

Agriculture, Land Use Change and Poverty in Latin America

**Geospatial Open Source Hosting of Agriculture,
Resource and Environmental Data (GEOSHARE):
Kickoff Workshop for the Pilot Project**

**Monday, May 23, 2011
Purdue University
West Lafayette, Indiana**

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Data needed to understand tradeoffs between agriculture and the environment

Resources:

- Climate
- Population
- Land (soil)
- Water
- Cultivars
- Livestock
- Energy
- Other Assets

Economic and institutional factors:

- Land tenure
- Market Access
- Credit Availability

Environmental and socio-economic variables:

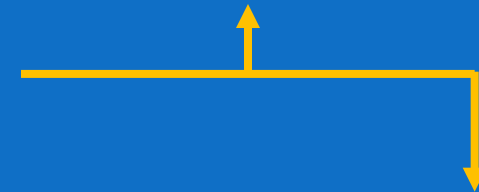
- Poverty
- Greenhouse gas fluxes
- Biodiversity
- Water quality
- Soil degradation



Agriculture and Forestry sectors

Management:

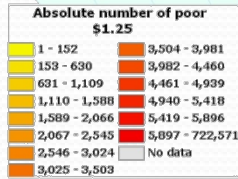
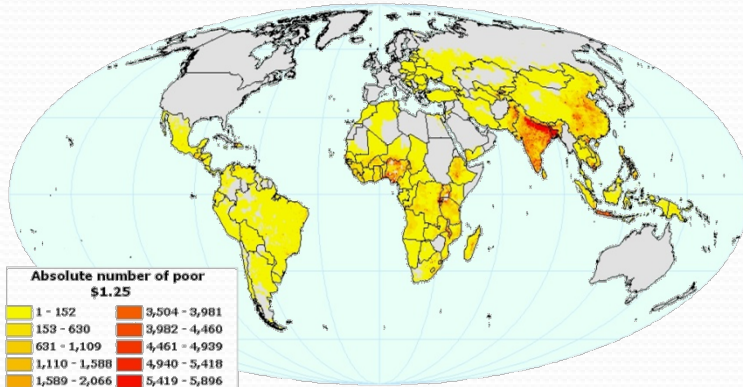
- Planting/harvest dates/cropping intensity
- Irrigation
- Fertilization
- Plant protection
- Labor
- Other management practices



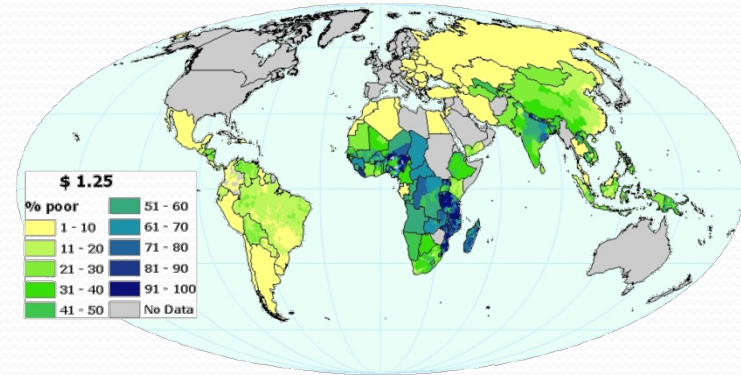
Marketed products:

- Food
- Fiber
- Fuel
- Timber
- Carbon credits

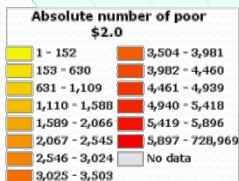
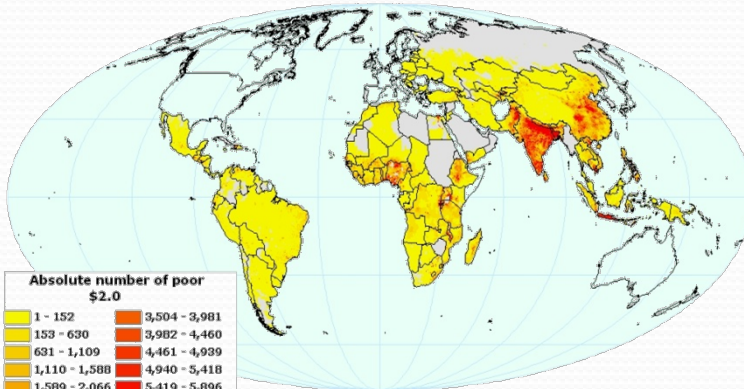
Developing-country poverty maps



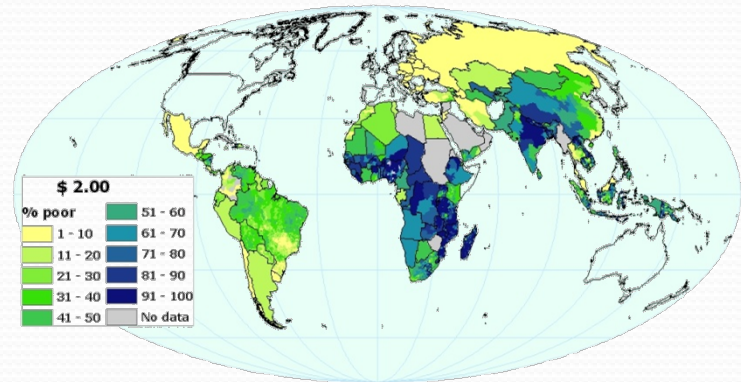
Absolute number of people living below the \$1.25 a day poverty line



