

BIOFUEL SUSTAINABILITY IN LATIN AMERICA & THE CARIBBEAN – A REVIEW OF RECENT EXPERIENCES

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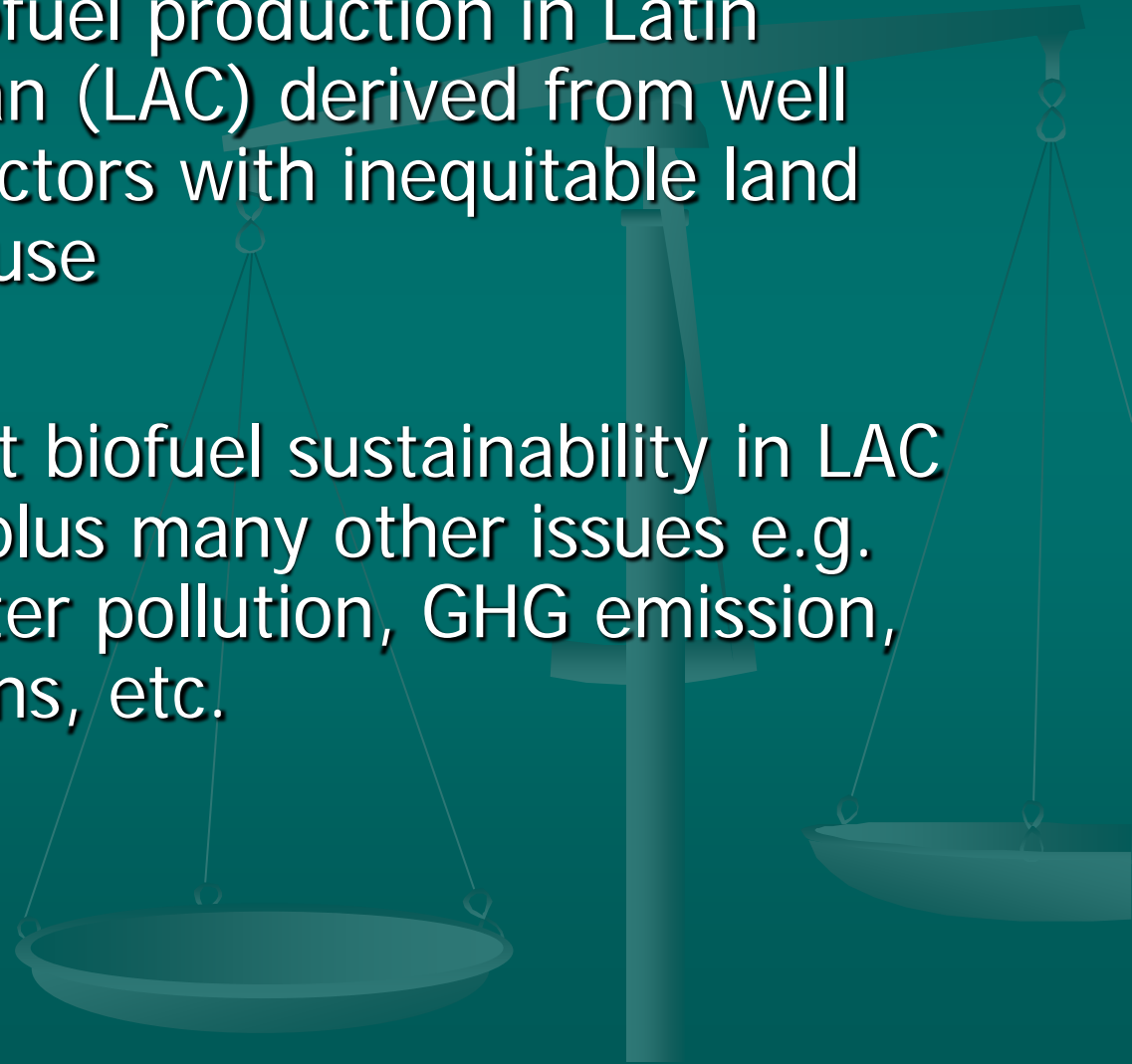
