

UN-REDD PROGRAMME POLICY BRIEF



Food and Agriculture
Organization of the
United Nations



Empowered lives.
Resilient nations.

Fiscal incentives for agricultural commodity production: Options to forge compatibility with REDD+

Author: Gabrielle Kissinger

Contributors: María Dolores Almeida & Jacinto Coello

Key messages

1. Fiscal policies and incentives are often key underlying drivers of forest change that influence land use behavior in sectors that encroach on forests, although the understanding of their impacts on forests is often lacking. Fiscal policies have not been systematically examined as part of REDD+ readiness.
2. Public policy and related fiscal policy and incentives must seek coherence across sectors, in order to overcome inherent conflicts between sectors and competing land uses, and to send the right signals.
3. REDD+ provides an entry to rethink fiscal incentives for agricultural commodities as part of Countries National REDD+ Strategies and Actions Plans.

1. Introduction

Fiscal policies and incentives are often key underlying drivers of forest change that influence land use behaviour in sectors that encroach on forests, although the understanding of their impacts on forests is often lacking. Developing countries that are pursuing REDD+¹ seek to reduce greenhouse gas (GHG) emissions from the clearing and degradation of forests. Agriculture is estimated to be the direct driver for around 80 per cent of deforestation worldwide, and yet in order for countries to reverse this pressure, they must influence the underlying or indirect drivers associated with the production of agricultural commodities in an increasingly globalized economy.² The future pressures on forests are enormous. More

than 80 per cent of growth in global demand over the next 15 years for field crops, fibre and beverage crops, meat, timber and forest products, will be in developing countries, and yet the options to overcome crop and pasture yield constraints present huge technical, social and economic challenges.³ To avoid crop expansion and just meet projected crop needs by increasing production, it is predicted that crop yields would need to increase by an estimated 32 per cent more from 2006 to 2050 than they did from 1962 to 2006 during the height of the 'green revolution'.⁴ Reaching such increases in yields is highly unlikely. With global population rising to at least nine billion people by 2050, it is commonly accepted that

the resource degradation and increasingly marginal food production circumstances risk the economic and ecological stability we have come to rely on in the past.^{5,6} Our agricultural systems are reaching a productivity plateau, and often depend on spatial expansion, rather than increases in yield per hectare, for production increases.

Our natural capital - forests, agricultural lands, water - are increasingly being understood in the context of building social capital and stable economies. The Aichi Biodiversity Target number 3 calls for the elimination and reformation of incentives and subsidies harmful to biodiversity by 2020.⁷ The post-2015 sustainable development goals (SDGs)⁸ identify a range of economic, social and environmental goals that countries agree should form the basis for sustainable development moving forward. Halting and reversing land degradation and biodiversity loss, sustainably managing forests, ensuring sustainable production and consumption patterns, and promoting inclusive and sustainable economic growth are key goals.⁹ One sustainable development target specifically calls for the phasing out of inefficient fossil fuel subsidies that encourages wasteful consumption and market distortions.¹⁰ Income inequality and economic efficiency are important indicators for how far countries are along the pathway towards inclusive economic growth. The UN report, *Inequality Matters*, finds that economic inefficiency traces back to highly unequal land distribution in a significant number of developing countries, and enhancing land equity and productivity crucially must underpin broader rural development strategies.¹¹ The report finds that while some Latin American and African countries have reduced economic inequalities over the last two decades, income disparities have increased within many countries, and risk development futures. Further, the unequal distribution of public and private assets is an important determinant of spatial disparities, and this is visible in the enduring urban-rural divide. **For REDD+ countries, this requires decoupling economic growth from deforestation and forest and land degradation, and finding greater compatibility between rural development, commodity production and REDD+, for solutions towards low-carbon growth.** The redesign of fiscal incentives can help enable that transition, and this paper explores examples of and pathways for how this can work.

While decoupling economic growth from deforestation and degradation sounds simple, operationalizing the concept requires rethinking the fiscal incentive frameworks promoting agriculture and the opening of the forest frontier. The recent *New Climate Economy* report notes that many countries subsidize key agricultural inputs, such as irrigation

water and fertilizer, in order to boost productivity, but evidence suggests these subsidies can also lead to waste and environmental damage. There is an urgent need to identify how policy changes can increase the efficiency of agricultural production and reduce GHG emissions.¹² Fiscal and policy incentives that support agricultural development were usually not designed with REDD+ in mind, and thus need to be better understood and revised to identify the complementarities and conflicts between such fiscal policies and REDD+. This should include assessing how social, economic and environmental impacts and benefits associated with fiscal policies and measures can be better understood and balanced.

A. Definitions

Box 1 below provides a set of working definitions for the full range of subsidies and fiscal incentives that affect production and land use. The definition of fiscal policies and incentives should be broad enough to capture the range of fiscal instruments that affect land use and forest cover change. This research adopts the World Trade Organization's (WTO), Food and Agriculture Organization of the United Nations (FAO) and Global Subsidies Initiative definitions of subsidies and fiscal incentives. The WTO defined a subsidy to exist if a benefit is conferred through: direct transfers of funds (e.g., grants, loans); potential direct transfers of funds or liabilities (e.g., loan guarantees); foregone government revenue (e.g., tax credits); government provision of goods or services; government payments to a funding mechanism, or entrusting a private body to carry out what would normally be a government function; and income or price support as understood in GAT agreements of 1994.

The FAO adopted a broader definition (in the fisheries context) than the WTO, defining subsidies as government *actions* or *inactions* outside of normal practices that modify - by increasing or decreasing - the potential profits by industry in the short-, medium- or long-term. The FAO definition thus includes direct and indirect financial transfers and services, regulations and lack of intervention for purposes of affecting industry profit, which are outside of normal practices. This definition includes the direct and indirect transfer of funds and liabilities, various forms of tax relief, the provision of access to capital, land, water and public infrastructure at below-market rates (which can also include in-kind support), as well as market and price support. Intergovernmental fiscal transfers can also function as a fiscal incentive, giving sub-regional governments the means to distribute incentives to the private sector, rather than central government (this is a 'pass-through').

Consumption mandates are not included in the WTO definition, yet are a primary means through which government-led demand-side measures influence land conversion activity for commodities, such as biofuel-blending mandates. The Global Subsidies Initiative considers the market price support enabled by consumption mandates to be a subsidy. Mandates can have the effect of driving demand and prices, thus improving producer access to capital in

financial markets to meet the demand.

While the above provides an expanded definition of subsidies, there are also fiscal incentives that do not constitute subsidies. Fiscal policy is the means through which governments adjust spending, taxes and their national economies, thereby enabling subsidies and fiscal incentives.

