



Sustainability for the Global Biofuels Industry Minimizing Risks and Maximizing Opportunities

May 17, 2011

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CONSERVATION
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**CONSERVATION
INTERNATIONAL**



vision

We imagine a healthy prosperous world in which societies are forever committed to caring for and valuing nature for the long-term benefit of people and all life on Earth.

mission

Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature for the well-being of humanity.



field presence

- Offices in 35+ countries
- 1000+ partners worldwide
- Strong connections to communities, governments
- Focus on developing solutions that work locally and can be replicated globally

top rated charity

Charity Navigator ★★★★★ (four stars)

Exceptional: Exceeds industry standards and outperforms most charities in its cause



smart science + solutions in action

- CI has helped protected more than 500 million acres on land and sea, an area large enough to be seen from space.
- CI pioneers innovative funding, giving more than \$100 million to conservation partners over the past five years.
- CI has helped to safeguard about one-third of all globally threatened mammals, birds and amphibians around the world.
- CI will work with indigenous people to protect more than 61 million acres of traditional lands by the end of this decade.
- CI will protect 35 new marine areas in the next three years, preserving some of the world's most pristine coral reefs.

leading the responsible corporate movement





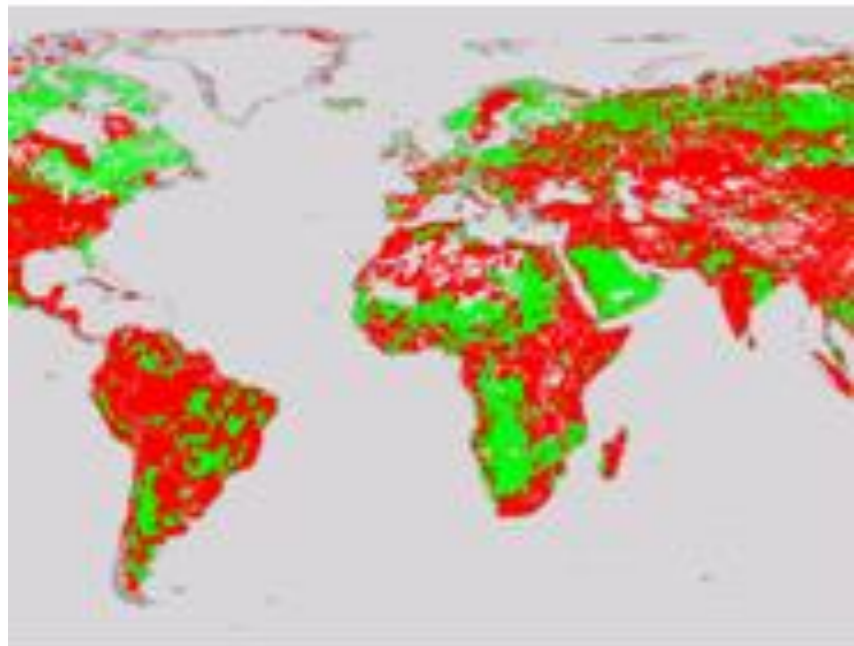
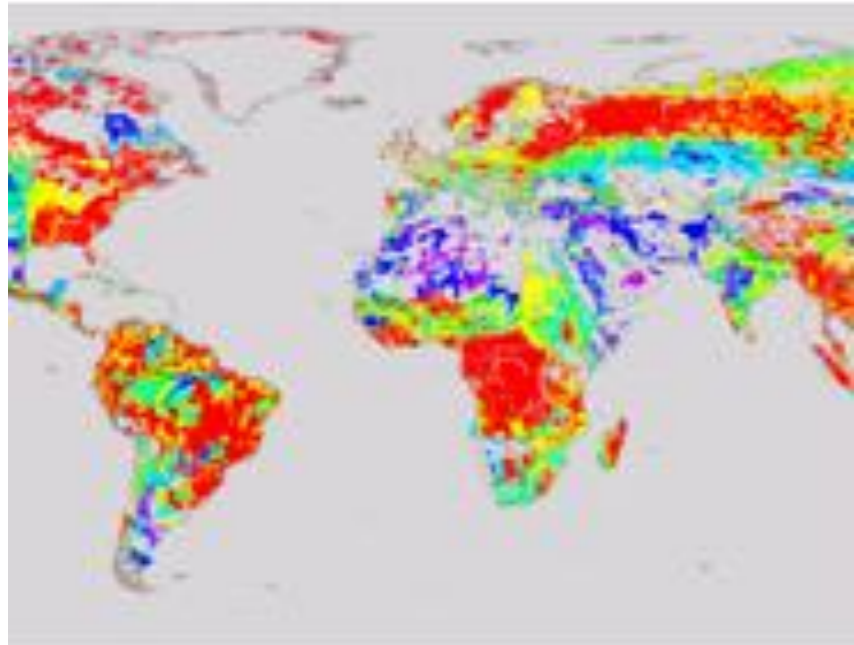
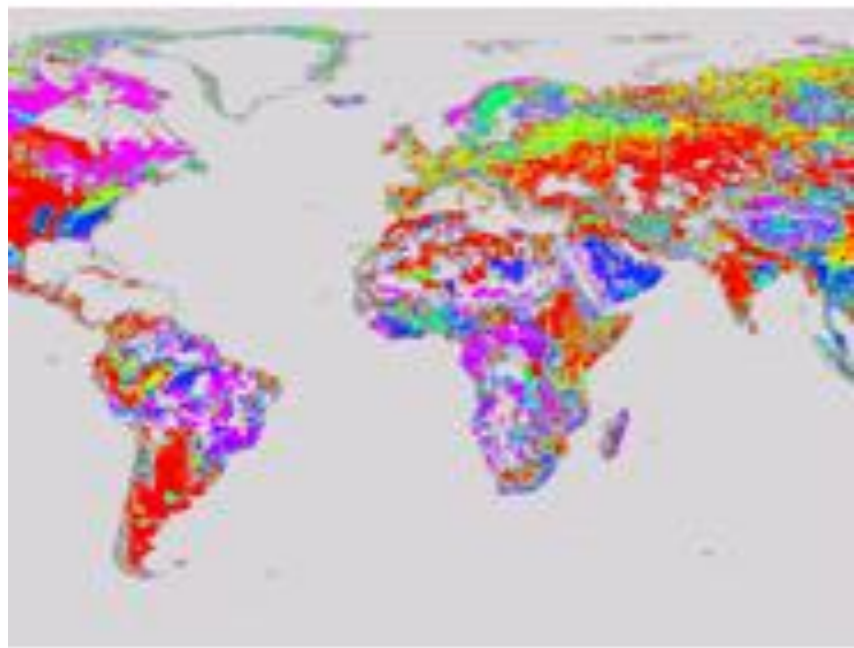
Sustainable Biofuel Crops Project

Objectives of SBFI

Produce fundamental knowledge based upon sound scientific **data generation, mapping, and field implementation** that ensures the development of a **global biofuel industry**, and especially feedstock production, is managed consistently with **environmental sustainability**.

Sustainable Biofuel Crops Project

- Work in 5 countries/ regions, plus US and global
- Integrates science, field work, policy and markets
- Three components:
 - Knowledge Generation
 - Field Studies
 - Policy and Market Frameworks