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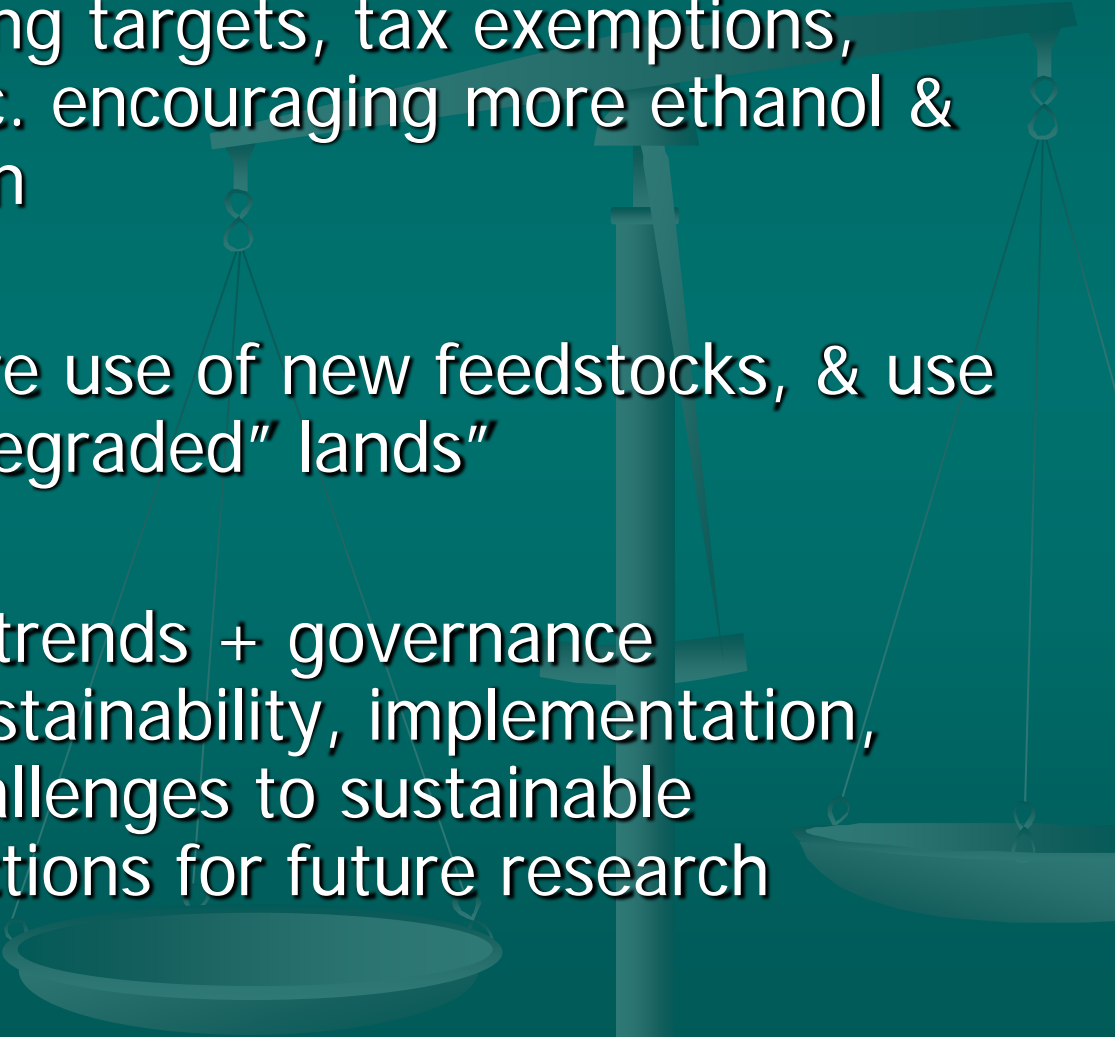
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Introduction