Box 1: Definitions of subsidies and fiscal incentives

- The WTO defines* a subsidy as ‘any financial contribution by a government, or agent of a government, that confers a benefit on its recipients.’
- The FAO uses a broader definition** and classifies subsidies into four main categories: (1) direct financial transfers; (2) services and indirect financial transfers; (3) regulations; and (4) lack of intervention.
- In addition, the Global Subsidies Initiative further refines the WTO definition to include the market price support enabled by consumption mandates to be a subsidy.*** Consumption mandates are commonly utilized to increase demand for biofuels, and are a primary means through which government-led demand-side measures influence land conversion activity for commodities.

This analysis refers to fiscal policies and incentives as all activities captured in the above definitions. For more detail on definitional aspects, refer to Kissinger, G., forthcoming.

* World Trade Organization, 1994. Agreement on Subsidies and Countervailing Measures.

** Food and Agriculture Organization of the United Nations (FAO), 2004. Guide for identifying, assessing and reporting on subsidies in the fisheries sector. FAO, Rome.

*** Gerasimchuk, I., R. Bridle, C. Beaton, C. Charles, 2012. State of Play on Biofuel Subsidies: Are policies ready to shift? IISD, Winnipeg, Canada.

Table 1 identifies the different types of fiscal incentives that are generally observed in production and land use, which meet the composite definition of fiscal incentives. While

fiscal incentives can be directed towards all stages in the production and manufacturing supply chain, the focus here is on those primarily targeted towards production.

Table 1: Types of fiscal incentives

Type	Example
Grants and other direct payments	Transfers to companies or producers to cover specific costs, payments or vouchers to consumers to cover a portion of costs (such as for cooking oils) <i>Example: Cooking oil subsidies, subsidized land, fertilizer subsidies, inputs (planting materials, herbicides), rural development grants</i>
Tax concessions	Allowing firms not to pay a tax that it would otherwise owe as an inducement to invest <i>Example: Income tax deduction or exemption, lower foreign taxes, accelerated depreciation and amortization, loss-carry forward provisions, Value-Added Tax exemptions, biofuel import and stamp duty relief, tax holidays</i>
In-kind subsidies	Non-monetary benefits that confer a benefit on the recipient <i>Example: Privileged or streamlined land access and permitting, publicly-funded research providing private benefit, corruption</i>
Cross-subsidies	Market transfer or price discrimination within the scope of one unit <i>Example: Electricity and irrigation use within a public utility</i>
Credit subsidies and government guarantees	Below-market interest loans, underwriting risk and loan guarantees, incentives promoting foreign investment <i>Example: Loss compensation, concessionary interest rates</i>
Hybrid subsidies	Instruments utilizing the tax system to lower the costs of private investment <i>Example: Tax-free bonds, tax increment financing</i>
Derivative subsidies	Subsidies to counter the distortions caused by other subsidies upstream, such as higher input prices for downstream manufacturers or consumers <i>Example: Compensatory or countervailing support, subsidy clusters</i>
Procurement	Preferential public purchasing, special financing arrangements <i>Example: Public procurement commitments seeking to support domestic producers</i>
Market price support (in the producer country)	Deficiency payments or artificial price support to cover the gap between target price for a good and actual market price <i>Example: Fuel blending mandates</i>

Source: Adapted by the author based on IISD: <http://www.iisd.org/gsi/subsidy-types>

Fiscal incentives occur at different stages in commodity supply chains, ranging from land access to production, downstream processing and manufacturing, and domestic and international demand-side measures such as market-price support or fuel blending mandates. At the production sale, land access fiscal incentives often come in the form of in-kind subsidies to producers, which allow for access rights, relaxed permitting, or reclassification of lands to enable commodity production. Land access incentives can also include grants and direct payments. In Indonesia, decentralization policies and intergovernmental fiscal

transfers function as a pass-through, giving district governments the means to distribute incentives to the private sector, rather than central government. Fiscal incentives that support the financing of investments in production come in the form of credit subsidies, government guarantees and tax concessions. As shown below in the case studies, most production incentives come in the form of grants, direct payments, credit subsidies and government guarantees. In Ecuador, though most fiscal incentives were developed with the intention to increase productivity and yields, the opposite has occurred. Increases in production

have come from expansion, while overall productivity generally declined. Similarly in Indonesia, it appears that while accounting for a significant portion of public spending on agricultural production, fertilizer subsidies have had a negative effect on agriculture sector growth. Downstream sector development largely takes the form of tax concessions, often to support investments in production facilities and to ease foreign investment rules.

B. Why REDD+ is an entry point to rethink fiscal incentives for agricultural commodities

The Warsaw Framework for REDD+ encourages governments and others to take action to reduce the drivers of deforestation and forest degradation, and reaffirms the importance of addressing these pressures in the context of the development and implementation of REDD+ national strategies and action plans by REDD+ countries, depending on their national circumstances.¹³

Based on an initial review of subsidies to beef and soy in Brazil, and timber and palm oil in Indonesia, it is clear that domestic subsidies causing deforestation vastly outweighs the international aid seeking to prevent it. Brazil and Indonesia combined provided over US\$40 billion in subsidies to the palm oil, timber, soy, beef and biofuels sectors between 2009 and 2012, which is 126 times more than the US\$346 million they have received through REDD+.¹⁴ While it is difficult to quantify the impact of these subsidies as a percentage of forest cover change, the findings help illustrate that REDD+ readiness payments will not deliver the intended outcomes unless parallel efforts focus on bringing coherence to fiscal incentive frameworks.

The review of 43 country REDD+ readiness plans finds that very few countries, if any, call out the need to review and reform existing fiscal incentives as part of their REDD+ readiness activities.^{15,16} The provision of REDD+ finance has also not been explicitly linked to addressing perverse fiscal incentives.

While the political economy of reversing perverse incentives for unsustainable land use requires careful consideration of how to minimize impacts on rural economies and communities, countries can increasingly find willing private sector partners interested in finding solutions to more sustainable land use. Growing pressure from brand manufacturers and consumers is putting pressure on producers of agricultural raw materials to demonstrate sustainability through standards compliance, adherence to national regulations, and reduced greenhouse gas emissions. The Consumer Goods Forum, comprised of more than

400 retail and brand manufacturers globally with total combined sales of €2.5 trillion, seeks to achieve its goal of zero net deforestation by 2020 by working in partnership with governments and NGOs to address challenges in the sourcing of such commodities as palm oil, soya, beef, and paper and board.¹⁷ Catalyzed by this private sector commitment, the Tropical Forest Alliance 2020 formed as a public-private partnership with the governments of Indonesia, Liberia, the Netherlands, Norway, United Kingdom and United States and numerous NGOs seeking to work with private sector actors to address deforestation pressures in four key commodity value chains of palm oil, soy, pulp and paper and beef. These platforms are emblematic of the public-private partnerships that are possible to address the interface between agriculture and forests.

Supply chain sustainability and zero net deforestation commitment success depend on getting the enabling environment right - and this is the crucial domain of REDD+ governments. REDD+ countries will need to define, based on their own national circumstances, how domestic policies and financial incentives can guide and promote private sector investment in land use and production. Public policy and related fiscal policy and incentives must seek coherence across sectors, in order to overcome inherent conflicts between sectors and competing land uses, and to send the right signals.