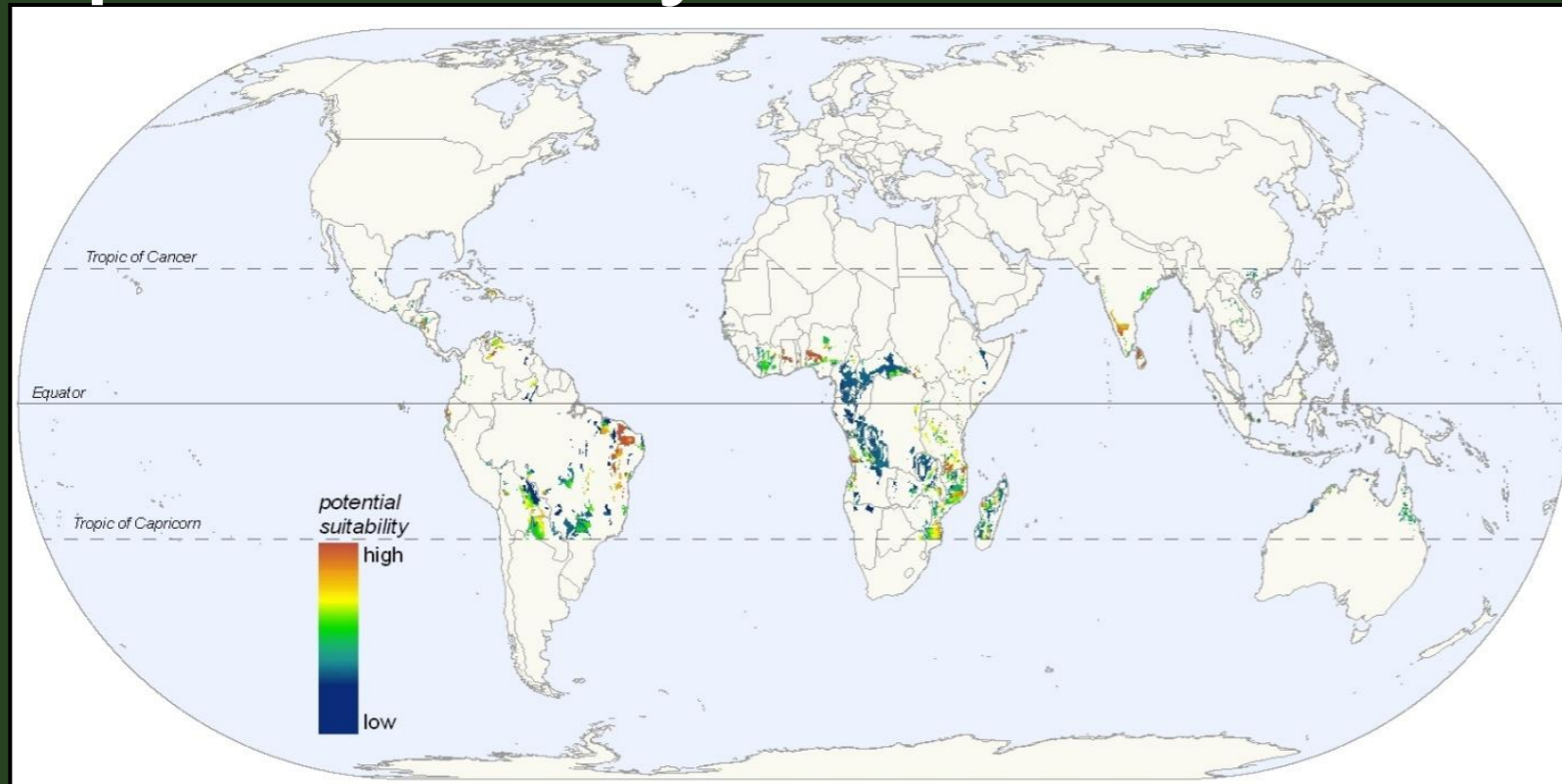
Sustainable Biofuel Crops Project

Knowledge Generation

Spatial analysis: Identify Risk and Opportunity

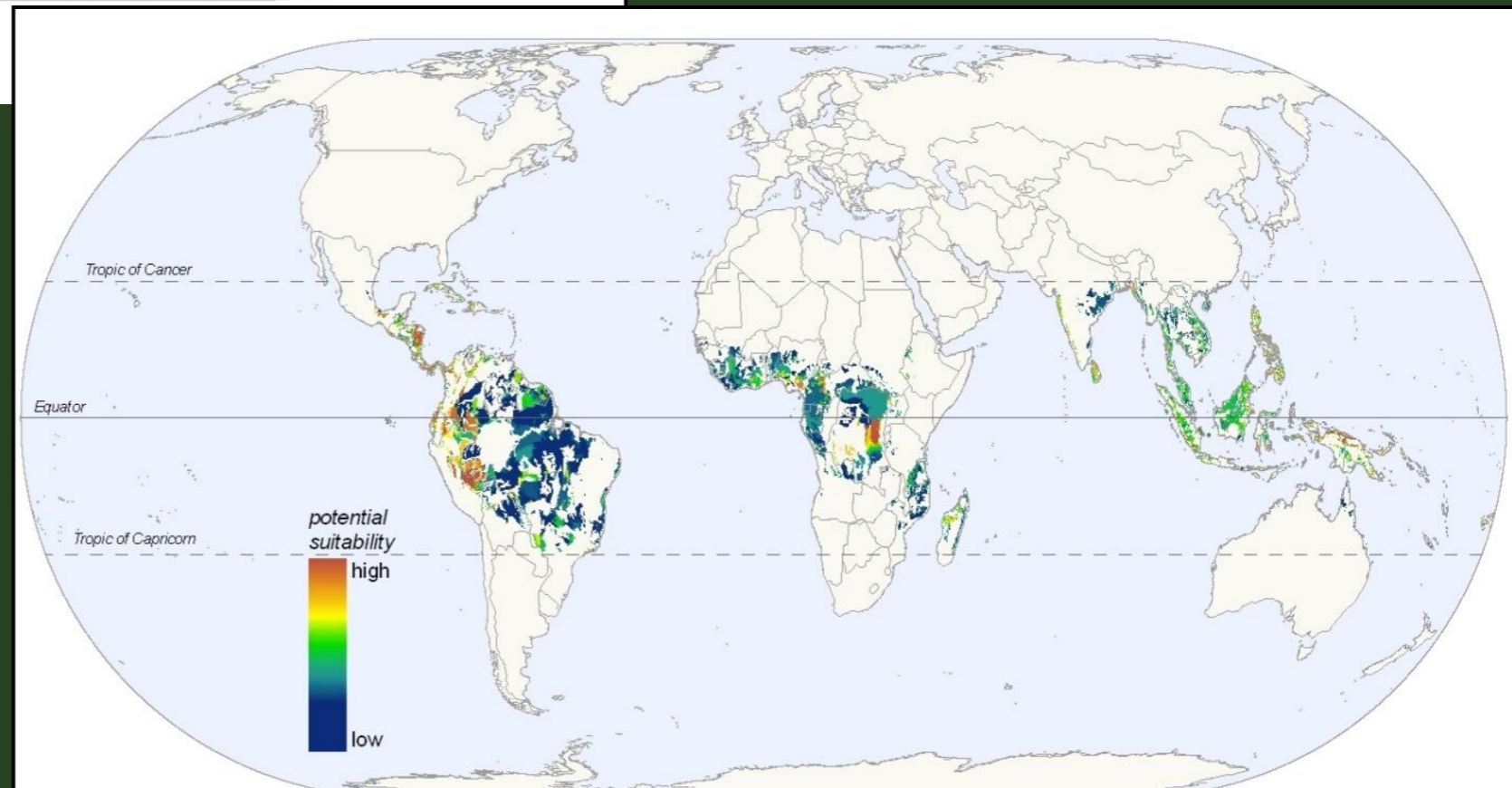
- Develop potential suitability profiles for 9 feedstocks
- Assess potential **risks**:
 - Traditional food crop suitability
 - Secondary agricultural effects (displacement)
 - Biodiversity priority
 - Ecosystem services
- Assess potential **opportunities**:
 - Underutilized/degraded lands
 - Low traditional food crop suitability
 - Minimal negative impacts on conservation priority areas