- Vast majority of biofuel production in Latin America & Caribbean (LAC) derived from well established farm sectors with inequitable land distribution & land use
- Doubts raised about biofuel sustainability in LAC for these reasons, plus many other issues e.g. food insecurity, water pollution, GHG emission, labor rights violations, etc.



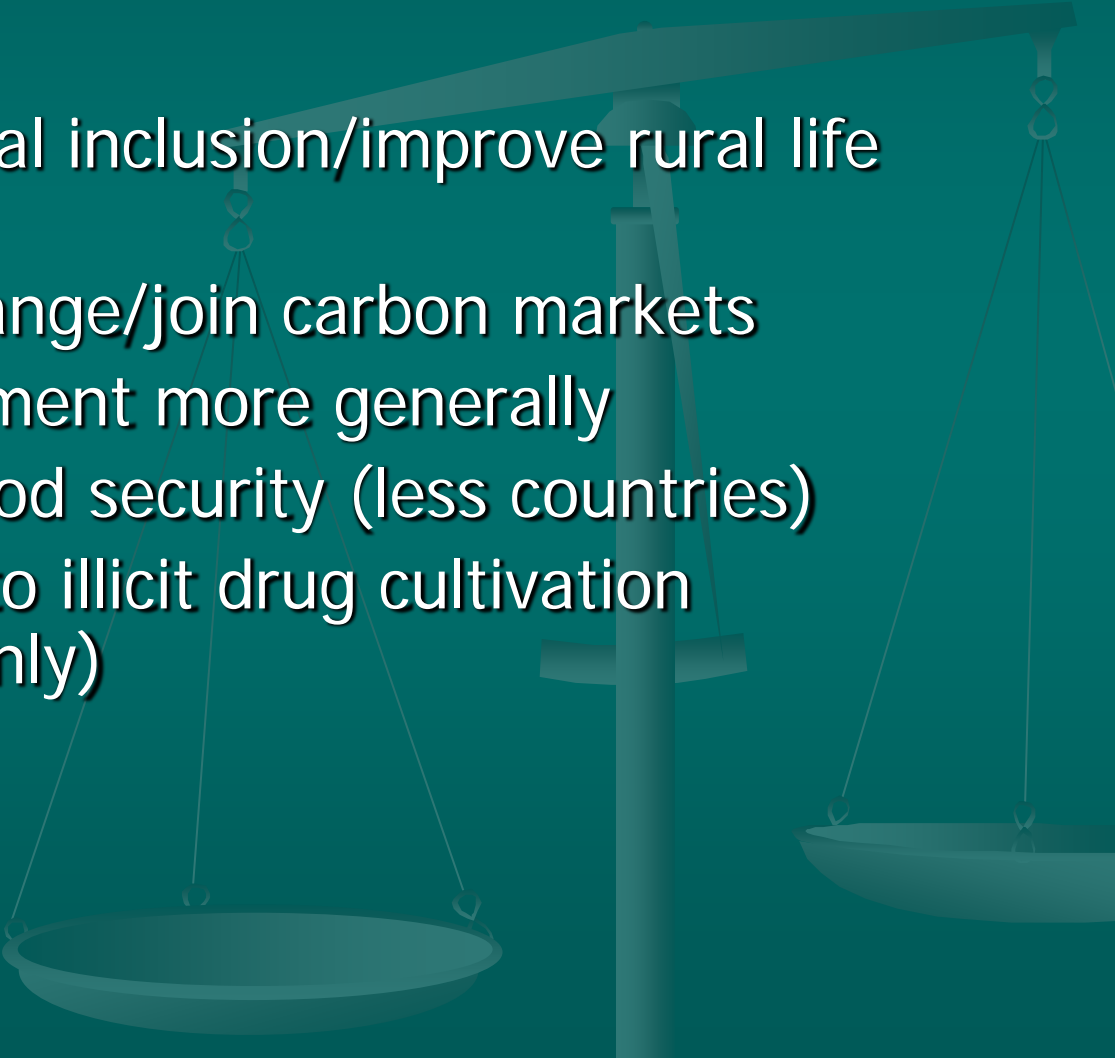
Introduction - cont.