Importantly, fiscal incentives supporting agricultural production can be important levers to promote sustainable land use, if they are conceptualized and designed to do so. **This brief explores opportunities for REDD+ countries to do this, and provides a starting point for considering how to reform perverse incentives to safeguard forests.** While fiscal incentives are only one part REDD+ implementation, they have not received enough attention given their impact on decisions to unsustainably use forests. Two case studies of fiscal incentives promoting palm oil production in Ecuador and Indonesia, which were completed in the first phase of this research, are explored. This is followed by exploration of success stories in Brazil and India, along with other examples of fiscal policy reform and reversal of perverse incentives in the land use sector. These examples form the basis for a discussion of key lessons learned and knowledge gaps, and recommendations for pathways forward for countries to create stronger coherence in their fiscal policies and incentives across multiple government objectives. Lastly, a decision tree for finding complementarity between fiscal incentives for agricultural commodity production and REDD+ is provided, to help guide countries in their assessment of options to redesign or revise fiscal incentives. While the focus is on fiscal incentives for agri-

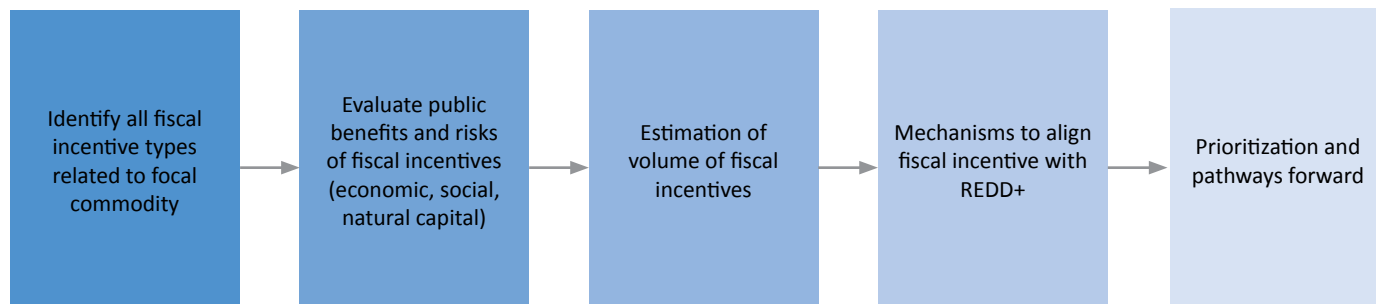
cultural commodities, the decision tree can also be applied to other drivers of deforestation and forest degradation.

II. Case studies

Two case studies were completed as the first phase of this research to explore fiscal incentives promoting palm oil

production in Ecuador¹⁸ and Indonesia¹⁹ in order to better understand what current fiscal policies and instruments exist that influence oil palm production in these two countries, the impacts of these incentives on forests, and what the options the governments have to create better compatibility between oil palm production and REDD+. Figure 1 provides the analytical framework that both country assessments followed to complete the analyses.

Figure 1: Analytical framework: Bringing fiscal incentives for agricultural commodities into compatibility with REDD+



Below are condensed summaries of these two stand-alone reports.

A. Ecuador

Country and commodity context:

Deforestation and changes in land use as part of Ecuador's expanding agricultural frontier has led to a 47 per cent increase of GHG emissions from the agriculture and forest sector between 1990 and 2010.²⁰ During roughly the same period, 99.4 per cent of the deforested areas were transformed into agricultural areas, consisting mostly of industrial monocultures and livestock, and less than 0.6 per cent for infrastructure and other uses.²¹ Palm oil is a primary contributor to deforestation, often occurring in territories with previously existing primary tropical forests. Almost half of all plantations are concentrated in the provinces of Esmeraldas, with smaller amounts in Santo Domingo, and Los Ríos and other provinces. The amount of land area under palm cultivation has increased by 77.7 per cent between 2000 and 2013, and with the majority of palm trees being so young, only 14 per cent of plantations are in full production. Exports of palm oil increased by 30 per cent between 2008 and 2013.

Types of fiscal incentives and where in the supply chain:

- The analysis identified that Ecuador has implemented 27 tax and financial incentives (grants, subsidies, tax concessions, preferential lending rates, among others)

directly or indirectly related to palm oil production in the agriculture sector, without considering the effects they can have on deforestation, degradation or conservation of carbon stocks.

- Most of the incentives are weighted toward to the supply side (producer) rather than demand-side. The incentives are focused on reducing production costs and few are geared towards crop intensification and improving productivity, and none set as a condition best practices in production in order to access incentives.
- While most fiscal incentives developed so far been created with the objective of increasing productivity and yields, increases in production came from expansion, while overall productivity generally declined.
- Subsidized credit is the primary form of fiscal incentives to palm oil production, and is estimated to be 0.034% per cent of Ecuador's GDP in 2013.
- In 2013, the allocation of expenditures on palm oil by the Instituto Nacional Autónomo de Investigaciones Agropecuarias was 0.12 per cent of expenditure in the agricultural sector, primarily for improving palm seed genetics for productivity and disease resistance, plus controlling the 'bud rot,' which has recently afflicted palm trees. Incentives are concentrated on palm cultivation and marginally supports value-added processing such as extraction or processing of products derived from the palm. Area subsidies can be

accessed by small- and medium-sized producers.

- Financing for palm oil production is primarily from private sources, and the public Banco Nacional de Fomento and Corporación Financiera Nacional only supplied 8.9 per cent of the financing needs of the industry in 2012.

Prioritization of incentives to focus on:

Of the 27 identified economic and fiscal incentives, seven have a high probability of having a high negative impact on deforestation and are related to subsidies or tax exemptions for fertilizers/pesticides and lines of public financing supporting access to or acquisition of rural land. However, nine incentives could support REDD+, including the ones targeting research on genetic improvements of seeds (if it is coupled with measures to reduce expansion into forests), tax expenditures to promote the improvement of productivity and use of cleaner technologies or disincentives for owners of large tracts of rural land, and public credit supporting agro-forestry. The remaining 40 per cent of incentives have medium- or low-impact in relation to the objectives of REDD+. Prioritization of fiscal incentives to target for reform was based on identifying those that could be easily modified through ministerial agreements or resolutions.

Recommendations for complementary with REDD+ actions and measures:

- Link fiscal incentives such as subsidized credit, tax concessions and credit guarantees to certification and standards such as RSPO to promote the adoption of best production practices.
- Fund technological innovation in the agricultural sector and especially in the oil palm sector to contribute to improving the productivity of small and medium farmers.
- Create differentiated rural property tax exemption for conversion of crops to agroforestry, to occur at municipal levels.
- Prioritize, allocate and guarantee finance to support objectives aligned with REDD+ in the budget guidelines for state budget programmes, through a ministerial agreement.
- Establish a differentiated tariff in the Comunidad Andina de Naciones to import palm oil certified as sustainable.
- Include an indicator related to REDD+ (specifically for deforestation and associated emissions) in the Territorial Equity Model within the Index of Goal Compliance under the National and sub-national Development

Plans, so that transfers from the central government increase if territorial projects are aligned with REDD+ objectives.