Spatial analysis: Potential feedstock suitability

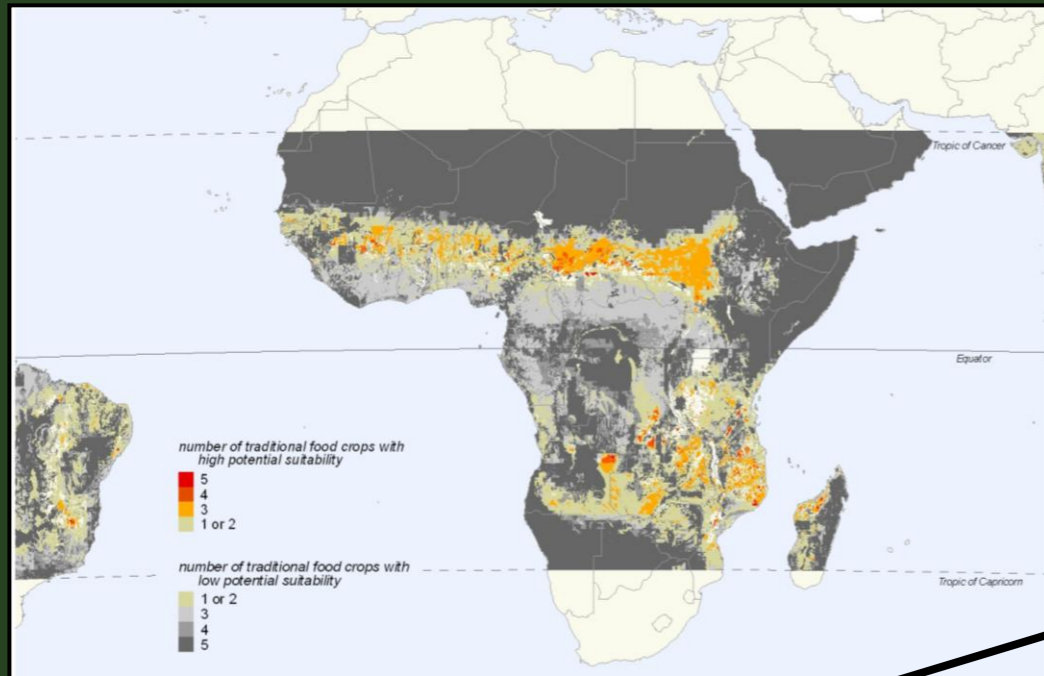


Jatropha

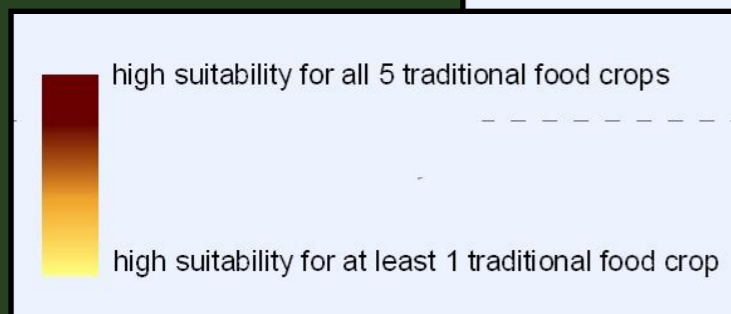
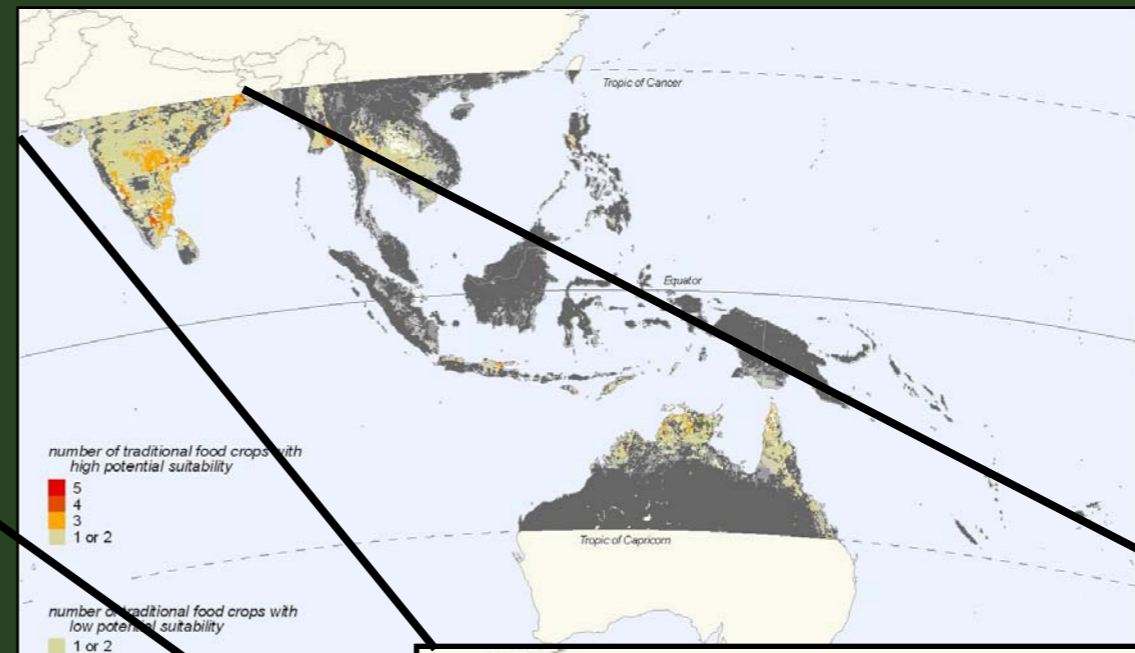
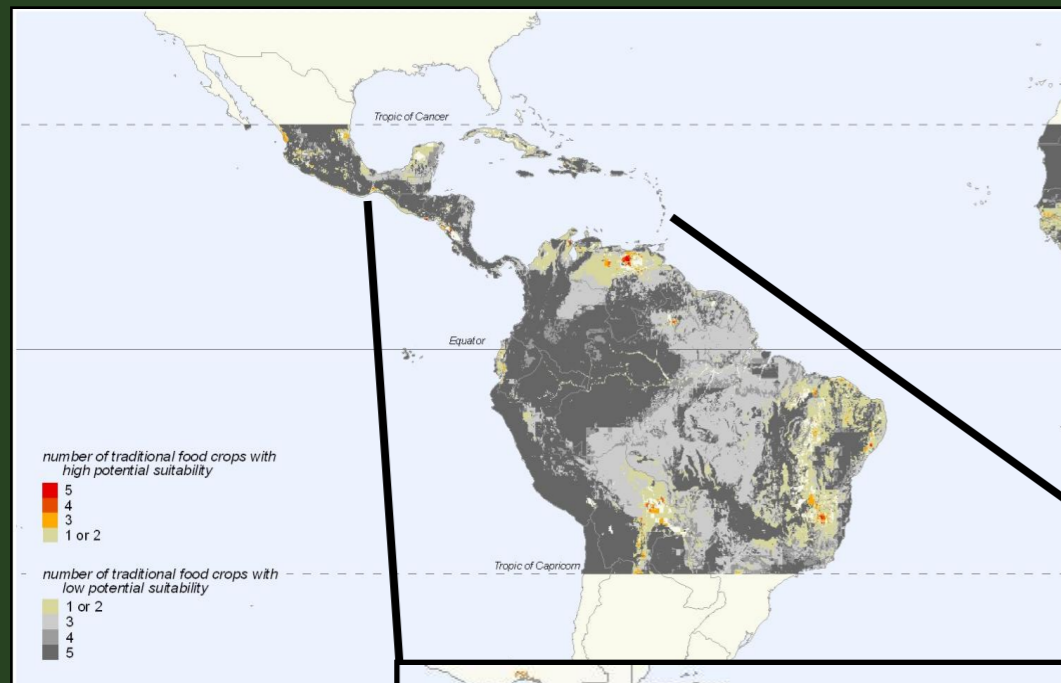
Oil Palm



Potential Risk: feedstock suitability & staple food crop suitability

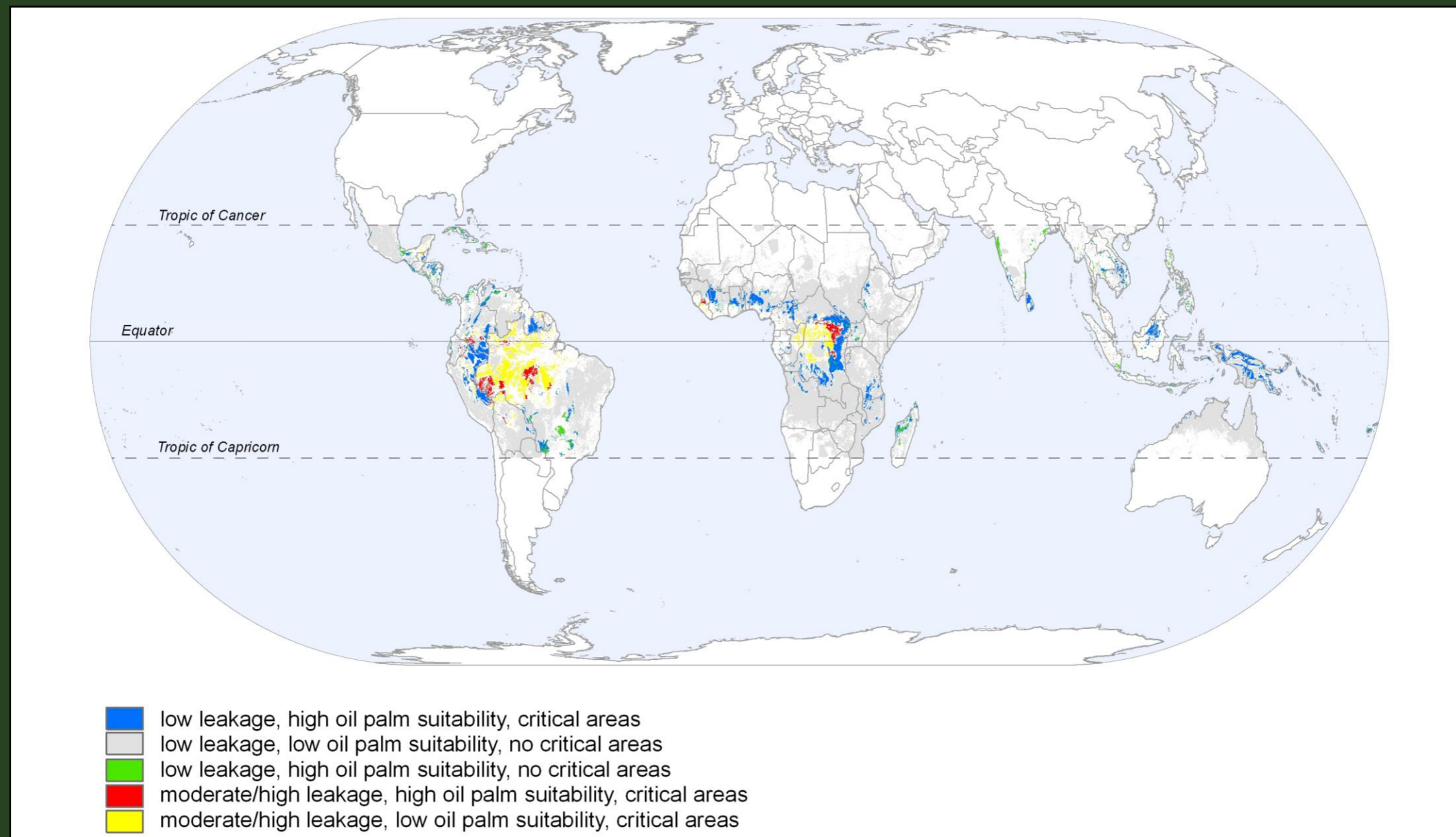


Potential Risk: biofeedstock suitability & staple food crop suitability

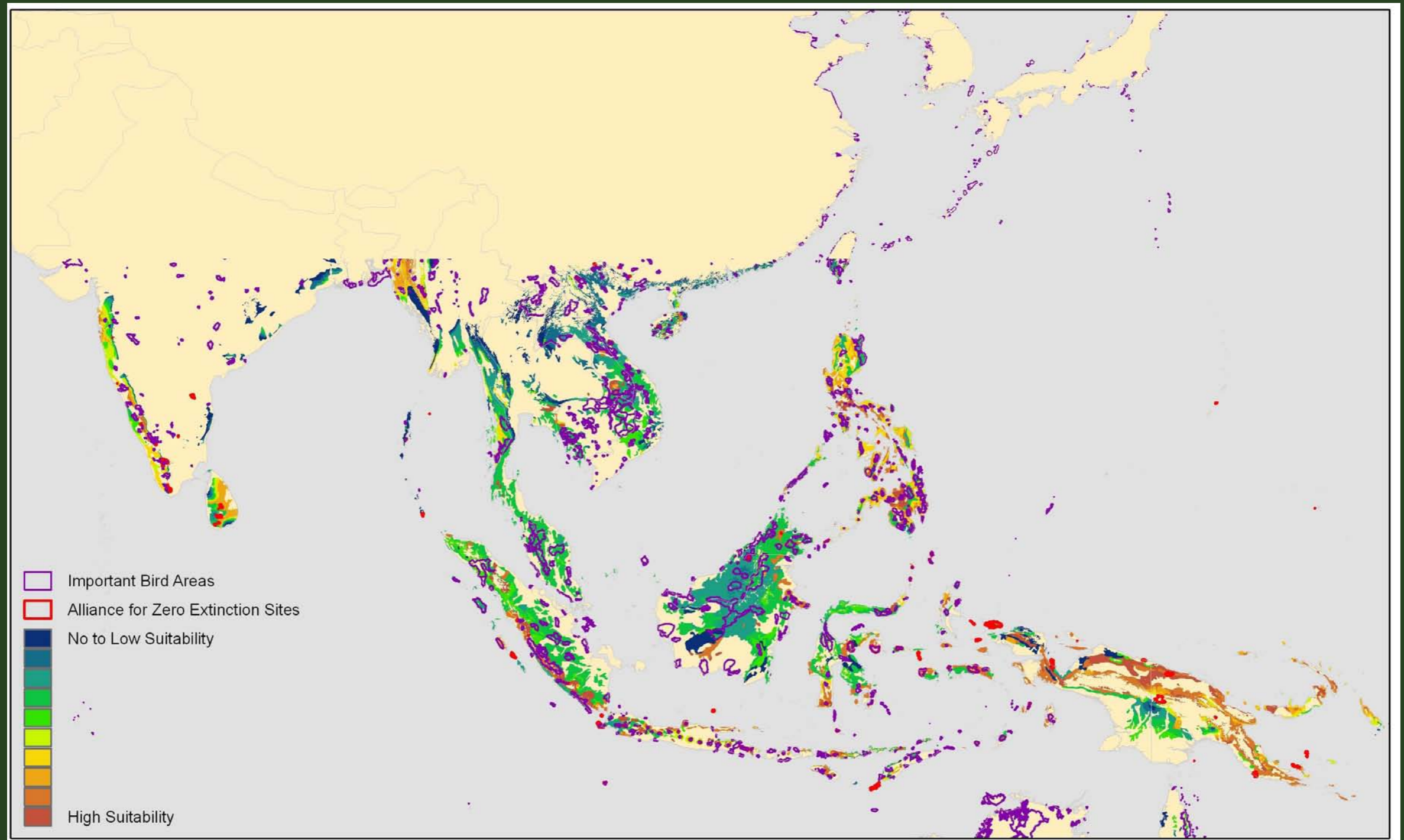


Potential Risk: areas sensitive to secondary effects of agricultural-displacement