- Globally there's been proliferation of biofuel mandates & blending targets, tax exemptions, other subsidies, etc. encouraging more ethanol & biodiesel production
 - Also encouraged are use of new feedstocks, & use of "marginal" or "degraded" lands"
 - We'll review these trends + governance mechanisms for sustainability, implementation, how to address challenges to sustainable production, + directions for future research
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National Biofuels Policy Objectives

- In LAC today there are several **policy objectives** for biofuels development; 10 are widespread plus an 11th in 2 countries only:
 - energy security/rural energy access;
 - gain competitive advantage/new markets;
 - stimulate economic growth;
 - promote rural development;
 - strengthen or diversify farm sector

Policy Objectives

- job creation
 - reduce poverty/social inclusion/improve rural life (less countries)
 - mitigate climate change/join carbon markets
 - protect the environment more generally
 - avoid impacts on food security (less countries)
 - create alternatives to illicit drug cultivation (Colombia & Peru only)
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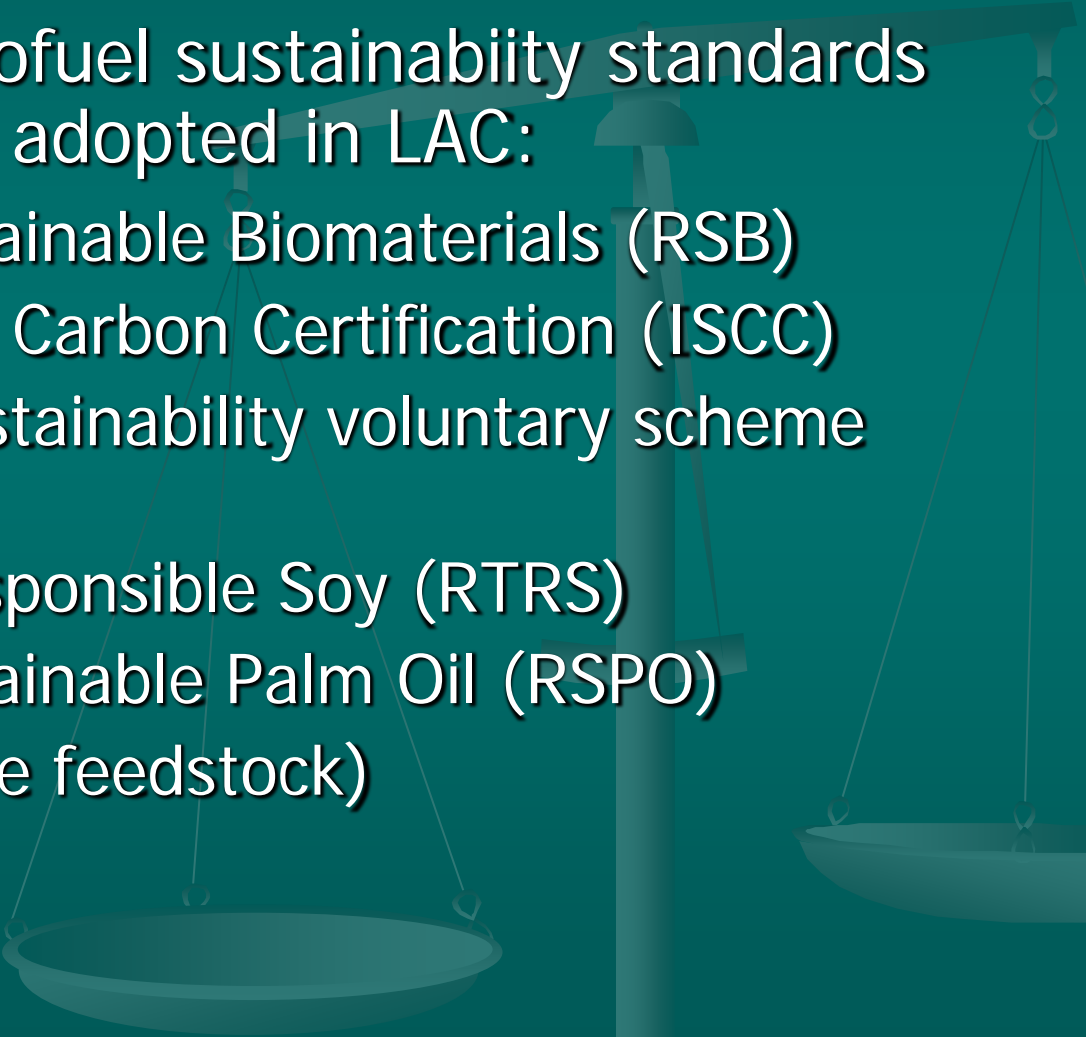
Governing Biofuel Sustainability in LAC & Role of Export Markets