B. Indonesia

Country and commodity context:

Indonesia accounts for 53 per cent of the global production of palm oil, and China and India buy 38.7 per cent of Indonesia's palm oil exports. Palm oil contributes 4.5 per cent to Indonesia's GDP. The recently unveiled National Medium Term Development Plan (RPJMN) of 2015-2019 seeks national economic growth acceleration through increased production of value added products, and competitiveness of agricultural commodities, including oil palm. The RPJMN also identifies forestry/peatlands and agriculture as two of the five key sectors that are key to meeting Indonesia's GHG emission reduction target of 26 per cent by 2020. These two sectors supply the majority of Indonesia's overall GHG emissions. Indonesia's REDD+ National Strategy of 2012 identifies the need to address perverse incentives and promote a shift in commodity production, including better alignment of incentive systems to support REDD+ outcomes. Meanwhile, domestic demand for palm oil for biofuel is expected to increase considerably, due to the recent decision to direct some of the savings from rescinded fossil fuel subsidies towards biofuels, and a fairly aggressive national biofuel plan.

Types of fiscal incentives and where in the supply chain:

- *Land access* fiscal incentives include grants, direct payments or in-kind subsidies to producers allowing for access rights, relaxed permitting, reclassification of lands to enable palm oil development. Land access incentives also include decentralisation policies and intergovernmental fiscal transfers.
- *Financing Investment in production* includes credit subsidies, government guarantees and tax concessions, such as debt restructuring, tax breaks, preferential lending rates, 'production forest for conversion' timber sales, and investments in biofuel production.
- *Crude palm oil production* incentives are mostly grants, direct payments, credit subsidies and government guarantees, comprised of the fertiliser subsidy, interest rate subsidies for developing palm oil seeds, and a range of incentives available to tied smallholder schemes.
- *Incentives specific to biofuels* include market price support, regulatory and tax concessions, and grants and direct support. These include a biofuel import tariff, Special Biofuel Zones, investment income tax

deductions, VAT exemption for domestic biofuel production, state oil company losses, biodiesel production subsidies, biofuel investment incentives, subsidized fuel policy and the biofuel blending mandate.

- *Downstream sector development* includes differential export taxes on crude and refined palm oil products, cooking oil subsidies, subsidized infrastructure for processing, storage and market access, and a tax holiday facility. These are more recent.
- *Domesitc and international demand-side measures* also play a role, including the EU fuel-blending mandate for biofuels, EU restrictions on palm oil imports for food and biodiesel, and India's import duties on refined palm oil.

Prioritization of incentives to focus on:

The prioritization of which fiscal incentives to reform to create better compatibility between oil palm production and REDD+ hinges upon:

- Strategic assessment of points of leverage for the central government, how compliance and enforcement with existing and new laws can be enabled.
- Identifying how to base access to credit and tax incentives on improved oil palm production practices, spatially targeting fiscal incentives and identifying which incentives have greatest impacts on forests.
- Identifying those fiscal incentives that are easiest to reform and those that improve budget efficiency.

An initial framing of public benefits and risks identifies that:

- Given the high profitability of palm oil production, as compared to other segments of the value chain, fiscal incentives promoting production are unjustified. New land allocations for palm oil expansion may not be necessary.
- Government has not appropriately captured economic rents from oil palm plantations, and more analysis is needed to understand how timber and palm oil revenues can be redirected to support the sector's production standards.
- Fiscal incentives to promote yield improvements among smallholder oil palm producers can be very important for livelihoods and economic benefits, but must be coupled with spatial constraints on expansion.
- The current state budget allocation priorities in the agriculture sector may not deliver on sector growth and food security.

- There exists significant public risk through corruption and illegality.

Recommendations for complementary with REDD+ actions and measures:

- High-level political commitment is essential to more clearly define how to operationalize the REDD+ compatible elements within the 2015-2019 National Mid-Term Development Plan.
- The intergovernmental fiscal transfer system should be reviewed to identify the most efficient and equitable option to incentivize increased productivity and spare land. Options include determining allocations based on productivity, not land area, or retaining the land area basis, but amending it to better reflect levels of ecosystem service provision.
- Bring coherence to management of forest land outside the forest estate and high-carbon stock areas management, but consider using spatial planning and regulatory tools rather than new fiscal incentives for plantation estates.
- Raise smallholder yields and livelihoods by linking smallholder access to fiscal incentives and government-facilitated land tenure clarification, giving less emphasis on subsidized inputs and more support to smallholders to access global and domestic value chains. Consider concessional loans made available to certified producers. Identify options to better target independent smallholders, which often have unclear land tenure and exert pressures on the forest estate through forest clearance. Ensure that investments in yield increases are accompanied by spatial constraints on expansion, to increase production/yields and not increase crop expansion as farmers experience better performance.
- Improve land management performance in order to access government incentives by limiting access to credit subsidies and government guarantees through state banks, and tax concessions, on the basis of performance measures.
 - This can include transfer mechanisms to regional governments screening for compatibility with low carbon growth objectives, jurisdictional approaches to REDD+ to bundle and spatially direct incentives, targeting incentives towards degraded lands, incorporating performance standards into bank lending (public and private).
 - Identify how performance against certification and standards (RSPO and ISPO) can be linked to

fiscal incentives such as credit guarantees and tax concessions, as well as differentiated tariffs for certified exports, in order to improve palm oil production practices across the sector.

III. Success stories

There are examples of governments reversing perverse incentives that drive forest clearing and unsustainable land use, and these experiences are important models for what has worked, and what risk factors governments will need to address in such reform. Each REDD+ country will have its own unique national and sub-national circumstances to consider in designing policies, actions and measures for greater compatibility between rural development, commodity production and REDD+. Lessons learned from these examples will be further explored in the '*knowledge gaps and pathways forward*' section at the end of this brief.

A. Overview of known examples

The inequity in agricultural subsidies is well debated in many countries, with concern that the largest and wealthiest producers typically reap the bulk of benefits, while small producers loose out. The Global Subsidies Initiative argues that by design, subsidies that are tied to outputs or inputs tend to favour larger producing units.²² **Subsidies for rice producers in Costa Rica provides an example of the inequity of agricultural subsidies**, but was also a flaring point in agricultural trade relations. Roughly 90 per cent of Costa Rica's rice subsidies benefited the six largest producers, while less than 2 per cent went to small local farmers.²³ In response to WTO disputes, Costa Rica ended rice subsidies from 1 March 2014.

