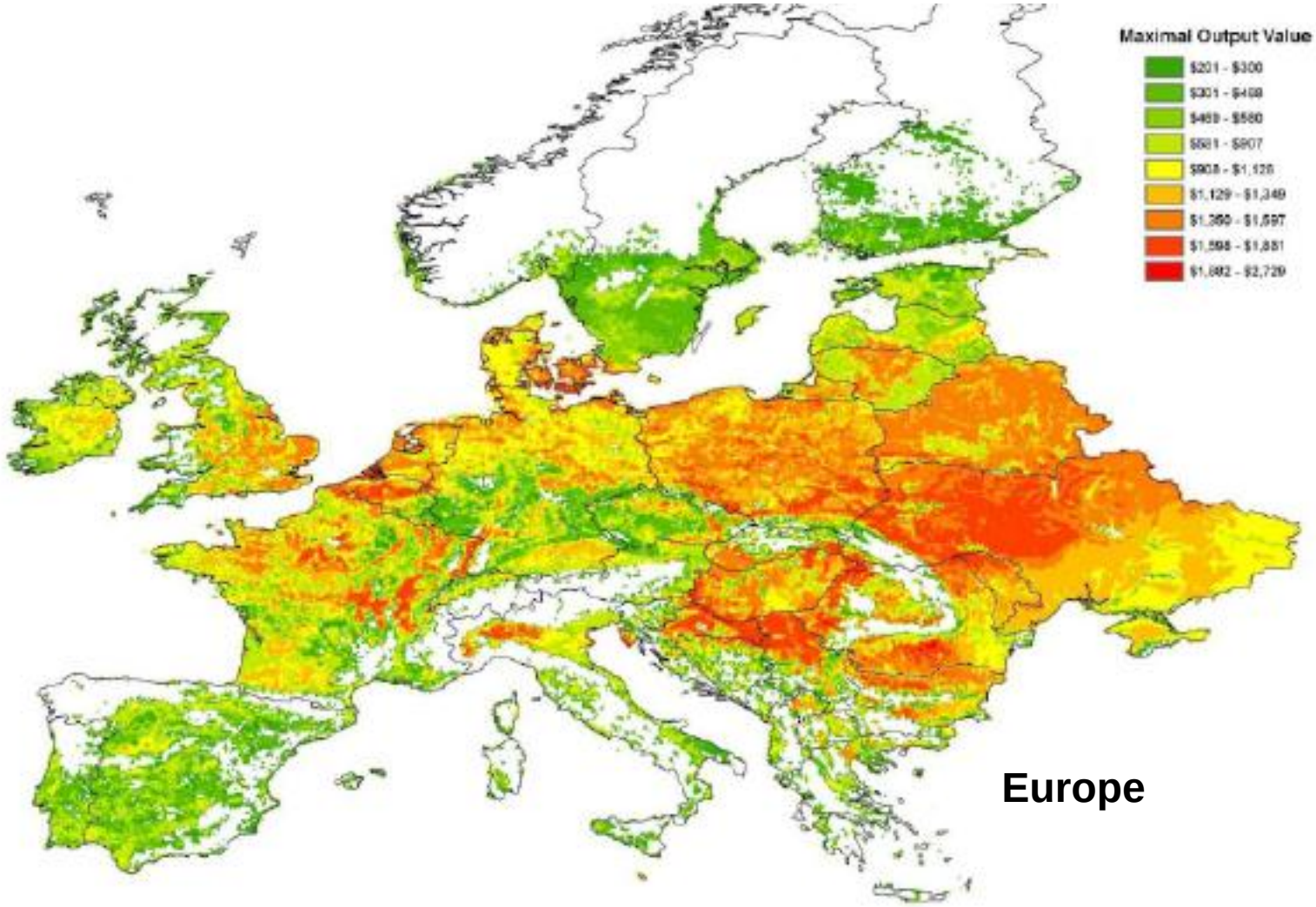

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