Headcount ratios for the \$1.25 a day poverty line

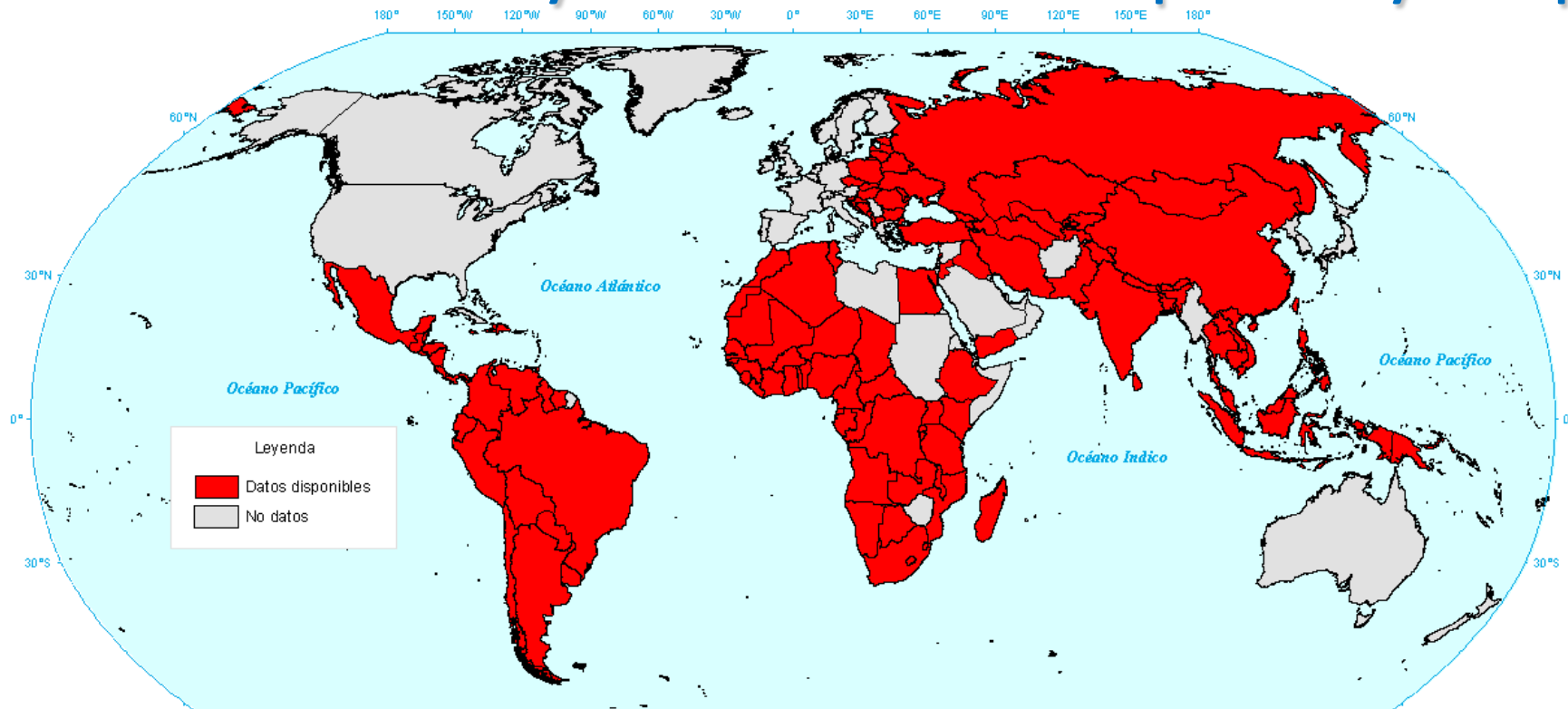


Absolute number of people living below the two dollar a day poverty line.



Headcount ratios for the two dollar a day poverty line

Global inventory of sub-national poverty maps

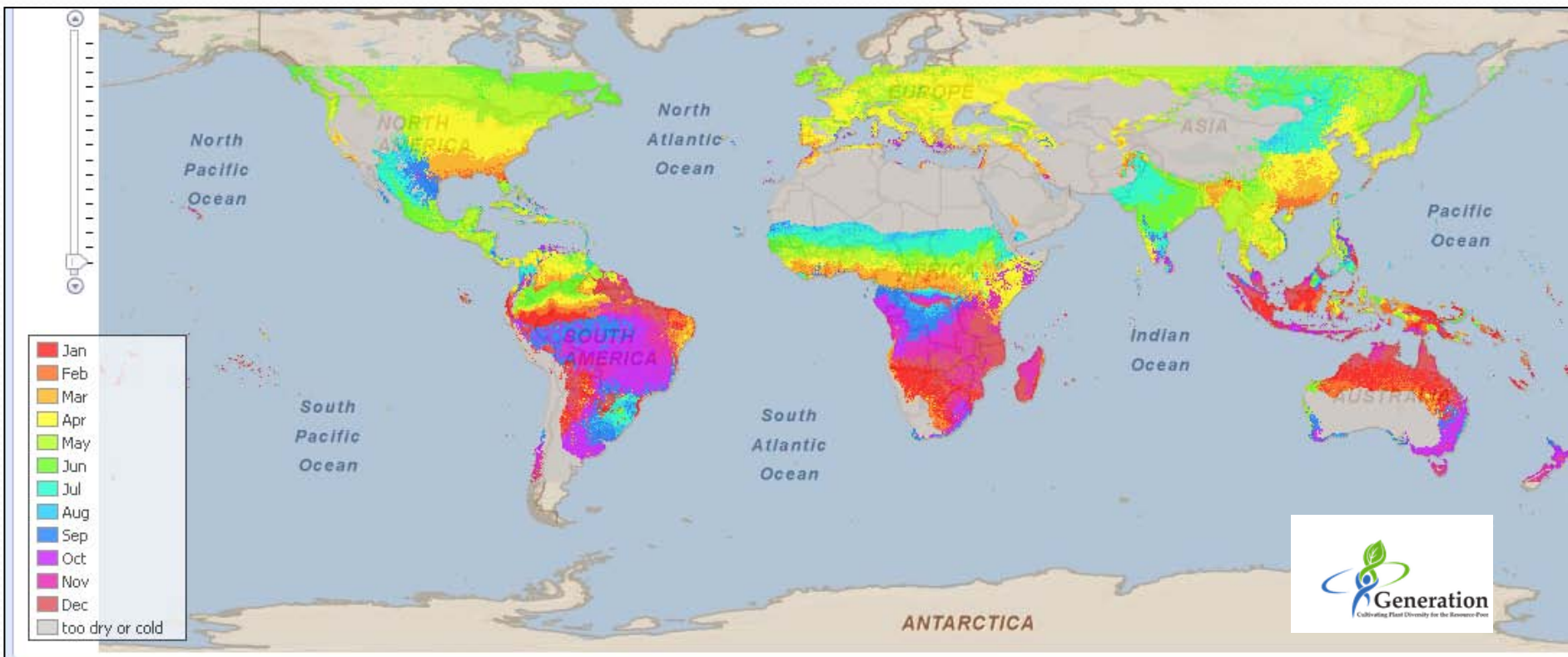


Region	Number of			Variables at finest resol.	# Units by level			Total Units	Units at finest resol.
	Countries	Shapefiles	Variables		Level 1	Level 2	Level 3		
LAC	21	48	1,772	1,151	193	9,141	7,997	17,331	16,941
ASIA	25	66	1,368	680	535	2,152	17,773	20,460	20,180
AFRICA	22	28	464	412	198	1,456	6,840	8,494	8,494
EUROPE	3	6	189	118	134	303	379	816	730
	71	148	3,793	2,361	1,060	13,052	32,989	47,101	46,345

Downscaled climate data

The image is a screenshot of a web browser displaying the CCAFS Climate website. The browser's address bar shows the URL www.ccafs-climate.org. The website's navigation menu includes: HOME, SPATIAL DOWNSCALING, SPATIAL DISAGGREGATION, TEMPORAL DOWNSCALING, DOCUMENTATION, LINKS, and CONTACT. The main content area features a large banner with the text "GCM DOWNSCALED GCM DATA PORTAL" and logos for "CLIMATE CHANGE AGRICULTURE AND FOOD SECURITY", "CIAT" (Centro Internacional de Agricultura Tropical), and "ILRI" (INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE). Below the banner are six vertical navigation buttons: "Spatial Downscaling", "Spatial Disaggregation", "Temporal Downscaling (MarkSim)", "Useful Documents", "Links", and "Contact". The Windows taskbar at the bottom shows the system clock as 6:40 AM on 5/22/2011.