Subsidy reform has been used to promote more ecologically-attuned agricultural production systems, while benefitting producers. In the 1980's, outbreaks of the brown planthopper threatened Indonesia's rice production. But the yearly US\$100 million in pesticide subsidies promoted such large-scale use of pesticides by farmers, that natural predators of the pest were exterminated as well, increasing the crop devastation from the next wave of the pests hatching from eggs in the rice stems. **Indonesia's National Development Planning Agency and Ministry of Finance developed a plan to reduce pesticide subsidies by almost a half within one year and eliminate them entirely within three years**, and promote integrated pest management (IPM). The IPM programme reached hundreds of thousands of farmers within the first few years, achieved pest reduction goals, and provided the extension and technical

support for farmers to transition away from pesticides.²⁴

Particularly challenging in the forest context is how to reverse incentives when existing regulations are incongruous. **In Niger's Sahel region, regulatory incentives were reversed** which had functionally promoted the removal of young trees by farmers from areas that had historically been savanna or very open canopy forests with scattered trees in fields (parkland agroforests). Ambiguity in Niger's forest code discouraged farmers from taking care of trees on their farms because a higher amount of tree cover could put their farms at the risk of being declared a "forest," and forest tenure regulations required approval and license fees for the felling or commercialization of certain parkland tree species, even if they were growing on farm land belonging to households. While no formal policy change occurred, forest department field officers relaxed their policing role regarding trees on agricultural land, incentivizing farmer-managed natural regeneration. The result was at least 4.8 million ha having been regenerated, and farmer household incomes increasing 18 – 24 per cent over those households that did not respond to the change.²⁵ This example is also noted for its progressive intervention at the field officer level of the forest department, and did not require changes in formal legislation.²⁶

Quite often, simply reversing perverse incentives will not address the negative effects of such action, and the cross-sector support and phased approach necessary to transition economies. **Fishery subsidy reforms in New Zealand** were precipitated by the need to stop government support towards unsustainable fishing practices. The quick elimination of subsidies was part of a broader package of sector reforms and management changes that granted individual transferable quotas so that those remaining in the sector stood a chance of creating a viable business, and those willing to leave the sector could be bought-out. Simply reducing subsidies alone would not have provided the financial options necessary for fishing communities to adapt and readjust, and would have likely increased overfishing, as fishers try to cover marginal costs. Similar fisheries subsidy reforms in Norway, the northeastern United States and Canada demonstrate this need.

Similarly, Colombia provides an example of a REDD+ jurisdictional performance system linked to a cross-sectoral redesign of fiscal incentives, guided by land-use plans. Colombia plans to end deforestation by 2020. The key agricultural commodity sectors (palm oil, sugarcane and biofuels) have committed to zero deforestation and low-emission supply chains, and cattle producers seek to reduce the area of pasture, while increasing productivity. This is

an aspirational example, as efforts are currently underway through the government agricultural finance institution – Colombian Fondo para el Financiamiento del Sector Agropecuario (FINAGRO) – to leverage its US\$4 billion in agricultural and forestry working capital loans and investment finance for new projects that are currently made available to farmers and agribusinesses each year to more clearly support low-emission rural development.²⁷

In many contexts, subsidy reform requires finding a means to reconcile competing land uses and interests. **Austria removed subsidies promoting wetland drainage** for agriculture, and combined it with compensation for restrictions on land use and incentives for sustainable land use practices in an area surrounding a newly created national park.²⁸

Brazil redesigned a federal transfer mechanism to reflect environmental protection at state levels, while not increasing tax burdens. Brazil's environmental fiscal reforms in the early 1990's saw creation of an Ecological Value-Added Tax (ICMS Ecológico). The Ecological VAT collects proceeds from state taxes on goods and services, and then redistributes those proceeds to states based on the level of economic activity in the municipalities and environmental protection.

Fossil fuel subsidies have been criticized for incentivizing the continued extraction of carbon-rich oil, gas and coal reserves, at the expense of investing in cleaner alternatives. Further, low energy prices encourage more use, rather than conservation or wise use. **Indonesia made a bold move to reform fossil fuel subsidies.** Indonesia's previous national budget allocated US\$31 billion for energy subsidies, amounting to 18 per cent of total government spending. Despite the political sensitivity of taking on the issue, President Joko Widodo increased gasoline and diesel fuel prices by 30 per cent or US\$0.16/litre²⁹ in late November 2014.

The next two sections provide more in-depth detail on successful interventions in India and Brazil.

B. India's intergovernmental fiscal transfer: formula for state allocations includes forest cover

Country and commodity context:

India has 69.7 million hectares of forest,³⁰ though extraction of fuelwood and fodder exert pressure on forests. While India is preparing for REDD+, and considering the UN-REDD Programme and FCPF participation to leverage resources for capacity building for implementation,³¹ the country is moving ahead to directly address the perverse incentives that impact forests by reconfiguring their intergovernmental

transfer system.

Types of fiscal incentives and where in the supply chain:

India's intergovernmental fiscal transfer system is the mechanism by which the central government distributes the net proceeds of taxes back to states. As significant amounts of forestland are utilized and managed at local scales, in Panchayats and Gram Sabhas, fiscal policies and decisions at these scales are important. India's intergovernmental fiscal transfer system previously did not include a way to recognize the fiscal implications of natural resource and forest management decisions.

Rationale for intervention:

India's 14th Finance Commission recognized the perverse incentives that state and local governments had to undervalue and mismanage forests, and observed that declining revenue from forests was a concern to some states, due to the implementation of the National Forest Policy.

Evaluation of trade-offs:

As the Commission was charged with considering the need to balance management of ecology, environment and climate change consistent with sustainable economic development, the Commission concluded,

*"Forests and the externalities arising from them impact both the revenue capacities and the expenditure needs of the States. We have noted that there is a need to address the concerns of people living in forest areas and ensure a desirable level of services for them. At the same time, it is necessary to compensate the decline in the revenues due to existing policy prescriptions. In our view, forests, a global public good, should not be seen as a handicap but as a national resource to be preserved and expanded to full potential, including afforestation in degraded forests or forests with low density cover. Maintaining a green cover, and adding to it, would also enable the nation to meet its international obligations on environment related measures. We recognise that the States have to be enabled to contribute to this national endeavour and, therefore, we are designing our approach to transfers accordingly."*³²

Action taken to reverse or reform fiscal incentives:

India took action on two fronts: 1) increasing the amount of revenue allocated to states by 10 per cent, and 2) Assigning a 7.5 per cent weight to forest cover in the allocation formula of revenue going to states. The criteria and weights in the new allocation formula are as follows:

Table 1: Criteria and Weights

Criteria Weight	(per cent)
Population	17.5
Demographic Change	10
Income Distance	50
Area	15
Forest Cover	7.5

The percentage weight allocated to forest cover is expected to deliver US\$6 billion a year to Indian states. This works out to roughly US\$120 per hectare per year and is competitive with agriculture production earnings, thus providing economically viable support to states seeking to grow their agricultural output without clearing forests.³³

C. Reducing deforestation in Brazil: Reversing perverse incentives

Country and commodity context:

Like many developing countries with abundant forests, Brazil's national development policies and incentives had sought for decades to develop the forest frontier and integrate the Amazon into the national economy.³⁴ Until the mid-1990's, forests were viewed as an obstacle to development. Though current pressures through cattle and soy production continue to exert pressure on the Amazon forest, Brazil took bold and coordinated steps in the 2000's to reverse perverse incentives that drove Amazon clearing.

