

Environmental-related biofuel trade barriers

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Biofuel market expansion

- High oil prices
- Energy security concerns
- Environmental friendliness

=> Rapidly growing biofuel market

Brazil

- Second largest producer of ethanol
 - 11% growth rate between 2000-2007
 - 17.4 billion liters in 2006
 - Estimated production by 2015: 35 billion liters
 - Estimated production by 2020: 50 billion liters
- Mandatory blends
 - 20% - 25% ethanol blended on gasoline
 - 3% biodiesel blended on diesel (5% by 2013)

Argentina

- Huge potential for biodiesel production
- Potential for sugarcane expansion, but areas distant from ports
- Production growth limited by current agriculture policies
 - Export taxes
 - Government intervention on domestic prices

Argentina

Table 1. Area Planted, Yields and Production Projections for Main Annual Crops
(million hectares, ton/hectare and million ton)

Crops	Area (million ha)			Yields (ton / ha)			Production (million ton)		
	Average 2004-06	2015 Alt 1	2015 Alt 2	Average 2004-06	2015 Alt 1	2015 Alt 2	Average 2004-06	2015 Alt 1	2015 Alt 2
Soybean	14.76	19.1	31.46	2.55	2.94	2.53	36.8	55.1	78.0
Sunflower	2.03	2.3	2.12	1.81	1.92	1.74	3.6	4.3	3.6
Wheat	5.84	6.3	6.05	2.59	2.89	2.48	14.4	17.8	14.6
Corn	3.19	6.1	3.34	6.87	7.59	7.05	16.7	37.7	19.1
Sorghum	0.58	0.7	0.63	4.83	5.55	5.0	2.5	3.5	2.8
Others	2.80	2.8	2.8	1.23	1.29	1.29	3.4	3.6	3.6
TOTAL	29.2	37.3	46.4	2.65	3.27	2.62	77.4	122.0	121.7

Source: Oliverio, G. and G. López. La Agricultura Argentina al 2015. 2007. www.producirconservando.org.ar

Current important environmental-related biofuel trade issues for LAC countries

1. European Community case: environmental sustainability criteria for biofuel imports
2. US case: the renewable fuel standard

European Community case: biofuels environmental sustainability criteria

- Renewable Energy Directive (RED)
 - Biofuels' share in transport sector by 2020: 10%
 - ⇒ Consumption share in volume: 14%

- Fuel Quality Directive (FQD)
 - 6% reduction in GHG emissions between 2010-2020

- RED and FQD: environmental sustainability criteria for both domestic and imported biofuels

EC environmental sustainability criteria

- To be considered for computation of targets set by RED and FQD, biofuels must comply with the following criteria
- Criteria #1: Reduction emissions with respect to fossil fuels
 - 2013: -35% GHG emissions
 - 2017: -50% GHG emissions

EC environmental sustainability criteria

- Criteria #2: “no-go areas” - areas with high carbon stocks
 - Wetlands
 - Forests

- Criteria #3: “no-go areas” - areas with high biodiversity value
 - Primary forests
 - Protected environmental reserves
 - Highly biodiverse grassland

- Biofuels not attending these criteria may be in the EC market, but will not be considered for targets defined in RED and FQD

EC biofuels policy: Critical issues for LA exports

- Definition of “highly biodiverse grassland”
 - Imprecise concept
 - May prevent biofuel production in areas with high agricultural potential

- Indirect land use change (ILUC)
 - RED did not incorporate ILUC greenhouse gas penalty factor
 - Report to be presented until December 2010
 - Some informal discussion on ILUC mitigation policies include
 - Banning biofuel from some feedstocks
 - Introducing ILUC greenhouse gas penalty factor

EC biofuels policy: critical issues for LA countries

- Important topics to be detailed
- 1. Provision to minimise the impact of indirect land use change (Art.19.6)
 - Report by EC expected for March 2010
- 2. Criteria and geographic ranges to determine areas of highly biodiverse grasslands, in which biofuels feedstock cannot be produced (Art. 17.3)