Planting dates



Agricultural technology evaluation: cultivars, livestock, management practices

- Standardized database of cultivar trials
- Builds on CGIAR and NARS multi-environment trials program
- Over 500 sites globally
- Initiative of CCAFS and CGIAR-CSI
- Advances to date: Trials on potato & sweet potato, soybean, livestock technologies, rice, beans, barley, wheat, lentil, kabuli chickpea, faba bean, grass pea, vetch

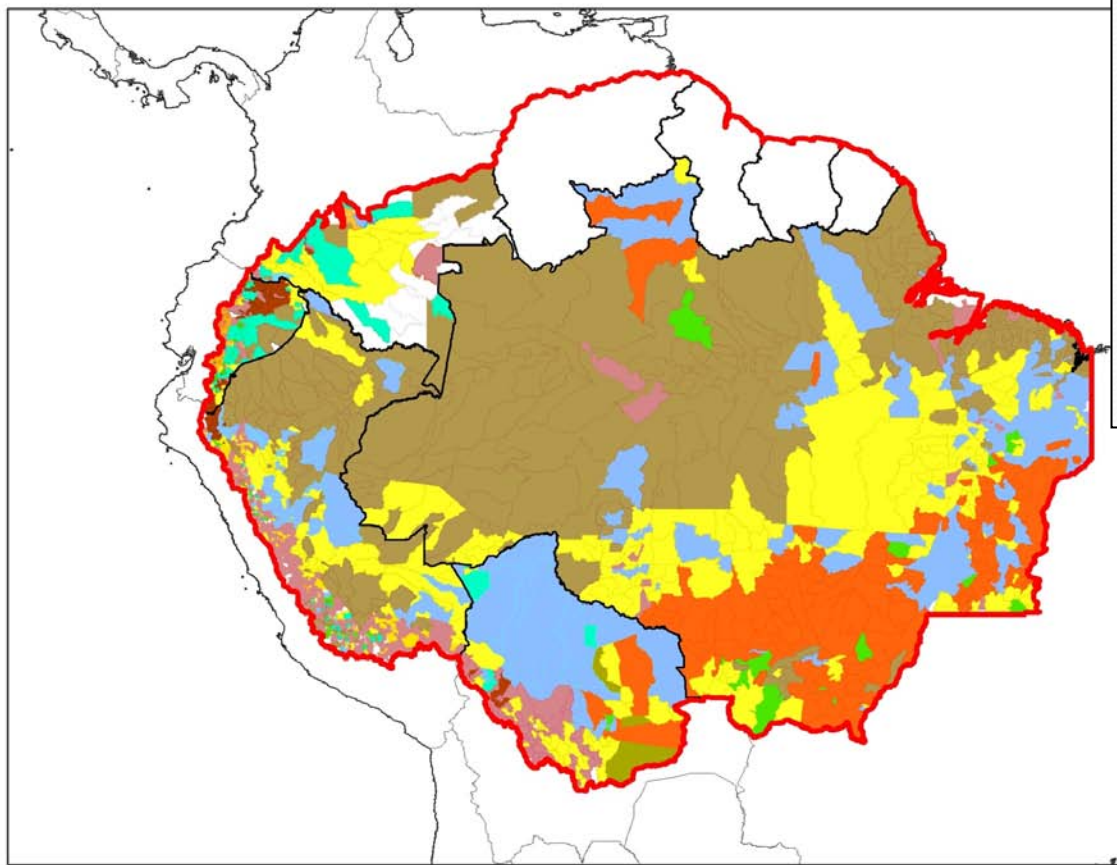
Common bean experimental sites



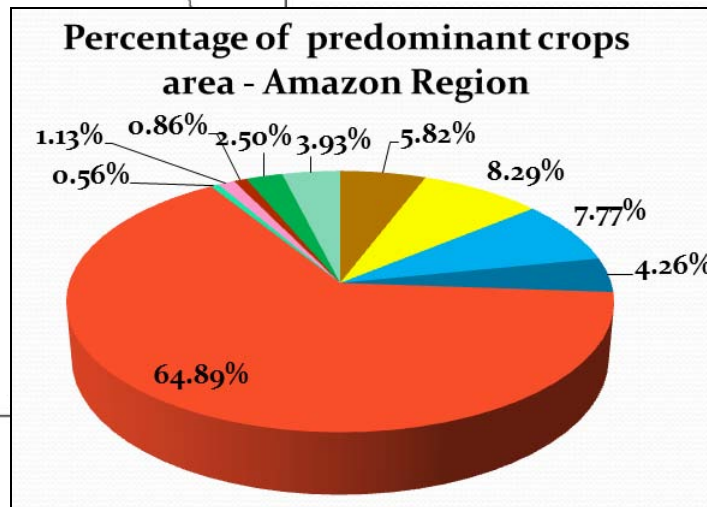
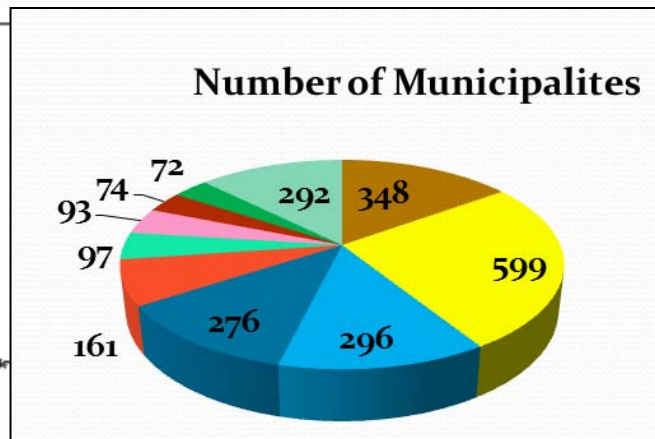
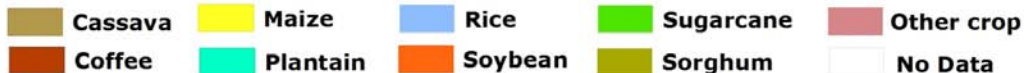
Agtrials.org