Types of fiscal incentives and where in the supply chain:

Brazil's Constitution of 1988 provided strong incentives for smallholders and large-holders to clear land, simply to solidify land claims by demonstrating 'productive use of land.' Credit and tax incentives for activities responsible for clearing forests were enabled through development plans. Charcoal production and iron extraction, mutually dependent on each other, had a substantial impact on the Amazon in these early phases of forest clearance. The access to and extraction of iron ore, later transformed into pig iron, was heavily subsidized by the governments *Fundo de Investimentos da Amazônia* (FINAM).

Rationale for intervention:

Brazil faced strong internal civil society pressure and international pressure to control Amazon deforestation. At the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, the Pilot Program to Conserve the Brazilian Rainforest (PPG-7) was endorsed,

beginning Brazil's interventions to address deforestation.

Evaluation of trade-offs:

Brazil recognized that the complexity of the problem required a mix of changes in incentives, disincentives and enabling conditions through policy reform to reshape forest use. Besides the PPG-7, Brazil established the Action Plan to Prevent and Control Deforestation in the Amazon in 2004 and of the Cerrado in 2010, in order to control illegal activities, and identify solutions for regulation and monitoring. Brazil's Forest Code (most recently revised in 2012) establishes reserves and permanent protection areas, and requires a minimum level of forest cover on each parcel. The Sustainable Amazon Plan was adopted. The Amazon Fund, which is managed by the Brazilian Development Bank, was created to channel donations to address deforestation and sustainable use of the forest. Efforts to align steel sector development with lower carbon emissions and deforestation (particularly illegal logging for charcoal production) were solidified in the Steel Sector Plan.

Action taken to reverse or reform fiscal incentives:

Brazil made deforestation a crime³⁵ in 1998, and the ability to access rural credit dependent upon legal compliance. The ability to demonstrate compliance has improved with satellite imagery and monitoring, better enforcement, and creation of the *Cadastro Ambiental Rural*, a nation-wide electronic land registration system.

In 2006, Brazil set a ban on the commercialization of soy grown in the Amazon (was set to expire in 2013 but since renewed), and the Bank of Brazil agreed to veto of agricultural credit for soy farmers who want to plant in newly cleared forest.

In 2008, the Brazilian National Monetary Council resolved that the granting of rural credit in the Amazon Biome must be based upon proof of compliance with legal and environmental regulations. This resulted in USD \$1.4 billion not being loaned between 2008 through 2011 due to restrictions imposed by the resolution, and one analysis estimates this may have resulted in a 15 per cent decrease in deforestation in the Amazon during the period.³⁶

A decree was passed to evaluate municipalities on environmental compliance, with producers in blacklisted municipalities being denied access to agricultural credit and subjected to product supply embargoes, until the municipality has registered 80 per cent of its properties in the *Cadastro Ambiental Rural* and lowered deforestation rates.³⁷

IV. Knowledge gaps and pathways forward

REDD+ country governments can define, based on their own national circumstances, how their fiscal policies and incentives can overcome inherent conflicts between sectors and competing land uses, and to send the right signals to the private sector. Minimizing the socio-economic side-effects of reversing perverse incentives for unsustainable land use requires careful design and management, and this is explored in more detail below. Importantly, fiscal incentives supporting agricultural production can be important levers to promote sustainable land use, while safeguarding natural capital, including forests, if they are conceptualized and designed to do so within a broader coherent policy context.

The Ecuador and Indonesia case studies highlight the value of simply **identifying the full range of public fiscal incentives that work to support or work at cross-purposes with REDD+ and sustainable land management**. Governments can do this fairly easily. But the framing of what to include is important, and must be broad enough to include the range of incentives that transfer a fiscal benefit, such as relaxed permitting, ease of access to tenure or concessions, and reclassification of lands to benefit production. These in-kind subsidies can play a large role in land use, and yet the impacts of them are much harder to quantify than production-level incentives. Thus, determining the impacts that fiscal incentives have had on forests, and also how domestic policies and incentives relate to other factors such as demand-side incentives (for example, EU fuel-blending mandates) or foreign exchange rates (which is believed to have had a strong impact on Amazon forest clearing), is not easy.

The evaluation of current fiscal incentives must include an **assessment of public benefits and risks**, and revisions to current incentives and design of new ones should seek to promote public benefits while minimizing risks. Analysis will also be needed to evaluate the political economy and mechanics of implementing the measures.

Governments can also consider how to better capture economic rents from commodity production, as the case studies indicate governments currently lose out. Indonesia has been unable to capture economic rents from oil palm plantations largely due to licensing information on ownership and permits not being integrated into the revenue chain. Indonesia has also suffered from poor reallocation of revenues. While large amounts of revenue were collected from crude palm oil export duties in the

past (duties were once as high as 25 per cent), the revenues were not utilized for infrastructure or sector development, which raises concerns about how these funds are used, and what public benefits derive from them. Governments can also **better utilize these revenues** to build sector capacity through credit access to small- and medium-sized enterprises, value-added processing, fund technical support to improve smallholder yields, and other currently underfunded priorities.

Consideration of **how best to shift or realign existing fiscal incentives can be useful**, rather than redesigning whole fiscal incentive systems, though this depends entirely on the context, and is not suitable when 'whole-of-government' and packaged reforms are necessary. An example is India's intergovernmental fiscal transfer allocation formula, shifted simply to include a forest cover criteria and weight. Similarly, Indonesia's ramping down of fossil fuel subsidies will not only spare fiscal outlays, but could also free up much needed resources of health, welfare, education and other underfunded areas. However, more information is necessary here, and assessment of the portion that will be directed towards biofuels (a majority of which is from palm oil) is necessary.

Governments should **consider whether to unpack incentives related to specific commodities, or look more generally at how aligned current fiscal policies are with low-carbon rural development**. This is highly context-specific and depends on what the primary drivers of forest cover change are, the agricultural and forest management systems, and the range of other relevant issues, such as poverty reduction, need to develop value-added industries, and others.

Cross-sectoral and 'whole-of-government' approaches are often required. Brazil's efforts to address the range of incentives promoting Amazon deforestation provides an example of how multiple bureaucratic, political and stakeholder interests redefined management objectives for the region, from which a complex package of policies across many sectors, funds and incentives, the revision of perverse incentives, and better information and enforcement could be derived. In short, an umbrella approach to design holistic change management across the relevant sectors was required, and continues to be to this day. Both the Ecuador and Indonesia case studies identified that for each possible intervention to reform or create a new incentive, multiple ministries must be involved, particularly the Finance, Agriculture, Environment, Forests and Planning agencies. Individual ministries do not have the tools, or the ability to influence actions in other sectors.