- Governance mechanisms introduced by wide range of actors → national & sub-national governments, intra & supra govt. orgs, private corporations, civil society actors
- **Mechanisms:** policies, regulations, voluntary certification schemes, sustainability standards, meta standards, codes of conduct
 - may be single issue or comprehensive

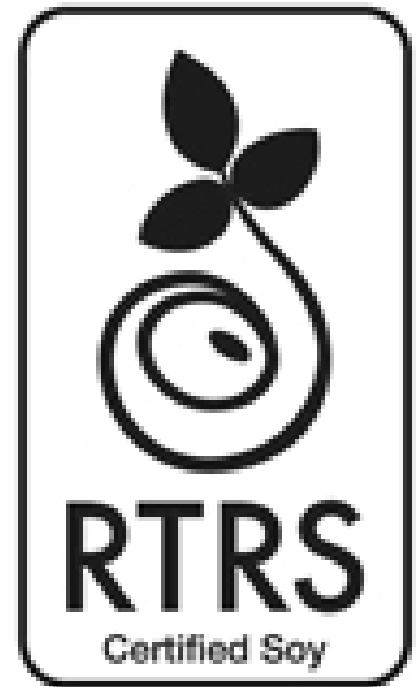
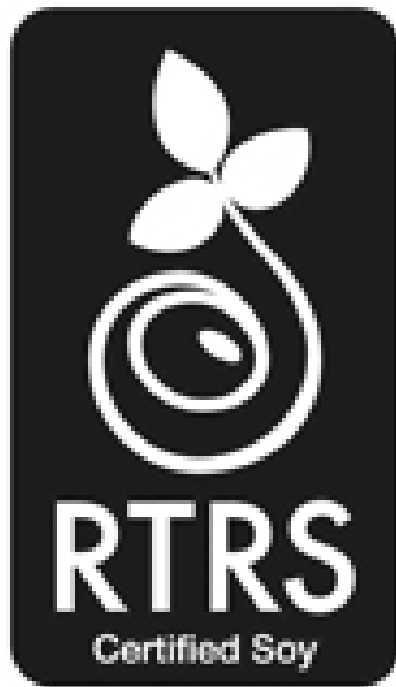
Governance cont.

- US & EU major biofuel export targets from LAC
 - US requires greater GHG reduction from biofuel (2007) imports, and transportation fuel providers in Calif.
- EU passed Renewable Energy Directive (RED) in 2009 to mandate 10% renewable transport fuel; must reduce lifecycle GHG emissions, avoid high bio-diverse lands, lands with high carbon stocks, peatlands → incentives to produce on severely degraded or heavily contaminated lands
 - European Commission (EC) monitors implementation

Governance cont.

- 14 international biofuel sustainability standards accepted by EC; 6 adopted in LAC:
 - Roundtable on Sustainable Biomaterials (RSB)
 - Int. Sustainability & Carbon Certification (ISCC)
 - Biomass biofuel, sustainability voluntary scheme (2BSvs)
 - Round Table on Responsible Soy (RTRS)
 - Roundtable on Sustainable Palm Oil (RSPO)
 - Bonsucro (sugarcane feedstock)
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Governance cont.

- also: Inter-American Development Bank – *Biofuels Scorecard*; Global Bioenergy Partnership – 24 sustainability indicators, pilot tested in Colombia; ISO developing voluntary bioenergy sustainability criteria (Brazil & Germany cooperation – ref. Maggie's talk)
- Schemes usually have multiple criteria & indicators to demonstrate compliance, and have involved multiple stakeholders across supply chain
- - social issues often downplayed or are weak

Status of Sustainability Standard Adoption in LAC

- Voluntary biofuel project certification gaining traction in LAC, incl. qualifying standards for RED
- based on nation by nation review, as of July 2014: 315 certificates in Brazil, 88 in Argentina, 9 in Paraguay, 6 in Guatemala, 5 each in Colombia & Uruguay, 4 in Costa Rica, 3 each in Peru & Nicaragua; 2 each in Chile & in Mexico
 - most popular schemes: RTRS, 2BSvs, ISCC, Bonsucro; only a few have adopted RSP, RSB

Standard Adoption cont.