- Expansion of feedstock cultivation in agricultural areas
- Expansion of agriculture into forest extent → *leakage*
- Potential impact on critical natural areas



Potential Risk: Biodiversity

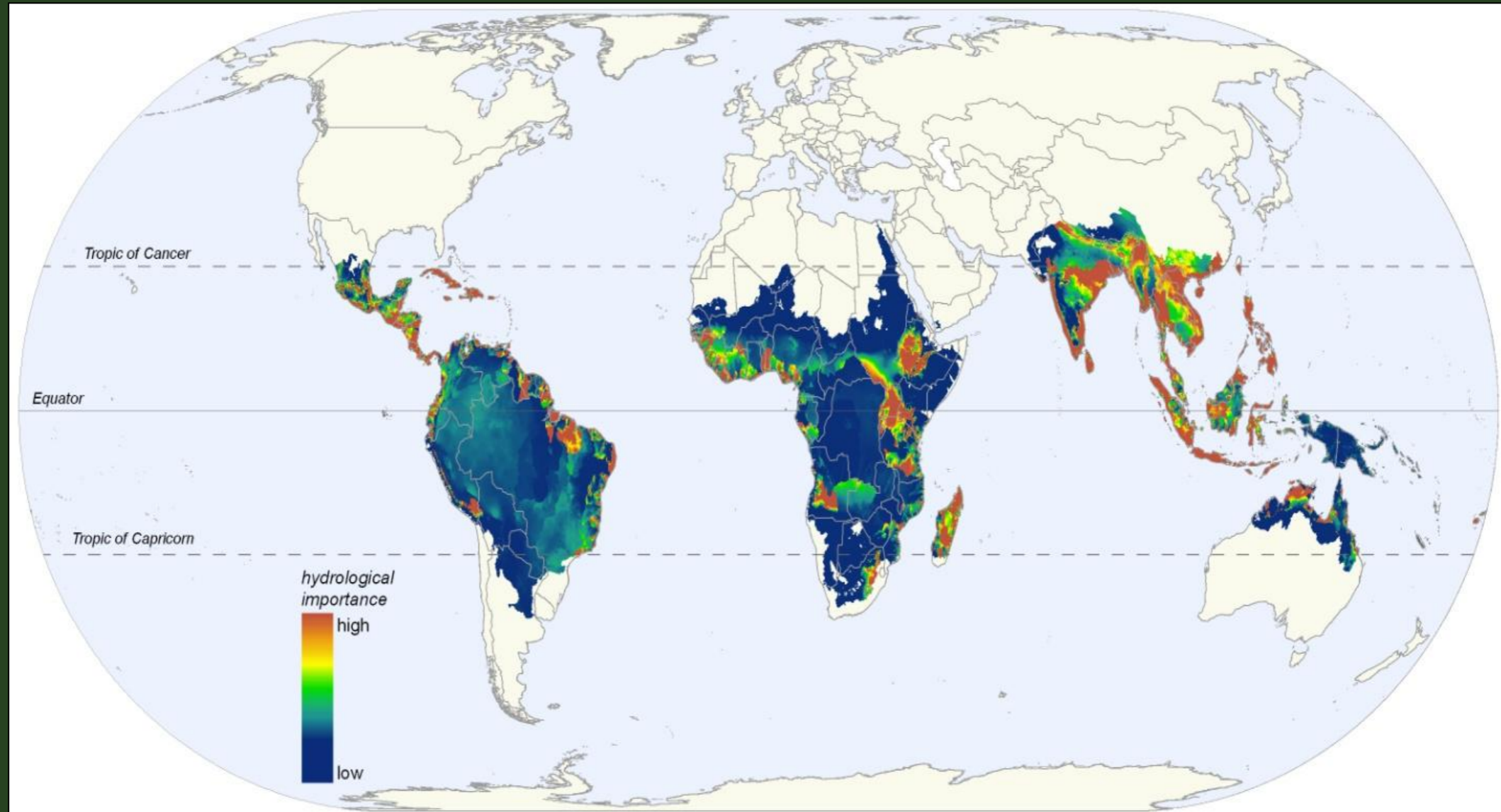


Oil palm suitability, Important Bird Areas, and Alliance for Zero Extinction Sites

Potential Risk: Biodiversity

Crop & Region	Total area suitable for oil palm (ha)	Total area of biodiversity priority (ha) (by priority type)	Area of biodiversity priority within land suitable for biofuel (ha)	% of biodiversity priority land that is suitable for biofuel (%)	% of land suitable for biofuel that is also biodiversity priority land (%)
		Protected Areas			
Oil Palm Africa	209,898,690	384,148,613	28,600,998	7	14
Oil Palm Asia	259,662,440	223,704,073	41,401,616	19	16
Oil Palm Central South America	265,788,610	538,267,301	65,960,550	12	25
		Wetlands			
Oil Palm Africa		144,748,921	3,816,692	3	2
Oil Palm Asia		103,015,681	11,268,213	11	4
Oil Palm Central South America		154,547,669	12,784,711	8	5
		Key Biodiversity Areas			
Oil Palm Africa		194,622,702	15,029,094	8	7
Oil Palm Asia		80,050,010	30,794,436	38	12
Oil Palm Central South America		213,700,044	45,622,208	21	17
		Important Bird Areas			
Oil Palm Africa		103,162,178	12,989,039	13	6
Oil Palm Asia		68,053,646	25,177,712	37	10
Oil Palm Central South America		214,176,515	44,929,581	21	17
		Alliance for Zero Extinction			
Oil Palm Africa		7,270,189	1,433,357	20	0.68
Oil Palm Asia		3,733,677	1,815,720	49	0.70
Oil Palm Central South America		32,133,541	8,149,068	25	3
		Hotspots			
Oil Palm Africa		402,882,861	49,830,173	12	24
Oil Palm Asia		454,470,118	211,792,024	47	82
Oil Palm Central South America		592,373,334	104,572,636	18	39
		Wilderness Areas			
Oil Palm Africa		291,733,395	55,008,177	19	26
Oil Palm Asia		82,206,495	35,068,979	43	14
Oil Palm Central South America		666,261,023	143,723,856	22	54

Potential Risk: Hydrological importance



Composite index showing the combined influence of population, area of irrigable agriculture and important biodiversity areas

Potential Risk: Hydrological importance

Region	Biofuel crop	Total area of hydrological priority (ha)	Area of hydrological priority within land suitable for biofuel (ha)	Overlap of hydrological priority area with land that is suitable for biofuel crops (%)
Central & South America	Jatropha	318,943,965	35,366,205	11
	Eucalyptus (nit)		22,648,093	7
	Eucalyptus (cam)		112,359,498	35
	Eucalyptus (glob)		17,931,510	6
	Eucalyptus (grand)		89,627,975	28
	Soy		79,601,658	25
	Sugarcane		104,760,497	33
	Switchgrass		13,800,301	4
	Cassava		162,762,059	51
	Oil Palm		76,342,269	24
Africa	Jatropha	425,490,416	72,253,459	17
	Eucalyptus (nit)		31,179,434	7
	Eucalyptus (cam)		246,545,103	58
	Eucalyptus (glob)		43,916,780	10
	Eucalyptus (grand)		161,302,899	38
	Soy		205,757,952	48
	Sugarcane		82,166,429	19
	Switchgrass		40,649,270	10
	Cassava		257,192,269	60
	Oil Palm		70,209,780	17
Asia	Jatropha	531,197,530	43,158,820	8
	Eucalyptus (nit)		11,073,032	2
	Eucalyptus (cam)		253,117,990	48
	Eucalyptus (glob)		17,972,541	3
	Eucalyptus (grand)		164,234,127	31
	Soy		127,018,797	24
	Sugarcane		222,680,018	42
	Switchgrass		54,608,908	10
	Cassava		351,506,395	66
	Oil Palm		194,319,233	37