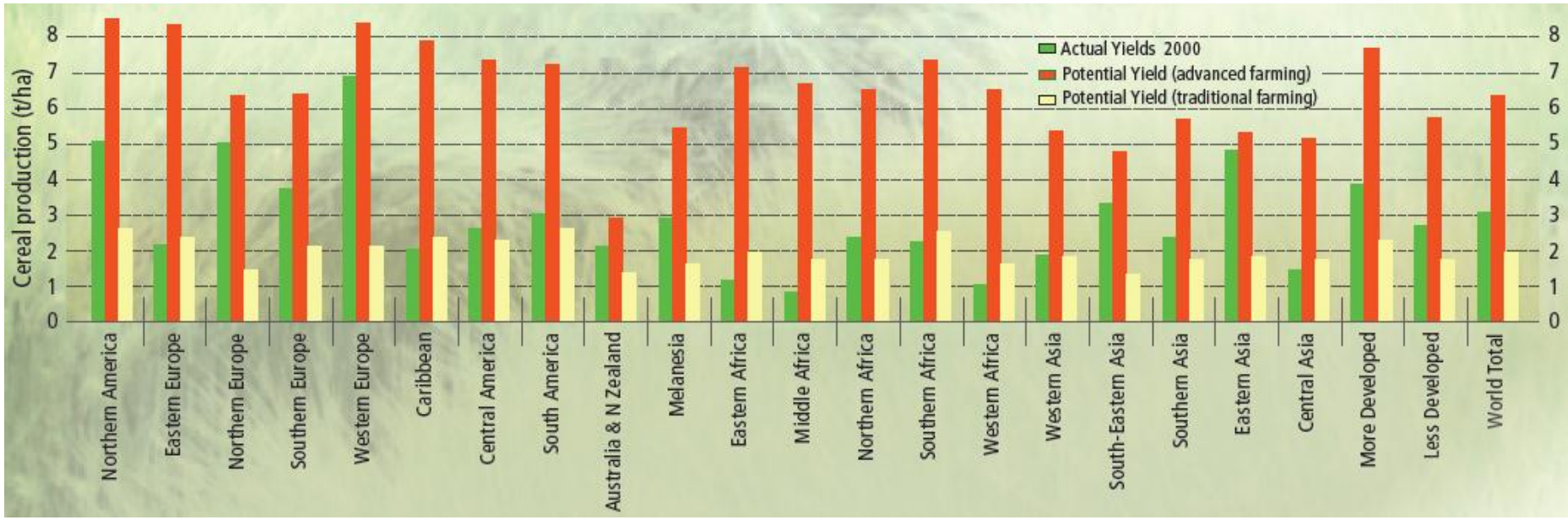
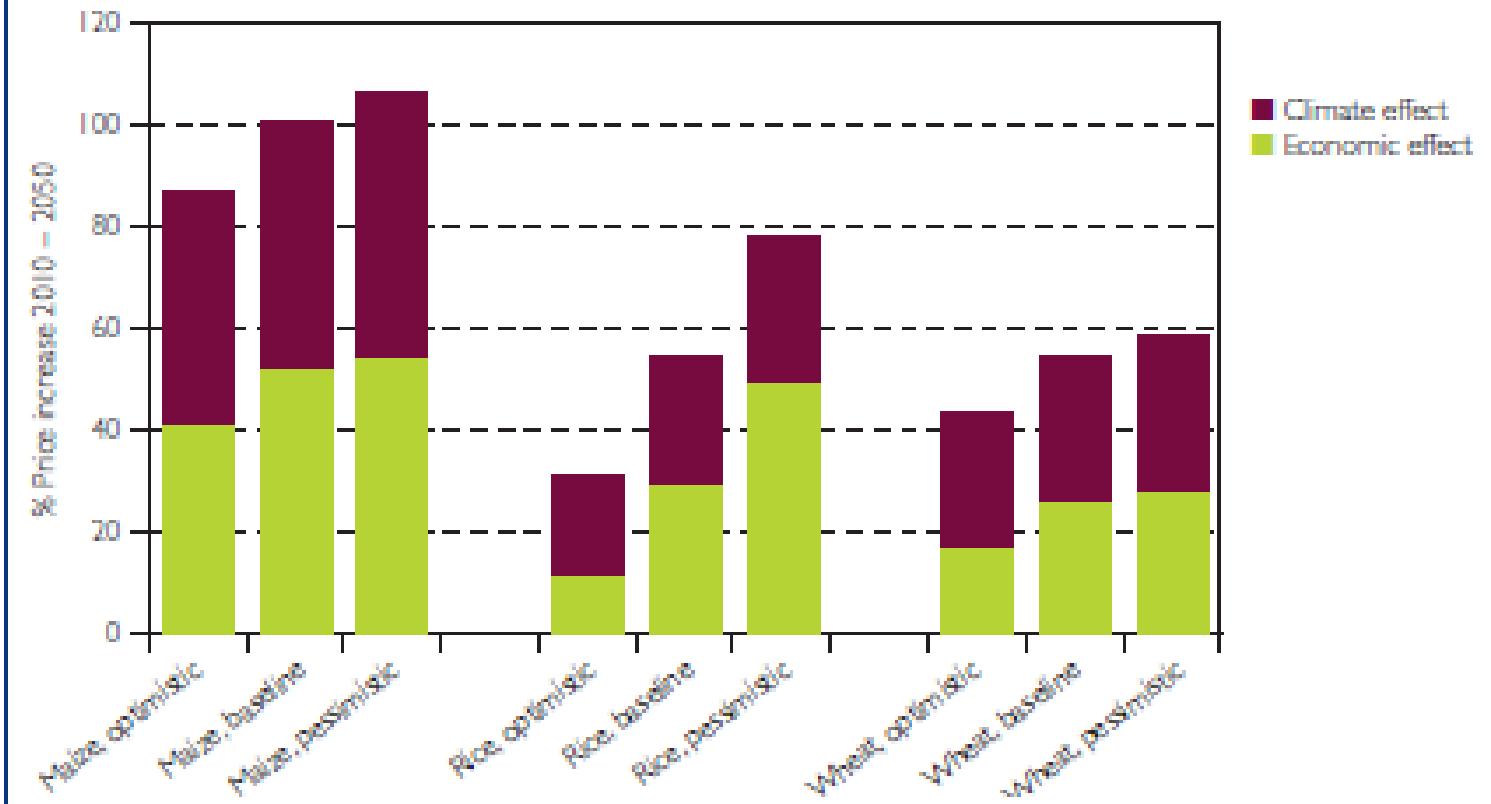
POTENTIAL YIELDS