- Biggest surprise → few takers of RSB standards, which are most detailed & comprehensive, had very widespread stakeholder input worldwide, thus high awareness among practitioners
 - 12 principles, 35 criteria, 200 indicators!
- the popular 2BSv (industry led), in contrast, only requires applicants meet RED minimum criteria in order to access profitable EU biofuel markets

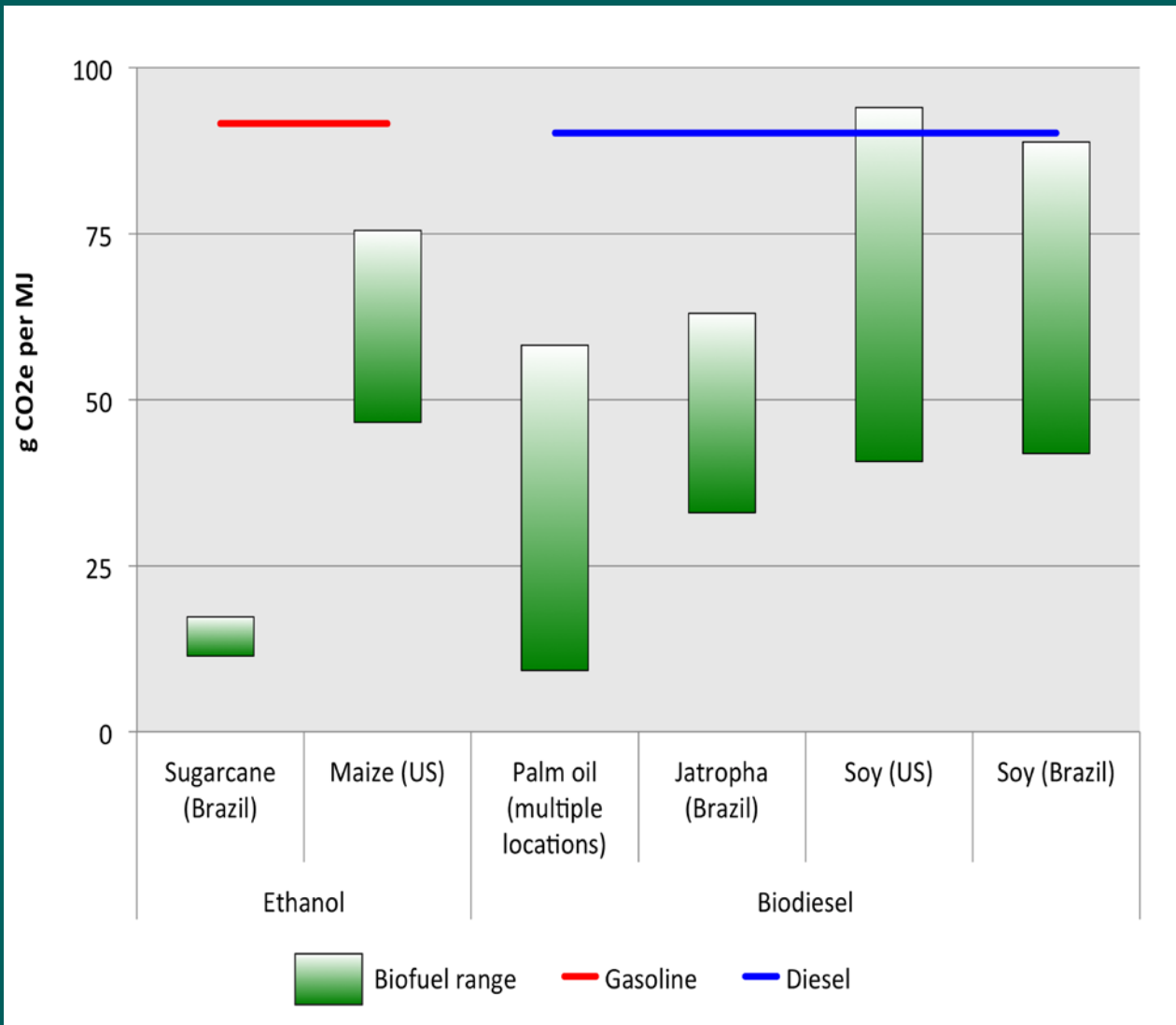
Standard Adoption cont.