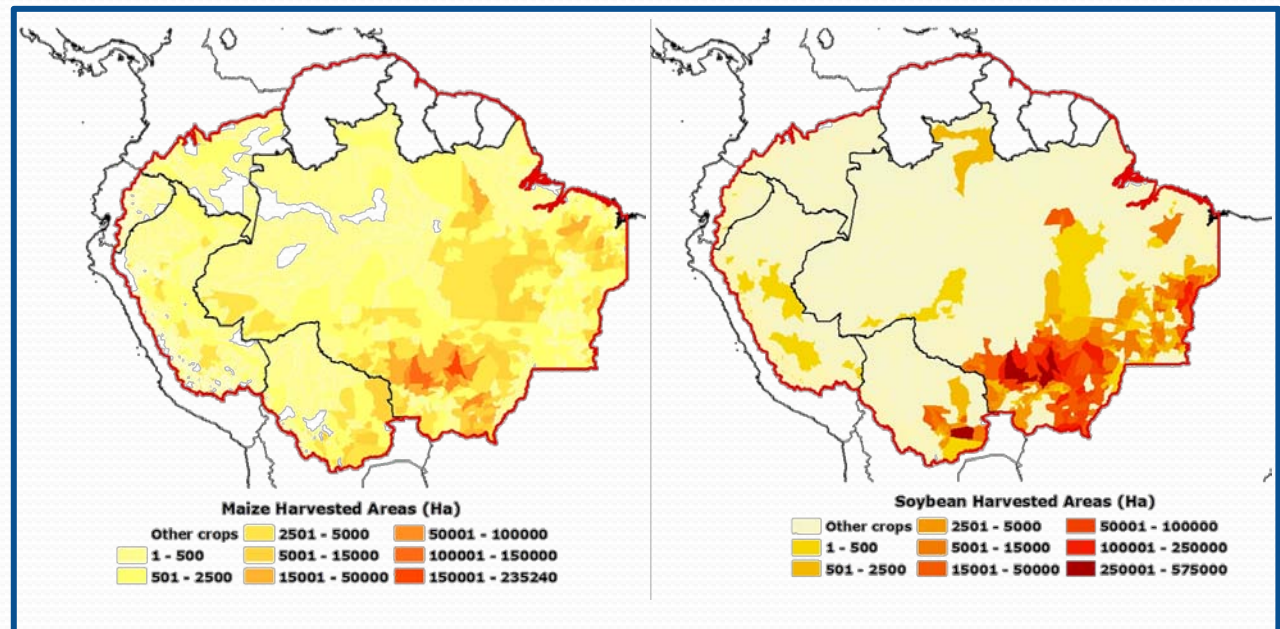
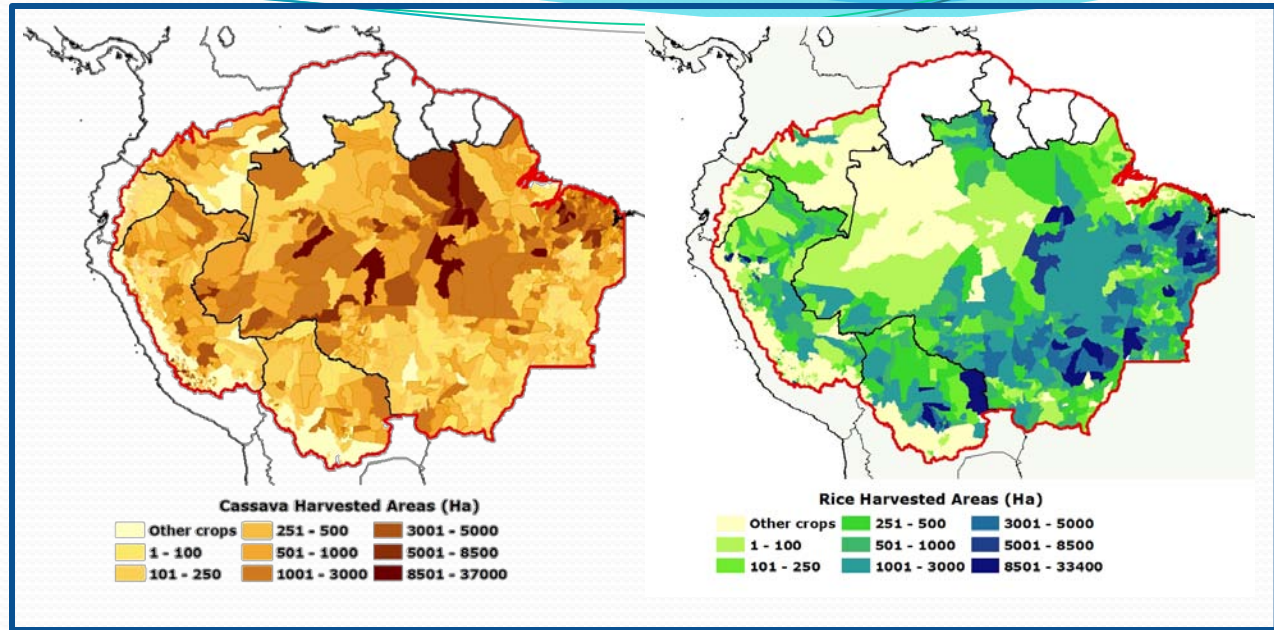
Land use in the Amazon