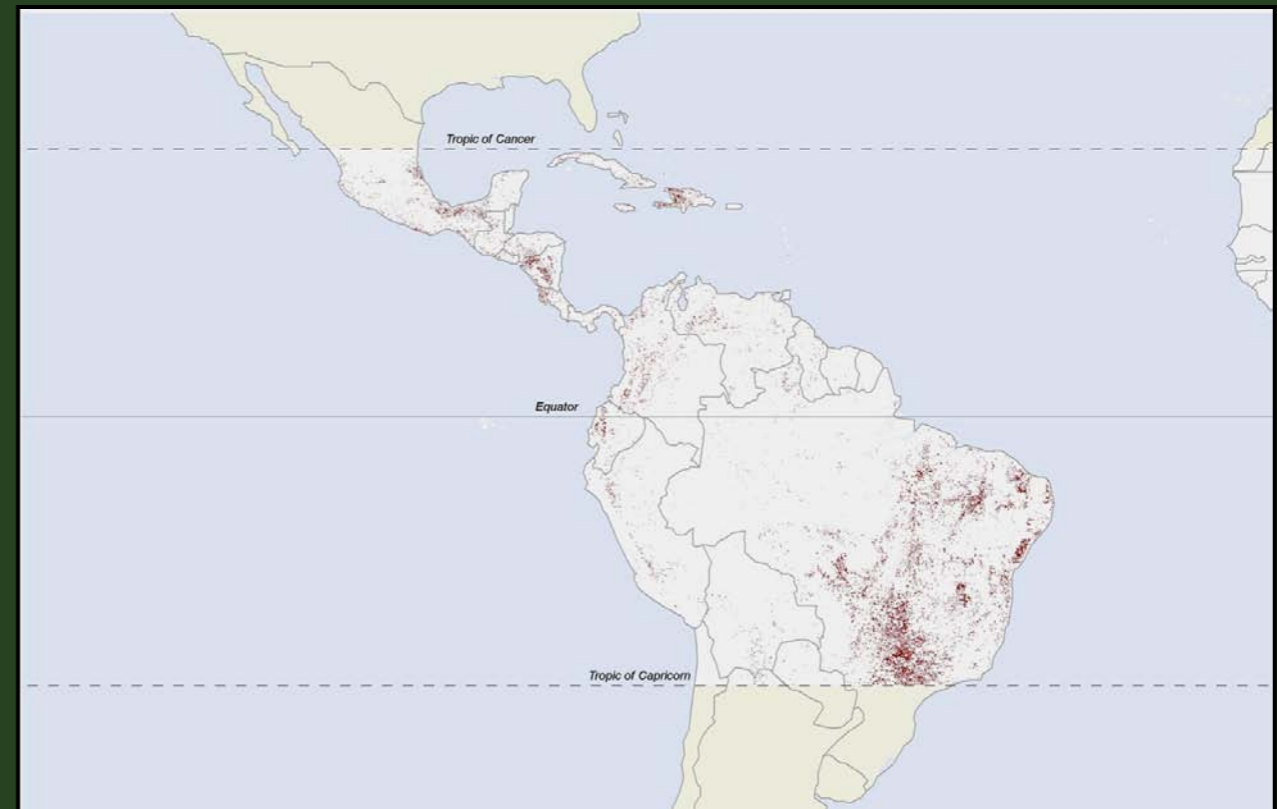
Potential opportunity: underutilized & degraded lands



Coarse scale identification:

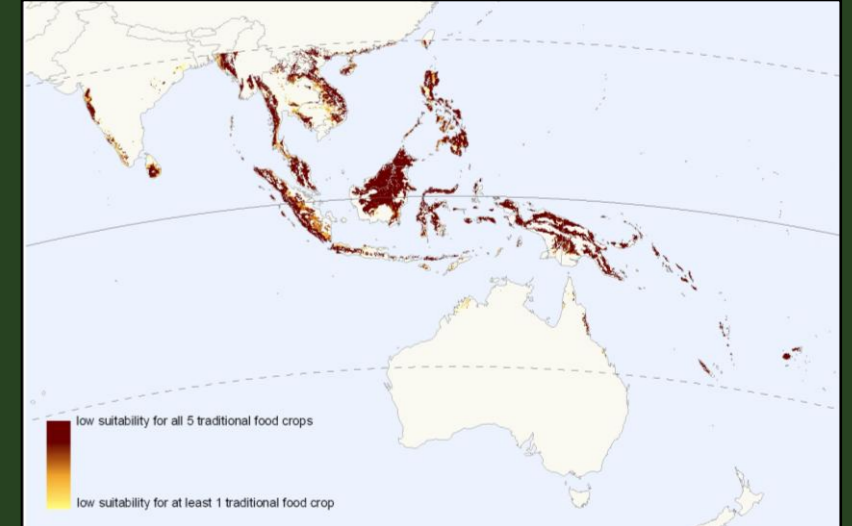
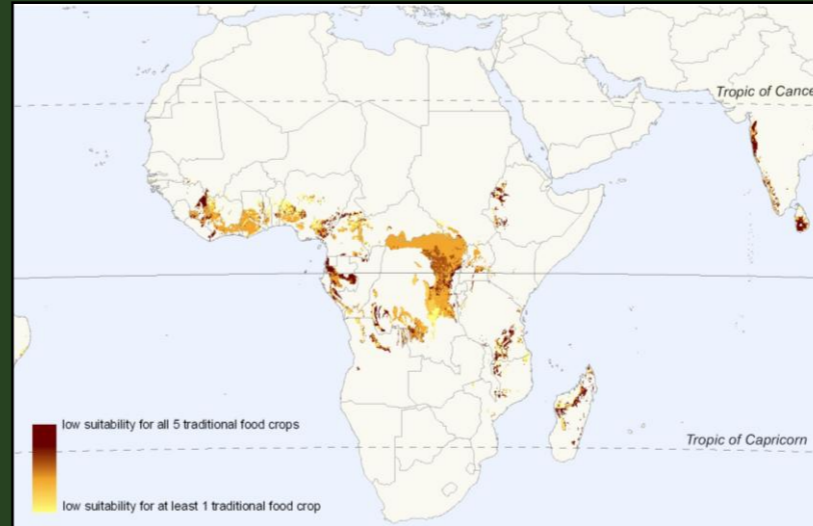
- Areas defined as previously converted
- Areas considered underutilized/degraded

Represent potential opportunities for feedstock cultivation while minimizing potential negative impacts

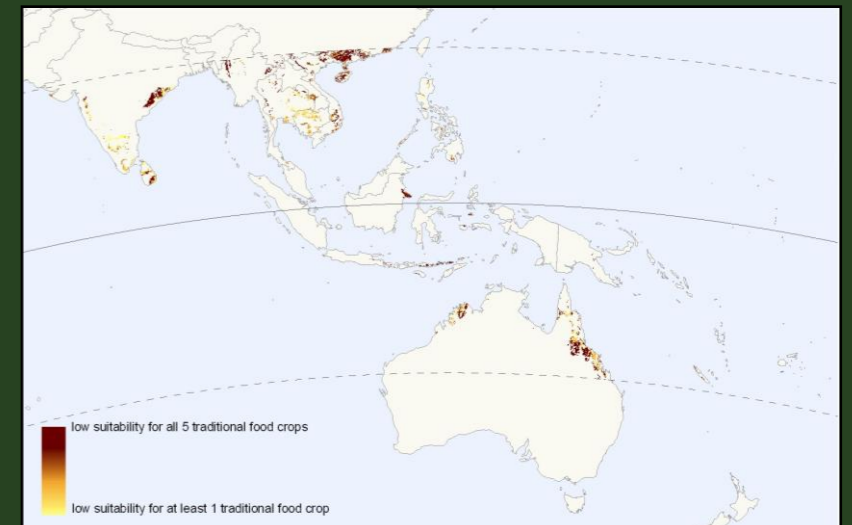
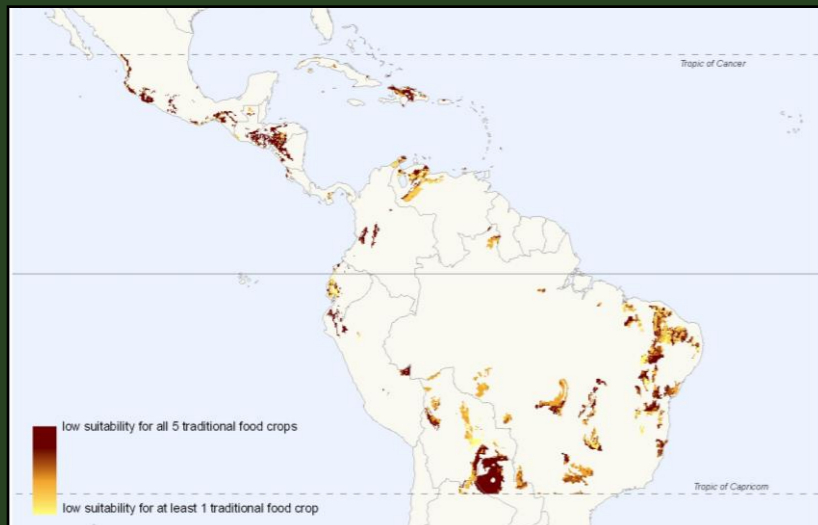


