

REDD AND AGRICULTURE



IMPLICATIONS OF DEFORESTATION FOR AGRICULTURE AND CLIMATE CHANGE

REDD, or Reducing Emissions from Deforestation and Forest Degradation, could:

- Create economic value for preserving international forestland
- Reduce the pressure to convert international forestland into international agricultural production
- Lower greenhouse gas emissions in developing countries and combat global climate change
- Reduce compliance and energy costs for a cap-and-trade greenhouse gas system in the US without flooding the carbon market with international credits

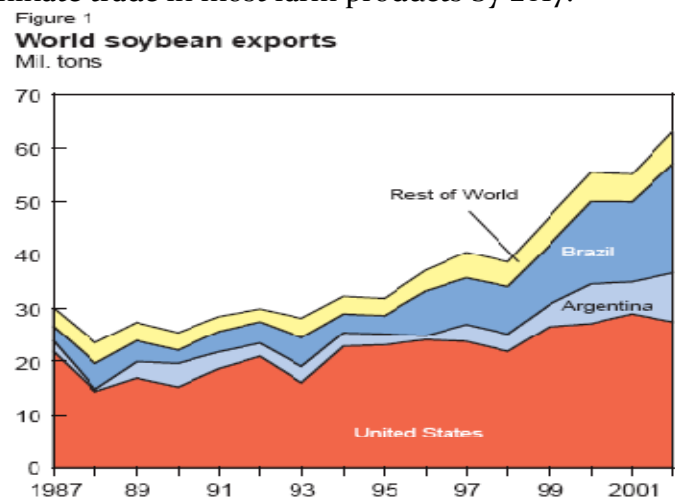
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IMPLICATIONS OF DEFORESTATION FOR AGRICULTURE AND CLIMATE CHANGE

ISSUE: DEFORESTATION AND AGRICULTURE

Globalization and increasing demand for agricultural commodities are escalating the profitability of deforestation and agricultural production in developing countries. Both consumption and production are growing faster in developing countries than developed countries for all agricultural commodities except wheat.¹ According to the Food and Agriculture Organization of the United Nations, developing countries are expected to dominate trade in most farm products by 2017.²

South America continues to come forward as a major competitor in the global agricultural commodities market. For example, the graph at right shows recent trends in soybean production in the United States, Argentina, Brazil and the rest of the world.³ According to USDA, increases in South American soybean production have put downward pressure on US soybean prices.⁴ These trends are expected to continue. Similar trends have been seen for South American production of corn and cattle.



Source: Foreign Agricultural Service, USDA.

The availability of cheap land in developing countries is a competitive advantage for foreign agricultural producers. Forests in developing countries are being cleared at a rapid pace for many reasons, but largely for the expansion of agricultural lands. Agriculture is linked to deforestation in developing countries both directly through expansion and indirectly through infrastructure development and the displacement of cattle ranchers. The chart on the next page shows the correlation between soy prices, cattle prices, and deforestation in the Brazilian Amazon.⁵

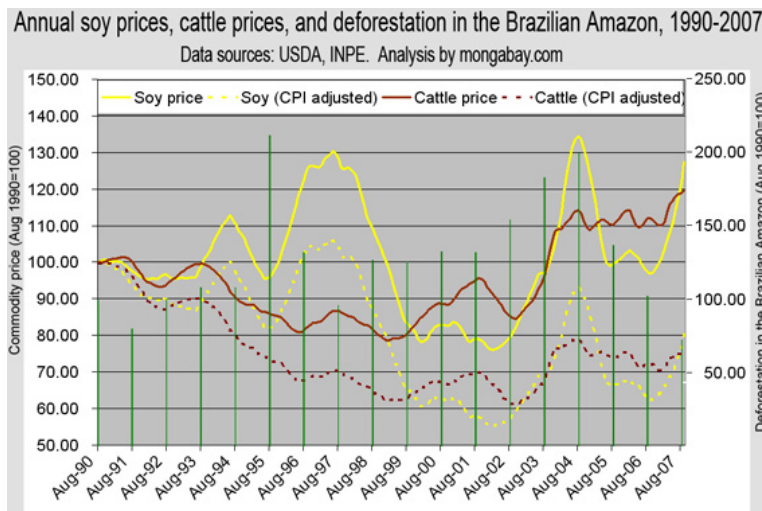
¹ Food and Agriculture Organization of the United Nations. (29 May 2008). *Agricultural Commodity Prices Expected to Remain High*. <http://www.fao.org/newsroom/EN/news/2008/1000849/index.html>.

