

Trase data sources (release 1.1)

BRAZIL		
DATA	Description	Source
Agricultural Indicators		
Production of Soy	Municipal production of soy in tons from the Brazilian Bureau of Statistics (IBGE)	http://www.ibge.gov.br/home/estatistica/economia/pam/2015/default.shtm
Average soy yield	Municipal yield (Tn / ha) from the Brazilian Bureau of Statistics (IBGE) annual municipal production survey	http://www.ibge.gov.br/home/estatistica/economia/pam/2015/default.shtm
% soy of total farming land	Percentage of the municipal farming area that is cultivated for soy vs the total farming area	http://www.ibge.gov.br/home/estatistica/economia/pam/2015/default.shtm
Socio-economic Indicators		
GDP per capita	GDP per capita in Brazilian Reals 2013	http://ibge.gov.br/home/estatistica/economia/pibmunicipios/2010_2013/default_xls.shtm
% GDP from agriculture	% of the municipal GDP that corresponds to the farming sector	http://ibge.gov.br/home/estatistica/economia/pibmunicipios/2010_2013/default_xls.shtm
Population	Population per municipality in 2013	http://ibge.gov.br/home/estatistica/economia/pibmunicipios/2010_2013/default_xls.shtm
Human development index (HDI)	Municipal Human Development Index 2013, Atlas do Desenvolvimento Humano, PNUD	http://www.atlasbrasil.org.br/2013/en/
Land conflicts	Number of land conflicts per municipality in 2014 according to the Comissão Pastoral da Terra (http://www.cptnacional.org.br/)	Retrieved from http://maps.lapig.iesa.ufg.br/lapig.html

Reported Cases of Forced Labour	Number of people involved in lawsuit of forced labor or made subjects to degrading working conditions in 2014. Comissão Pastoral da Terra (http://www.cptnacional.org.br/)	Retrieved from http://maps.lapig.iesa.ufg.br/lapig.html
Smallholder dominance	Proportion of a given municipality that is in the hands of smallholders as defined by the Brazilian government (based on size and dependence on family labour)	Medina et al (2014) http://www.sciencedirect.com/science/article/pii/S0305750X15001412
Territorial Governance		
Forest Code deficit	Area of land in Permanent Protected Areas and Legal reserves that must be restored or compensated for (LR only) to achieve in compliance with the Brazilian Forest Code - as a percentage of the total area of private land.	Citation information forthcoming
Legal reserve (LR) Deficit	Area of Legal Reserves (ha) that must be restored or compensated off-farm to achieve compliance with the Brazilian Forest Code.	Citation information forthcoming
Permanent Protected Area (PPA) deficit	Area of Permanent Protected Areas (ha) that must be restored to achieve compliance with the Brazilian Forest Code.	Citation information forthcoming
Number of Environmental Embargos (2015)	Number of fines and embargos associated to environmental infractions per municipality in 2015	https://servicos.ibama.gov.br/ctf/publico/areasembargadas/ConsultaPublicaAreasEmbargadas.php
Environmental Indicators		
Territorial Deforestation	Annual rate of clearance of native vegetation in ha, with respect to previous year, based on combining municipal annual deforestation rates from different sources	
	INPE-PRODES deforestation estimates in the Amazon Biome and municipalities on the border between the Amazon and Cerrado Biomes	http://www.dpi.inpe.br/prodesdigital/prodesmunicipal.php
	LAPIG deforestation alerts for the Cerrado Biome, including the Legal Amazon portion	http://maps.lapig.iesa.ufg.br/lapig.html

	SOS-MATA ATLANTICA for the Atlantic Forest biome between 2011-2014. For municipalities spanning both the Atlantic Forest and Cerrado biomes, LAPIG estimates were combined with SOS-MATA ATLANTICA.	http://mapas.sosma.org.br/
	MAPBIOMAS preliminary version for all other biomes	http://mapbiomas.org/pages/databas e/mapbiomas_collection
Soy Deforestation	Annual deforestation rate in hectares, per municipality in areas under soy production, with respect to previous year. Calculated based on overlay of LAPIG deforestation alerts and soy field land cover classifications from AGROSATELITE produced from MODIS images (MCD45A1).	http://agrosatelite.com.br/
Maximum Soy Deforestation	<p>Deforestation rate in a given year restricted by the amount of new planted area for a commodity. For planted area A of a commodity, total municipal deforestation D, in year y, commodity deforestation C, in hectares, is defined:</p> $C_y = \delta A_y \quad \text{if } D_y > \delta A_y$ $C_y = D_y \quad \text{if } D_y < \delta A_y$ <p>Where</p> $\delta A = \max(0, A_y - A_{y-1})$ <p>This measure represents the maximum area of deforestation that could be attributed to soy expansion in a given region. As an example in a municipality with 1000 ha of soy expansion, but only 500 ha of deforestation, the potential soy-related deforestation is 500 ha. The remaining 500 ha of soy expanded onto non-forest land, typically cattle pasture. This expansion may contribute towards the displacement of cattle pastures into forest land, a phenomenon known as indirect land-use change.</p>	<p>Planted area from http://www.ibge.gov.br/home/estatistica/economia/pam/2015/default.shtm. Deforestation calculated as above.</p>
Areas affected by Fires 2013	Municipality area affected by fire (km ²) in 2013	LAPIG http://maps.lapig.iesa.ufg.br/lapig.html
Water scarcity	Levels of criticality of water stress on a scale of 1-7. Aggregated to the median water stress level per municipality weighted by percentage of available water. Based on data from the Brazilian National Water Agency ANA (2013)	Flach et al (2016) http://iopscience.iop.org/article/10.1088/1748-9326/11/7/075003/meta