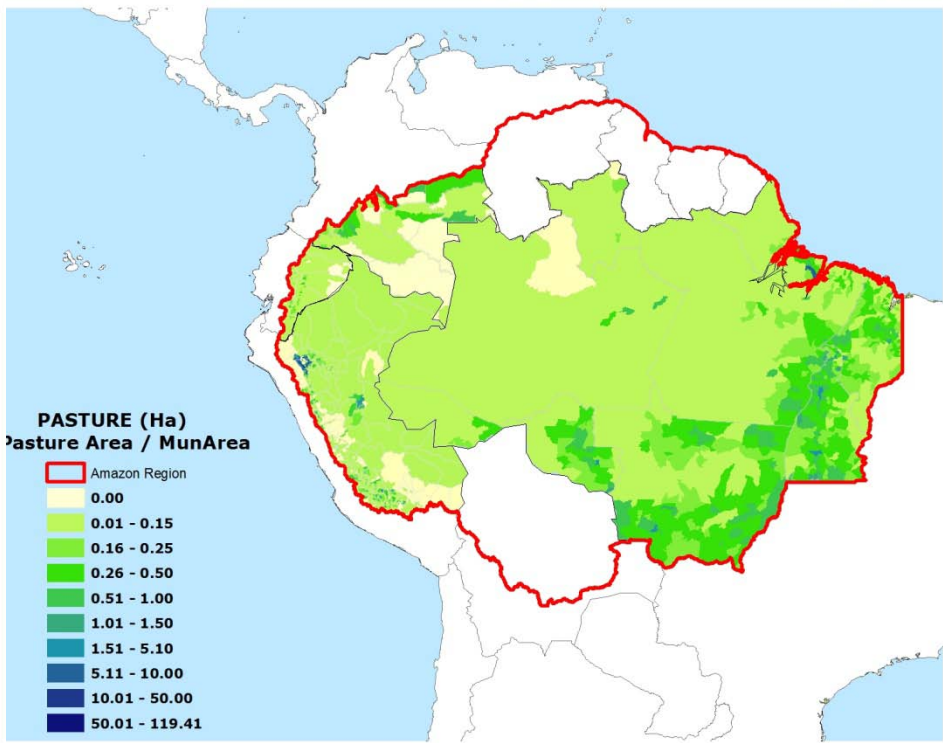
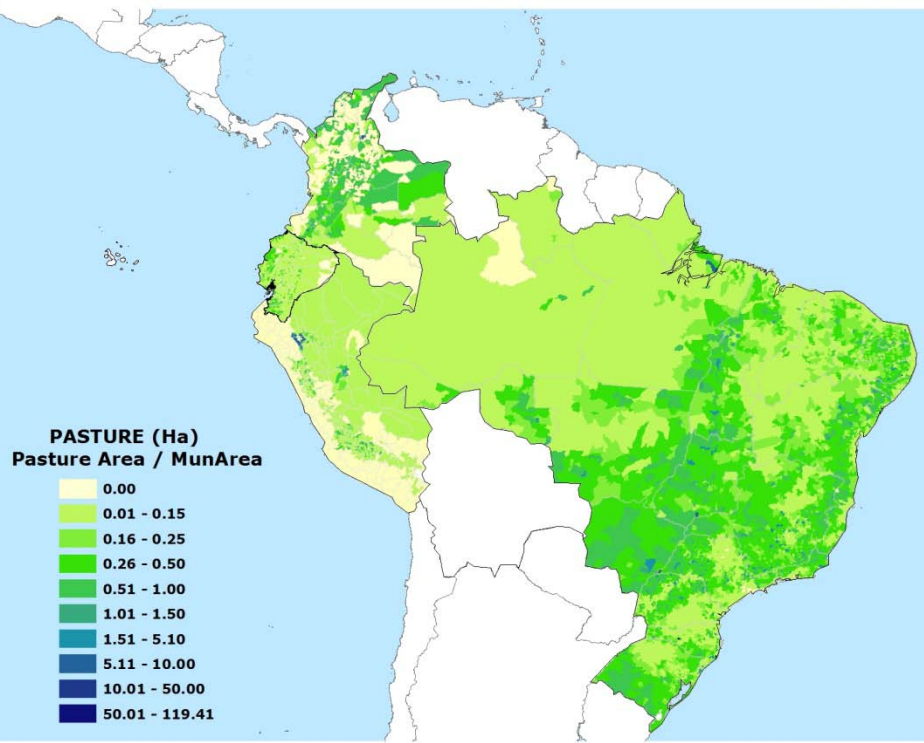
Crop with largest harvested area in administrative unit



Cassava, rice, maize and soybean in the Amazon



Land use data on pastures is uneven



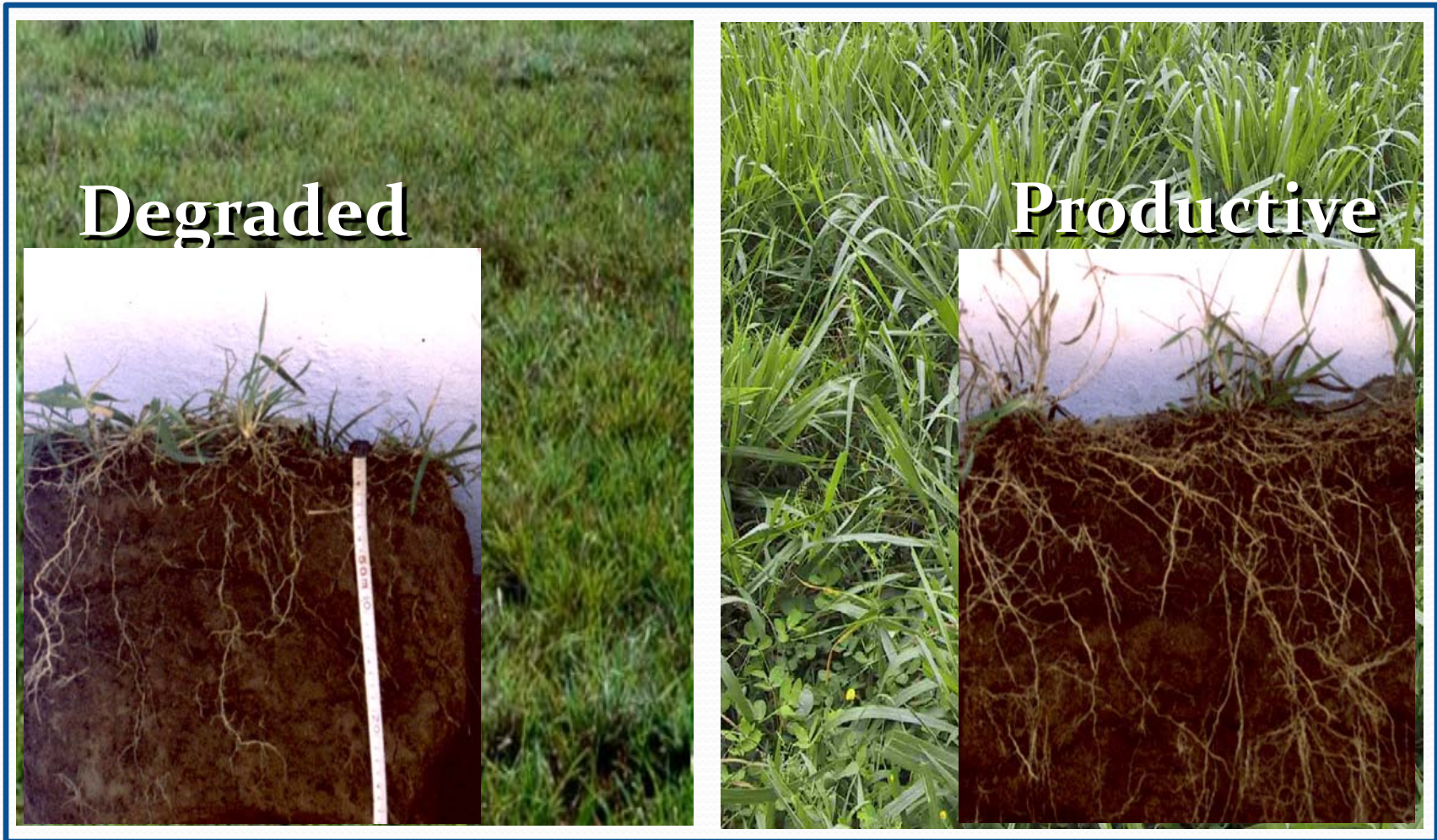
Country	Total Pasture	Natural Pasture	Improved Pasture
ECUADOR 2000	2,187,114.08	593,552.32	1,593,561.76
Non Amazon	1,741,596.90	489,351.92	1,252,244.97
Amazon	445,517.18	104,200.40	341,316.79
BRAZIL 1996	177,700,429.70	78,048,453.08	99,651,976.62
Non-Amazon	127,497,409.99	60,454,625.12	67,042,784.87
Amazon	50,203,019.70	17,593,827.96	32,609,191.75
BRAZIL 2006	172,332,910.00		
Non-Amazon	111,914,963.00		
Amazon	60,417,947.00		