² *Ibid.*

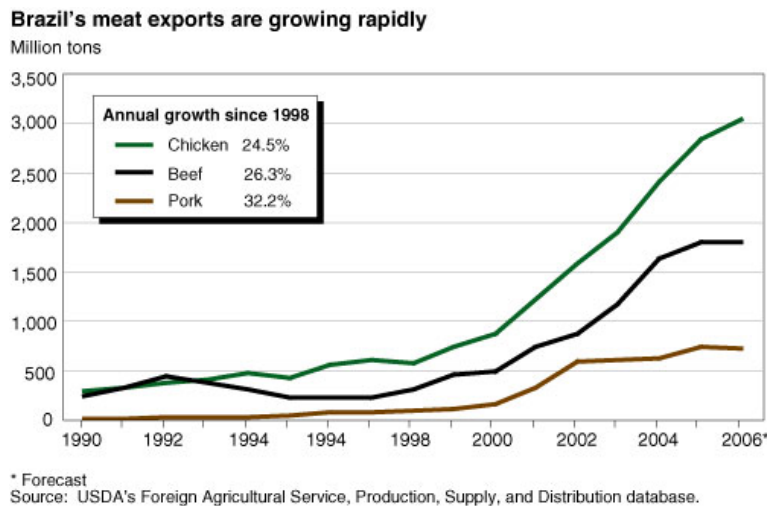
³ Source: Plato G., Chambers W. USDA ERS. (Apr 2004). *How Does Structural Change in the Global Soybean Market Affect the U.S. Price?* <http://www.ers.usda.gov/publications/wrs013/wrs013f.pdf>.

⁴ Plato G., Chambers W. USDA ERS. (Apr 2004). *How Does Structural Change in the Global Soybean Market Affect the U.S. Price?* <http://www.ers.usda.gov/publications/wrs013/wrs013f.pdf>.

⁵ Mongabay. (22 Oct 2007). *Annual Soy Prices, Cattle Prices, and Deforestation in the Brazilian Amazon*. <http://news.mongabay.com/2007/1021-amazon.html>.



Clearing forest land for cattle pasture is the largest driver of deforestation in the Amazon, accounting for more than two-thirds of annual forest clearing in many years.⁶ At the same time, Brazil is now the world’s largest beef-exporting country by volume, due in part to Brazil’s ready availability of land resources.⁷ In areas suitable for soy cultivation, forest lands are typically cleared for cattle ranching then sold to soy producers some two to three years later.⁸ As ranchers move further into frontier areas, the pattern of deforestation and expansion continues.



There is a linkage between deforestation and agricultural production in developing countries.

⁶ Mongabay. (31 Jul 2008). *Future Threats to the Amazon Rainforest*. <http://news.mongabay.com/2008/0801-amazon.html>.

⁷ Valdes C. USDA ERS. (Apr 2006). *Brazil Emerges As Major Force in Global Meat Markets*. <http://www.ers.usda.gov/AmberWaves/April06/Findings/Brazil.htm>.

⁸ Mongabay. (31 Jul 2008). *Future Threats to the Amazon Rainforest*. <http://news.mongabay.com/2008/0801-amazon.html>.