Source: Fischer G and Shah M, 2011

REAL FOOD PRICES CHANGES IN THE MAIN SCENARIOS, 2010-2060 (%)

Figure 3.2: Real food price changes for the main scenarios, 2010–2050 (%).



Source: Nelson et al. (2010)

Source: The Future of Food and Farming; Challenges and Choices for Global Sustainability, (Beddington Report), 2011

INDUSTRIAL WOOD DEMAND INCREASE TO 2030 IS SIZEABLE

Product Area	RWE Increase 2010-2030[A]
Pulp & Paper [B]	150 million m^3 sub
Sawnwood [C]	250 million m^3 sub
Wood-based panels	400 million m^3 sub
TOTAL (gross)	800 million m^3 sub
TOTAL (net) [D]	700 million m^3 sub

A) Increase according to Pöyry scenario in KSLA presentation
B) Virgin pulp based demand increase
C) Softwood & hardwood sawnwood including demand recovery 2020
D) Including utilization of sawnwood residues in pulp and panels

Source: Pöyry, 2011

WHAT DOES ALL THIS TELL US?[1]

1. We know nothing

   Uncertainty in data sets greater than 50%

2. We CAN fix it

"The land issue can be harnessed if land use is understood as being part of open and complex human/nature/environmental systems dominated by long distance flows of commodities, capital and people." (Lambin and Meyfroidt, 2011)

"With better governance, the world would have enough productive forest land and agriculture land available for demand for food, wood products and bio-energy." (IIASA and WWF, 2011)

We can fix it 'with increased yields, GMOs, restoration of degraded lands, agro-ecology, and advanced farming' is a common argument

'we just have to do the right things in the right place' is another argument

WHAT DOES ALL THIS TELL US?

- We CAN do it
- WILL we do it
- … Probably NOT
- Taking, for example, human livelihood, equity, knowledge distribution, energy, water, biodiversity, climate… into account, they generate a problem of immense complexity with cascading sets of interactions, trade-offs, and synergies that for decision makers make the problems impossible to solve (Obersteiner M., 2011)
- Land use stake-holders are conservative and are not willing to change (aversion to new technologies, innovations, risks, and markets)
- The political will is lacking and there are no universal ‘fixes’

WHAT DOES ALL THIS TELL US?

3. We are facing a HUGE problem

   The analyses made point at a minimum deficit of some 300 million ha of productive land by 2030 and with continued transformation of natural forests

   There is no unused land reserve at all in the developing countries. All land is used for some kind of activity-purposes (Persson, 2007)

IF WE HAVE A HUGE PROBLEM, WHAT TO DO ABOUT IT?

- Lift up the land use / availability issue at the highest political level as a green economy issue demanding integrated land policies, solutions, and management at RIO +20
- Intensify the work of broad-based economic development for diminishing poverty and enhancing well-being which will contribute to sustainable land use
- Establish a new global Remote-Sensing Program (high resolution) and platform for analyses of land use and land availability
- Establish a process of integrated assessments of future land use and land availability, like IPCC, Global Energy Assessment, IAASTD, etc.

IF WE HAVE A HUGE PROBLEM, WHAT TO DO ABOUT IT?

- Demonstrate the global economic magnitude of future land use and land availability options
- Promote integrated land use policies and management with re-arrangement of institutional, legislative and monitoring infrastructures at national and international levels
- Set up sustainable land use innovation awards
- Limit climate change impacts on land use and land availability

Thank you for your attention!

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