Country	Total Pasture
COLOMBIA 2006	30,154,987.47
Non-Amazon	25,212,238.95
Amazon	4,942,748.52
PERU 2008	5,111,625.03
Non-Amazon	334,295.60
Amazon	4,777,329.43

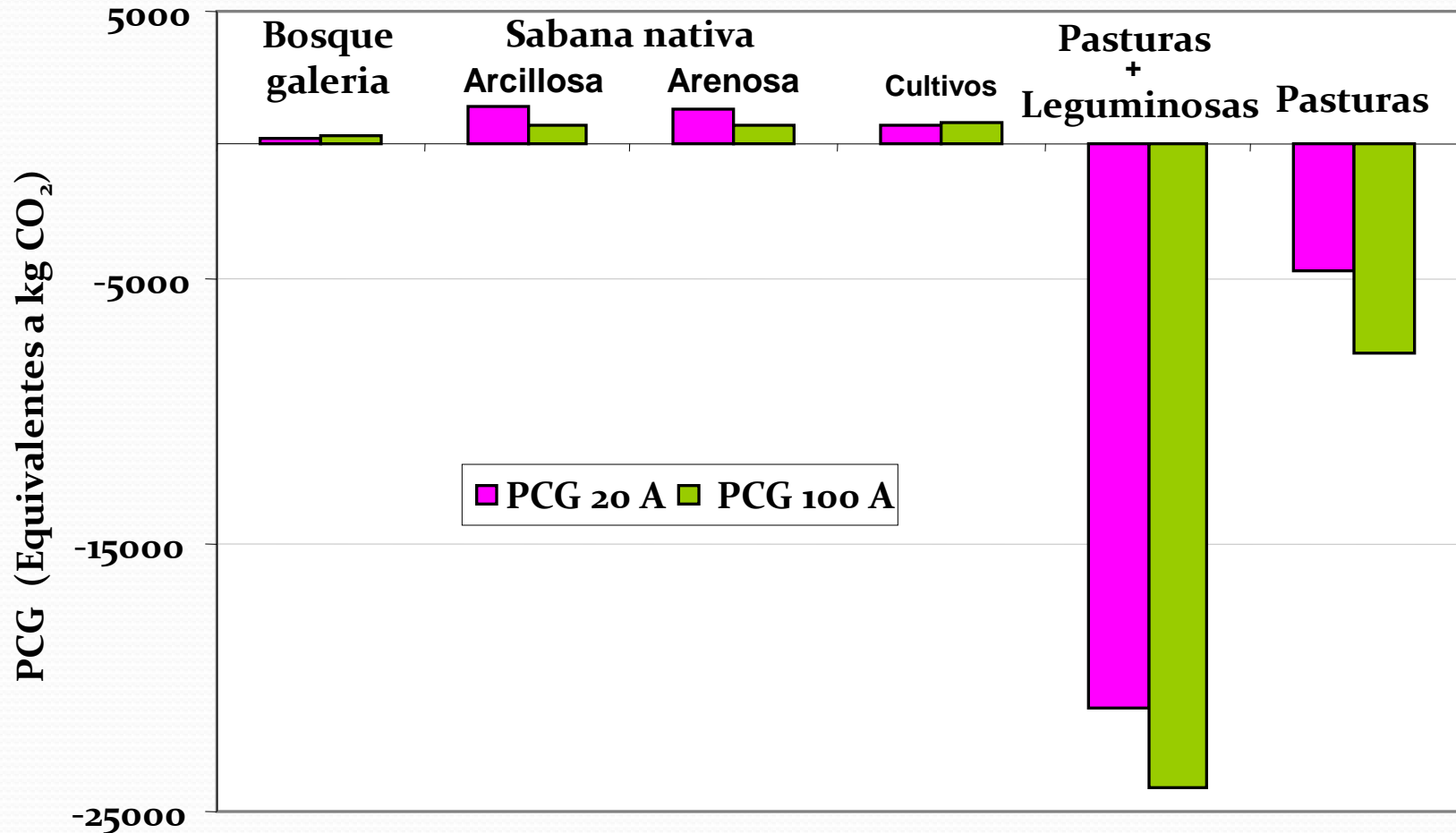
Grass legume system in Colombian savannas