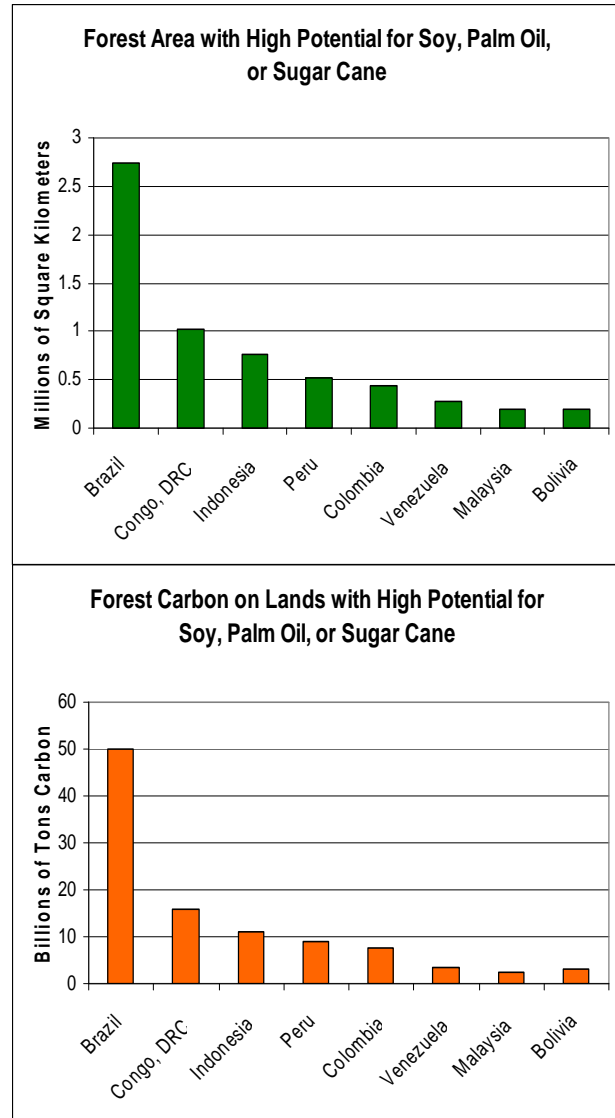
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While the drivers and dynamics of deforestation differ from place to place, at the most general level, forests currently have more economic value after they have been cut down than when they are standing.⁹ In the absence of large-scale incentives for conservation, deforestation is likely to continue at a rapid pace.¹⁰

If tropical deforestation continues at its current rate, approximately 300 billion tons of carbon currently stored in tropical forests will be released into the atmosphere.¹¹ Clearing and burning tropical forests causes approximately 20% of global greenhouse gas (GHG) emissions every year – more than all the cars, trucks, buses and trains in the world.¹² In dry years, forest and peat fires in the Amazon and Southeast Asia raise this total to as much as one-third of global emissions.¹³

SOLUTION: VALUING CARBON STORAGE

Agriculture and forestry have a critical role in stabilizing global climate change. Carbon is stored by plants in vegetation and in the soil as the plants grow and decompose. Certain management practices can be taken on to promote the storage, or sequestration, of carbon in order to offset emissions from other sources. These practices include agricultural soil carbon



Forest area and forest carbon stocks on forested lands that have suitable soil and climate for major drivers of tropical deforestation (soy, oil palm, sugar cane). Thirty-six per cent of the land suitable for any one of these crops is in Brazil.^a

⁹ Schwartzman, S., Environmental Defense Fund, *et al.* (2007). Getting REDD Right: REDD in the UNFCCC.

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² *Ibid.*

¹³ Page S. E., Sigert F., Riley J. O., Boehm H.-D.V., Jaya, A., Limin S. (2002). The amount of carbon released during peat and forest fires in Indonesia during 1997. *Nature* 420:61-65.