- ISCC scheme covers similar range of criteria as RSB but has seen much higher uptake rate
- main difference between ISCC & RSB: ISCC had less stakeholder involvement in standard setting & governance, & has fewer criteria & indicators to comply with, thus probably less burdensome
 - overall: cost of achieving certification gives strategic advantage to large-scale industrial firms vs. small-scale producers

Key Challenges cont.

■ GHG Emissions & Land Use Change

- GHG reduction targets set in USA & EU; incorporated into many certification schemes, though specific reduction targets not set in LAC
- GHG reduction estimates vary widely due to different assumptions & methodologies
- sugarcane can reduce emissions 80-90%, palm 35-90%, jatropha 30-60%, soy 50%, or much less
- however actual emissions reduction may be less due to dLUC (direct land use change) & iLUC (indirect)



Key Challenges cont.

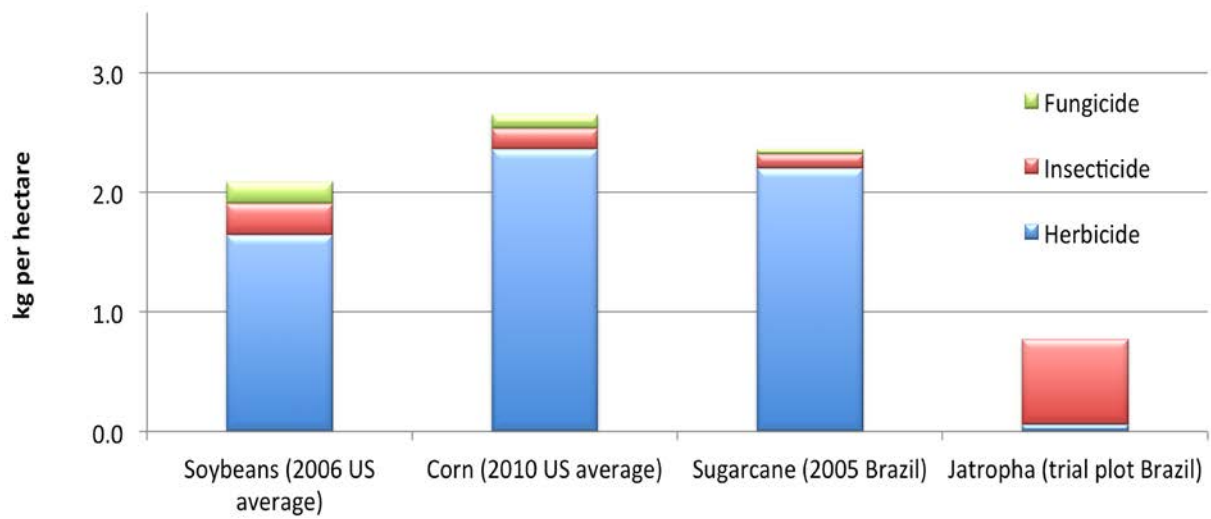
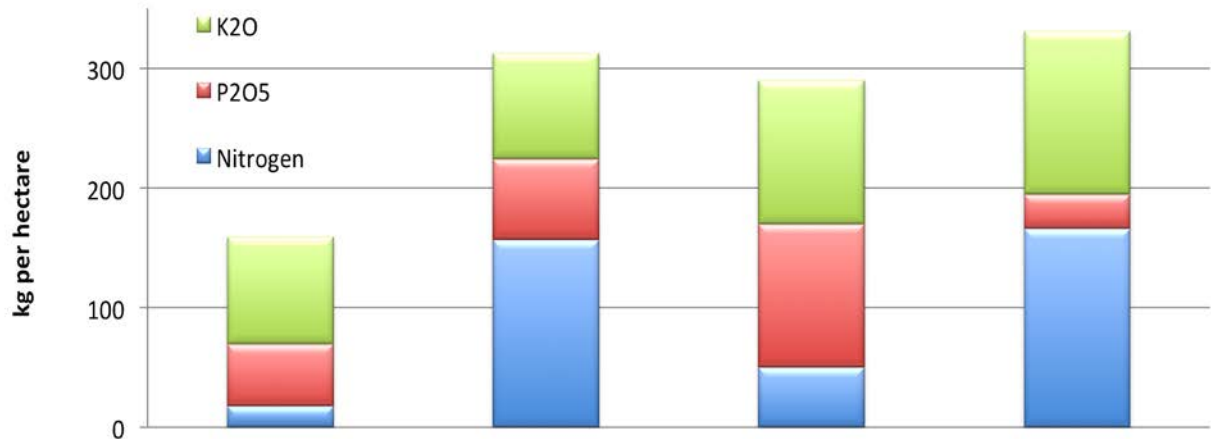
■ GHG Emissions & Land Use Change