Root distribution in degraded and productive pastures of *Brachiaria*

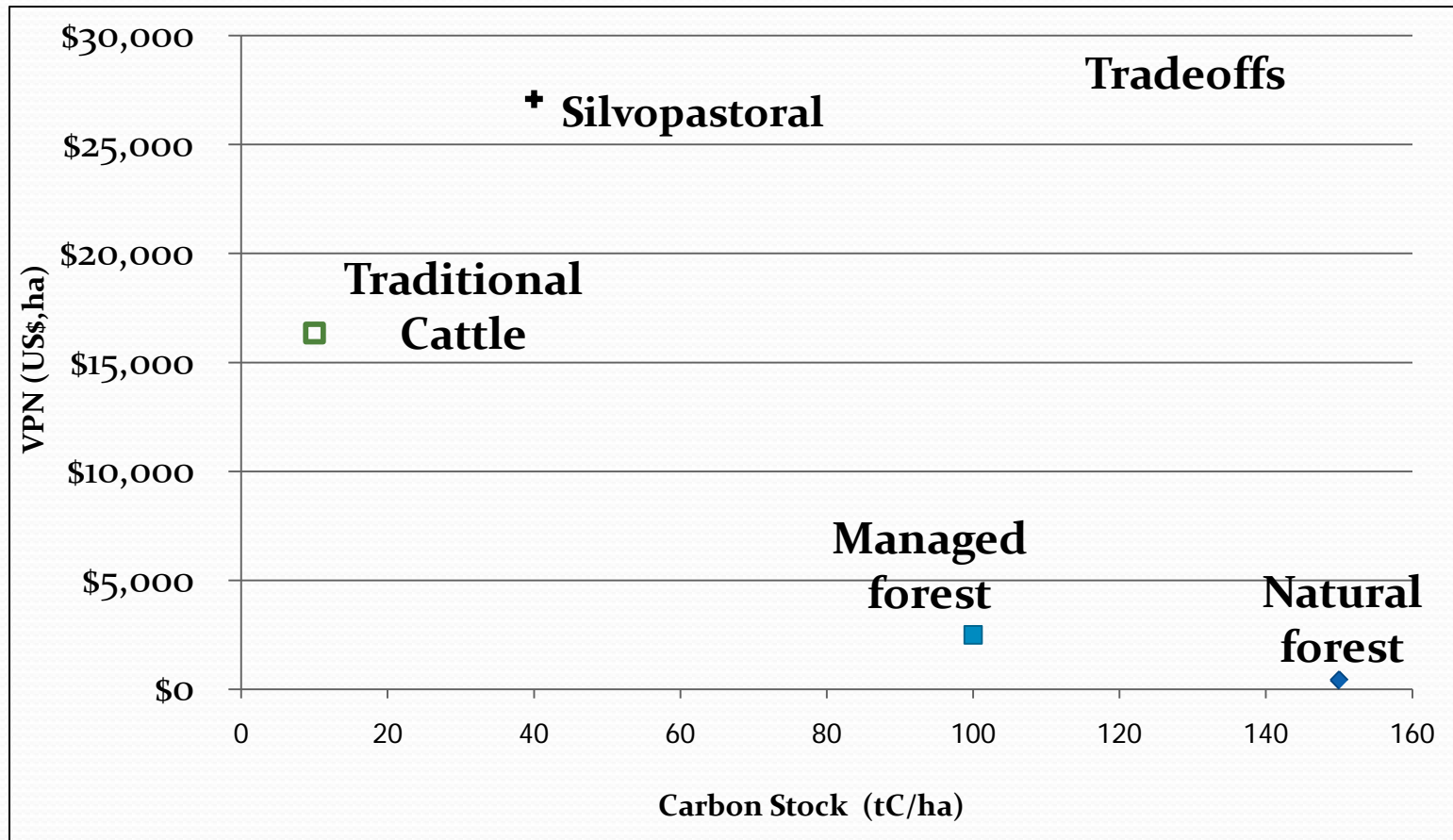


Global warming potential of different land use systems in the Colombian savannas



(Rondon et al., 2006)

Tradeoffs between agriculture and the environment:



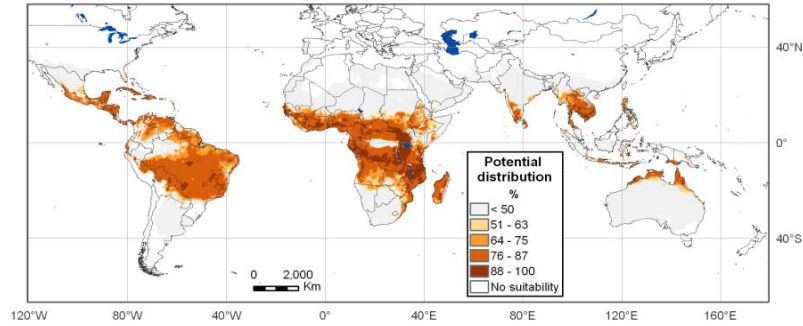
From El Hatico, Valle del Cauca, Colombia