^a Source: Schwartzman, S., Environmental Defense Fund, *et al.* (2007). Getting REDD Right: REDD in the UNFCCC. Data from: Stickler, C., *et al.* (2007). Readiness for REDD: A preliminary global assessment of tropical forested land suitability for agriculture. <http://whrc.org/BaliReports/>.

management techniques, forestation, and avoided deforestation. Forests are particularly important as carbon sinks: carbon stored in forest biomass, deadwood, litter and soil together is roughly 50 percent more than the amount of carbon in the atmosphere.¹⁴

There are a range of approaches and technologies that could be used to limit carbon in the atmosphere. Forestry and agriculture could account for up to 30% of the total reductions needed to stabilize atmospheric carbon.¹⁵ Forest conservation and agriculture offer low-cost, readily available sources of beneficial near-term GHG reduction.

SOLUTION: CARBON OFFSET FUNDS AND REDD

Congress is considering policies that would cap GHG emissions from industries and allow those who reduce emissions to sell credits in a cap and trade market. In this type of market, forestry and agriculture could sell credits for sequestering and reducing greenhouse emissions, and industries required to reduce their emission levels could purchase those credits. Such a program would deliver incentives for promoting forest conservation and sustainable development in developing countries as well as in the United States.

A range of proposals for REDD design have been advanced or are under development by individual countries or groupings, advocacy organizations, academics and others, differing along a number of dimensions, such as type of commitment (emission vs. cause-oriented), scale (national vs. project), financing (funds vs. market), determination of reference line (historical plus other factors).¹⁶

International carbon markets are the first – and possibly last – chance to create economic value for living forests at a scale commensurate with large-scale deforestation.¹⁷ A mechanism such as REDD would:

- Create economic value for preserving international forestland
- Reduce the pressure to convert international forestland into agricultural production as the only means of receiving economic value for the land
- Lower GHG emissions in developing countries and combat global climate change

REDD, which stands for **Reducing Emissions from Deforestation and Forest Degradation** (REDD), is a proposal to compensate developing countries for nation-wide reductions in greenhouse gas emissions from deforestation and forest degradation.

¹⁴ Food and Agriculture Organization of the United Nations. (14 Nov 2005). *Deforestation Continues at an Alarming Rate*. <http://www.fao.org/newsroom/EN/news/2005/1000127/index.html>.

¹⁵ Socolow, R. and Pacala, S. (13 Aug 2004). "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies." *Science*, Vol. 305.

¹⁶ Carbon Forestry Research, Center for International Forestry Research. (2008). *Integrating REDD into the Global Climate Protection Regime: Proposals and Implications*.

<http://www.cifor.cgiar.org/carbofor/projects/globalredd/Introduction.htm>.

¹⁷ Schwartzman, S., Environmental Defense Fund, *et al.* (2007). *Getting REDD Right: REDD in the UNFCCC*.

CONSIDERATION: REDD CREDITS WON'T FLOOD THE CARBON MARKET

Forest carbon credits from developing countries, including REDD credits, have considerable potential to help decrease the costs of compliance with cap-and-trade programs in the EU and United States. Despite the potential lower cost of some of these credits, REDD credits are unlikely to flood the carbon market and crash the carbon price.

This is in part because forest carbon credits would not be able to account for all of the necessary reductions. For example, recent modeling of Amazon carbon supply shows that while up to 94% of avoided Amazon deforestation would cost under \$5/ton C (much less than previously estimated)¹⁸, these reductions would represent only a small part of those needed to achieve moderate reductions targets.¹⁹

A study undertaken by Environmental Defense Fund (EDF) indicates that concerns about forest carbon credits driving the carbon price into the single digits appear unfounded. Even if no limit were placed on the use of forest carbon credits for compliance with cap-and-trade programs, and even if forest carbon credits throughout the developing world became available within the next five years, EDF models project that the market price of GHG allowances would be \$16/ton in the year 2012, rising to \$24/ton by 2020 and \$40/ton by 2030.²⁰ These levels are high enough to ensure that important low-carbon technologies, such as renewable energy sources, remain economically viable.²¹ If REDD credits are allowed for compliance, but not credits from other forestry activities, the projected price of allowances in the US and EU markets is \$21/ton in the year 2012, rising to \$30/ton in 2020 and \$49/ton by 2030.²²