Potential opportunity: areas of low staple crop* suitability

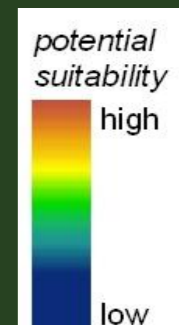
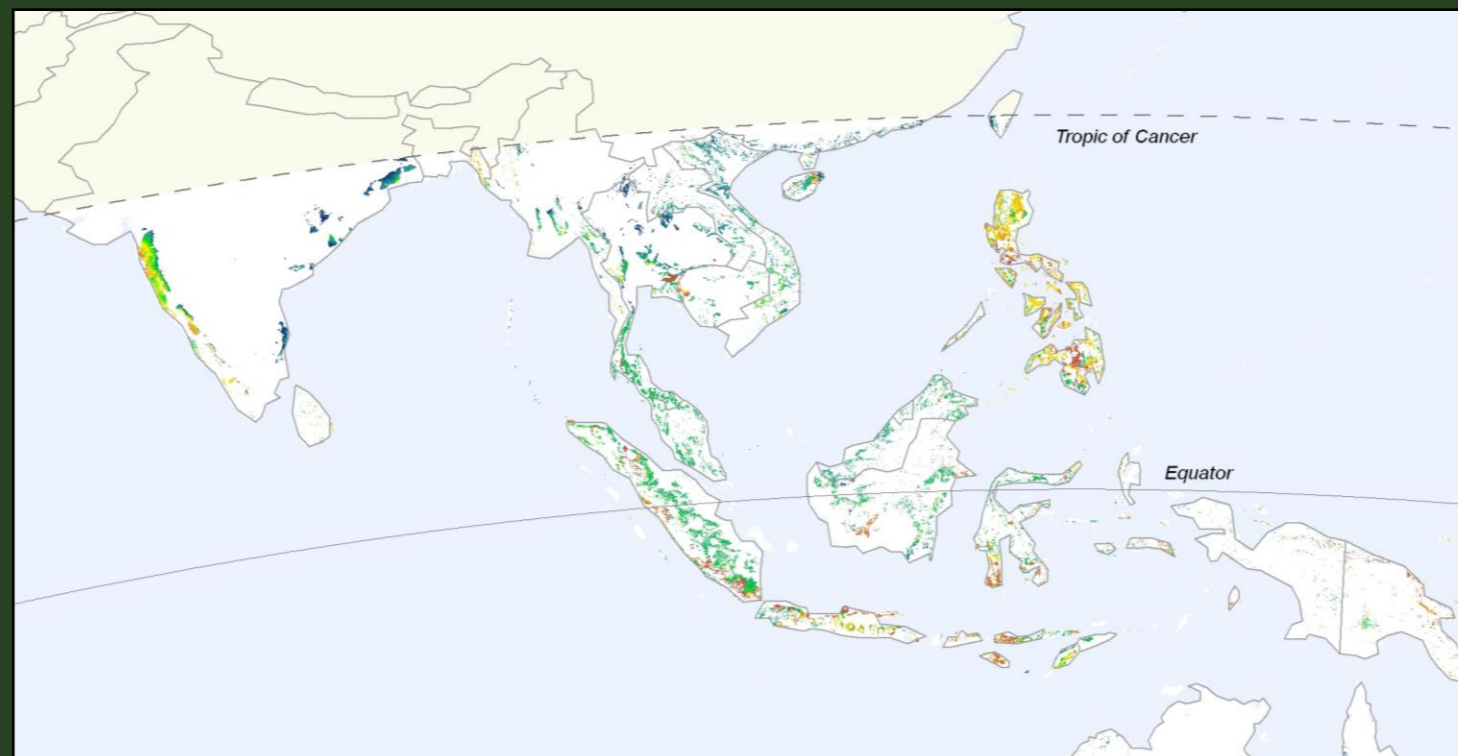
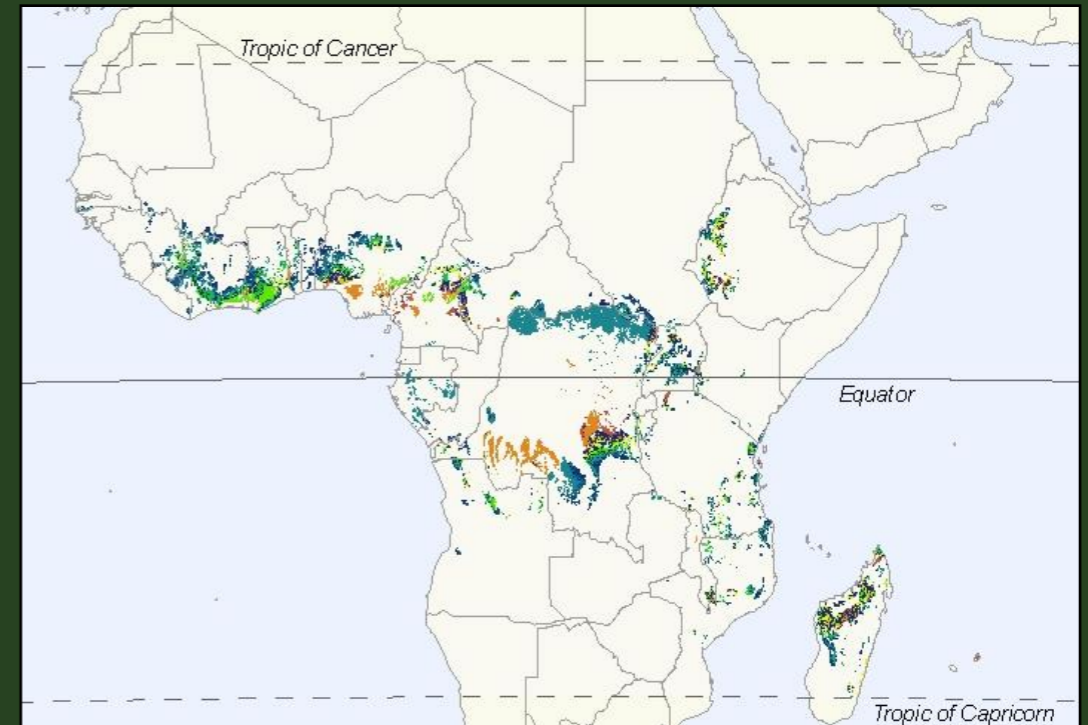
Oil palm



Jatropha



Potential opportunity: conservation priority areas omitted from oil palm suitability zones



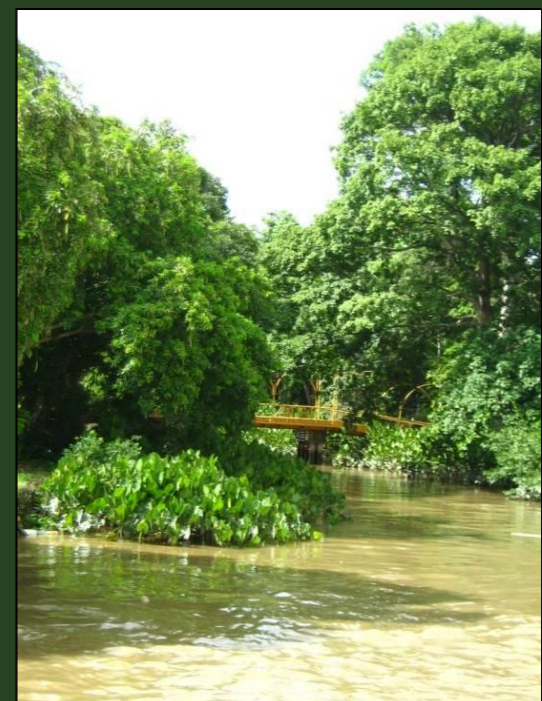
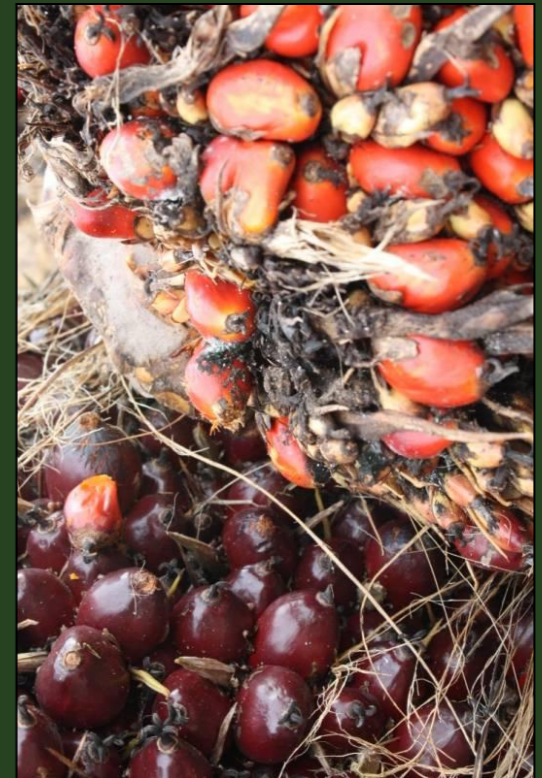
Responsible Cultivation Areas

Partnership between CI, Ecofys, and WWF
(coordinated by Ecofys)

Identify, and (eventually) certify feedstock production with a low risk of indirect effects

- Use land without provisioning services (“degraded”)
- Increasing land productivity through integration with non-bioenergy feedstock systems
- Increasing land productivity of existing bioenergy feedstock systems

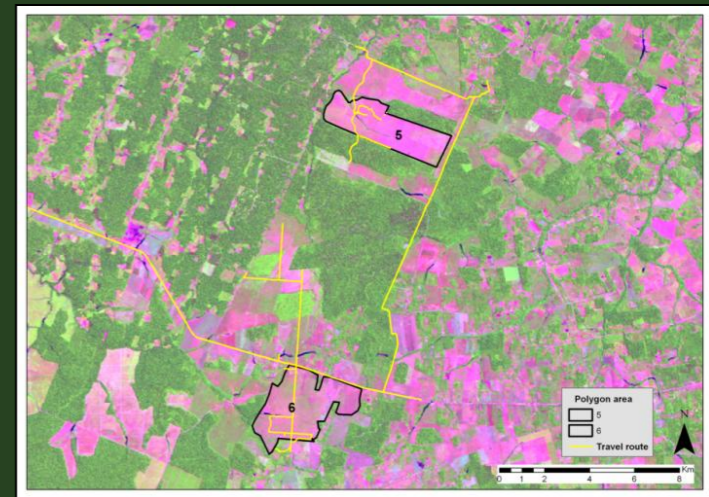
Methodology is universally applicable (different crops, regions) and uses existing tools



RCA Values

Establishment of energy crop plantations:

- Maintains or increases **High Conservation Values**
 - Does not lead to significant reductions in **carbon stocks**
 - Respects the legal **land status** and **customary land rights**
 - Does not cause **displacement** of existing (and future) production
- ...and
- Intensification does not cause adverse **environmental or social effects**