Loss of amphibian habitat	Relative reduction of extent of suitable habitat (ESH) for 237 species of Amphibian between 2000-2010 due to land conversion of any type, relative to the proportion of each species range that overlaps with Cerrado. Unitless.	World Conservation Monitoring Centre, developed under the project CONTACTED with funding from the Luc Hoffman Institute and WWF UK. Author Paz Duran
Indigenous areas	Area of indigenous areas per municipality, in hectares, from FUNAI, National Indian Foundation (Brazil)	http://www.funai.gov.br/
Protected areas	Protected areas of all designations within Brazil	Environmental Ministry of Brazil
Land based CO2 Emissions	Per municipality, estimated CO2 emissions attributable to deforestation, including from above and below-ground biomass (Tn). Created by overlaying deforestation polygons (as calculated above) with the FUNCATE Emissões LULUCF MCTI/PNUD territorial biomass maps.	FUNCATE 2013. Emissões LULUCF MCTI/PNUD. Relatório de Entrega 14
Actor Commitments		
Forest 500 score	Score of the company commitments according to GCP's Forest 500 score	Global Canopy Programme's Forest 500 http://forest500.org/
Member of RTRS	Member of RTRS (yes/no)	www.responsiblesoy.org/about-rtrs/members/?lang=en
Zero deforestation commitment	Zero deforestation commitment by company (yes/no)	Compiled from company websites and New York Declaration of Forests
% of soy under zero deforestation commitments	Per municipality, the percentage of 2015 soy exports from a company with a zero deforestation commitment for that region.	Compiled from company websites and New York Declaration of Forests
Member of TFA	Member of the Tropical Forest Alliance TFA (yes/no)	http://www.un.org/climatechange/sustainable/wp-content/uploads/sites/2/2014/07/New-York-Declaration-on-Forest-%E2%80%93-Action-Statement-and-Action-Plan.pdf
Trade Data		

Customs Declarations	Tax documents recording shipments compiled by the Brazilian government	Various sources
Bills of Lading	Maritime contracts between exporters and importers guaranteeing volume, value and destination of shipments	Various sources
Crushing Facility Data	ABIOVE Soy crushing and processing facilities	http://www.abiove.org.br/
Silos	CONAB SICARM silo records	http://www.conab.gov.br/detalhe.php?a=1078&t=2

PARAGUAY

DATA	Description	Source
Departmental Statistics		
Soy Production	Municipal production of soy in tons from the Paraguayan Department of Statistics (DCEA) from agricultural surveys, 2016.	http://www.mag.gov.py/index-b-nuevo.php?pag=sintesis-estadistica.html
Environmental Characteristics		
Territorial Deforestation	Annual rate of clearance of native vegetation in ha, with respect to previous year.	http://www.wwf.org.py/que_hacemos/sig2/monitoreo_de_la_deforestacion/
Maximum Soy Deforestation	<p>Deforestation rate in a given year restricted by the amount of new planted area for a commodity. For planted area A of a commodity, total departmental deforestation D, in year y, commodity deforestation C, in hectares, is defined:</p> $C_y = \delta A_y \quad \text{if } D_y > \delta A_y$ $C_y = D_y \quad \text{if } D_y < \delta A_y$ <p>Where</p> $\delta A = \max(0, A_y - A_{y-1})$	

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Zero deforestation commitment	Zero deforestation commitment by company (yes/no)	Compiled from company websites and New York Declaration of Forests
Member of TFA	Member of the Tropical Forest Alliance TFA (yes/no)	http://www.un.org/climatechange/submit/wp-content/uploads/sites/2/2014/07/New-York-Declaration-on-Forest-%E2%80%93-Action-Statement-and-Action-Plan.pdf
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