OTHER CONSIDERATIONS: REDD Implementation

Lower Compliance and Energy Costs

Forest carbon credits and other offsets have the potential to lower the costs of compliance with a GHG cap-and-trade system. EDF models found that allowing the use of REDD credits for compliance lowers the projected price of GHG allowances by at least 10%.²³ While these forest carbon credits would not “flood the market”, they would lower the cost of GHG regulation on industry and the energy sector. This would lessen the costs of compliance for energy, transportation, and energy-intensive products, such as fertilizer; all of which are important for agriculture.

¹⁸ Nepstad, D., Soares Filho, B., *et al.* (2007). The Costs and Benefits of Reducing Carbon Emissions from Deforestation and Forest Degradation in the Brazilian Amazon. Woods Hole Research Center, Woods Hole, MA.

http://www.whrc.org/policy/BaliReports/assets/WHRC_Amazon_REDD.pdf

¹⁹ Schwartzman, S., *et al.* (2007). *Getting REDD Right: REDD in the UNFCCC.*

²⁰ Piris-Cabezas, P., Keohane, N. Environmental Defense Fund. (Jun 2008). REDD: Implications for the Carbon Market.

²¹ *Ibid.*

²² *Ibid.*

²³ Piris-Cabezas, P., Keohane, N. Environmental Defense Fund. (Jun 2008). REDD: Implications for the Carbon Market.

Market v. Non-Market Approaches

Market-based REDD creates a long-term, reliable source of funding to compensate nations for reducing GHG emissions from deforestation and degradation. Non-market funding opportunities create incentives for maintaining the stock of existing forests and provides assistance to nations in building capacities in preparation for national-level market-based REDD programs.²⁴ However, market-based REDD has the potential to generate significantly greater financial streams than fund-based approaches.²⁵ Both financial approaches can play a key role in reducing deforestation.

Contribution

Concerns have arisen that REDD might not lead to absolute emission reductions and that developing nations would not be contributing to global GHG reductions at the same level as developed nations. However, in many developing countries, the majority of emissions come from deforestation.²⁶ If allowances in a market-based REDD are awarded post facto, when country-wide reductions are achieved below a historical level, REDD has the potential to achieve national-level reductions comparable to those achieved under a cap.²⁷

Banking

The ability to bank credits for the future is a crucial factor that sustains carbon prices at a stable level in a market system. Forest carbon credits represent a reservoir of low-cost emissions reductions that are available in the short-term.²⁸ Their true economic value lies in their potential to be banked for the long-term, rather than being used all at once.²⁹ Banking allows the system manage surplus to meet demand and mitigate risk in both the short and long-term.

Measurement and Monitoring

Any carbon market must account for accurate measuring and monitoring of carbon credits to ensure credits are real and verifiable. Issues such as additionality, permanence and leakage, terms that relate to concerns that projects result in real long-term reductions of GHG emissions, can be addressed through careful program design. For example, market-based allowances issued for national-level reductions in deforestation below historical baselines can help ensure additionality and permanence.³⁰ No matter the type of credit or the trading system, these issues should be taken into account in the design of a cap and trade system for reducing greenhouse gases, compensating those who protect forests, and rewarding sustainable agriculture.

²⁴ Environmental Defense Fund. (20 Aug 2008). REDD Financing: Different Approaches for Different National Circumstances.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ *Ibid.*

²⁸ Piris-Cabezas, P., Keohane, N. Environmental Defense Fund. (Jun 2008). REDD: Implications for the Carbon Market.

²⁹ *Ibid.*

³⁰ Environmental Defense Fund. (20 Aug 2008). REDD Financing: Different Approaches for Different National Circumstances.