Packaged interventions have a role to play, particularly to manage socio-economic impacts of change. As the New Zealand fisheries subsidy reform example demonstrates, the economic impacts of reform on communities and businesses require tailored solutions to shift the fisheries economy. Subsidy reforms can negatively affect resource-dependent communities and economies, particularly in the short-term, and there may be impacts on upstream and downstream sectors. Therefore, addressing reform in the context of a package of interventions (such as short-term transition payments, buy-out's, regulatory reform, technical assistance, etc.) can ease adjustment processes. Managing the social effects of subsidy changes, such as on rural economies and communities, is important. In some cases, transitional supports may be required to get rid of longer-term embedded subsidies.³⁸

Following on the last two points, countries will do well to **consider revisions to or redesign of fiscal incentive structures in the context of relevant development plans** (strategic, sector based ones, five-year plans or even longer-term plans) and low-carbon growth, in order to promote greater policy coherence across the sectors.

Both Ecuador and Indonesia's palm oil example highlight how many of the fiscal drivers of activities that cause deforestation and degradation operate at both national and subnational levels, and quite often at regional and global scales as well. Identifying **what interventions can have effect or leverage action and at what scale** takes careful consideration. Much of the commodity production that drives forest clearing serves both export and domestic markets, and therefore fiscal and trade policies must send the right signals, whether on the demand side or the supply side.

Also important is identifying **how much influence public fiscal policy and incentives have compared to private finance and to other underlying drivers such as international demand is important**, and this is highly context specific. Brazilian soy farmers rely to a large extent on supply chain finance, with as much as 40% of their financing from large agriculture companies, such as Archer-Daniels-Midland, Bunge and Cargill.³⁹ Indications are that this is similar in the Indonesian palm oil production context, though Bank Mandiri and regionally-based public and private finance also plays a role. Thus, fiscal and trade policies that impact multinational companies can have strong indirect effects on producers. Investment screens and lending performance standards also could have a large role to play.

As evidenced in both the Ecuador and Indonesia case studies, **more focus is needed by government to identify how fiscal incentives can support smallholders and those at the low-yield end of the production supply chain.** Increasing palm oil yields on existing lands is crucial, particularly among smallholders, and yet these producers are often left out of the incentives mix or cannot access them due to tenure constraints, and lack of access to credit and public finance. Helping small to medium-sized producers grow, while placing spatial constraints on expansion into forests is crucial. This creates a context for redesign that demands thoughtful attenuation between incentives and desired outcomes.

Some perverse incentives could be fairly easily modified to **incorporate criteria for best practices in production in order to access the incentive**, as was developed in Brazil to affect deforestation rates. This is a tool widely practiced by governments in the agriculture sector. For instance, Brazil's Low-Carbon Agriculture Plan (ABC Plan)⁴⁰ allows farmers to access credit and training and extension services if management practices are compliant with ABC Plan objectives. Fifty percent of ABC Plan financing so far has supported recovery of pasture lands and degraded areas, in order to make more farmland available while reducing encroachment into forests.⁴¹ In the United States, eligibility for commodity, conservation, disaster payments, and access to US Department of Agriculture farm loan and loan guarantee programs depend on farmers having an approved soil conservation plan on "highly erodible" lands (which affects 25 per cent of U.S. cropland).⁴² Compliance has reached roughly 98 per cent since its inception in the mid-1980's. Linking best practices to credit, tax incentives, and other fiscal incentives can reinforce on-going efforts in the agriculture sector towards sustainability such as certification and demand-side commitments.

Pathways forward for REDD+ countries to reverse perverse incentives, reform existing ones, or design new incentives are highly context-specific, and depend on the pressures on forests, national development objectives, and many other factors. What follows is a brief decision tree, based on the above case studies and observations, to help guide countries in their assessment of options to redesign or revise fiscal incentives. This is intended to prime assessments by governments, and will need to be revised to reflect national circumstances and the priority of government. Countries can review fiscal policies, incentives and subsidies to ensure that economic, social and environmental impacts and benefits are understood, as part of holistic approaches to reform and redesign.

Box 2: Decision-tree for finding complementarity between fiscal incentives for agricultural commodity production and REDD+

Information gathering

What are the primary direct and indirect drivers of deforestation and forest degradation currently? How will future driver pressure differ from historic ones?

What are the policies and fiscal incentives currently in place that have influence on those drivers? Conversely, what policies and fiscal incentives promote sustainable land management?

Strategic assessment

What other market and financial forces influence driver activities? What points of leverage or influence can government have on these? What incentives operate at what scale (local, national, international)? What is the best tool to affect these (e.g. incentives ('carrots'), regulations ('sticks'), or both) that can minimize public risk while maximizing public gain, and also maximize aligned private investment?

Cross-compare relevant development plans and GHG reduction/REDD+ goals. Where are the conflicts? Where do they complement each other? How can synergies be maximized?

What are the public benefits and risks associated with each fiscal incentive? What are the externalities or deferred costs associated with the incentives (include environmental, economic and social aspects)?

Defining solutions

What is the basis for prioritizing which incentives to reform? Is it more appropriate to review incentives related to specific commodities, or look more generally at how to align fiscal policies with low-carbon rural development goals? How does this relate to development plans, and how can those plans reflect better policy and incentive coherence? Which fiscal incentives are easiest to reform and which can improve budget efficiency?

Depending on possible pathways to reverse perverse incentives, what are the environmental, economic and social impacts of these? How are the short-term impacts different from long-term ones? How can impacts be minimized for rural communities and stakeholders?

How can compliance and enforcement with existing and new laws can be enabled? How can access to fiscal incentives be linked to improved production practices? Can they be spatially targeted? Which will have greatest impacts on forests?

The pathway forward

Priority pathways or scenarios are identified: Which ministries/departments need to part of the solution, and which one is best positions to take a lead? Who are the key stakeholders necessary to forge solutions? What mechanisms are required to revise these incentives (e.g., legislation, development bank resolution, Ministry of Finance rulemaking, etc.)? What related and complementary measures could be pursued (e.g. spatial targeting or constraints on the incentive, etc.)?

Acknowledgements:

The author would like to gratefully acknowledge comments and inputs provided by: Tim Christophersen (UNEP), Iain Henderson (UNEP FI), Johan Kieft (UNORCID), Berta Pesti (UNDP), Estelle Fach (UNDP), Daniela Carrion (UNEP), and Avishan Chanani (UNEP).