US case: renewable fuel standard

- Energy Independence and Security Act of 2007 (EISA 2007)
 - Biofuels target: 36 billion gallons by 2022
 - Full lifecycle analysis for renewable fuels for verifying whether biofuels will meet GHG established by EISA
 - direct + indirect emissions
- Draft Redulatory Impact Analysis (RFS-2 DRIA)
 - Impact assessment of higher US ethanol demand on Brazilian exports
 - DRIA model: Brazil has not enough land to accomodate all the increase in sugarcane production
 - ICONE, Brazil Land Use Model (BLUM): DRIA overstate GHG emissions associated to land use changes; sugarcane does not displace natural forest area

Biofuels and ILUC:

is there a food-fuel-forest competition?

- Sectoral (partial-equilibrium) models
- Msangi et al. (2006): IMPACT model (IFPRI)
 - Biofuel expansion with focus on food security
 - Biofuel expansion will imply in high food price increases
- Walsh et al. (2003):
 - biofuel supply: 86 billion gallons by 2025
 - ⇒ 16% increase in corn prices
 - ⇒ 6% increase in wheat prices
 - ⇒ 60% increase in soybean prices

Biofuels and ILUC:

is there a food-fuel-forest competition?

- General equilibrium models
- Dixon, Osborne and Rimmer (2007):
 - Substituting 2% oil consumption for ethanol consumption until 2020 reduces oil price, increase employment and increase agricultural export prices
- Reilly and Paltsev (2007)
 - Different GHG targets would make US a net import of agricultural products

Is there a food-fuel forest competition? empirical evidence on the Brazilian case

- Féres et al. (2009)
- Econometric land use model
 - 5 use types: forest, pasture, subsistence crops, other crops, sugarcane
- Simulation: ethanol prices in 2035

Land area variations: A2 scenario

Region	Subsistence crops	Other crops	Sugarcane	Pasture	Forests
Nortn	0,15% ($0,35 \times 10^4$ ha)	-20,65% ($-0,17 \times 10^6$ ha)	959,77% ($0,05 \times 10^6$ ha)	-0,0093% ($-0,21 \times 10^4$ ha)	0,38% ($0,11 \times 10^6$ ha)
Northeast	0,34% ($1,95 \times 10^4$ ha)	-24,99% ($-2,19 \times 10^6$ ha)	803,89% ($8,07 \times 10^6$ ha)	-0,0035% ($-0,11 \times 10^4$ ha)	-20,75% ($-5,89 \times 10^6$ ha)
Southeast	0,49% ($1,42 \times 10^4$ ha)	-9,55% ($-0,84 \times 10^6$ ha)	331,75% ($8,53 \times 10^6$ ha)	-0,0023% ($-0,09 \times 10^4$ ha)	-66,86% ($-7,70 \times 10^6$ ha)
South	0,11% ($0,66 \times 10^4$ ha)	-3,62% ($-0,26 \times 10^6$ ha)	198,96% ($0,69 \times 10^6$ ha)	-0,0022% ($-0,05 \times 10^4$ ha)	-5,56% ($-0,44 \times 10^6$ ha)
Center-West	0,60% ($1,41 \times 10^4$ ha)	-12,23% ($-0,63 \times 10^6$ ha)	614,77% ($1,78 \times 10^6$ ha)	-0,00018% ($-0,01 \times 10^4$ ha)	-3,46% ($-1,17 \times 10^6$ ha)

Is there a food-fuel forest competition? empirical evidence on the Brazilian case

■ Main results

- Absence of deforestation pressure in Amazon region
- Farmers convert pasture and other crops into sugarcane, but not subsistence crops
- Empirical evidence does not support food-fuel-forest competition

Recommendations for LA countries

- Active participation on public consultation regarding international biofuel trade regulation
- Development of land use models/CGE models with a regional perspective
- Engage in effective mapping/monitoring of land use activities