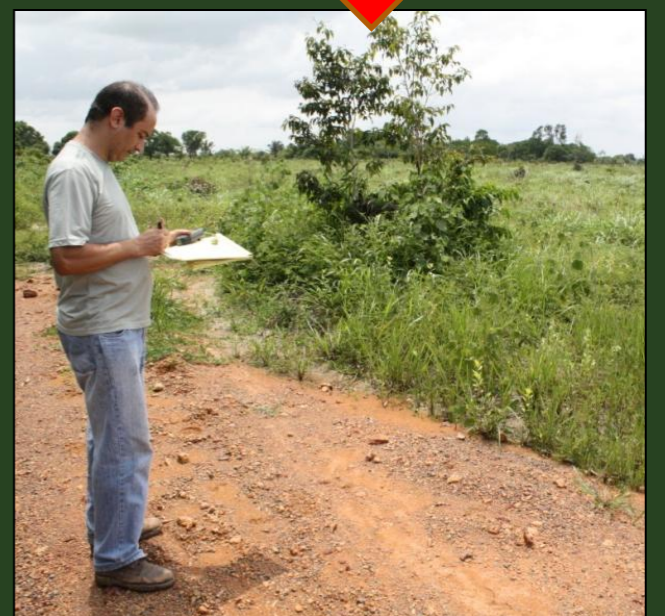
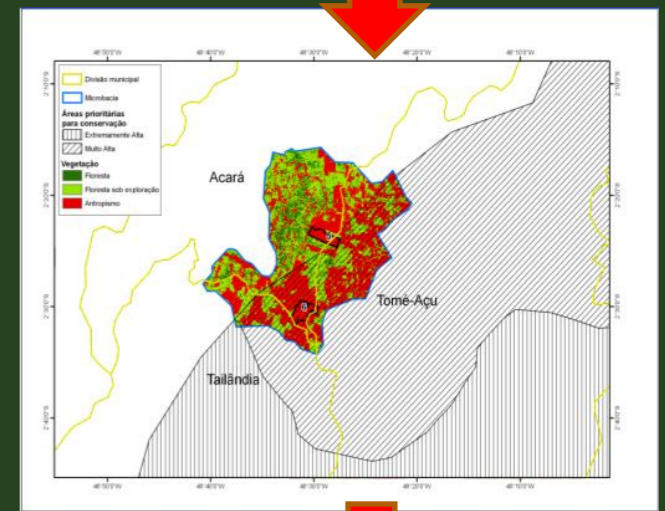
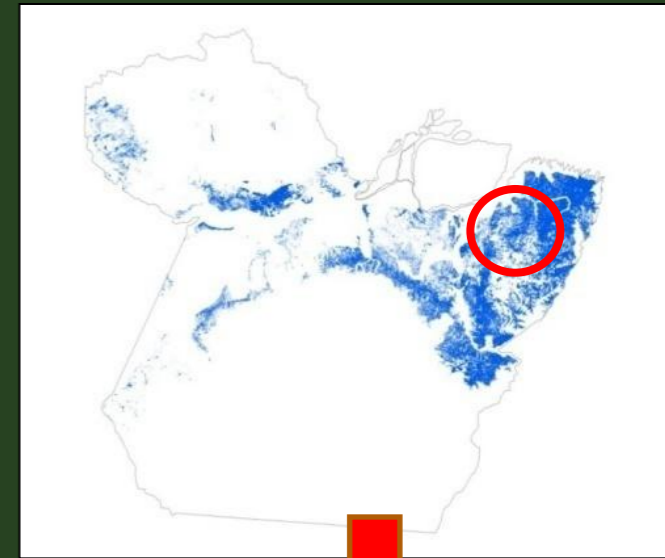


RCA Pará: Process

Phase 1: Desktop assessment based on existing information

Phase 2: Selection of areas for field study based on finer-scale information

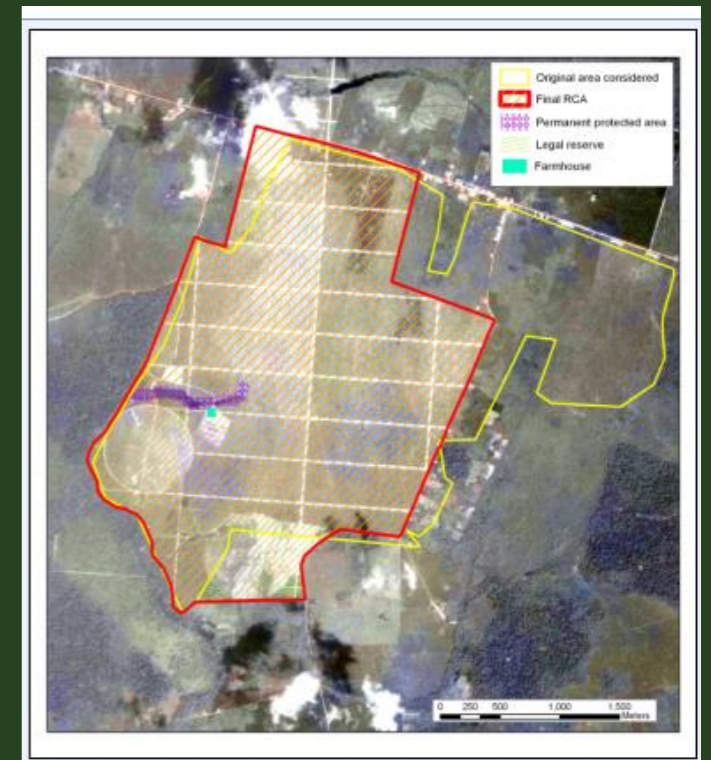
Phase 3: Field work to fill in information gaps and groundtruth data



RCA Pilot Pará



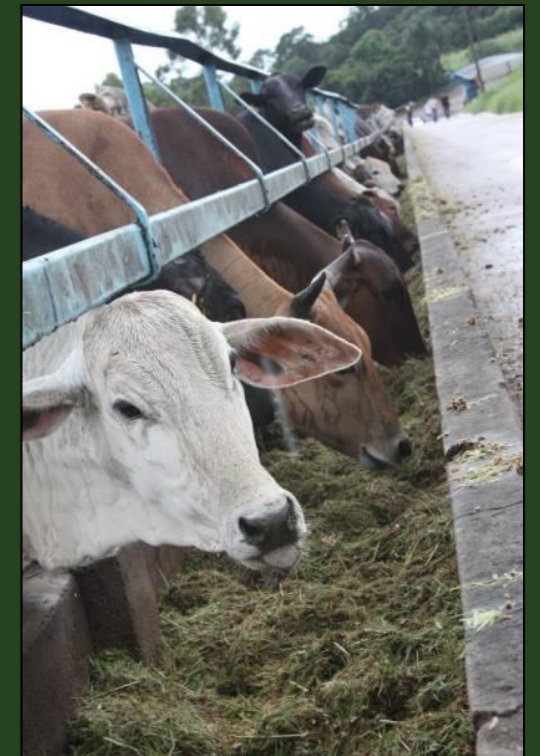
- Focus on oil palm, degraded pasture
- Areas were bought by an oil palm company focused on “degraded lands” (suitability confirmed)
- Minimal biodiversity, water value outside reserves; low carbon values
- No land conflicts, little value to communities
- Oil palm company confirmed methodology was appropriate to companies
- Successful pilot



RCA Pilot: São Paulo



- Focus on sugarcane/ cattle Integration: Increase productivity of existing agricultural lands
- Integration or coordination is possible, and exists
- Three possible systems:
 - Sugarcane mill/ cattle confinement
 - Other sugarcane producer/ cattle confinement
 - Other sugarcane producer/ extensive cattle
- Comprehensive promotion approach needed
- Success will depend in part on external factors: cost of Amazon beef, mill ownership, labor

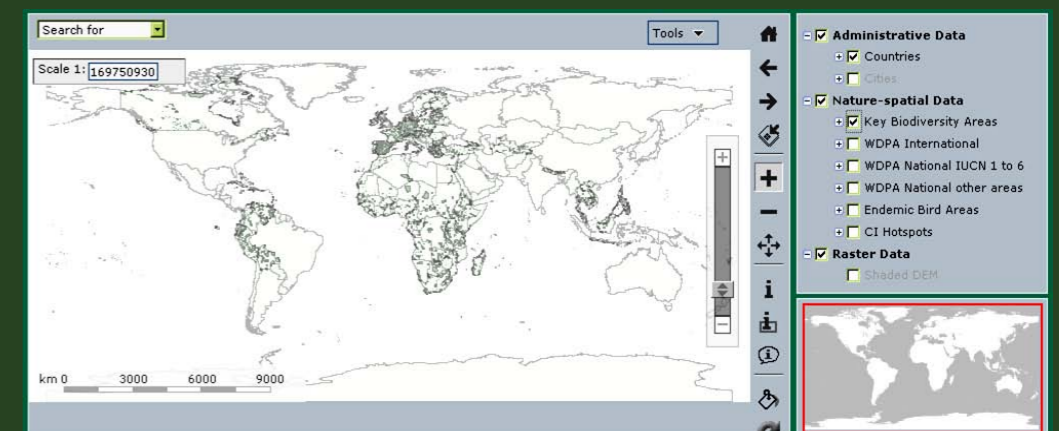
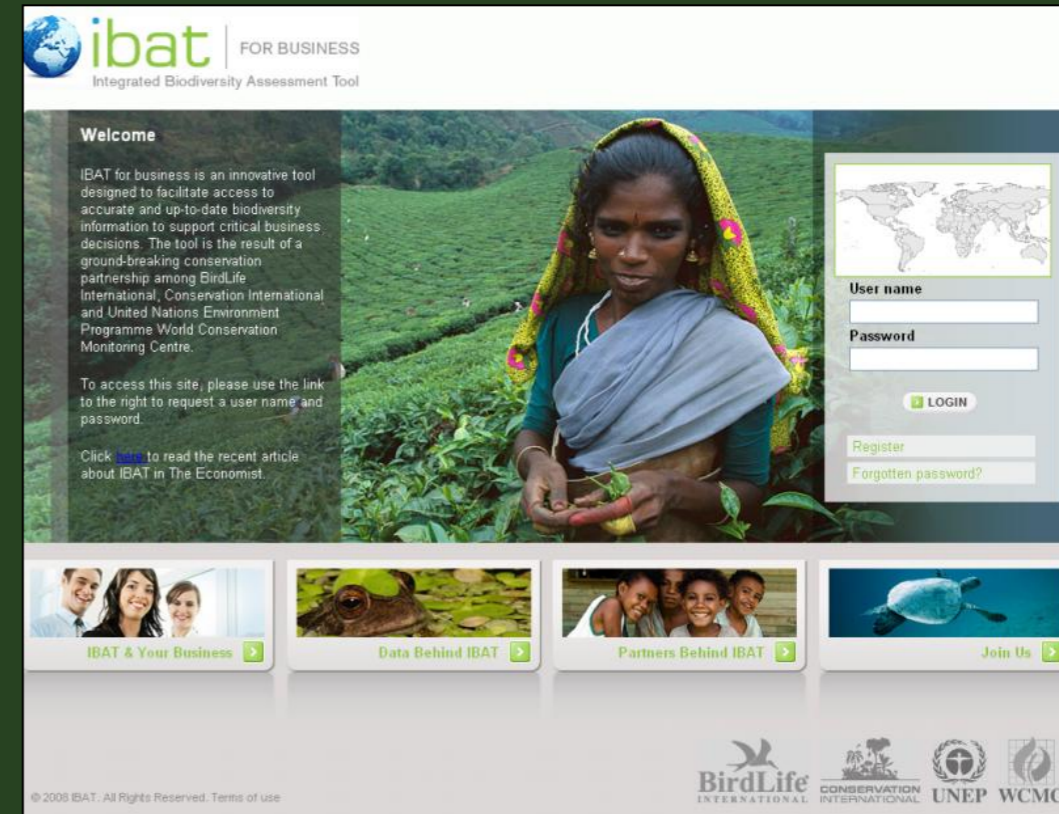