- dLUC results from feedstock cultivation displacing natural vegetation
- iLUC results if biofuel feedstock affects commodity markets in ways that induce LUC elsewhere
- however: dLUC can be positive, eg perennial crops planted on degraded pasture lands may increase C
- most sustainability schemes *acknowledge* iLUC, but only the US EPA & CA incorporate it, and have been subjected to legal challenges

Key Challenges cont.

■ Water Accessibility & Quality

- large scale farming production can have large impacts on nearby communities (incl. evapo-transpiration & irrigation, eg Colombia), from water demand for feedstock production & processing, plus runoff or pollution from refining
- fertilizer & pesticide use high in LAC
- salts from cooling towers & boilers must be discharged
- ethanol also discharges vinasse waste, though Brazil increasingly using it for ferti-irrigation in cane fields




Key Challenges cont.

■ Food Security

- occurs through *indirect* impact of biofuels on global markets, effecting prices of staple grains & oils
- in 2007-08, e.g. biofuel expansion may have added 20-40% to increased price of staple foods, *but*: many other factors account for more
- ethanol production from maize? Little such production in Latin America, but Mexico & Colombia are major importers, thus backlash (Mexican 'tortilla crisis' & backlash in 2007)

Key Challenges cont.

■ Food Security

- factors within LAC countries are relevant in even less direct ways
 - while soy & sugar are not really staple foods, expanded cultivation for biofuel could displace land used for food crops, mainly affecting local communities
 - among the 6 biofuel certification schemes adopted in LAC, only ISCC & RSB have food security criteria, and for ISCC isn't a core criterion
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Key Challenges cont.

■ Land Tenure Issues

- generations of unequal land ownership in the region have resulted in some of the highest such land & wealth disparities in the world, + conflict/violence
- most biofuel production highly concentrated, *not* helping the rural poor
- sugarcane & soybean production highly concentrated, e.g. in Brazil ~70% of cultivation done by 340 large-scale mills, w/avg. holding of 30,000 ha

Key Challenges cont.

■ Land Tenure Issues

- result of inequities has been social reform movements, via *Via Campesina* (global movement of peasants & small farmers w/roots in Central America, & Brazil's Landless Rural Workers' Movement (MST in Portuguese) → some opposition to biofuels
- most sustainability standards have land rights provisions, but rely largely on existing law & international treaties protecting indigenous rights; 2BSv doesn't mention land tenure & not a *core* criterion for Bonsucro; RSB goes further but few use it

Conclusions/Future Research

- many social/environmental concerns accompanied rapid biofuel development in LAC
- 400+ feedstock cultivators in region certified as "sustainable" operations
- unclear if this means real sustainability in LAC, or simply market savvy businesses "green-washing" their operations in order to access foreign markets in EU & USA
- active monitoring & impact evaluation needed to determine true sustainability of biofuel operations

Conclusions/Future Research cont.

- too early to say if sustainable biofuel certification schemes in LAC (esp. ISCC, Bonsucro, RTRS) are strong enough to safeguard against adverse environmental & social effects
- additional mechanisms besides these voluntary certification schemes needed, e.g. make more schemes RED eligible & make it more rigorous?
 - regional cooperation could facilitate this
- also need for greater incorporation of social movements & their concerns into biofuel sector