Opportunity costs of REDD+

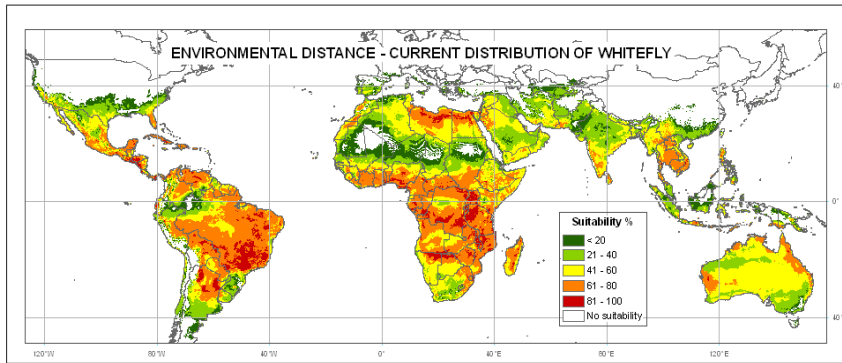
16-20 May 2011

CIAT – HarvestChoice

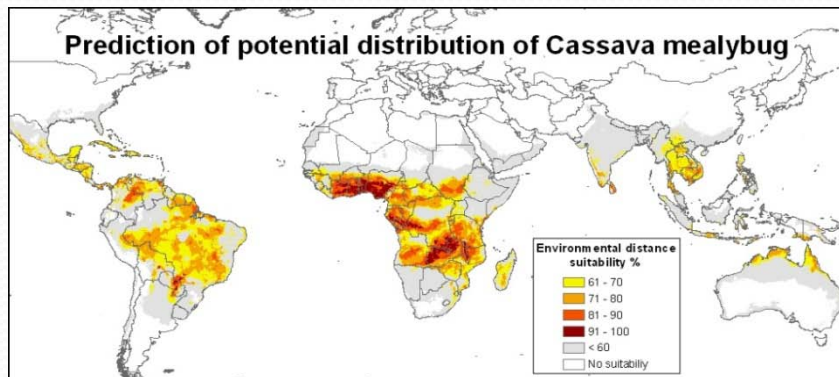
Cassava Mosaic Disease



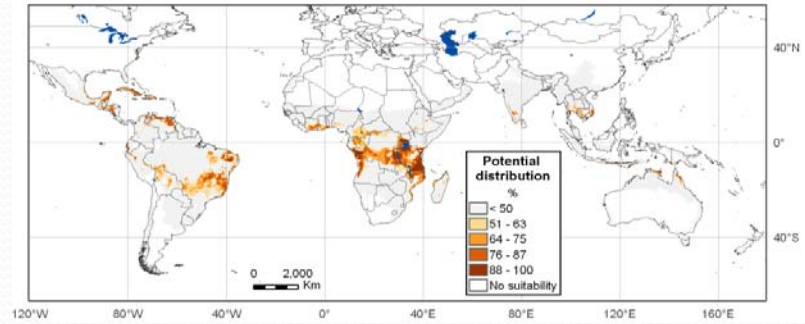
Bemisia Tabaci – Whitefly



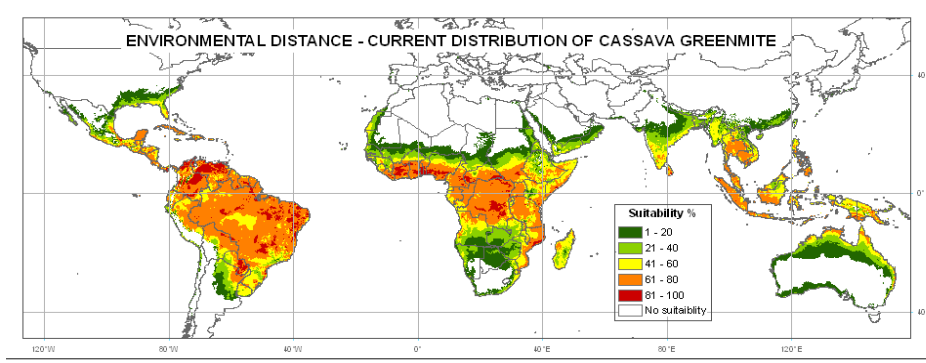
Phenococcus Manihoti– Mealybug



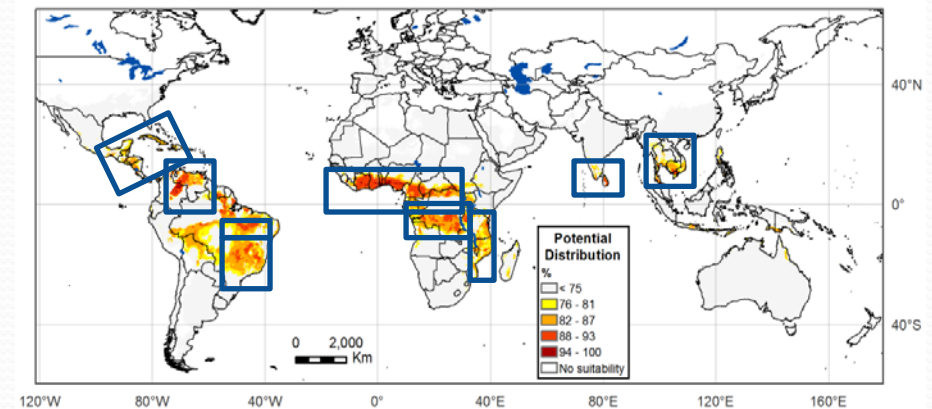
Cassava Brown Streak Virus

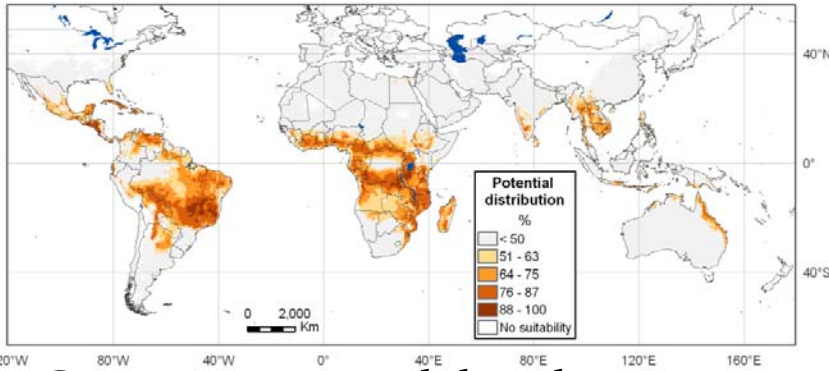


Mononychellus tanajoa – Green mite

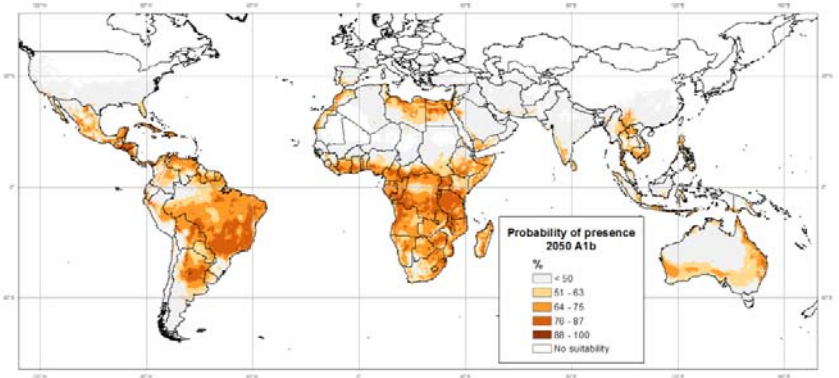


Cassava Pest/Disease Hotspot map

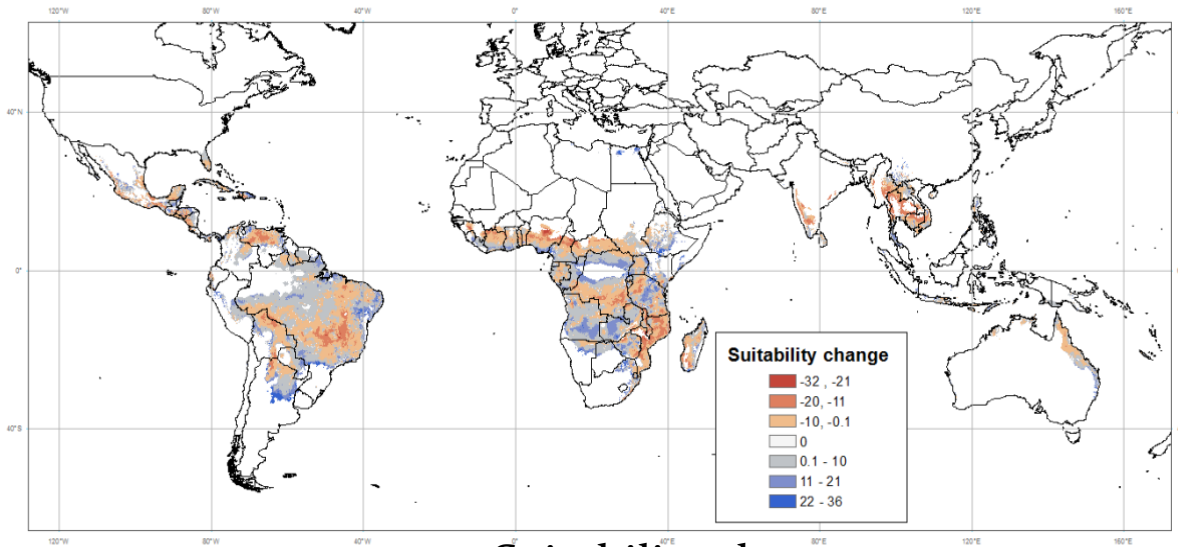




Current – potential distribution



Potential distribution -2050



Suitability change

Potential distribution of whitefly (*B. tabaci*) under climate change

CIAT-HarvestChoice