Integrated Biodiversity Assessment Tool (IBAT)

- Provides users **site-specific biodiversity, wetland, and protected areas data**
- Informs project screening, **ESIA** and **environmental management plans**
- Can assist in incorporating biodiversity into **risk analysis, decision-making and planning processes**

www.ibatforbusiness.org

www.ibat-alliance.org/ibat-conservation



Relevance: Knowledge and Tools

- **Process is key**

- Improve **consistency** of comprehensive assessments
- Facilitate **replication** in other areas by other groups
- Facilitate **access to information** by all decision-makers
- Ensure **timely** decision-making
- Highlight **information gaps** for strategic on-the-ground assessment

- **Consider environmental & social values**

- Holistic approach to risk assessment
- Avoid risks & identify opportunities for more sustainable production



Sustainable Biofuel Feedstocks Initiative

Field Projects

Atlantic Forest, Brazil: Conservation & restoration in productive landscapes

Developed **Forest Restoration and Environmental Compliance** course for sugarcane actors

Conducted **biodiversity & fragmentation studies** in sugarcane landscapes



Held workshops on the **management of private reserves**, and on biodiversity monitoring for NE mills

Assessing local **tree nursery capacity** to support reforestation efforts by mills

Engaging producers unions on **forest restoration, climate change, forests for energy**

Relevance: Conservation & restoration in productive landscapes

- Model for improving practices in existing agricultural landscapes
- Concentration on biodiversity, carbon, water
- Focus on building local capacity
- Use of awareness building to generate demand for services, improved practices
- Sustainability does not reduce profitability

Aceh, Indonesia: Planning for oil palm development

Contributing to provincial-level **spatial planning** and **green development** plans

Conducted first **biodiversity surveys** of Singkil Swamp area

Completed **carbon assessments** in areas of oil palm expansion

Presented workshop on **best practices** for the oil palm industry to stakeholders in two districts

Assisting two districts with spatial plans in **high-biodiversity oil palm expansion zone**



Relevance: Planning for oil palm development

- Model for how land use planning might be approached in areas of feedstock expansion
- Focus on incorporating full range of scientific information, as well as social and economic criteria, into decision-making
- Recognition of multiple demands, needs
- Opportunity to “do right” from the beginning



Sustainable Biofuel Feedstocks Initiative

**Policy & Market
Engagement**

US/ EU Policy Engagement

Technical input on planned biofuel-related policy,
eg US RFS2 and EU RED

- Focus on land use related issues, indirect land use change
- Draw on science, field experience



Provide information on US, EU policy to field programs, partners

- Develop understanding on legislation, regulations and policy that could affect feedstock development/land use
- Provide information to policy makers, private sector leaders and other relevant stakeholders



Mesoamerica: Policy Engagement

Biofuel sustainability criteria incorporated in the Central American **Regional Strategies for Agriculture and Health, and Climate Change**

Sustainability criteria included in proposed **Guatemalan climate change policy**

Community level workshops on biofuels, climate change, and agriculture held in Guatemala and Mexico

Convention on **climate change and biofuels** incorporated into in the Indigenous Peoples Climate Change Roundtable in Guatemala



South America: Policy Engagement

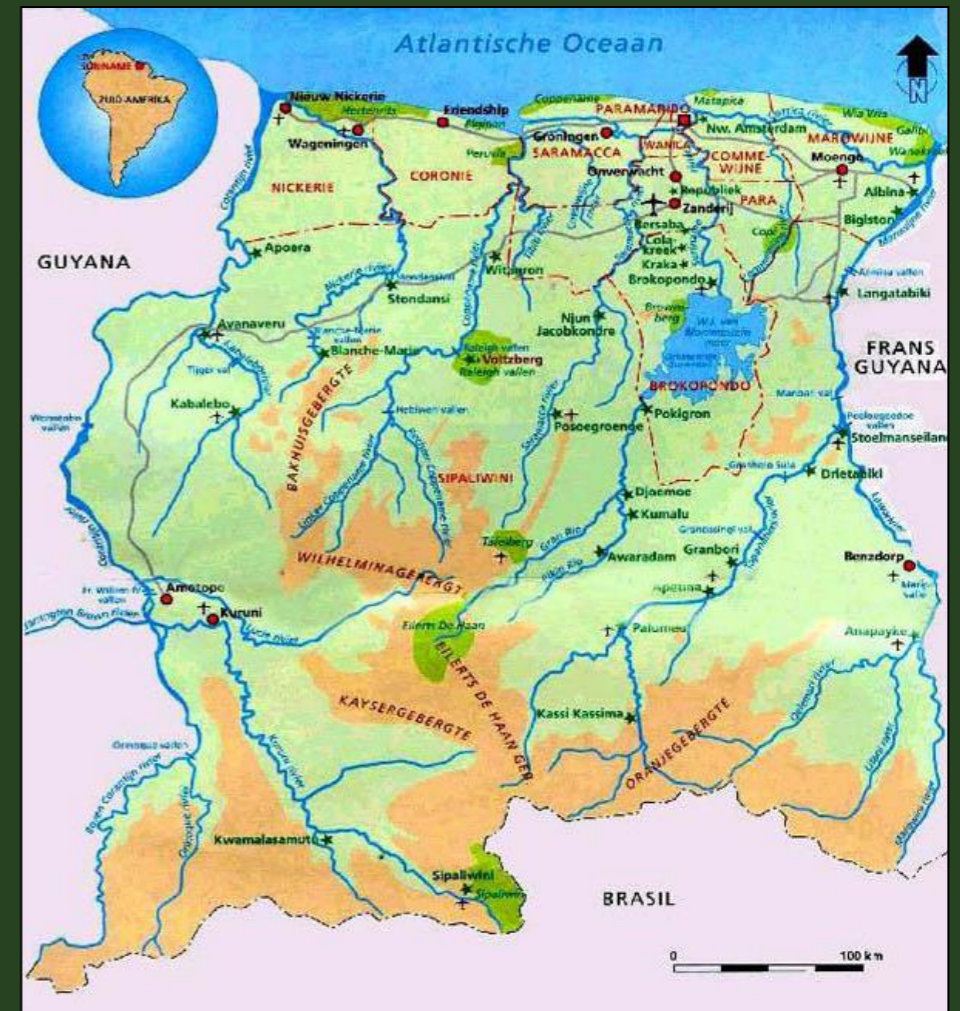
Analysis of biofuel-related policy framework in Ecuador

Outreach and interviews with Ecuadorian stakeholders

Database of regulations, projects, programs, and stakeholders in Ecuador

First national roundtable on biofuels in Suriname

Study on environmental, social, & economic implications of proposed feedstock expansion in Suriname



Industry & Market engagement

Roundtable on Sustainable Palm Oil (RSPO) – Board, GHG Working Group

Roundtable on Sustainable Biofuels (RSB) – Indirect Impacts Experts Group, Chamber 6

Round Table on Responsible Soy (RTRS) – National interpretations and mappings, members

Engagement with individual industry leaders on policies, guidelines, investments



Industry & Market engagement

Mill + plantation + smallholder production models

- Schemed vs. independent smallholders

Smallholder engagement / needs

- Extension, land tenure, credit, infrastructure
- Environmental issues, diversification, risk management

Climate finance (adaptation & mitigation)

- Land-use sector within LEDS, REDD+LEDS,
- Low interest loans & risk insurance (Africa)

Regulatory framework

- Tax incentives, concessionaire frameworks
- Land-use planning initiatives

High Conservation Value (HCV)

- HCV1** Globally, regionally or nationally significant concentrations of biodiversity (endemism, endangered species, and refugia).
- HCV2** Globally, regionally or nationally significant large landscapes where viable populations of native species exist in natural patterns of distribution and abundance.
- HCV3** Contain rare, threatened or endangered ecosystems.
- HCV4** Provide basic ecosystem services in critical situations (watershed protection, erosion control).
- HCV5** Provide basic needs of local communities (subsistence hunting, health).
- HCV6** Are critical to traditional cultural identity (cultural, economic or religious significance identified in cooperation with local communities).

Relevance: Policy & Markets

Potential to transform global markets

- Demand for “sustainability” is driving market change
- Value chain where value = sustainability
- Recognize that biofuel feedstocks are global commodities imbedded in food and fiber markets

Link climate finance to poverty reduction

- Provide developing countries (& emerging markets) with a sustainable rural development paradigm
- Take REDD+ to scale via the private sector
- Certification = MRV



Sustainable Biofuel Feedstocks Initiative

Future Priorities

Looking Forward: Priority

Applied Geographic Research and Economic Analysis of Biofuel Feedstocks at the Regional Scale

- *Feedstock production and land use in each region*
- *Biofuel production and human livelihoods, food security*
- *Impact of biofuels production on ecosystem services and biodiversity*
- *Scenarios modeling to evaluate policy options*



Looking Forward: Priority Actions

Field Extension and Practical Action at the Landscape Scale

Applied Field Studies

Amazon/Cerrado

Atlantic Forest

Ecuador

Indonesia -Aceh

Liberia

Mexico-Chiapas

Peru

Suriname

Policy

California

US

EU





Thank you!



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