End notes

1. Reducing emissions from deforestation and forest degradation in developing countries: the '+' refers to the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
2. Kissinger, G., M. Herold, V. De Sy, 2012. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers. Lexeme Consulting, Vancouver Canada.
3. Searchinger, T., C. Hanson, J. Ranganathan, B. Lipinski, R. Waite, R. Winterbottom, A. Dinshaw, R. Heimlich, 2013. Creating a Sustainable Food Future: A Menu of Solutions to Sustainably Feed More than 9 Billion People by 2050. World Resources Report 2013-14: Interim Findings. World Resources Institute, the World Bank, United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), Washington, DC.
4. Ibid.
5. Food and Agriculture Organization of the United Nations (FAO), 2009. How to Feed the World in 2050. Discussion paper prepared for Expert Forum.
6. Foresight, 2011. The Future of Food and Farming, 2011. Final Project Report. The Government Office for Science, London, UK.
7. www.cbd.int/sp/targets/
8. In their draft version as of July 2015 on <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals>
9. United Nations, 2015. Targets in the proposed Sustainable Development Goals framework. Available at: https://sustainabledevelopment.un.org/content/documents/6769Targets%20document__March.pdf
10. United Nations, 2015. Sustainable Development Goals, Draft SDG Target 12c: <https://sustainabledevelopment.un.org/content/documents/1579SDGs%20Proposal.pdf>
11. United Nations, 2013. Inequality Matters: Report of the World Social Situation 2013. Department of Economic and Social Affairs. New York.
12. New Climate Economy, 2014. Better growth, better climate. The Global Commission on the Economy and Climate, London.
13. UNFCCC Decision 15, COP 19, 2013. Available at: <http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf#page=43>
14. McFarland, W., S. Whitley, G. Kissinger, 2015. Subsidies to key commodities driving forest loss: Implications for private climate finance. Overseas Development Institute, London.
15. Salvini, G., M. Herold, V. De Sy, G. Kissinger, M. Brockhaus, M. Skutsch, 2014. How countries link REDD+ interventions to drivers in their readiness plans: implications for monitoring systems. Environmental Research Letters
16. Kissinger, G., M. Herold, V. De Sy. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers. Lexeme Consulting, Vancouver Canada, August 2012.
17. Consumer Goods Forum, 2014. Sustainability Pillar.
18. Almeida, M.D., forthcoming. Política fiscal en el sector de la palma aceitera sus implicaciones en el programa REDD+ en Ecuador. PNC ONU REDD.
19. Kissinger, G., forthcoming. Fiscal incentives for Indonesian palm oil production: Pathways for compatibility with REDD+. UNEP Finance Initiative//Green Commodities Programme.
20. Ministerio del Ambiente (2012), "Estrategia Nacional de Cambio Climático del Ecuador 2012-2025", Ecuador, pág. 31.
21. Castro, M., R. Sierra, O. Calva, J. Camacho, F. López y P. Lozano (2013), Zonas de Procesos Homogéneos de Deforestación del Ecuador. Factores promotores y tendencias al 2020. Programa GESOREN-GIZ y Ministerio de Ambiente del Ecuador. Quito, Ecuador.
22. Global Subsidy Initiative, available at: www.iisd.org/GSI/effects-subsidies
23. Arroyo, N., R. Lücke, L. Rivera, 2014. Análisis sobre el mecanismo actual para la estimación u determinación de los precios del arroz bajo el contexto de la cadena de comercialización. IICE, Universidad de Costa Rica. http://www.iice.ucr.ac.cr/informes/p_721_b2_810.pdf
24. Resosudarmo, B.P. 2014. The political economy of the Indonesian Integrated Pest Management Program. In Peshin, R., D. Pimentel, Eds., Integrated Pest Management: Experiences with Implementation, Global Overview, Volume 4. Springer
25. Haglund E., J. Ndjeunga, L. Snook, D. Pasternak, 2011. Dry land tree management for improved household livelihoods: farmer managed natural regeneration in Niger. J Environ Manage 92:1696–1705

26. Ajayi, O.C., F. Place, 2012. Policy Support for Large-Scale Adoption of Agroforestry Practices: Experience from Africa and Asia. In P.K.R. Nair and D. Garrity (eds.), *Agroforestry - The Future of Global Land Use*. Springer.
27. Nepstad, D. S. Irawan, T. Bezerra, W. Boyd, C. Stickler, J. Shimada, O. Carvalho Jr, K. MacIntyre, A. Dohong, A. Alencar, A. Azevedo, D. Tepper, S. Lowery, 2013. More food, more forests, fewer emissions, better livelihoods: linking REDD+, sustainable supply chains and domestic policy in Brazil, Indonesia and Colombia. *Carbon Management* (2013) 4(6).
28. Convention on Biological Diversity, 2011. Austria: Removal of subsidies for wetland drainage. Case Study. <http://www.cbd.int/doc/case-studies/inc/cs-inc-austria-technical-en.pdf>
29. www.bbc.com/news/business-30092295
30. India State of Forest Report 2013. Available at: www.fsi.nic.in/details.php?pgID=mn_93
31. Government of India, 2014. Reference document for REDD+ in India. Ministry of Environment, Forests and Climate Change.
32. Government of India, 2015. Report of the Fourteenth Finance Commission (FC-XIV): Recommendations for the period 2015-20. Adopted 24 February, 2015.
33. Busch, J. India's big climate move. Centre for Global Development. Blog post: www.cgdev.org/blog/indias-big-climate-move
34. Brazil, 1974. *II Plano Nacional de Desenvolvimento (PND II)* (1975 -1979).
35. Law 9605 of 1998: www.planalto.gov.br/ccivil_03/leis/l9605.htm
36. Assunção, J., C. Gandour, R. Rocha, R. Rocha, 2013. Does Credit Affect Deforestation? Evidence from a Rural Credit Policy in the Brazilian Amazon. Climate Policy Initiative. Rio de Janeiro.
37. Duchelle, A. E. et al., 2014. Linking Forest Tenure Reform, Environmental Compliance, and Incentives: Lessons from REDD+ Initiatives in the Brazilian Amazon, *World Development*.
38. OECD, 2007.
39. Etter, L. In Brazil, Credit to Farmers Dries Up. *Wall Street Journal* 29 November 2008. www.wsj.com/articles/SB122792036438265797
40. Government of Brazil, Resolution No. 3896 of 17/08/10
41. See Banco do Brasil: www.bb.com.br/portalbb/page100,19424,19427,20,0,2,1.bb?codigoNoticia=33990&codigoMenu=16983&codigoRet=16996&bread=2_2_1
42. <http://webarchives.cdlib.org/sw1vh5dg3r/http://ers.usda.gov/Amberwaves/June04/Features/HaveConservation.htm>

UN-REDD Programme Secretariat

International Environment House,
11-13 Chemin des Anémones,
CH-1219 Châtelaine, Geneva, Switzerland.

un-redd@un-redd.org

www.un-redd.org



UN-REDD PolicyBrief Issue #07

UN-REDD
PROGRAMME



The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries