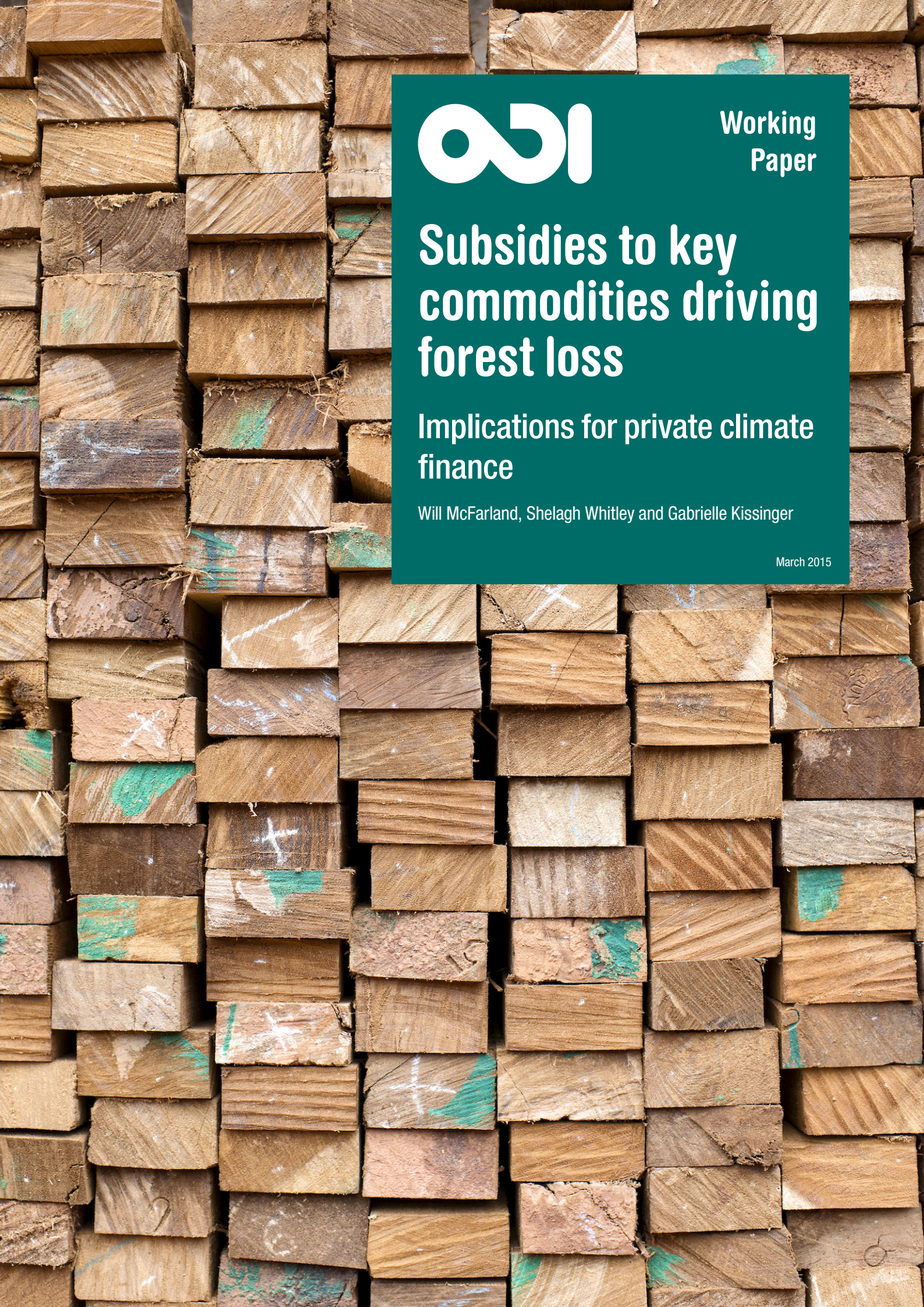

Working Paper

Subsidies to key commodities driving forest loss

Implications for private climate finance

Will McFarland, Shelagh Whitley and Gabrielle Kissinger

March 2015

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ

Tel. +44 (0) 20 7922 0300
Fax. +44 (0) 20 7922 0399
E-mail: info@odi.org.uk

www.odi.org
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Abstract

There is an increasing focus on the role that public and private resources can play in supporting activities that reduce forest loss as part of wider efforts to address climate change, and ensure sustainable development. This report highlights the role that subsidies play in shaping the investment climate in a country, and how they are (and can be) used to drive or avoid forest loss.

From our initial review of subsidies to beef and soy in Brazil, and timber and palm oil in Indonesia we find that there are significant opportunities for REDD+ finance to support identification, estimation and designing the reform of these subsidies - as part of a wider transition to economic development which increases agricultural productivity while avoiding forest loss.

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Abbreviations

ABC	Agricultura de Baixo Carbono (Brazil's low carbon agriculture programme)
BNDES	O Banco Nacional do Desenvolvimento (Brazil's national development bank)
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GHG	Greenhouse gases
HTI	Hutan tanaman industri (commercial timber pulpwood plantations)
IEA	International Energy Agency
IPK	Izin pemanfaatan kayu (timber use permit)
MP3EI	Indonesia's Masterplan for Acceleration and Expansion of Indonesia's Economic Development
OECD	Organisation for Economic Co-Operation and Development
PAC	Brazil's Programa de Aceleração do Crescimento (growth acceleration programme)
PPCDAm	Action Plans to Prevent and Control Deforestation in the Amazon (Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal)
PPCerrado	Action Plans to Prevent and Control Deforestation in the Cerrado (Plano de Ação para Prevenção e Controle do Desmatamento das Queimadas no Cerrado)
R&D	Research and development
REDD+	Reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WTO	World Trade Organization

Executive summary

There is increasing focus on the role that public and private resources can play in supporting activities that reduce forest loss as part of wider efforts to address climate change and ensure sustainable development. This report highlights the role that subsidies play in shaping the investment climate in a country, and how they are (and can be) used to drive or avoid forest loss.

The McKinsey Global Institute estimated that governments were subsidising the consumption of resources (including water, energy and food) by up to $1.1 trillion per year in 2011. By reducing the price of a natural resource below the marginal cost to society, subsidies can have far-reaching impacts (positive or negative) on both investment and consumption patterns. Subsidies can accelerate environmental degradation through resource inefficiency, overcapitalisation, overconsumption and by depriving the state of resources to support sustainable management.

This report highlights the growing role that key commodities play in driving forest loss (palm oil, timber, soy and beef), and the wide range of subsidies that governments currently use to support investment in and development of these commodities. Based on early analysis, we find that these subsidies dwarf current climate finance in support of REDD+, both globally, and in key countries with high levels of forest loss including Brazil and Indonesia. However, in spite of the significant levels of subsidies in these countries and opportunities for reform, a recent review of REDD+ readiness finance to these countries found that there is not a focus on identification, estimation and reform of these subsidies; nor is the provision of REDD+ finance conditional on addressing subsidies.

Any efforts to shift investment towards REDD+, be it public or private, must take into account governments' existing use of subsidies to: 1) identify opportunities to phase out or reform current subsidies that encourage forest loss; 2) support the design of any new incentives for REDD+, so they complement domestic efforts to shape private investment; and 3) ensure subsidy reform protects the poor and most vulnerable. The use of REDD+ finance to support the reform of subsidies to key commodities driving deforestation is a critical step in a transition to economic development which increases agricultural productivity while avoiding forest loss.

From our initial review of subsidies to beef and soy in Brazil, and timber and palm oil in Indonesia we find that there are significant opportunities for REDD+ finance to support identification, estimation and design in reforming these subsidies – in a manner that would shift incentives and resulting investment away from forest loss and toward REDD+.

There is current momentum on subsidy reform, through existing and emerging commitments under the United Nations Framework Convention on Climate Change (UNFCCC), UN Sustainable Development Goals, and at the UN Climate Summit in September 2014, and the recommendations of the New Climate Economy report. There is an opportunity to take advantage of these opportunities and the climate finance resources made available through the Green Climate Fund (GCF) and other channels, to shift subsidies and investment in developing countries toward REDD+ with speed and at scale.

1 Introduction

Governments around the world are seeking to reduce deforestation and forest degradation (forest loss) as part of wider efforts to address climate change and support sustainable development. This is demonstrated through commitments under the UNFCCC (UNFCCC, 2014), the UN Sustainable Development Goals (UN SD Platform, 2014), and at the UN Climate Summit in September 2014 (UN, 2014). In addition, there is widespread recognition of the need for public and private finance to back up any new international agreements emerging from these processes in 2015 (UNFCCC, 2013; ICESDF, 2014).

The recent New Climate Economy report has recommended that developed countries provide at least $5 billion per year to finance REDD+[1] in developing countries (New Climate Economy, 2014). Unfortunately, there remains a significant gap between those objectives and current public and private finance for REDD+. Between 2006 and March 2014 global public and private finance pledged for REDD+ was on average only $1 billion per year, with almost 90% coming from the public sector (Norman and Nakhooda, 2014). The focus of most REDD+ spending to date has been on capacity building and readiness.[tttv] In addition, commitments have slowed since 2011, which has been attributed to challenges in delivering REDD+ and the impact of the financial crisis on public sector finances (UN-REDD, 2013; Norman and Nakhooda, 2014).

There are currently efforts to address this growing finance gap while recognising that additional resources must be brought to bear alongside those of governments. By scaling up existing public support and developing new incentives, governments and international organisations believe that additional private finance can be attracted to support REDD+. Examples of interventions proposed to mobilise private investment include: concessional finance for sustainable land use; payments for carbon, biodiversity and watershed services; certification of commodities and secondary products; and new investment vehicles including impact bonds, and climate or green bonds (UN-REDD, 2013; Norman and Nakhooda, 2014).

However, at present, little attention has been paid to address the role that existing government support plays in driving forest loss. In particular, little effort has been made to understand and reform existing subsidies that contribute to make forest loss profitable (see definition of subsidies in Box 1).

This report takes a first step in identifying and estimating subsidies currently driving investment towards forest loss, in order to demonstrate the potential to shift these subsidies and as a result, wider private investment in REDD+. The focus of this desk study is on subsidies to four commodities in two key countries that are widely acknowledged as driving forest loss: soy and beef in Brazil, timber and palm oil in Indonesia. It also highlights opportunities for reforms, both in the context of lessons from the countries reviewed and the emerging field of 'climate-smart' fiscal policy.

Box 1: Definition of subsidies

The World Trade Organization (WTO) defines a subsidy as '*any financial contribution by a government, or agent of a government, that confers a benefit on its* recipients' (WTO, 1994).

The Food and Agriculture Organization (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 (FAO, 2004).

For the purpose of identifying and estimating subsidies in this report we include the first three categories within the FAO's definition. Although the fourth category (lack of intervention) is more challenging to quantify, we discuss qualitatively both the impact of a lack of regulation and the failure to enforce existing regulations (illegal activity) on investment.

For non-experts, language can create one of the first barriers to understanding and unpicking 'subsidies'. This is often the result of the negative associations with this term, and the potential for legal challenge of subsidies within the WTO both of which can drive policy-makers to seek euphemisms or synonyms (Whitley, 2013a). The Global Subsidies Initiative has stated that 'incentive' is a common replacement term for 'subsidy', but other frequently used substitutes (ranging from general to technical) include: support, aid, assistance, fiscal policy and fiscal instruments.

See Section 4 for additional information on the approach taken in this report for identifying and estimating subsidies.

1 REDD+ is activities that lead to: reducing emissions from deforestation and forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (IPCC, 2014).

2 REDD-Readiness is a national strategy to prepare for a REDD+ payment mechanism by understanding and addressing gaps that may exist between a country's existing social, technical and institutional capacities and those that may be required for participation in an eventual REDD+ mechanism (Johns, Johnson and Greenglass, 2009).

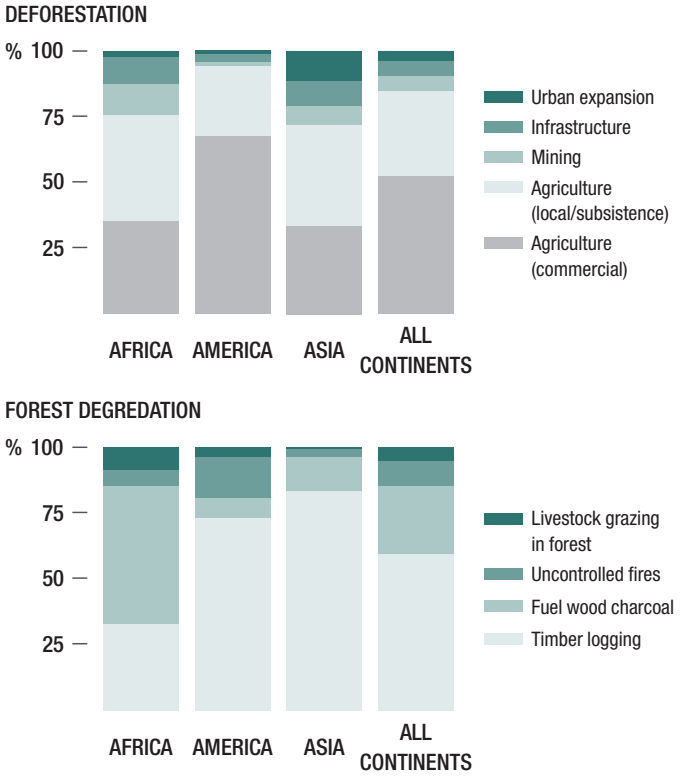
2 The role of key commodities in driving forest loss

Over half of total global forest loss between 1990 and 2010 occurred in Brazil and Indonesia (FAO, 2010), with Brazil losing an average of 2.7 million hectares per year during the period and Indonesia losing 1.2 million hectares. After peaking in 2004, rates of forest loss in Brazil have fallen significantly.[3] In contrast, the rate of forest loss in Indonesia has continued to rise over the same time period, and may now surpass that in Brazil (Hansen et al, 2013; Margono et al., 2014). Between 2008 and 2012 forest loss accounted for 61% and 28% of greenhouse gas (GHG) emissions in Indonesia and Brazil, respectively (WRI, 2014).

While there are different patterns of forest loss across each region of the world and within countries, agriculture is widely acknowledged to be the largest driver of forest loss globally, linked to 80% of forest loss (Geist and Lambin, 2002; Gibbs et al., 2010; Kissinger et al., 2012; Hosonuma et al., 2012; Houghton, 2012;). Commercial timber extraction has also been identified as a key driver of forest loss accounting for over 70% of forest degradation in Latin America and Asia (see Figure 1) (Hosonuma et al., 2012). In addition, the drivers of forest loss in large parts of Africa include: mining, infrastructure development, urban expansion, uncontrolled fire, fuel wood collection and charcoal production (Hosonuma et al., 2012). Although data is limited on country and commodity specific causes of forest loss, in Latin America, commercial agriculture (including livestock) is responsible for 68% of deforested areas, with a further 27% linked to subsistence farming (Kissinger et al., 2012). Historically forest loss in the Brazilian Amazon has also been explicitly linked to agriculture, first as a result of the expansion of cattle farming in the 1990s, then by soybean cultivation in recent years (Boucher et. al., 2011). In sub-tropical Asia (including Indonesia), commercial and subsistence agriculture are responsible for one-third of forest loss each (see Figure 1). One of the most recent drivers of forest loss from agriculture has been palm oil production, which has more than doubled in the past decade, with most of the expansion of oil palm in South-East Asia (Global Canopy Programme, 2013).

Agricultural commodities and timber contribute large values to domestic economies and in global markets. The estimated annual producer values for beef and soy (globally) were $14 billion and $47 billion, respectively in 2011 (Global Canopy Programme, 2013). The estimated annual producer value for palm oil globally was $31 billion in 2011 (Global Canopy Programme, 2013). In 2012 the combined global export value of timber, pulp and paper was $233 billion (Global Canopy Programme, 2013).

Figure 1: Principle drivers of forest loss in tropical and sub-tropical countries (2000-2010)



Source: Kissinger et al., 2012

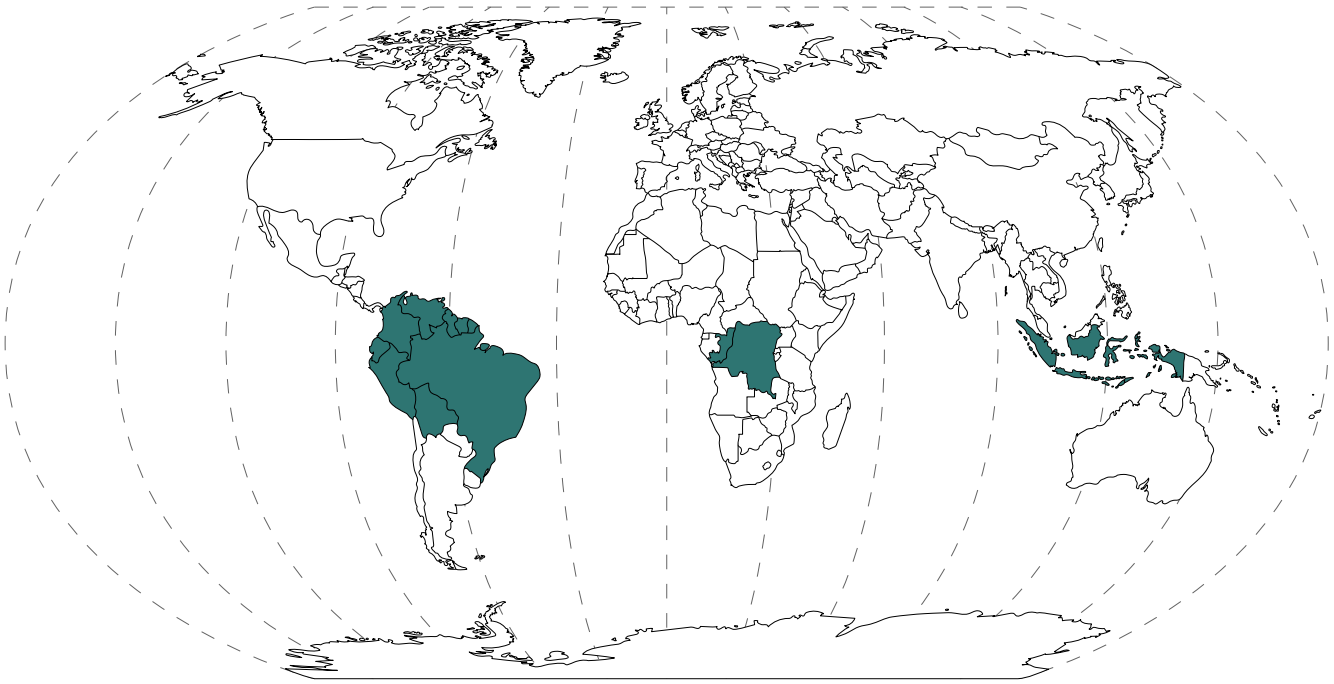
3 Despite a year-on-year increase in forest loss from 2012-2013, and uncertainty over the change in 2014, overall forest loss in the Amazon has dropped by 80% since 2004 (Mongabay, 2014).

These drivers of forest loss are only set to grow. By 2050, worldwide demand for agricultural products is expected to increase by more than 50% (including an 85% increase in the volume of meat produced). Evidence suggests that tropical countries will be called on to meet much of this demand (FAO, 2009; Gibbs et al., 2011; Gasparri et al., 2013). For example, in response to growing domestic and international demand for palm oil, Indonesia has set a target to increase the volume of production by 60% from 2012-2020 (Obizindski, 2013). In addition, the growing role of logging and mining within global commodity markets makes it likely that their impact on forest loss will also increase over the coming years (Meyfriodt et al., 2013; Karstensen et al., 2013). International demand for agricultural and forest commodities is responsible for about a third of forest loss, with the proportion of forest loss linked to production of these commodities rising in most countries between 2000 and 2009 (Persson et al, 2014).

In addition, it is estimated that between 2001 and 2012, $61 billion per year of the trade in commodities from Brazil and Indonesia (including beef, leather, soy, palm oil and timber products) was based on illegal conversion of tropical forests (Lawson, 2014).

The particular focus of this report on subsidies to beef and soy production in Brazil (see Section 5), and timber and palm oil production in Indonesia (see Section 6) rests on the role of these commodities as major drivers of tropical forest loss, and their growing position within global supply chains (see Figure 2).

Figure 2: Key forest risk commodities from tropical forest regions



AMAZON BASIN

SOYA
BEEF
TIMBER

CONGO BASIN

TIMBER

SOUTH EAST ASIA

PALM OIL
TIMBER, PULP & PAPER

Source: Global Canopy Programme, 2013

3 Subsidies and REDD+ finance

While forest country governments have pledged to reduce forest loss, their direct and indirect support to agriculture and forestry sectors is leading to greater GHG emissions and forest loss. Instead of raising the cost of GHG emissions or penalising activities linked to forest loss and degradation, the balance of government support is in the form of subsidies to the production and consumption of the key commodities that are driving forest loss (see Box 2).

This section provides a general overview of why subsidies exist and persist (Section 3.1), the current data sets that exist on subsidies in sectors linked to forest loss (forestry, agriculture, biofuels and fossil fuels) (Section 3.2), and assesses the role that REDD+ finance is currently playing in identifying, estimating and addressing these subsidies (Section 3.3).

Box 2: The impact of subsidies on natural resource industries

The McKinsey Global Institute estimated that governments were subsidising the consumption of resources (including water, energy – including fossil fuels, steel, and food) by up to $1.1 trillion per year in 2011 (Dobbs et al., 2011).

By reducing the price of a natural resource below the marginal cost to society, subsidies can have far-reaching impacts (positive or negative) on both investment and consumption patterns, which can accelerate environmental degradation.

- The overcapitalisation effect: subsidies to natural resource industries draw more investment into that natural resource sector than would have been made in an undistorted market.
- The resource inefficiency effect: by artificially depressing the prices of natural resources, subsidies remove the incentive for efficient use of resources by industries that process the resources or use it as an input, or by consumers.
- The overconsumption effect: subsidies to natural resource industries result in lower prices for the resources and lead to overconsumption of the good.
- The public resource deprivation effect: subsidies that involve selling natural resources from the public domain cheaply deprive the state of revenue that could have been used to enforce laws and regulations protecting natural resources and to promote their sustainable management. (Porter, CIEL, no date).

3.1 Why subsidies exist and persist

The reasons for the existence and persistence of subsidies vary across countries and regions and as a result subsidies need to be understood in the context of a particular political-economy logic. First, governments act to remain in power. Second, once subsidies are in place, interest groups solidify around them and hinder their elimination (Victor, 2009).

Researchers have identified several specific reasons for both the provision of and persistence of subsidies – some of these are explicit, such as social protection and economic development; others implicit, driven by special interests (Whitley, 2013b).

Ensuring food and energy self-sufficiency and security

Subsidies are often justified as a way to help the poorest households or to ensure food security. Although similar data for subsidies in the agriculture and forest sectors are not available, recent studies on fossil fuel subsidies show that they more often benefit the middle and upper classes than the poor in developing countries (Arze del Granado, 2010).

Income buffering

Subsidies are often initiated as temporary income buffers. However, in the face of (increasingly common) commodity price shocks and volatility, they become more permanent and difficult to eliminate (Commander, 2012).

National patrimony (land and forests)

In a number of commodity producing countries, revenue flows from natural resources have been seen as a national patrimony to be shared across the population in the form of subsidies (Commander, 2012). For major commodity

producers, the opportunity costs of these subsidies are less evident than actual budgetary costs because revenues rise and fall with the costs of subsidy, giving little incentive for phase-out (Victor, 2009).

Diversifying energy supply

Governments often seek to increase diversity in energy supply through subsidies to specific energy sources (Commander, 2012). Examples include Brazil and Indonesia's biofuel subsidies, which in part aim to reduce the countries' dependence on fossil fuel imports (see Sections 5 and 6).

Special interests (in specific sectors and regions)

Particular industries or companies often secure specific benefits from subsidies, such as reduced costs. Governments often use the under-pricing of inputs (such as seeds, fuel and fertiliser) to support production across selected sectors or firms, or to increase the competitiveness of firms that are export-oriented. The benefits of these subsidies are often concentrated among specific actors, while the costs are spread across the general population (Commander, 2012). One example is India, where cheap or free electricity to farmers creates a significant fiscal burden on the country as a whole, but where the farming lobby (which has political influence) has ensured that no government can hold on to power without holding on to these subsidies (Victor, 2009).

Weak institutions

Governments sometimes use subsidies because they lack other effective levers and/or institutional capacity to implement policy. In most countries, the price of key commodities such as cooking oil, beef and energy are simple indicators that are fairly easy for citizens to monitor, and so downstream subsidies are a visible way to deliver benefits in exchange for political support (Victor, 2009).

Lack of information

Though citizens are acutely aware of many commodity prices, they rarely have complete or accurate information on what they or others receive in terms of subsidies. This lack of transparency can, in turn, affect the political dynamics associated with revising or eliminating a subsidy. The phase-out of subsidies is hampered by a basic lack of information about the extent of support to commodity production and consumption and where this information, if it exists, is held. The majority of subsidies are not clearly identified in standard government budget documents (de Mooij et al., 2012).

Amongst all of the reasons outlined above, the absence of data and publicly available information is one key obstacle to subsidy reform and removal.[4] To date there is no detailed inventory of subsidies to key commodities driving forest loss in all countries. However, there are several international data sets and resources that can support the identification of subsidies linked to forest loss.

3.2 Global estimates of subsidies in key sectors linked to forest loss

3.2.1 Agriculture

Although this information is not available for the majority of developing countries, the Organisation for Economic Co-operation and Development (OECD) provides detailed information on support to the agricultural sector in 47 countries,[5] which are responsible for almost 80% of global agricultural production (OECD, 2013).

In addition, although it does not focus on forest loss or climate change impacts of agriculture, a 2013 OECD review of support to the sector has highlighted the potential role of agricultural subsidies in resource use (land, water and biodiversity):

> *Policies directly addressing environmental concerns continue to represent a small part of countries' policy settings although in some countries cross-compliance represents a broad-based policy tool linking the provision of payments to farmers to the compliance with certain environmental standards above the legal minimum.*
>
> *(OECD, 2013)*

Based on OECD research it is estimated that agricultural subsidies were worth $486 billion across these 47 countries in 2012 (Worldwatch Institute, 2014). This support[6] is not evenly distributed, with the highest total support between 2010-12 found in China ($160 billion), the United States ($145 billion), Europe ($121 billion) and Japan ($69 billion). Support as a percentage of gross domestic product (GDP) is highest in Indonesia at over 3% (OECD, 2013). The average annual total support estimates for Indonesia

4 There is a significant body of work on subsidy reform. Much of this has been completed looking at fossil fuel subsidies (oil, gas and coal). Many of the recommendations on processes to reform and remove fossil fuel subsidies would apply equally to other commodities, including those reviewed in this report (palm oil, beef, timber and soy). For a brief introduction to subsidy reform and key reference on this topic see Whitley, 2013b. See also OECD, 2007 Subsidy Reform and Sustainable Development http://www.cbd.int/financial/fiscalenviron/g-subsidyreform-oecd.pdf

5 These countries include the members of the OECD and Brazil, China, Indonesia, Kazakhstan, Russia, South Africa and Ukraine.

6 These subsidies include support to both consumption and production, and would include those to soy, beef and palm oil.

and Brazil (between 2010 and 2012) were $27 billion and $10 billion, respectively (OECD, 2013).

Not all subsidies identified in the agricultural sector are specifically targeted at one commodity, and they often address costs and inputs across the sector. Nor will all of them drive forest loss, and some may even be designed to support sustainable behaviours. Nonetheless, the estimates above indicate the level of support that governments are providing to the sector. Further to this, some of the information on individual support measures compiled by the OECD is grouped by commodity and can be used to identify subsidies that might drive forest loss such as: levels of market price support, payments based on output and inputs, and transfers to consumers from taxpayers (OECD, 2013).

3.2.2 Forestry

There is less information available on the value of subsidies to the forestry sector. This may be due to the absence of an international organisation regularly identifying and estimating subsidies to the forestry sector (the OECD currently plays this role in terms of support to the agriculture sector and fossil fuels). Nonetheless, primary subsidies within the sector have been identified as: funding for afforestation and reforestation; failure to capture economic rent; tax expenditure (tax breaks); support to processing industries (including log export restrictions); accelerated depreciation for investments in the forestry sector; financing infrastructure development, such as roads and energy transmission; and public funding to mitigate the environmental damage associated with forestry activities (Porter, 1998; Sizer, 2000; EFI, 2005; Goetzl, 2006).

Example approaches for collecting information on subsidies in the forestry sector are available. The World Resources Institute (Sizer, 2000) published a report estimating 'perverse incentives' for forestry across the G8 countries,[7] and the European Forest Institute (EFI, 2005) published a report of forestry financing in Europe. This research identified how certain subsidies that increase investment in the forestry sector may simultaneously lead to increased forest loss by:

- enabling inefficient logging companies to operate profitably
- reducing government revenues, thereby reducing funds available to invest in activities that could promote sustainability
- reducing the price of forest products, which stimulates increased consumption
- encouraging companies to log, unsustainably and often illegally because of greater than normal profits.

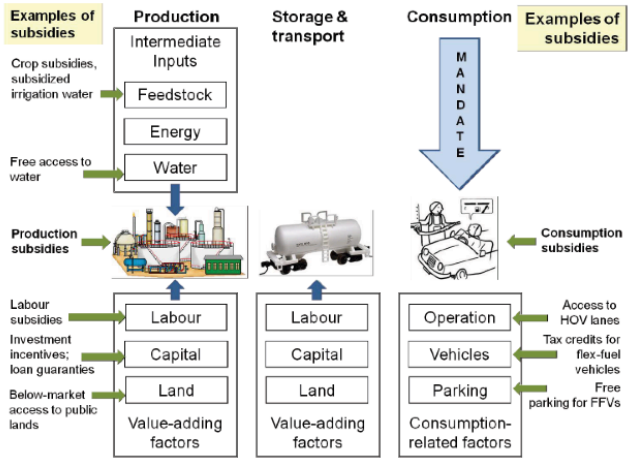
Source: Sizer, 2000; EFI 2005; World Commission on Forests and Sustainable Development 1999

3.2.3 Biofuels

The International Energy Agency (IEA) and the Global Subsidies Initiative have estimated biofuel subsidies for a number of producer countries (Gerasimchuk et al, 2012). As both palm oil and soy beans are important biofuel feed stocks, subsidies to these commodities through support to biofuel production, processing and consumption may also be responsible for driving forest loss.[8]

The IEA estimated that total global subsidies for biofuels were $22 billion in 2010 (IEA, 2011). As these estimates also include production subsidies supporting intermediate inputs they may overlap with some of the broader agricultural subsidies identified above by the OECD (Gerasimchuk et al, 2012) (see Figure 3).

Figure 3: Illustrative example of biofuel subsidies



Source: Gerasimchuk et al, 2012

7 Canada, France, Italy, Germany, Japan, Russia, United Kingdom and United States.

8 In 2014, 13% of Brazilian soy and 11.6% of Indonesian palm oil were used to produce biodiesel (ODI calculation based on data from USDA 2014a, 2014b and 2014c). This figure is expected to rise due to increasing domestic biodiesel blending mandates in both countries.

3.2.4 Fossil fuels

Although fossil fuels subsidies are not the focus of this analysis, their sheer scale and role in shaping private investment in commodities linked to forest loss (by reducing costs of natural resource extraction) is significant enough to warrant mention here. The OECD, IEA and IMF currently provide estimates of fossil fuel subsidies at country level, with the OECD providing the most detailed and comprehensive[9] inventories of specific subsidies to both production and consumption (McFarland and Whitley, 2014). Subsidies to fossil fuel consumption alone in Indonesia were $20.7 billion in 2014 and to consumption and production in Brazil $5 billion in 2011 (GSI, 2014; IMF, 2013).[10]

3.3 Role of current REDD+ finance to Brazil and Indonesia in addressing subsidies

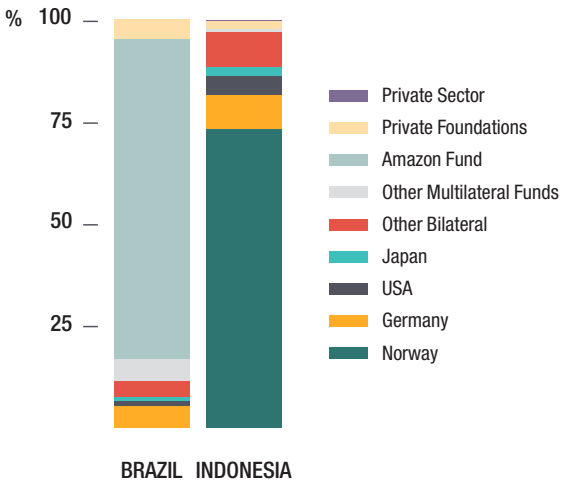
Given the role of key commodities in driving tropical forest loss and the scale of subsidies that shapes investment in these commodities, the following section reviews the current role of finance for REDD+ in subsidy identification, estimation and reform.

Commitments of REDD+ finance are an important contribution to wider pledges on climate finance under the UNFCCC, whereby developed countries have agreed to mobilise $100 billion annually from public and private sources to address the needs of developing countries by 2020 (UNFCCC, 2009). As a result of these climate finance pledges, there has been an increased focus on the role of the private sector in climate action, including supporting REDD+ (Mabey, 2012; Buchner et al., 2013).

A recent review of REDD+ finance found that donors have supported activities in at least 81 countries, with global commitments of $8.7 billion since 2006. Of these commitments, 40% has been promised to Brazil and Indonesia ($1.31 billion and $1.35 billion, respectively) (Norman and Nakhooda, 2014). Figure 4 shows the sources of pledged finance to Brazil and Indonesia. Norway is the source of the majority of REDD+ finance for both countries (Norway's contribution to Brazil is through the Amazon Fund). Norway also contributes 41% of funding for the other multilateral funds that support REDD+ both globally and in these countries (Climate Funds Update, 2014).[11]

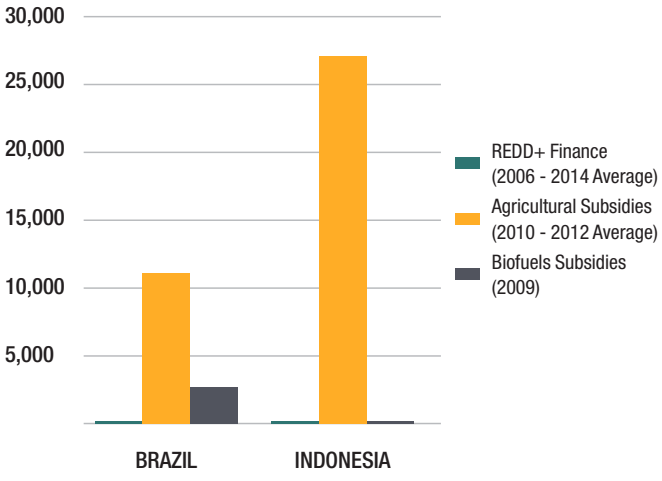
These levels of REDD+ finance stand in stark contrast to domestic subsidies, with average annual domestic agriculture subsidies in Brazil and Indonesia exceeding REDD+ finance by factors of 70 and 164 times, respectively (see Figure 5).

Figure 4: Sources of pledged REDD+ finance to Brazil and Indonesia



Source: Norman and Nakhooda, 2014

Figure 5: Domestic agriculture and biofuel subsidies as compared with REDD+ finance commitments (average annual $ million)



9 The OECD inventory currently includes all OECD and will shortly include the BRICS countries – Brazil, Russia, India, Indonesia, China and South Africa (OECD, 2013).

10 Research for this report was conducted from February to December 2014, and we acknowledge that since completion some of the subsidies have changed. For example, significant progress was made on fossil fuel subsidy reform in Indonesia in early 2015, with Indonesian President Joko Widodo announcing the removal of subsidies on Premium gasoline and the introduction of a "fixed" subsidy on diesel, which could lead to a decline in fuel subsidy expenditure of $15.5 billion (GSI, 2015). Related to this, in February 2015, the Indonesian government announced a 333% rise in the biofuel subsidies in order to protect the country's biofuels industry and uphold demand for palm oil (Jakarta Globe, 2015).

11 These include The Congo Basin Forest Fund, The Forest Carbon Partnership Facility, The Forest Investment Programme and the UN-REDD Programme.

This pattern is common across countries receiving REDD+ finance. We compared REDD+ finance with estimates of biofuel and agricultural support for five countries where data was available, and showed that agriculture and biofuel subsidies exceed REDD+ finance by factors of 600 and 9 times, respectively (see Table 1).

Table 1: Comparing REDD+ finance received, with domestic expenditure on biofuel and agricultural subsidies (average annual $ million)

	REDD+ Finance (2006-2014 Annual Average)	Agricultural Subsidies (2010-2012 Annual Average)	Biofuel Subsidies (2009)
Brazil	158	11,082	2,700
Chile	0	709	v/a
China	9	160,023	500
Indonesia	165	27,072	79
Mexico	12	7,880	n/a
Total	**346**	**206,766**	**3,279**

Sources: REDD+ finance (Norman and Nahkooda, 2014); Agricultural subsidies (OECD, 2014); Biofuel subsidies (Gerasimchuk et al, 2012).

In spite of the significant levels of subsidies in Brazil and Indonesia, including a sub-set of which that are key commodities driving forest loss (as will be outlined in more detail in Sections 5 and 6), reviews of REDD+ finance to these countries have found that there is not a focus on identification, estimation and reform of these subsidies (Nakhooda and Watson, 2012; REDDx, 2014a; REDDx, 2014b; Salvini et al, 2014).[12]

A recent assessment of 43 REDD+ countries and 98 REDD+ readiness documents reveals few concrete proposals to remove subsidies that drive forest loss (Salvini et al, 2014). A review of the activities supported by the Amazon Fund showed that fewer than 20% of projects were focused on 'forest management policies altering economic incentives for forest use' (Nakhooda and Watson, 2012). Of this small number, there is no indication if these projects address existing subsidies that are driving forest loss or are instead focused on developing new 'economic incentives' that support REDD+.

The stated objectives of the majority of existing REDD+ finance is to increase the 'readiness' (see footnote 2) of these countries for receiving and accessing additional REDD+ finance. However, we find that there has been very little focus by REDD+ finance on the existing domestic and international subsidies that shape private investment. This is in spite of the UNFCCC decisions from the eighteenth session of the Conference of Parties (COP 18) which requests that countries address 'the drivers of deforestation…when developing and implementing their national strategies or plans' (UNFCCC, 2010).

It is possible that some REDD+ finance is seeking to address subsidies to key commodities that drive forest loss, however, the categories used by donors and delivery organisations to describe these interventions are too broad to be certain of their specific focus (see Box 3).

Given the level of subsidies available to support investment in agriculture (which includes a number of the commodities that drive forest loss), and the stark contrast with the volumes of available REDD+ finance, there is clearly potential to address these subsidies in conjunction with the development of any new incentives for REDD+. Even without the design of new incentives through REDD+ finance, the reform of key subsidies linked to forest loss could create a more level playing field for private investment in REDD+. Finally, REDD+ finance could be used as a resource to support transparency, and as a lever to encourage subsidy reform.

To address the current gap in REDD+ finance focused on subsidies that currently drive forest loss, the balance of this report outlines:

- An approach for identifying and estimating subsidies to key commodities driving forest loss (see Section 4).
- The findings from applying this methodology to soy and beef in Brazil and timber and palm oil in Indonesia (see Sections 5, 6 and 7).
- Opportunities for REDD+ finance to support subsidy identification, estimation and reform (see Section 8).

Box 3: Current focus of REDD+ finance in Brazil and Indonesia

The top four activities supported by REDD+ finance to date are:

- stakeholder engagement
- policy and legal analysis and development (REDD+ strategy development and advocacy)
- institutional strengthening
- improved forest and land management (implementation).

Source: REDDx, 2014a; REDDx, 2014b

12 However, this is consistent with findings around an absence of climate finance support for addressing other subsidies that have significant climate impacts, including those to fossil fuels (Whitley, 2013a).

4 Approach for identifying and estimating subsidies

4.1 Subsidy identification and classification

This report was completed through a desk study of secondary information on domestic subsidies to key commodities driving forest loss. Additional research was completed through a literature review and selected interviews. Data collection did not include a detailed review of government budgets, legislation or specific in-country interviews.

A review was completed for each commodity (beef and soy in Brazil, and timber and palm oil in Indonesia), collecting the following information (where available) for each domestic subsidy identified (see Sections 5 and 6, and Appendix 1):

- description
- type of government support (regulatory, economic, and information instruments) (see Figure 6)
- detail of the subsidy
- targeted beneficiaries
- intended purpose
- qualification of whether the subsidy is current or historic
- year the subsidy was effective from
- qualification of whether there are any lessons for reform
- source (within government)
- annual value ($)
- point applied on domestic 'supply and demand chain' (see Figure 7)
- qaualification of whether the subsidy is specific to the commodity, or general.

Appendix 1 contains all publicly available information that was found for each subsidy, with a worksheet for each commodity as well as references for all sources of information. Within the text of this report, we have referred to each subsidy by the identification code attributed to it in Appendix 1 (e.g. BB.1 is the first entry in the worksheet on subsidies to beef in Brazil). Where government policies and programmes might be multi-faceted, we have referred to different components as IT.4a and IT.4b, for example.

Figure 6: Instruments of government support[13]

Regulatory Instruments Influence behaviour through legality (funded through budget support or grants - see economic instruments)	• Standards (for processes and products) • Property rights / land rights and land use laws • Legally binding targets • Quotas • Licenses • Planning laws • Accounting systems (mandatory) • Copyright and patent protection (intellectual property rights) • Import / export restrictions • Enforcement

Economic Instruments
 	
Influence behaviour through price
	• Access to resources (at reduced cost or free)
	• Taxes
	• Levies
	• Royalties
	• Tradable permits
	• Budget support
	• Grants
	• Lending and guarantees
	  ◦ Debt - lending
	  ◦ Equity - investing
	  ◦ Guarantees
	• Insurance
	• Public procurement
	• User fees / charges
	• Price support or controls
	• Parallel infrastructure (roads and transmission lines)

Information instruments Influence behaviour through awareness (funded through budget support or grants – see economic instruments)	• Policies, plans and strategies • Research and development • Information centres • Statistical services • Awareness campaigns • Training / education • Industry associations • Transparency initiatives • Voluntary performance targets • Certification / labelling (voluntary) • Accounting systems (voluntary)

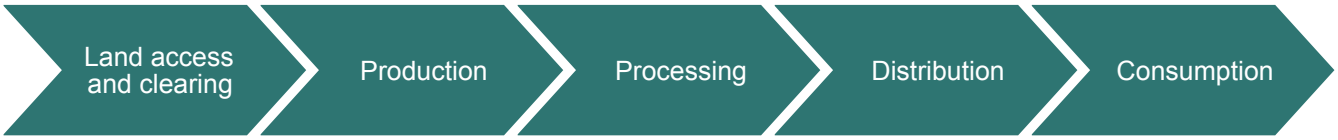
13 This typology of instruments of government support is a more general framing than subsidies. Within this framework most (but by no means all) subsidies as defined by the WTO and FAO (see Box 1) fall under the category of 'economic instruments'. We review regulatory and information instruments in order to identify subsidies that are provided to these instruments through use of national, regional and local budget and grants.

In order to facilitate comparison of subsidies across different commodities, we developed a 'supply and demand' chain to represent the typical stages in the production and consumption of the commodities reviewed in this report (see Figure 7).

These stages include:

- Land access and clearing: the process of obtaining ownership of, or leases for, land and permits to convert forest land and develop it for producing the commodity.
- Production: planting, growing and harvesting the commodity, including inputs to production.
- Processing (primary and secondary): refining, treating and packaging of the commodity
- Distribution: transport of the products, either domestically or for export
- Consumption: purchase and use of product.

Figure 7: Supply and demand chain



4.2 Subsidy estimation

This review attempted to capture subsidies including: direct financial transfers; services and indirect financial transfers (including tax breaks); and regulations (for which a value or cost to government may not be specified) (see Box 1). We also capture the value of domestic public finance where provided by governments. However, as the share of overall financing that constitutes a subsidy depends on the terms of the arrangement, and this information is not provided by many of the sources assessed in this report, this report therefore provides the overall value of public finance, unless otherwise specified.

Our research did not seek to quantify subsidies for which a value had not already been attributed, however, this could be completed as part of further analysis (see Section 5). From this analysis, we can begin to identify for each subsidy:

- Their role in driving public and private investment toward each of the commodities.
- The extent to which subsidies may affect forest loss.
- Where there might be opportunities for a more in-depth review or quantification, to inform reform.
- How identification, quantification and reform might be supported by climate finance and development finance more broadly – including that which is targeted toward REDD+.

For ease of comparison, we refer to all figures in US dollars ($). Where figures were given in both national currencies (Brazilian Reals – BRL and Indonesian Rupiah – IDR) and $, we have used the exchange rates and conversion figures cited by the primary sources. Where only the domestic currency was used, we used the exchange rates published as part of the OECD's agricultural policies and support database (OECD, 2014).

The estimated values of the subsidies do not represent their specific impact on investment in commodities or on forest loss. Each subsidy will have a different impact on commodity production and forest loss depending on the influence of that subsidy on investment in the supply and demand chain and related land use decisions. Additional research is required to determine the links between specific subsidies and forest loss. See sections 5.4 and 6.4.

4.3 International and sub-national subsidies

The research was focused on domestic subsidies at the national level, which have an impact on production or consumption of the given commodity. While there is some reference in the discussion to key international and sub-national subsidies, the remit of the report did not allow us to comprehensively review international or sub-national subsidies, including those through international public finance (see Section 3.1.5).

5 Findings: subsidies to beef and soy in Brazil

5.1 The context for commodity investment and REDD+ in Brazil

In 2008 Brazil's then President Luiz Inácio Lula da Silva approved Brazil's National Climate Change Policy (Plano Nacional sobre Mudança do Clima) which set a legally binding GHG emissions reduction target of between 36.1% and 38.9%, compared to projected emissions pathways, by 2020 (Government of Brazil, 2008).

On average, between 2008 and 2011 forest loss was responsible for 28% of Brazil's GHG emissions (WRI, 2014). The links to climate change and wider international and domestic attention on forest loss in the Amazon have led to the country prioritising action to address forest loss. Brazil's actions to address forest loss have included:

- Enforcing the Forest Code, which establishes reserves and permanent protection areas, and requires a minimum level of forest cover on private land.
- Making deforestation a crime in 1998 (Law 9605) and linking the availability of rural credit to compliance with this law.[14] The ability to demonstrate and ensure compliance has improved with satellite imagery and monitoring, better enforcement and creation of the National Rural Environment Registry System (Cadastro Ambiental Rural or CAR), a nation-wide electronic land registration system.
- Establishing the Action Plans to Prevent and Control Deforestation in the Amazon and Cerrado (Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal and das Queimadas no Cerrado PPCDAm and PPCerrado) in 2004 and 2010, respectively, which have focussed on monitoring and control of illegal deforestation and tenure management and regulation.
- Establishing a legal basis for both singling out municipalities with high levels of forest loss and taking differentiated action towards them (through Decree 6321). This includes municipality specific changes in environmental monitoring, law enforcement, licensing procedures and credit approval.
- The private sector led 'soy moratorium' – an initiative whereby associations representing 90% of the Brazilian soy market committed not to buy soy grown on land cleared after July 2006. This commitment has recently been extended to May 2016.

As a result of these measures, and wider economic changes, over the past decade, there has been a well-documented decrease in the rate of forest loss in Brazil, dropping by about 80% from its peak in 2004.[15] [16]

In support of its continued activities to slow forest loss, Brazil has received pledges of over $1 billion in climate finance specifically to support REDD+, primarily through Norway's commitment to the Amazon Fund (Figure 4).

In spite of this domestic and international support, Brazil may be losing ground in addressing forest loss. Between 2012 to 2013 forest loss increased (INPE, 2013). This may be due to underlying demand for the commodities that threaten forests, including beef and soy, and the interactions between the two (see Box 4). The context in Brazil is therefore mixed: with recent success in reducing forest loss directly attributable to some of the government's policies, contrasted with continued government efforts to open market access and facilitate investment in agriculture which is a key driver of forest loss (Assunçao et al., 2012).

All of this establishes a context in Brazil whereby on the one hand there are significant commitments to addressing forest loss, and on the other hand economic development plans including subsidies to facilitate investment in commodities that drive forest loss.

The next sections outline in more detail the specific subsidies identified that are supporting investment in beef and soy production in Brazil.

14 Law 9605 of 1998: http://www.planalto.gov.br/ccivil_03/leis/l9605.htm

15 The changing value of the Brazilian Real and of global crop prices have been found to have a significant impact on forest loss (Arcand et al, 2008; Catteneo, 2002) (Assunçao et al, 2012)

16 See footnote 3.

Box 4: The links between beef and soy and deforestation in Brazil[17]

Despite the 'soy moratorium', and that most soy expansion is away from the forest frontier, soy is linked to deforestation through displacement of beef production to areas where deforestation is occurring. Rising income from soy production leads to conversion of cattle pastures in southern and western regions into soy production (Arima et al., 2011). New cattle pastures then emerge in other areas to meet beef demand with rapid expansion of herds in the north and northeast regions (Government of Brazil, 2013; CPI, 2013). Aldrich et al (2012) calculated that a 10% reduction of soy in old pasture areas would have reduced deforestation by 40%. The relationship between increases in productivity and expansion also needs fully understanding in this context (see Section 5.5).

5.2 Beef (Brazil)

5.2.1 Background

Beef production plays a very significant role in the Brazilian economy. The country has the largest number of commercial cattle of any country in the world, and is the world's largest exporter of beef (USICT, 2012). Between 2001 and 2009 the export value of beef products tripled, and in 2012 the total value of beef exports was over $7 billion, or 3% of the country's export income (UNCOMTRADE, 2014). This growth in cattle production and beef exporting is in part due to Brazil's efforts toward trade liberalisation (Nepstad et al, 2009), and to significant increased local demand, as over 80% of the country's beef is consumed domestically.[18]

Since 1990, the number of cattle in the Amazon region has grown from 25 million to more than 70 million, with cattle ranching responsible for around three-quarters of forest loss in the region (Arima et al., 2011). An important regulatory change that has supported this growth was the conferral of foot and mouth disease-free status on a large portion of the Amazon (Nepstad et al., 2009), which gave the region an advantage over other cattle producing areas and increased the incentives for investing there.

5.2.2 Domestic subsidies

Our research identified eight individual domestic subsidies that support increased beef production in Brazil, which may be acting as additional drivers of forest loss. The full list of subsidies to beef can be found in Figure 8 and Appendix 1.

Overview of subsidies and their objectives

All of the subsidies identified to the beef industry in Brazil are provided through broad agriculture support programmes, rather than being subsidies specifically targeted at beef production.

Beef production has previously benefited from wider agricultural support programmes that were established to: encourage migration of workers to less populated areas, provide rural livelihoods, and increase the productivity and economic development of rural regions and states (BB.12, BB.13).

While migration is no longer a primary purpose of the current subsidies to beef outlined in this report, increasing productivity and quality are still the primary justifications used for the interventions in the agricultural sector that also benefit beef production. There is also a strong focus on increased investment in infrastructure and supporting 'family' farmers, land owners with few employees and a heavy reliance on farming for household incomes.

Current agricultural subsidies that benefit beef production include concessional loans (BB.2, BB.3, BB.4 and BB.7), insurance for lost income (BB.5 and BB.6), and tax breaks (exemptions) (BB.8). These are delivered and managed through a combination of regional funds, development agencies and farmer programmes including regional Fondo Constitucional, the National Programme for Strengthening Family Agriculture (Programa Nacional de Fortalecimento da Agricultura Familiar - PRONAF) and the Amazon development board (Superintendência de Desenvolvimento da Amazônia – SUDAM).

In addition, beef production, transport and processing has benefited from the nationwide Growth Acceleration Programme (Programa de Aceleração do Crescimento – PAC) launched in 2007 to stimulate private investment in infrastructure (BB.10). This has lowered costs for the agriculture sector through improvements in transportation networks including highway construction and road improvement in the centre-west region, construction of locks on rivers in the state of Para, and the expansion of the railways and ports (OECD, 2011).

Value of subsidies

In secondary sources we found estimated values for seven out of the eight subsidies identified for beef production (see Table 1). The values outlined below

17 Brazilian states are grouped into five regions: north, northeast, central west, southeast and south. The legal Amazon is mostly contained in the north, with some of the northeast and centre west states in the Amazon too. Other forest ecosystems exist across Brazil, although the 'arc of deforestation' is across states in the north, northeast and central west.

18 ODI calculation based on USDA data between 2009 and 2014 (USDA, 2014).

are estimates of government support (including public investment) and do not include resulting investment. In four cases (BB.2, BB.4. BB.5 and BB.7) where the subsidies are targeted at the agricultural sector as a whole, the OECD (2014) has calculated specific benefits to beef production.

It is estimated that the subsidies identified in this report do not provide the total value of subsidies to beef in Brazil, as in 2009/10,[19] Brazilian agriculture received $52.3 billion of rural credit, and in between 2010 and 2013, the Brazilian development bank (O banco nacional do desenvolvimento – BNDES) spent an average of $19.5 billion per year on transport loans which may have supported the expansion of beef production (USICT, 2012).

Table 2: Current subsidies to beef production for which value has been estimated[20]

Subsidy	Value (average annual US$)	Time period of calculation	Source (see Appendix 1 for references and additional information)
Concessional loans for family farmers	218 million	2004 - 2008	BB.2
Preferential interest rate subsidy on working capital loans (beef subtotal)	169 million	2010 - 2012	BB.4
Insurance for lost income for small-holders and family farmers (beef subtotal)	0.17 million	2010 - 2012	BB.5
Insurance for lost income for commercial agriculturalists	31 million	2007	BB.6
Preferential interest rate subsidy on marketing loans (beef subtotal)	10 million	2010 - 2012	BB.7
Public investment in priority activities in the Amazon (beef subtotal)	36.9 million	n/a	BB.9
Public investment in transport and infrastructure (livestock subtotal)	10 billion	2007 - 2011	BB.10

Impact of subsidies on forest loss

The estimated values of the subsidies do not represent their specific impact on investment in beef production or on forest loss. Each subsidy will have a different impact on beef production and forest loss depending on the influence of that subsidy on investment in the supply and demand chain and related land use decisions. Additional research is required to determine the links between specific subsidies and forest loss.

Nonetheless, there are indications that concessional loans are of particular importance to beef production. The state-led rural credit portfolio[21] covers 40% of the annual financial needs of the agricultural sector in Brazil and due to the otherwise high domestic finance lending rates, these below-market public finance rates are credited with significantly reducing the costs of producing beef in Brazil (USICT, 2012).

Also, one-third of PAC's expenditure is directed toward the primary areas of forest loss which are in the north, northeast and centre-west regions. Given transport costs are comparatively high for beef production in Brazil, these investments in reducing transport costs are a significant subsidy to beef production that may be linked to forest loss (USICT, 2012).

5.2.3 International subsidies

Given that domestic consumption accounts for 80% of Brazilian beef products, the role of international subsidies is of limited significance. The primary international interventions around beef have been regulations with the aim of increasing food safety and quality, linked to foot-and-mouth disease. In the past few years bans and border measures have been introduced in a number of countries, negatively affecting the export of Brazilian beef (FAO, 2014). These include policies in China and Russia, two of the largest importers of Brazilian beef.

19 Crop years overlap two calendar years, from the middle of one year to the middle of the next, since some crops, such as soybeans, are almost all produced in the Southern Hemisphere's wet season (November to May).

20 Full details on all these subsidies, including the timeframe of the incentive, and details on the nature of the subsidy can be found in Appendix 1.

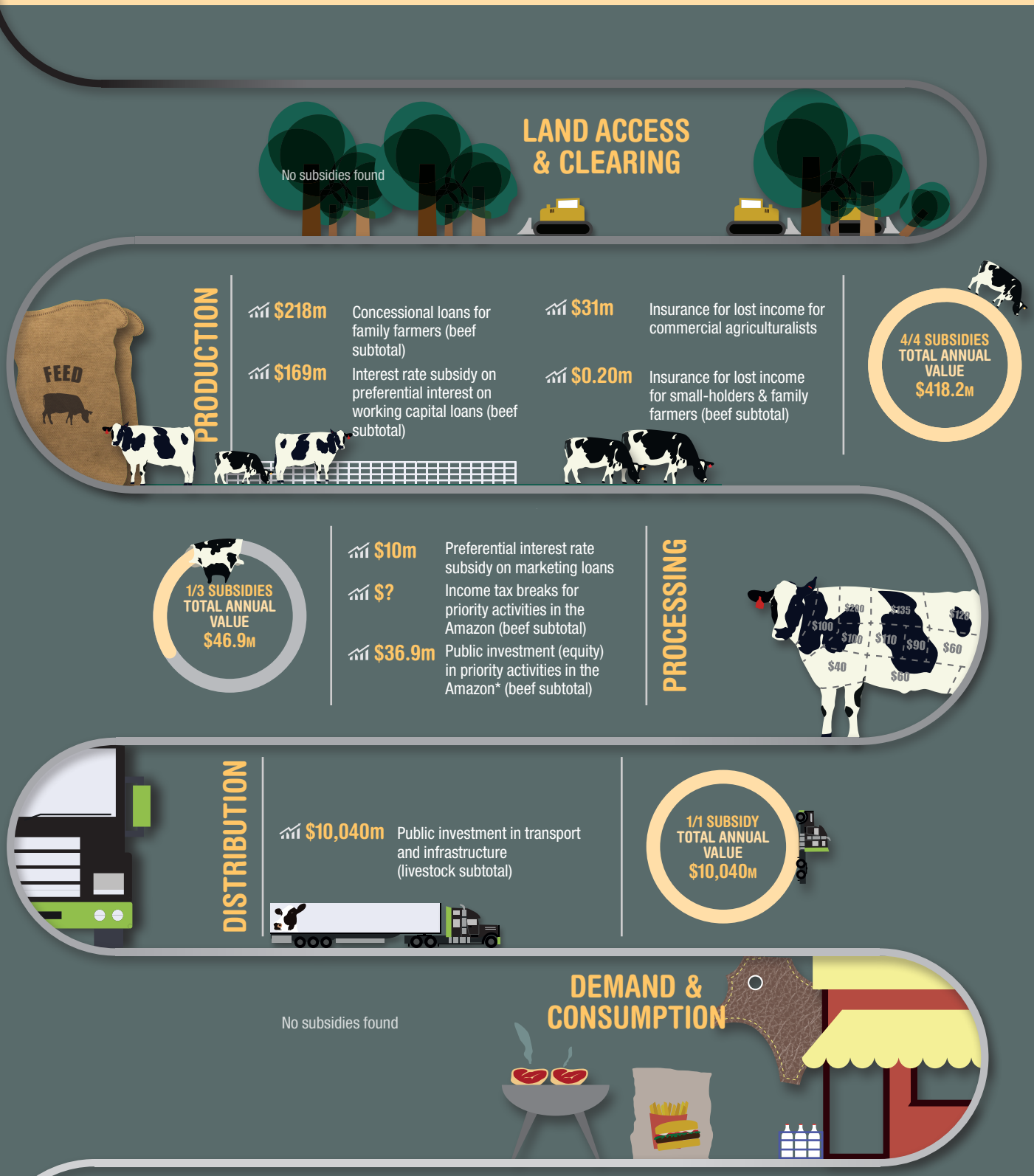
21 Which includes programmes such as PRONAF and others under the National System of Rural Credit (BB.2, BB.3, BS.4 and BS.5)

BEEF SUBSIDIES IN BRAZIL

Figure 8: Summary of subsidies for beef in Brazil

Our research identified eight domestic subsidies that support beef production and consumption in Brazil. This graphic identifies each subsidy, the stage of the supply chain that it impacts, what type of incentive it is, and the estimated value (US $10,505 million per year). Discussion and analysis of these subsidies is provided in Section 5.2.

These subsidies were identified and estimated through a desk study of secondary information on domestic subsidies to beef, and additional research was completed through a literature review and selected interviews. Data collection did not include a detailed review of government budgets, legislation or specific in-country interviews. Full details of all the subsidies, and full references, are provided in Annex 1.



Economic

Regulatory

*Indicates where the figure represents total investment, and not per year as with other values

5.3 Soy (Brazil)

5.3.1 Background

Brazil is the second largest soybean producer and exporter in the world, behind the United States. Brazilian exports of soy products (soybeans, soybean meal and soybean oil) were worth $ 26.2 billion in 2012, accounting for 10.6% of all the country's exports (UNCOMTRADE, 2014). In between 1990 and 2010, the area dedicated to soy production has increased from 9.7 million hectares to 24 million hectares, or 35% of the country's arable land (Boucher et al., 2011; World Bank, 2014c).

Roughly 50% of Brazil's annual soybean production is exported.[22] The key importers are China and the EU, accounting for 49% and 29%, respectively. Domestic consumption is also important, and in the last decade, targeted government policies to build a domestic biodiesel market have resulted in significant domestic investment in soy production (OECD, 2011).

5.3.2 Domestic subsidies

Our research identified 16 individual domestic subsidies that support soy production in Brazil, which may be acting as additional drivers of forest loss. There are also a number of international subsidies driving demand for soy, some of which are outlined in Section 5.3.3. The full list of subsidies to soy in Brazil can be found in Figure 9 and Appendix 1.

Overview of subsidies and their objectives

Soy production is currently subsidised throughout the supply and demand chain (Figure 7), with a focus on the use of economic instruments to support the production stage of the supply chain. Only one subsidy specifically targets soy production, while others benefit soy as part of broad agriculture support programmes, or increase demand for biodiesel for which soy is a key input.

The only commodity specific subsidy is to biofuel producers, offering favourable financial terms from BNDES, and use of a marketing label, under condition that they purchase soy from smallholders and provide extension services focussed on sustainable agricultural practices (BS.9).

Government expenditure on research and development (R&D) for oilseeds (BS.1) has been credited with facilitating the rapid expansion of soy across Brazil. The country's regulations on genetically modified crops (BS.2) have created a strong legal environment, relative to other soy producing countries, under which companies have invested in marketing and selling new seeds in the country. Both of these instruments are intended to increase crop productivity.

Soy producers also benefit from several agricultural support policies that were established to protect farmers from the impact of price fluctuations. Brazil's National Food Supply Company (Companhia Nacional de Abastecimento –CONAB) manages a number of price support programmes that periodically benefit soy producers (BS.3 and BS.4) depending on fluctuations in the market price for soy. Other subsidies identified include state-provided crop insurance (BS.6 and BS.7), and concessional loans for marketing and working capital (BS.5 and BS.8).

As with beef production, wider national investments in transport infrastructure made through the PAC facilitate the expansion of soy production (see Section 5.1) (BS.14). A key project related to soy is the development of the BR-163 highway connecting the state of Matto Grosso to northern ports fundamentally reducing transport costs in regions where previously the absence of this infrastructure limited investment into soy production.

Soy consumption is also subsidised through Brazil's domestic fuel blending mandate, which requires that 5% of petrol and diesel to be derived from biofuels (BS.13), which increases domestic demand for soybean oil. The biofuel industry is also subsidised by the government-led labelling scheme (BS.9) and tax deferrals (BS.10), a subset of which supports soy consumption.

22 Average is 53% between October 2011 and October 2014 – ODI calculation based on USDA data (USDA, 2014a).

Value of subsidies

In secondary sources we found estimated values for nine out of the 16 subsidies identified (see Appendix 1), (see Table 3). The values outlined below are estimates of government support (including public investment) and do not include resulting investment. In four cases (BS.5, BS.6, BS.7 and BS.8), where the subsidies are targeted at the agricultural sector as a whole, the OECD (2014) has calculated specific benefit to soy production.

As outlined above, it is estimated that the subsidies identified in this report do not provide the total value of subsidies to soy in Brazil, as in 2009/10, Brazilian agriculture received $52.3 billion of rural credit, and in between 2010 and 2013, BNDES spent an average of $19.5 billion per year on transport loans which may have supported the expansion of soy production (USICT, 2012).

Impact of subsidies on forest loss

The estimated values of the subsidies do not represent their specific impact on investment in soy production or on forest loss. Each subsidy will have a different impact on soy production and forest loss depending on the influence of that subsidy on investment in the supply and demand chain and related land use decisions. Additional research is required to determine the links between specific subsidies and forest loss.

Nonetheless, some information on the effectiveness of the subsidies in driving investment is available. For example, the Agriculture and Livestock Confederation of Brazil (Confederação da Agricultura e Pecuária do Brasil), a major farm group, considers the government's investment in crop R&D (BS.1) to have been a major factor in the change in productive capacity and geographic distribution of Brazilian agriculture (USICT, 2012). The domestic biodiesel blending mandate has undoubtedly contributed to the increase in investment in soy too, with soy accounting for 76% of Brazil's biodiesel feedstock (USDA, 2014b).[25] The current poor transport infrastructure in potential areas for expansion of soybean production has been identified as a key challenge for growth of the industry (USICT, 2012), and the national growth acceleration programme (BS.14) specifically aims to address this. Public investment in road and port building in these areas (for example the state of Matto Grosso) will likely increase parallel investment in production and distribution of soy (USDA, 2012).

Table 3: Current subsidies to soy production for which value has been estimated[23]

Subsidy	Value (average annual US$)	Time period of calculation	Source (see Appendix 1 for references and additional information)
Government expenditure on crop R&D	1.1 billion	2011	BS.1
Price support programmes for crops including soy	0[24]	2007 - 2014	BS.3
Concessional loans for family farmers	4.9 billion	2008	BS.4
Insurance for lost income for commercial agriculturalists	218 million	2010 - 2012	BS.5
Preferential interest rate subsidy on working capital loans (soy subtotal)	38.9 million	2010 - 2012	BS.6
Insurance for lost income for small-holders and family farmers (soy subtotal)	14.6 million	2007	BS.7
Preferential interest rate subsidy on marketing loans (soy subtotal)	32.9 million	2010 - 2012	BS.8
Public investment in priority activities in the Amazon (soy subtotal)	267 million		BS.15
Public investment in transport and infrastructure (soy subtotal)	540 million	2007 - 2011	BS.14

23 Full details on all these subsidies, including the timeframe of the incentive, and details on the nature of the subsidy can be found in appendix 1.

24 With the current soybean prices, payments have not been made to the soy industry since 2007, however soy is still covered under the price support programmes should the price drop.

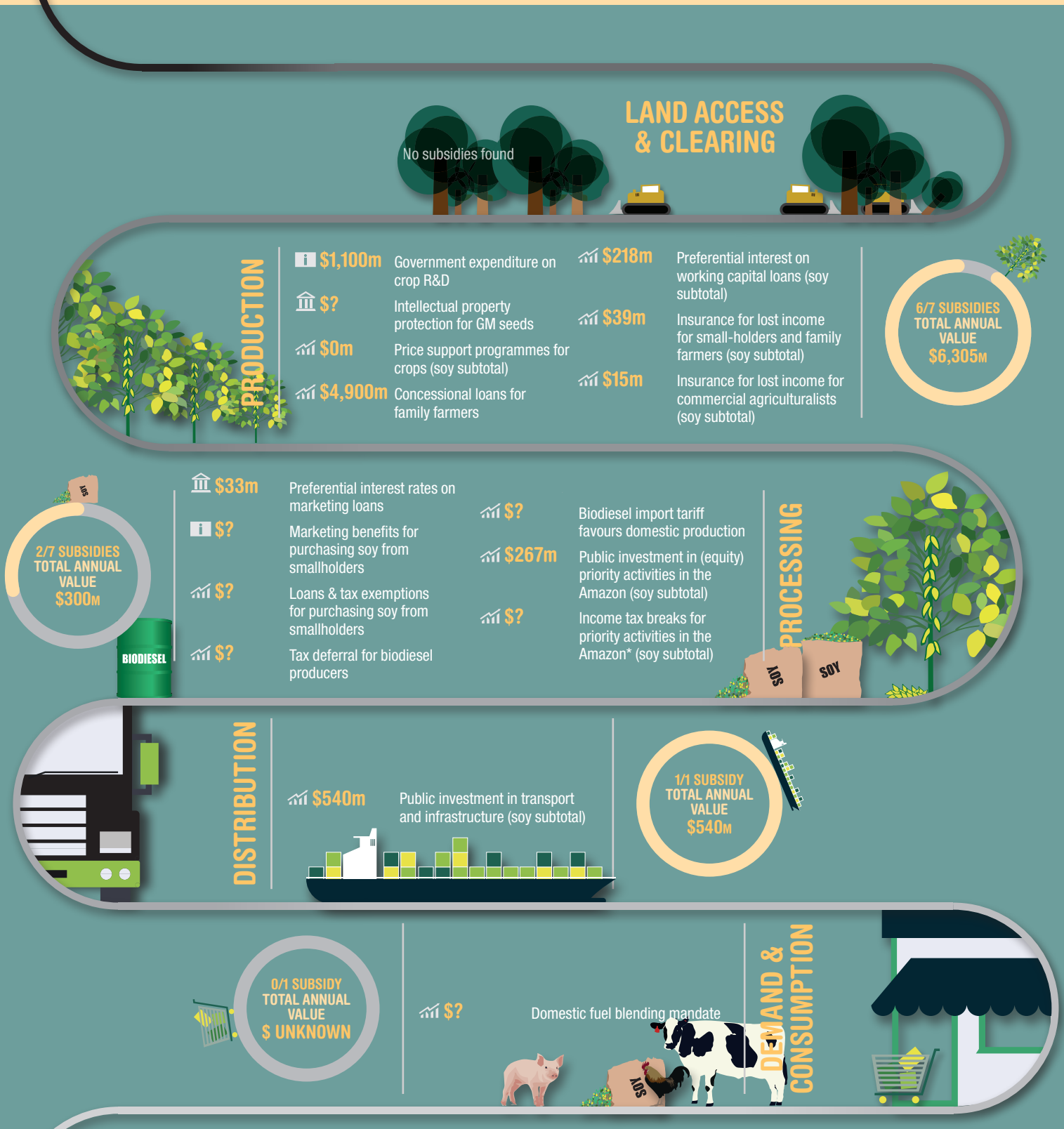
25 13% of Brazil's soy production is used for biodiesel production (USDA, 2014b).

SOY SUBSIDIES IN BRAZIL

Figure 9: Summary of subsidies for soy in Brazil

Our research identified 16 domestic subsidies that support soy production and consumption in Brazil. This graphic identifies each subsidy, the stage of the supply chain that it impacts, what type of incentive it is, and the estimated value (US $14,290 million per year). Discussion and analysis of these subsidies is provided in Section 5.3.

These subsidies were identified and estimated through a desk study of secondary information on domestic subsidies to soy, and additional research was completed through a literature review and selected interviews. Data collection did not include a detailed review of government budgets, legislation or specific in-country interviews. Full details of all the subsidies, and full references, are provided in Annex 1.



Economic
Regulatory
Information

*Indicates where the figure represents total investment, and not per year as with other values

5.3.3 International subsidies

The number of countries with biofuel blending mandates continues to rise every year: The Renewable Energy Policy Network for the 21st Century (REN21) identified 63 countries with mandates by the end of 2013 (REN21, 2014). China and the EU, the two largest importers of Brazilian soy products, both have regulations that require a certain proportion of transport fuels to be made from biofuels. These policies are primarily intended to speed up a transition away from fossil fuels and reduce reliance on imported transport fuel. While the blending mandates affect several oil crops, these have likely been a significant source of demand for soybeans and soybean oil.

As the world's largest exporter of ethanol (from sugarcane), Brazil has actively engaged to develop wider trade opportunities for biofuels (OECD, 2011). In December 2006, a special working group for biofuels was established within Mercosur.[26] In March 2007, a Memorandum of Understanding (MOU) was signed with the United States to foster private investment in the biofuel industry and establish uniform standards and norms within the global market. In the same month, the major biofuel producing and consuming countries (Brazil, China, EU, India, South Africa and the United States) launched the International Biofuels Forum to foster the international market for biofuels. Biodiesel exports were worth US$ 32 million to Brazil in 2013 and were exclusively to the EU (USDA 2014a).

5.4 Knowledge gaps and next steps (Brazil)

Almost all of the subsidies supporting beef and soy production in Brazil are general agricultural subsidies. In the majority of cases we have found information on the value of these subsidies, although in many instances these represent the total value across a sector or economy wide investment, which is not the specific benefit to beef or soy. It would be useful to undertake a more detailed review to identify the commodity specific values. This could include: reviewing Empraba's programming to isolate specific R&D expenditure on soy (BS.1); calculating the typical transport and infrastructure related costs to the soy and beef industries, and the subsequent cost savings associated with the government's investment in transport infrastructure (BB.10, BS.14); and undertaking a more detailed review of federal, state and municipal tax benefits to specific commodities which are understood to create supply chain distortions in both the soy and beef industries (USICT, 2012).

A significant proportion (40%) of working capital and investment capital in Brazil is provided at preferential rates through government rural credit programmes (USICT, 2012). It is likely that this has a significant impact on the parallel private investment provided to the sector by input suppliers, purchasers and commercial banks. This suggests taking a closer look at the role of public credit in shaping private investment that may be driving wider forest loss.

This could include a review of the large trading companies and the Brazilian state-owned oil company Petrobras that are active in financing soy production and processing (Van Gelder and Kouvenhoven, 2011). As well, it could be useful to identify the relevant government legislation that impact upon foreign ownership and international financial flows to the soy and beef industry. By way of example, China, is the largest buyer of soybeans and meal, it is also a major investor in soy production and expansion.

5.5 Opportunities for reform (Brazil)

Brazil has already reformed a number of its agricultural subsidies (including to beef and soy) with the aim of addressing forest loss and improving environmental performances. However, while subsidies aimed directly at cattle and soy have shifted, subsidies that seek to increase market access and lower transport costs provide on-going subsidies to production of both commodities (OECD, 2011) and there is very significant financing behind these. There are opportunities to learn from these previous reform processes, in order to address subsidies that may still be driving forest loss.

An example of historic subsidy that has now been reformed is the addition of conditions to the provision of rural credit. Resolution 3545, introduced in 2008, resulted in concessional rural credit only being awarded based on compliance with legal and environmental regulations. It is estimated the resolution led to $1.4 billion not being loaned between 2008 and 2011 – this is $350 million per year that was previously being lent to farmers that were breaking environmental regulations. It is estimated that without these provisions, 90% of this finance would have supported beef production, and led to an additional 2,700 km2 of forest loss (Assunçao et al., 2012), increasing the rate of forest loss by around 15%.

There are additional opportunities for subsidy reform in Brazil, both building on previous successes, existing incentives for sustainable agriculture practices (such as the ABC programme)[27], as well as the scope, and demonstrated ambition for, increasing productivity. Brazil's beef production is very extensive, and productivity per hectare and per animal is lowest in the regions with the largest herds, including the Centre-West and North

26 Mercosur (or Mercosul) is a sub-regional customs union and trading bloc comprising Argentina, Brazil, Paraguay, Uruguay and Venezuela.

27 Brazil's low carbon agriculture programme (Agricultura de Baixo Carbono - ABC) gives rural credit to encourage the adoption of sustainable farming techniques. It has disbursed over $3.8 billion of funding between 2011 and 2014 (ABC Observatorio, 2014).

East (CPI, 2013). This makes increased productivity a key objective for development of agriculture in Brazil which could support the objective to raise incomes and rural development, and set the foundation for reduced forest loss. Cattle intensification in Brazil can reduce GHG emissions by sparing land from deforestation, and policies aimed at incentivising intensification could lead to achieving over half of Brazil's target reduction in forest loss (Cohn et al., 2014). This focus on agricultural intensification would however be contingent on regulation that prevents expansion, as intensification alone may result in greater expansion (See section 7.5).

There have already been recommendations made that Brazil should move away from 'generic subsidies for expansion of livestock activity' to targeted investment in pasture reform, intensification of management and advanced technological systems. This would shift financing away from general expansion activities with the aim of ensuring greater income toward income improvements through productivity (Smeraldi and May, 2009). Research by the state-owned Brazilian Agricultural Research Company (Empresa Brasileira de Pesquisa Agropecuária - Embrapa) indicates that better pastures, intensification and improved technological systems have the potential to increase cattle numbers by 42% while decreasing pasture area by 35 % (Smeraldi and May, 2009).[28] Cohn et al. (2014), find that a subsidy to semi-intensive ranching could create a 10% increase in productivity and a 40% reduction in GHG emissions. Patterns of soy production following the 'Soy Moratorium' in 2006 provide interesting insight into how productivity gains need to accompany moratoriums on new concessions or protected areas in order to be effective. Since 2006, only 22% of the increase in soy production has occurred through yield gains, the rest is due to expansion onto other agricultural land (Macedo et al., 2012) leading to the displacement of other agricultural activities to the forest frontier described in Box 2.

An example of a subsidy that supports reduced forest loss and rural development is Brazil's social food stamp programme. By allowing biofuel producers to differentiate their product under the government's Social Food Stamp label, it encourages biodiesel producers to purchase feedstock, including oil palm and soybeans, from small family farms. Participating biodiesel producers will provide family farmers with technical assistance focused on sustainable agricultural practices. In return, the biodiesel companies benefit from the Social Fuel Stamp programme - gaining access to better financial conditions through BNDES and other financial institutions; the right to compete in auctions for the purchasing of biodiesel by the National Agency for Petroleum, Natural Gas, and Biofuel (ANP); certain tax exemptions; and the use of the Social Fuel Stamp logo for sustainability marketing.

Lastly, there may be opportunities to translate the reforms that have been made to add conditionality to public credit to also apply to private investment. This could include expanding the safeguards required for private lending. By way of example, BNDES has social and environmental guidelines for applicants seeking investment in cattle activities (BNDES, 2014). Refrigeration and slaughtering companies must prove that their suppliers have not been convicted of expansion onto indigenous lands, nor using child labour. It would be useful to examine how similar safeguards linked specifically to forest loss could be applied more widely to private finance.

28 This increase in cattle would need to be accompanied by methods for methane capture in order to avoid other wider climate impacts from agriculture aside from deforestation.

6 Findings: subsidies to timber and palm oil in Indonesia

6.1 The context for commodity investment and REDD+ in Indonesia

In 2009, the then President of the Republic of Indonesia Susilo Bambang Yudhoyono announced a voluntary GHG emissions reduction target of 26% by 2020,[29] and a 41% reduction target if Indonesia received international assistance to finance required actions. As emissions from forests and land use change accounted for 61% of Indonesia's overall emissions in between 2008 and 2011, addressing forest loss is critical to meeting this objective (Austin et al, 2014).

To support Indonesia's efforts to meet its climate change target, in 2010 the government signed a Letter of Intent, under which Norway pledged up to $1 billion in performance-based payments for reduced forest loss in Indonesia. A key policy development since that time has been a moratorium on granting new licences to convert primary forests and peat lands into plantations or timber concessions, which was introduced in 2011 and extended until the end of 2015 (Austin et al, 2014).

In parallel, Indonesia has a number of economic development objectives through further development of its agricultural sector. Agriculture is one of the primary sectors for Indonesia's economy and employment, and the country's objectives for the sector include increasing food security, crop diversity, farmer incomes and domestic value-added processing (OECD, 2012). Indonesia's current 'Masterplan for the Acceleration and Expansion of Indonesia's Economic Development' (MP3EI) from 2011-2025 specifically highlights the role of palm oil and timber in the economic development of the provinces of Sumatra and Kalimantan (GoI, 2011). The country has also set a target to increase the volume of oil palm production by 60% from 2012-2020 (Obizindski, 2013). In spite of the moratorium, there is up to 7 million hectares that had previously been allocated as oil palm plantation concessions and which may be developed in currently forested areas (USDA, 2013). Indonesia is also trying to promote large-scale investment in timber plantations, with an ambition for 9 million hectares of new plantations to be developed between 2007 and 2016 (Barr et al., 2010), almost doubling the area of timber plantations.

Despite these economic development objectives, doubts have been raised about the significance of the contributions that these sectors make to the Indonesian economy. Research has found that of all the economic sectors in Indonesia, the agriculture, animal husbandry, fishery and forestry sectors (which include palm oil and timber) pay the lowest levels of tax in relation to their contribution to GDP across all sectors, a gap of over $14.5 billion per year in comparison to the average (Prastowo, 2014). Other research found that illegal logging and forest sector mismanagement cost the Indonesian government $2 billion in lost revenue in 2011 (Human Rights Watch, 2013).

Box 5: The links between timber and palm oil production in Indonesia

Timber production and palm oil are linked in two ways. First, timber harvesting (both legal and illegal) is often a gateway activity that facilitates access to forest, contributes to its degradation, reclassification for planning purposes and eventually conversion to a plantation (for oil palm and other agricultural commodities). Second, oil palm producers can earn income and access to land on the basis of timber harvesting. Those seeking to develop oil palm plantations often target forested areas for conversion; with the sector generating profits from timber either as an end in itself, or as a means to generate additional capital for plantation development, offset investment costs, and secure land immediately for future expansion (Sheil et al. 2009).

29 Compared to a business-as-usual model.

All of this establishes a context in Indonesia whereby on the one hand there are significant commitments to addressing forest loss, and on the other hand economic development plans including subsidies that facilitate investment in commodities that drive forest loss.

The next sections outline in more detail the specific subsidies identified that are supporting investment in palm oil and timber production in Indonesia.

6.2 Palm oil (Indonesia)

6.2.1 Background

Indonesia's agricultural policy objectives are pursued through the use of output and input subsidies, and payments for the general provision of services to the sector (OECD, 2012). A wide range of input subsidies on fertiliser, seeds and credit are used to support agricultural producers, involving a relatively high burden on the economy (OECD, 2012). The government is actively promoting large-scale investments in agriculture through subsidies to support investment in commodities including palm oil, coffee and cocoa.

Palm oil is used primarily in food products and cosmetics. Demand for palm oil has rapidly risen since the mid-1990s and is only set to increase worldwide. Indonesia is the world's largest producer of palm oil contributing 45% of the global supply. Of the annual production, over 60% is exported, around 16% is used in the domestic food industry and 12% used in biodiesel production (USDA 2014a and 2014c). Exports of palm oil were worth $17.6 billion to Indonesia in 2012, making it the third most important traded commodity to the country (behind coal and petrol) (UNCOMTRADE, 2014).

The total area of oil palm plantations in Indonesia, owned by both companies and smallholders, was estimated at 10.8 million hectares in 2013/14 (USDA, 2013), covering almost one-fifth of the country's agricultural land.

6.2.2 Domestic subsidies

Our research identified 19 domestic subsidies that support palm oil production and consumption in Indonesia. There are also a number of international subsidies driving demand for palm oil, some of which are outlined in Section 6.2.3. It is possible that there are additional subsidies to palm oil in Indonesia that have not been identified through this desk study. The full list of subsidies to palm oil in Indonesia can be found in Figure 10 and Appendix 1.

Overview of subsidies and their objectives

Support for palm oil production in Indonesia occurs through both subsidies targeted specifically at palm oil production, as well as broader subsidies to the agricultural sector or supporting more general economic development.

Subsidies specific to palm oil production include R&D expenditure on developing new seed strains and seedlings (IP.3, IP.5), providing seeds and saplings at reduced costs (IP.4, IP.5) fiscal incentives including concessional loans (IP.6, IP.7) and tax breaks (IP.8), as well as differential export taxes on crude and refined palm oil with the objective of increasing the country's palm oil processing capacity and capturing greater value-added domestically (IP.13). Sector and economy-wide subsidies for key inputs such as fertilisers (IP.2) and transport fuels (IP.17) also reduce the costs of palm oil production.

Broad subsidies that affect palm oil production include regulations and policies relating to access to land and planning (IP.1, IP.14a), incentives for production of biofuels and biodiesel (IP.9, IP.10, IP.11, IP.15, IP.16), and investment in infrastructure in palm oil producing regions (IP.14b). Demand for palm oil is also created through policies such as the domestic fuel blending mandate (IP.16) and cooking oil subsidies (IP.18).

Subsidies to palm oil production have changed as the sector has developed. Government policy to encourage palm oil production has shifted from prioritising migration and access to land, to supporting deregulation and privatization (Colchester et al., 2006). Historically, palm oil production was primarily supported by facilitating access-to-land and licenses for plantations (IP.19, similar to subsidies in the forestry sector). The growth in palm oil production was also subsidised by direct state investment in early palm oil projects through public-private partnerships (IP.22) and the provision of concessional loans (IP.21).

With the moratorium now in place, and the country's economic strategy focused on increasing productivity and value-added, it might appear that there are fewer interventions that facilitate access to land.[30] However, the rule for classifying land means that all land currently categorized as 'production forest' (natural forests from which timber can be harvested) can still be converted into oil palm plantations. As a result, in spite of the moratorium companies previously awarded plantation licenses can harvest any existing natural forest on their land.

The most recently established subsidies target improved productivity and increasing domestic processing prior to export, planning improvements (IP.14a), infrastructure development (IP.14b) and reduced export taxes for refined palm oil (IP.13). Other more recent subsidies have been introduced with the objective of increasing fuel security through support to biofuel production, including tax breaks for investors in biofuel production (IP.8, IP.12), subsidising the market price of biodiesel (IP.10) and underwriting losses of the state-owned company Pertamina due to biofuel production (IP.11).

Value of subsidies

In secondary sources we found estimated values for nine out of the 19 subsidies identified (see Appendix 1), (see Table 4). The values outlined below are estimates of government support and do not include resulting investment. In many cases, the subsidy has the objective of supporting the agricultural sector or economy as a whole, and only a portion of this value (as yet undetermined) would benefit palm oil production.

Table 4: Current subsidies to palm oil production for which value has been estimated[31]

Subsidy	Value (average annual US$)	Time period of calculation	Source (see Appendix for references)
Fertiliser subsidy	1.8 billion	2009 - 2012	IP.2
Interest rate subsidies for seed R&D	0.8 billion	2006 - 2009	IP.3
Subsidised palm oil seeds	2.36 million	2009 - 2012	IP.4
Concessional loans for farmers of biofuel crops	51 million	2009 - 2012	IP.6
Transport fuel subsidy (agriculture sector subtotal)	2.98 billion	2014	IP.17
Subsidised biofuel production	270 million	2012/2013	IP.10
Write-off of state owned company losses (Pertamina)	13.3 million	2006 - 2008	IP.11
Government economic plan creates planning certainty for palm oil industry	2.5 billion	2011 - 2014	IP.14a
Government infrastructure investments in palm oil producing regions	12 billion	2011 - 2014	IP.14b

Impact of palm oil subsidies on forest loss

The estimated values of the subsidies do not represent their specific impact on investment in palm oil production or on forest loss. Each subsidy will have a different impact on palm oil production and forest loss depending on the influence of that subsidy on investment in the supply and demand chain and related land use decisions. Additional research is required to determine the links between specific subsidies and forest loss.

An example of a high value, but low impact subsidy for palm oil, is Indonesia's fertiliser subsidy. This is because the fertiliser subsidy applies to other commodities aside from palm oil, and fertiliser makes up a small part of the cost of producing palm oil, and therefore access to the subsidy is unlikely to be a significant factor in palm oil investment (Kieft, pers. Comm).

30 The moratorium only applies to primary forest (not secondary forest) and to new concessions, not the millions of existing hectares already under concessions. In its current form it is considered ineffective (WRI, 2014).

31 Full details on all these subsidies, including the timeframe of the incentive, and details on the nature of the subsidy can be found in appendix 1.

PALM OIL SUBSIDIES IN INDONESIA

Figure 10: Summary of subsidies for palm oil in Indonesia

Our research identified 19 domestic subsidies that support palm oil production and consumption in Indonesia. This graphic identifies each subsidy, the stage of the supply chain that it impacts, what type of incentive it is, and the estimated value (US $16,657 million per year). Discussion and analysis of these subsidies is provided in Section 6.2.

These subsidies were identified and estimated through a desk study of secondary information on domestic subsidies to palm oil, and additional research was completed through a literature review and selected interviews. Data collection did not include a detailed review of government budgets, legislation or specific in-country interviews. Full details of all the subsidies, and full references, are provided in Annex 1.

LAND ACCESS & CLEARING

- $? — Relaxed rules on foreign ownership of land

0/1 SUBSIDY TOTAL ANNUAL VALUE $ UNKNOWN

4/7 SUBSIDIES TOTAL ANNUAL VALUE $1,854M

PRODUCTION

- $0.8m — Interest rate subsidies for seed R&D
- $2.4m — Subsidised Palm oil seeds
- $? — Improved strains provided to small holders
- $1,800m — Fertiliser subsidy
- $51m — Concessional loans for farmers of biofuel crops
- $? — Tax exemptions & deferrals on palm oil investments
- $? — Concessional loans for SMEs

PROCESSING

- $? — Streamlined registration process for biofuel production licenses
- $270m — Subsidies for biofuel production
- $13m — Write off of state-owned company biofuel production losses
- $? — Differential export taxes on crude and refined palm oil products
- $2,500m — Economic plan creates planning certainty and grants for industry
- $? — Tax reduction & relief to incentivise biofuel production

4/7 SUBSIDIES TOTAL ANNUAL VALUE $2,783M

1/2 SUBSIDIES TOTAL ANNUAL VALUE $12,000M

DISTRIBUTION

- $12,000m — Government infrastructure investment in producing regions
- $? — VAT exemptions on biofuel transfers

DEMAND & CONSUMPTION

- $? — Domestic fuel blending mandate
- $? — Subsidised cooking oil during high demand
- $2,980 — Transport fuel subsidy (agriculture subtotal)

1/3 SUBSIDIES TOTAL ANNUAL VALUE $2,980M

Economic

Regulatory

Subsidies that may have a greater impact on wider investment, and forest loss, include those driving domestic demand for palm oil, such as: Indonesia's domestic fuel blending mandate (IP.16), subsidies to biofuel production (IP.10, IP.12, IP.15) such as exempting biofuels from the transport fuel sales tax, and the government covering financial losses resulting from Pertamina's (a state-owned company) sale of biofuels at less than production costs (IP.11). Given that Indonesian bioethanol production is highly variable, and that palm oil is the only commercially viable large-scale feedstock for biodiesel in Indonesia (USDA, 2014c), subsidies to biofuel production significantly affect demand for palm oil.[32]

Tax exemptions (IP.8) and concessional loans (IP.6) for investors and smallholders are also likely to have an impact on wider investment in palm oil production. For example, between 2000 and 2009, interest rate credits aided the establishment of 1.1 million hectares of new oil palm plantations (USDA, 2009). The Indonesian government has previously provided other subsidies directly to smallholders, facilitating migration and supporting them to establish oil palm plantations (IP.22), catalysing the 2 million hectares of oil palm expansion between 2000 and 2009 – 44% of total national oil palm plantations (USDA, 2009).

Some of the subsidies identified may be considered insignificant by the industry themselves. For example, the government investment in agricultural R&D (IP.3) is comparatively low in Indonesia (OECD, 2012) and the spending primarily focuses on food crops. The palm oil industry is actively lobbying for greater investment in palm oil R&D as it considers the current spending ineffective and insignificant (Mafira, 2014: Pers. Comm). This investment is promised in the MP3EI (IP.14) in order to get Indonesian palm oil productivity on par with countries such as Malaysia, however detailed plans have not been identified.

6.2.3 International subsidies

Indonesian palm oil is exported all over the world, with India, China and the EU the main importers, accounting for 57% of Indonesia's palm oil exports (UNCOMTRADE, 2014). There are a number of international subsidies and regulations that have an impact on palm oil production in Indonesia including: trade policies to encourage domestic processing (in other countries), biofuel blending targets, and import restrictions (linked to forest loss).

A number of countries that are dependent on fuel imports, such as India, have modified their policies in order to stimulate domestic oilseed processing industries (FAO, 2014). These work against the differential tariffs applied by Indonesia to stimulate processing before export, as these differential import taxes are applied to encourage import of raw materials in order to increase processing and value-adding in-country (FAO, 2014).

India, China and the EU (the main importers of Indonesia's palm oil) all have regulations in place which require a certain proportion of fuels to be made from biofuels. These policies are primarily intended to speed a transition away from fossil fuels and reduce reliance on imported petroleum. The number of countries with biofuel blending mandates continues to rise every year with 63 countries having mandates in place at the end of 2013 (REN21, 2014).

Recent commitments on sustainability of palm oil production, particularly by trading and processing firms in India, the EU and other key export destinations for Indonesia, may soon have an impact on palm oil production in the country. For example recent EU policy prohibits the import of biofuel feedstock grown in high biodiversity and carbon stock areas (Gerasimchuk, 2013). In addition, there is a proposal in the EU, pending agreement by the commission, to apply sustainability criteria to biofuels stating that they, by 2020, must have GHG emissions that are 35% lower than those from traditional transport fuels. Based on these criteria, the current standards for Indonesian production of palm oil-derived biofuels would fail to meet these proposed EU standards (Caroko et al., 2011; Gerasimchuk, 2013).

6.3 Timber (Indonesia)

6.3.1 Background

Timber, and associated pulp, paper and wood product industries, make an important contribution to the Indonesian economy – worth $10 billion in exports alone in 2012 (UNCOMTRADE, 2014). Demand for timber is primarily met through selective logging of natural forest, leading to forest degradation. The paper and pulp industries are supplied through plantations of fast-growing softwoods which are primarily developed on deforested land.

Timber extraction provides materials for Indonesia's domestic wood processing industries and for international use, with high levels of demand that consistently exceeds legally permitted harvest levels (Williams et al., 2001; Indrarto et al, 2012). Illegal logging represents about 40% of the total timber harvest in Indonesia (Chatham House, 2010). It has been found that forest loss related to logging, especially in Asia, has often been the result of granting too many logging licenses and in the wrong areas, linked to high levels of corruption and weak enforcement of existing forestry regulation (Geist and Lambin, 2002). In a vicious cycle, illegal logging undermines the government's attempts to increase the productivity and sustainability of the sector,

32 Currently 12% of palm oil produced in Indonesia is processed into biodiesel, and biodiesel production increased 400% between 2010 and 2014 – ODI calculations based on data from USDA 2014a and 2014c.

reducing prices and eliminating the incentives to invest in better management practices (Burgess et al., 2011; Indrarto et al., 2012).

6.3.2 Domestic subsidies

Our research identified 10 domestic subsidies that support timber production and consumption. There are also a number of international subsidies driving demand for timber from Indonesia, which are outlined in Section 6.3.3. It is possible that there are additional subsidies to timber in Indonesia that have not been identified through this desk study. The full list of subsidies to timber in Indonesia can be found in Figure 11 and Appendix 1.

Overview of subsidies and their objectives

The majority of support for timber production in Indonesia is primarily delivered through commodity-specific subsidies, although there are some more general subsidies that benefit timber production. The commodity specific subsidies are: awarding licences for standing natural timber as incentives to develop plantations (IT.1); relaxing regulations on the siting of plantations (IT.2); providing concessional loans to fund plantation development (IT.3); proposal to restrict timber harvesting to plantations (IT.4a); simplifying investment rules to allow plantation investment (IT.5a); tax breaks for investors in commercial timber plantation (IT.5b); and low levy rates on harvesting timber (IT.6).

The objective of the majority of subsidies to timber in Indonesia is to incentivise the development of industrial timber plantations. The country's timber plantation policy aims to meet rising demand and make the timber processing industry in Indonesia sustainable, with the aim of reducing the pressure on natural forest (Guizol and Aruan, 2004; Obidzinski and Chaudhury, 2011). As a result, the primary beneficiaries of the country's timber subsidies are investors in commercial timber pulpwood plantations (hutan tanaman industri – HTIs), although the current economic plan also focuses on development of community-led plantations (IT.4a).

The subsidies to timber in Indonesia are focused on the early stages of the supply and demand chain; primarily supporting access to land and production (see Figure 7). The subsidies are delivered through concessional loans for plantation development (IT.3), co-investment in plantations by the government (IT.3), tax breaks for investors in the timber sector (IP.5b, IP.7), reductions in levies on timber harvesting (IT.6, IT.7), and facilitation of licensing for sites and logging permits (IT.1, IT.2, IT.5a).

Historically, commercial forestry has benefited from similar types of subsidies, such as public investment and concessional loans provided by the Reforestation Fund (IT.12) and reduced levy rates (IT.13). The sector has also previously benefited from loan rescheduling arrangements (IT.14) and policy measures intended to encourage migration of workers (IT.11). Over the past 20 years, the forestry sector has been continually reformed, with previous subsidies to timber removed, including by the increased scrutiny of the Ministry of Forests' finances by Indonesia's Corruption Eradication Commission and Financial Intelligence Unit (IT.6 and IT.14). In the past, thousands of small-scale logging permits were issued by local governments without safeguards for conservation and forest protection, however this practice has now been curbed (Indrarto, et al. 2012).

An important subsidy that is not specific to timber, but which has a significant impact on the sector, is Indonesia's domestic transport fuel subsidy (IT.8). Transport costs play a significant role in the economics of the timber industry, as with other sectors in Indonesia. This is demonstrated by the focus on investment in transport infrastructure to support commodity-based growth, including the timber sector in the MP3EI (IT.4b) (Picard, pers. comm; Government of Indonesia, 2011).

Value of subsidies

In secondary sources we found estimated values for 4 out of the 10 subsidies identified (see Appendix 1), (see Table 5). The values outlined below are estimates of government support and do not include resulting investment. In addition, the domestic transport fuel subsidy is applied to the economy as a whole, only a portion of which would benefit timber production and consumption.

Table 5: Current subsidies to timber production for which value has been estimated[33]

Subsidy	Value (average annual US$)	Time period of calculation	Source (see Appendix for references)
Concessional loans to fund plantation development	790 - 850 million	2007 - 2016	IT.3
Government economic plan only allows timber harvesting from plantations	0.85 billion	2011 - 2014	IT.4a
Government infrastructure investments in timber producing region	3.425 billion	2011 - 2014	IT.4b
Transport fuel subsidy (timber, paper and pulp subtotal)	725 million	2014	IT.8

Impact of timber subsidies on forest loss

The estimated values of the subsidies do not represent their specific impact on investment in timber production or on forest loss. Each subsidy will have a different impact on timber production and forest loss depending on the influence of that subsidy on investment in the supply and demand chain and related land use decisions. Additional research is required to determine the links between specific subsidies and forest loss. For example the total value of transport fuel subsidies (IT.8) is shared across all economic sectors in Indonesia (and this subsidy is also included in the palm oil section (6.2).

Nonetheless there are some forms of support that may have a greater influence than others on levels of forest loss linked to the sector. One example is the practice of awarding licences to harvest standing forest to incentivise plantation licences (IT.1). Timber plantation developers often obtain the majority of the value of the land from harvesting standing forest (izin pemanfaatan kayu – IPKs), and this access to standing forest is the primary reason for a number of actors seeking a plantation licence, with many never developing the subsequent plantation (Indrato et al., 2012). Since 2008, the potential impact of HTI licences and IPKs on forest loss has risen. Whereas HTIs were previously only granted for degraded forest areas (previously logged and of low value), now the legislation only prioritises degraded sites (IT.2), allowing plantation development on pristine and natural forest. This may have been mitigated due to the moratorium.

Forgone or lost revenue due to low levels of royalties in the timber sector, and uncollected royalties (IT.5, IT.6) currently represents a subsidy to timber production in Indonesia, allowing increased returns for the sector. This can lead to unsustainable practices by companies, as well as reduce the effectiveness of policies designed to increase the development of plantations, and the income received by the government.

Several of the subsidies to timber production are regulatory (IT.2, IT.4, IT.5) and lead to increased access to land (IT.1-5), without a direct transfer or expenditure by the government. The value of these types of subsidy is harder to identify (FAO, 2014) and this report found very few existing estimates for regulatory instruments, although as the first step of the supply and demand chain, access to land and obtaining licences for its use is clearly the essential stage for incentivising investment.

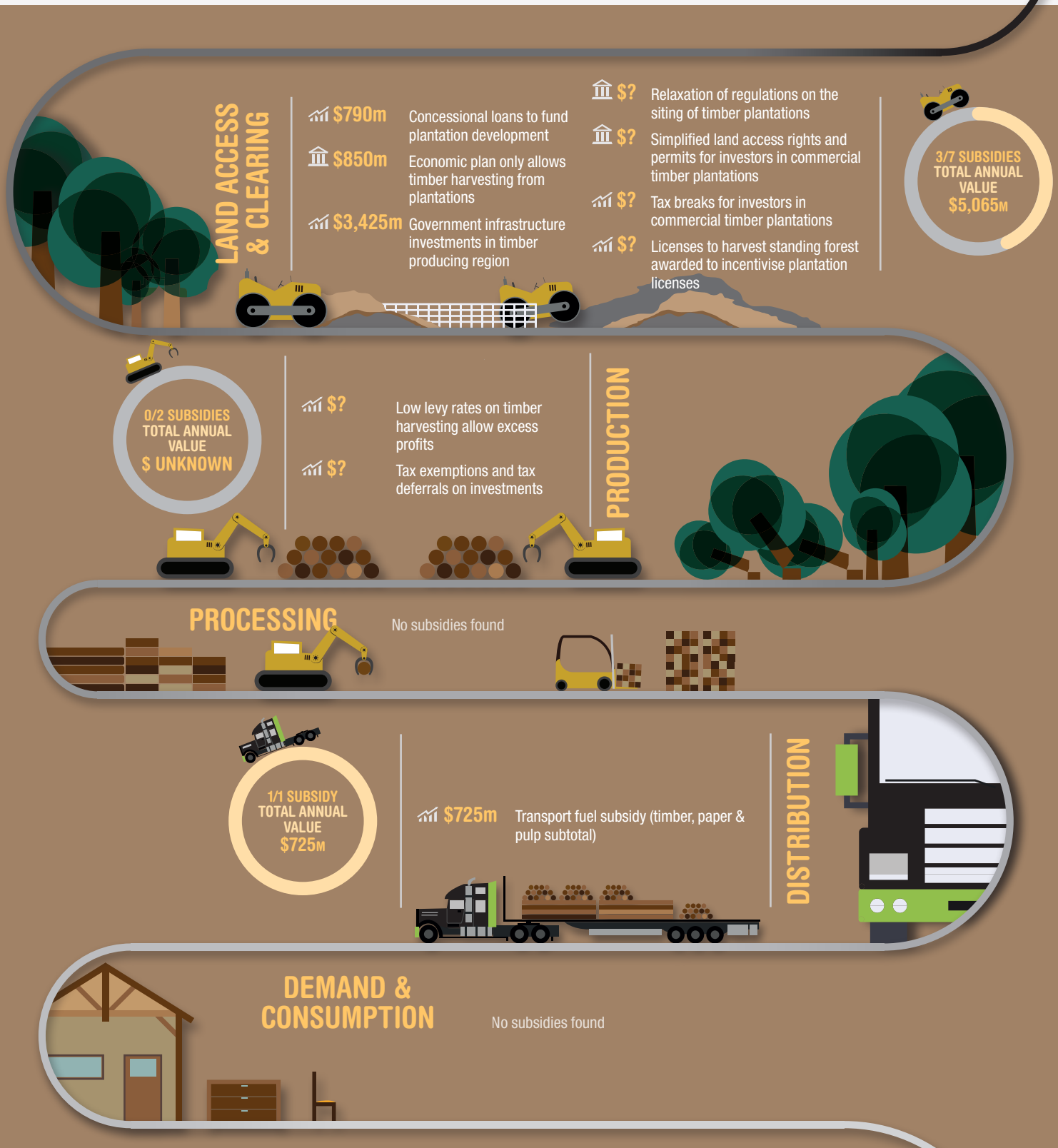
33 Full details on all these subsidies, including the timeframe of the incentive, and details on the nature of the subsidy can be found in Appendix 1.

TIMBER SUBSIDIES IN INDONESIA

Figure 11: Summary of subsidies for timber in Indonesia

Our research identified 10 domestic subsidies that support timber production and consumption in Indonesia. This graphic identifies each subsidy, the stage of the supply chain that it impacts, what type of incentive it is, and the estimated value (US $5,790 million per year). Discussion and analysis of these subsidies is provided in Section 6.3.

These subsidies were identified and estimated through a desk study of secondary information on domestic subsidies to timber, and additional research was completed through a literature review and selected interviews. Data collection did not include a detailed review of government budgets, legislation or specific in-country interviews. Full details of all the subsidies, and full references, are provided in Annex 1.



6.3.3 International subsidies

Indonesian timber products are primarily consumed domestically and in Asian countries. The top five importers of timber products from Indonesia are Japan, China, Singapore, South Korea and the EU.[34] As these countries and regions only account for 55% of the export value there is no single market that is particularly influential in shaping demand for Indonesian timber.

The most relevant international policies shaping the Indonesian timber industry are the increasing number of regulations in consumer countries (notably Australia, the EU, and the US) which prohibit trade in illegal wood products and establish requirements for traceability of wood products throughout the supply chain (see also Section 6.3.5).

6.4 Knowledge gaps and next steps (Indonesia)

Identifying the value of the subsidies has been possible for less than half of the subsidies to palm oil and timber. This is in part due to a general lack of available information from secondary sources, but also due to the complexity in understanding what proportion of broad subsidies are specifically benefiting timber and palm oil production.

A first task of a more detailed review of subsidies to these key commodities would be to identify the commodity-specific values of the broader subsidies. Examples of this work would include:

- Determining the importance of inputs such as fertiliser, seedlings and fuel to business and investment models in timber and palm oil production. These subsidies have been identified at the country level (IP.2, IP.5, IP.17 and IT.8), and could be estimated in terms of benefit conferred to the production of specific commodities.
- In addition, there are concessional loans, tax breaks, and investment in transport infrastructure (IP.3-8, IP.12, IP.13, IP.14, IP.15, IT.3, IT.4, IT.6 and IT.7) for which the specific benefit for palm oil and timber production could not be identified. Many of these subsidies apply to a number of different sectors and industries (IP.6, IP.8, IP.12 and IT.7) and the proportion of these allocated towards timber and palm oil is not known.
- Finally several subsidies are targeted at the biofuel sector (IP.6 and IP.9-12), of which palm oil is only one of several, although by far the most common, source. It would be useful to identify the proportion of these subsides that specifically went to palm oil.

Finally, in addition to the subsidies provided by the central government, and reviewed in this report, Indonesia's districts and provinces have the authority to charge taxes on a set of activities within ranges predetermined by national legislation. Full analysis of these will be helpful for understanding the incentives for production and processing of the commodities in different provinces, and estimating the full extent of taxation and tax breaks on production of palm oil and timber.

6.5 Opportunities for reform (Indonesia)

Given that over the past 20 or 30 years, the forestry sector in Indonesia has been continually reformed, there is precedent for changing regulations and restructuring the sector.[35] Considering the current rate of forest loss in Indonesia however, it is crucial to ensuring that future reforms of the sector actually result in reduced forest loss. As a relatively new and rapidly expanding industry, the same is true for palm oil: with opportunities to strengthen social and environmental safeguards and most importantly, invest in productivity of the sector, as the government seeks to rapidly develop this industry.

6.5.1 Palm oil

Productivity investments:

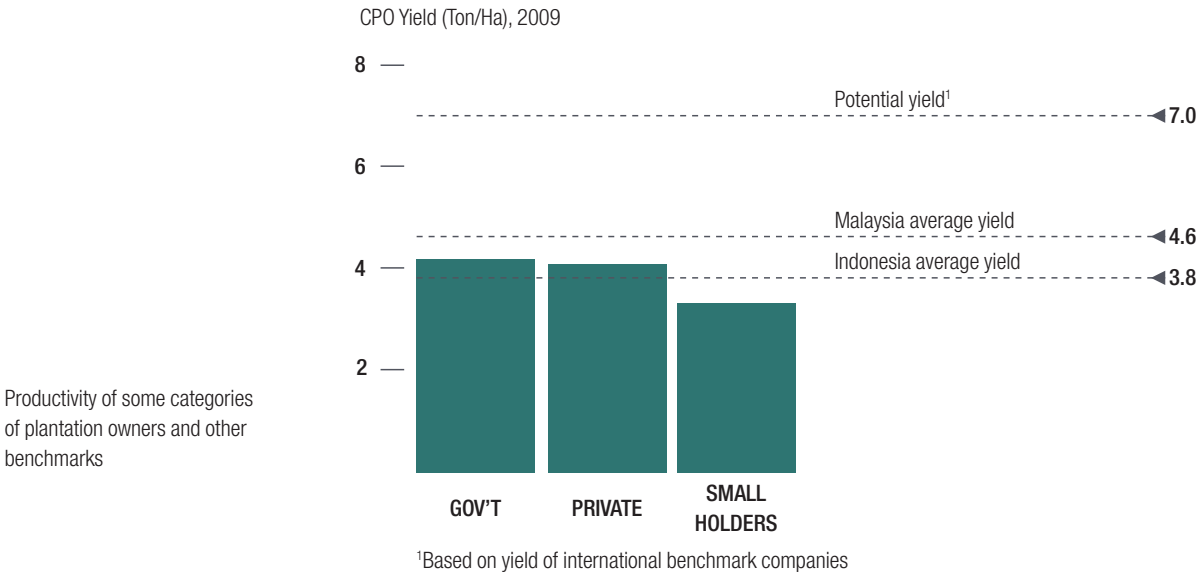
There are several opportunities to apply approaches for agricultural intensification in order to increase the yields of the existing oil palm plantations in Indonesia and to offset the need for additional land under plantations. Indonesia's current palm oil yield is 3.8 tons of oil per hectare, which is still far below the yield in Malaysia at 4.6 tons/hectare, and still much lower than the potential yield that could be achieved at 7 tons/hectare (see Figure 12). There is a particular issue where by the yields of Indonesian small holders are 17% lower than those of private or government owned plantations.

It is estimated that the increased use of higher quality varieties since 2009 will increase yield, with a greater proportion of drought tolerant plants now in peak production (USDA, 2014d). Additional investment in productivity gains and domestic value-adding could produce the desired levels of economic development, without the need for expansion of total area under oil palm plantations. However, this would only be effective if government control over plantation licenses and activities driving forest loss were effective, otherwise these subsidies would simply lead to increased marginal rates of return for, greater profitability of, and further investment in, oil palm expansion. If these controls were in place, investment in R&D, and extension services to support smallholders increase productivity, could be beneficial activities that

34 Trade data is broken down into discrete classes of timber products. This figure is calculated using data for the five product classes that represent 69% of the total timber product export value (uncoated paper, sulphate chemical woodpulp, plywood, kaolin coated paper and shaped wood).

35 See Barr et al, 2010, for a typology of the history of Indonesian forestry regulation

Figure 12: Relative productivity of Indonesian oil palm producers



Source: Government of Indonesia, 2011

allow sustained increases in economic returns while reducing pressure on forests due to palm oil production.

Meeting international biofuel standards:

With 12% of palm oil used to produce biodiesel, and the majority of this currently exported, Indonesia is exposed to policy changes in its key export markets such as Europe (USDA, 2014c).[36] Proposed sustainability criteria for biofuels in the EU, which would factor in the indirect emissions from expanding plantations as well those directly produced in by biodiesel production, would mean all existing biodiesel sources fail to meet the standards (Gerasimchuk, 2013). If these criteria were brought in, rapid reform of the industry in Indonesia would be required to keep the EU open as a market, such as requiring that biodiesel was only sourced from oil palm grown on previously degraded land.[37]

Making subsidies conditional with environmental criteria

There are a range of subsidies paid to fuel producers and processors that promote palm oil production to balance domestic transport fuel security (IP.8, IP.10, IP.12, IP.15), and also to stabilise cooking oil prices (IP.18). If these are felt to be politically too difficult to fully abolish, there is always the option to tighten these provision of subsidies on the basis of conditionality with key criteria, for example, the payments to reduce the cost of cooking oil during peak demand seasons could only be awarded to producers who have sourced from plantations that meet a set of social and environmental standards. Another example could be to link subsidies with district fiscal transfers based on their performance against development indicators.

6.5.2 Timber

The stated objective of Indonesia's timber plantations policy is to increase supply of timber, and to make the timber processing and pulpwood industries in Indonesia sustainable, reducing the pressure on natural forest. Despite the objectives of the policy, the consensus in the literature is that there is not an adequate incentive to develop plantations responsibly and at scale, leading to an industry that still leads to significant forest loss (Barr et al., 2010). This is due to a number of policies which both undervalue existing licences for timber and land (IT.1, IT.6) and create an oversupply of new areas of land (IT.2).

While it is considered doubtful that timber plantation development on its own can balance the supply-demand disparity in Indonesia (Obidzinski and Chaudhury, 2011), because the timber sector has a high number of commodity-specific subsidies, many of which are provided by the former Ministry of Forestry, there are opportunities for reform. These could include removing all incentives to develop commercial plantation forests on all mature forests and identifying mechanisms to ensure that plantation development occurs following land clearing.[38]

36 Although growing domestic consumption reduces this percentage every year.

37 This has its own challenges, as land classification in Indonesia does not necessarily allow this, rendering many suitable areas as legally unavailable for development (Rosenbarger et al., 2013).

38 This could be achieved by tighter regulation of the sector or financial incentives such as using a bond, paid by the developer to the government and returned on development of the plantation. This is similar to the original intentions of a scheme called the Reforestation Fund (Dana Reboisasi - DR), which was ultimately poorly managed, reformed and closed. See Barr et al (2010).

7 Cross-cutting findings

In addition to the specific findings on the subsidies identified by commodity and country above, there are a number of broader findings that appear to be applicable more generally to subsidies linked to key activities driving forest loss (see Table 6).

7.1 Subsidies are hard to identify and harder to estimate

We identified a total of 48 different subsidies across the two countries and four commodities included in this review (Indonesia – timber and palm oil, and Brazil – beef and soy), some of which apply to both commodities.[39] However, we were only able to find existing estimated values for a little over half of these subsidies, which in many cases were for the subsidies as they applied to a country, region or sector, as opposed to the specific commodity.

Beyond the OECD's agricultural policies and support: producer and consumer support estimates database (2014) there are very few international and national databases of subsidies that could be used to support our analysis. As a result our research was based on a literature review of disparate sources of existing research on the topic and an initial review of some government documents where they are publicly available. More detailed primary research using government resources and in-country interviews might allow for the identification and estimation of additional subsidies to each commodity that have not been identified through this desk study.

Also, as our research took a country and commodity focus, and focused on national as opposed to sub-national or international subsidies (including through trade support), it is possible that a number of additional subsidies could be identified particularly those focussed on supporting trade, consumption and demand.

7.2 Subsidies are rarely commodity specific

The majority of subsidies identified in this report are not commodity specific but are focused on wider objectives and beneficiaries at the sector, regional or national level. This ranges across:

- supporting smallholders and subsistence farmers
- reducing costs to the agricultural sector
- rural development – increasing investment and jobs in poorer regions
- improving national transport infrastructure
- driving demand for cooking fuels, transport fuels and biofuel
- national energy and food security
- ensuring environmental protection and sustainability.

As the objectives of a number of subsidies are quite wide, or general (see also Section 3.1), there appear to be significant opportunities to have these incentives be more tailored so that the broader goals can be achieved in ways that decrease, rather than increase forest loss.

The prevalence of general subsidies is not to say that they are not in some way implicitly targeted at these commodities. For example, in both Brazil and Indonesia, the investment in transport and infrastructure is intended to facilitate private investment into these regions – regions where cattle, soy, timber or palm oil are predominant economic activities.

The exception to this finding is the timber sector, where in Indonesia subsidies were specifically focused on developing commercial timber plantations.

7.3 Subsidies are provided through a wide range of government tools

Although our research found that subsidies were predominantly found to be provided through economic instruments, with direct spending, provision of concessional loans and tax exemptions the most common tools, we also found that regulatory and information instruments were important (Figure 7).

Regulatory instruments identified include:

- property rights and land use laws
- licenses to harvest natural resources, such as timber concessions
- planning laws that prioritise certain activities, such as plantation or processing mill development
- fuel blending mandates determining minimum biofuel content of transport fuel (fuel blending mandates).
- economic instruments identified include:
- access to resources and land (at reduced cost or for free)
- direct spending by governments: on infrastructure, through state-owned companies, investment in public-private partnerships, to manufacturers to reduce prices below price ceilings, to producers to purchase commodities above prevailing market prices
- provision of concessional loans and insurance

39 In Brazil we identified 8 subsidies to beef, and 16 to soy, 3 of which were shared across both. In Indonesia we identified 19 subsidies to palm oil and 10 to timber, 3 of which were shared.

- tax breaks and tax holidays, levies (such as on timber harvest) and tariffs on import and export).
- information instruments identified include:
- support for R&D (enhancing commodity productivity)
- development of voluntary standards and certification programmes.

Although within discussions of private climate finance, there is often a focus on governments' role in creating barriers to investment, and of private investors in creating the solutions, these findings highlight the diversity of tools that governments apply at the national, regional and local levels that can be applied to supporting economic, sector and commodity level objectives. There are likely many opportunities to apply these forms of government support in a manner that is conditional on or tailored to decreasing, rather than increase forest loss.

7.4 Subsidies are less focussed on access to land (or land clearing) than expected

As part of our attempt to classify subsidies, we sought to place them along a 'supply and demand chain' (Figures 8, 9, 10, and 11 – country and commodity summaries). As the result of this review, we found that timber was the only commodity where the subsidies were predominantly focused on land access. This is also reflected in the historic (reformed) subsidies for timber, which had previously had significant impact on land access. Of course, due to the interlinkages between the commodities (see Boxes 4 and 5), subsidies to any part of the supply and demand chain ultimately impact upon access to land.

We found that instead most subsidies to key commodities driving forest loss are focused on the production stage of the 'supply and demand chain', which includes planting, growing and harvesting of the commodities. These subsidies include reduced costs of inputs (fertiliser, seeds and fuel), R&D expenditure in improving strains and processes, provision of credit and tax breaks to encourage investment into production, and insurance and price support mechanisms that reduce risks to producers.

There were also a number of subsidies to processing, particularly for soy and palm oil with the prevalence of domestic subsidies to biofuel production. There were limited subsidies identified to distribution and consumption, which again may be due to the focus of the review at country and commodity levels. This shows the importance of engagement beyond Ministries of Forestry and Environment, who are often focussed on the forest frontier, and how important it is to address subsidies along the balance of the commodity supply chain (see Figure 7).

7.5 Subsidies should be better focussed at increasing productivity

Both Brazil and Indonesia have lower commodity productivity than other countries in their respective regions (see sections 5.5 and 6.5). Our research indicated that it might be possible to better target the existing subsidies that aim to support regional development, strengthen domestic industries and increase value-added. To increase yields, these subsidies could then contribute to reducing forest loss while more effectively meeting their objectives. This would of course only reduce forest loss if expansion of agricultural land were restricted at the forest frontier.

Examples of how subsidies could be better targeted include scaling up distribution of improved crop varieties, and ensuring that smallholders and family farmers have access to techniques and inputs required to increase productivity. Greater use of drought tolerant crops has already been credited with contributing to some improvements in Indonesian oil palm productivity in recent years (USDA, 2014d).

Current subsidies that reduce the costs of inputs could also be reformed, to incentivise efficiency and productivity. An example of this could include increasing the costs of accessing land, or in the case of timber the price per stump, and simultaneously reducing the overall costs of commodity production by reducing post-production taxes or increasing post-production subsidies. This way the overall level of support to commodity production can be maintained, but a greater emphasis would be placed on investment in productivity without expansion. Subsidies to producers who adopt more intensive techniques can also be considered (Cohn et al., 2014).

In order to be effective at reducing forest loss, increased productivity needs to be accompanied by government policy that clearly regulates and enforces expansion of commodity production at the forest frontier. Intensification rarely results in reduced agricultural expansion without this in place, however, compared to other policies to reduce forest loss it does have good potential for positive impacts on income and poverty reduction (Pirard and Belna, 2012) (Anglesen, 2010). Limiting expansion options would also have the benefit of channelling private finance into increasing productivity, rather than expansion. In both Brazil and Indonesia, there is uncertainty about the amount of expansion that will be allowed. For example, Brazil's reforms to relax the forest code and the areas of undeveloped palm oil concessions in Indonesia that will be cleared, as they were granted before the moratorium on new concessions, continue to provide opportunities for expansion. If clearer and longer-term regulations were established about availability of land for expansion, this would ensure that the investments in increased productivity led to reduced forest loss.

Within palm oil production specifically, there are opportunities to directly focus on supporting smallholders to increase productivity and reduce the impact of their production, given the important role of smallholders in palm oil production and forest loss. Such efforts could also better support the poverty alleviation and rural development objectives of many existing subsidies and agriculture policies.

7.6 Subsidy reform that supports REDD+ is already taking place

Our reviews of subsidies to key commodities driving forest loss has identified a number of examples of reform in both Brazil and Indonesia which demonstrates that governments recognize the potential to shift support to activities that reduce forest loss.

Brazil's reform of rural credit is the most notable for the successful contribution to reducing forest loss (Assunçao et al., 2012) and shows that controlling credit availability using policy and governance can have a significant impact on forest loss.

Other examples of reforms that support REDD+ include:

- Indonesia's timber plantation policy is designed to reduce pressure on natural forests in the long term, bridging the supply-demand gap of domestic timber needs, and was developed in response to the levels of forest loss that were historically due to timber production.
- Brazil's forest code establishes reserves and protected areas on all private land while the ABC programme supports sustainable agricultural practices.
- Brazil's social fuel stamp (BS.9) programme makes provision of a range of subsidies to biofuel producers conditional on companies purchasing soybeans from small family farms and providing family farmers with technical assistance focused on sustainable agricultural practices
- The Indonesian Ministry of Forestry and Environment (alongside all other ministries) is subject to financial oversight from Indonesia's Corruption Eradication Commission (Komisi Pemberantasan Korupsi - KPK) and Financial Intelligence Unit in order to improve transparency and financial management. This could contribute to the removal of subsidies that have historically been available to Indonesian timber producers through non-collection of royalties, uncollected loans, and low levy rates on timber harvesting (IP.6, IP.14).

International reforms are often relevant to commodities where the export market is important, and as an example the current and potential policy developments relating to sustainability of palm oil production in key export destinations for Indonesia. In response to concerns about the impact of biofuels on the environment and climate biofuel regulations in the EU continually tighten, and will require improved environmental performance of the Indonesian oil palm industry if these markets are to be accessed in the future (Caroko et al, 2011; Gerasimchuk, 2013; see section 6.1.3).

Table 6: Summary of findings

	Brazil - beef	Brazil - soy	Indonesia - palm oil	Indonesia - timber
Number of current domestic subsidies identified	8	16	19	10
Number of subsidies with value attributed	7	9	9	4
Number commodity specific	0 Wider focus on: family farming, agriculture, poorer regions, transport	1 Wider focus on: biofuels, family farming, agriculture, poorer regions, and infrastructure.	5 Wider focus on: biofuels, fertilizer, cooking fuel, agriculture and plantations, and infrastructure.	5 Wider focus on: transport, infrastructure and job creation.
Stated objectives of the subsidies identified	Regional development, reducing rural poverty and inequality, increasing productivity, strengthening family farming, accelerated investment in infrastructure.	Regional development, reducing rural poverty and inequality, increasing productivity, strengthening family farming, accelerated investment in infrastructure, energy security and reduced climate impact of energy use.	Job creation and investment, increasing domestic value added, reducing (rural) poverty, protecting local industry, increasing productivity, national fuel security, reducing users' costs.	Plantation development, forest protection, job creation.
Intended beneficiaries of the subsidies identified	Cattle farmers, marketers and processors, and investors in infrastructure.	Soy farmers, biofuel processors, soy marketers and processors, seed developers, and investors in infrastructure.	Palm oil producers and processors, oil crop producers, biodiesel industry, domestic fuel users, energy and cooking oil consumers, smallholders, and state-owned enterprises.	Plantation developers and forest concessionaires.
Type of subsidies (see figure 6)	Economic instruments: lending (debt including concessional loans), insurance, tax expenditure, direct spending.	Economic instruments: lending (debt including concessional loans), insurance, tax expenditure, direct spending. Information instruments: government funded R&D, voluntary certification Regulation instruments: fuel blending mandate).	Regulatory instruments: quotas, licenses, fuel blending mandate and planning laws. Economic instruments: lending (debt including concessional loans), tax expenditure, direct spending.	Regulatory instruments: licenses, property rights, planning laws, and quotas. Economic instruments: access to resources (concessional or for free), lending (debt), direct spending, tax expenditure.
Stage of 'supply and demand chain' (see figure 7)	Focused on production and processing, except the government investment in transport improvement (distribution).	Focused on production with some processing and also examples of distribution and support for consumption.	Focused on production, but examples found at all stages	Predominantly land access and clearing, with examples of production, and distribution.
Examples of subsidy reform (which may support REDD+)	Linking credit availability for farmers to adherence with environmental and legal criteria (BB.1).	Linking provision of subsidies to biofuel producers on conditionality of purchasing from, and providing technical assistance in sustainable techniques to, smallholders (BS.9). Linking credit availability for farmers to adherence with environmental and legal criteria (BS.1).	Proposed amendments to the EU biofuel blending mandate will set stretching indirect GHG emissions targets for biodiesel sector (IP.25).	Scrutiny of the Ministry of Forests' finances by independent bodies reforms levies (IT.6). Indonesia's timber plantation policy introduced to move investment into plantations and reduce commercial pressure on natural forests.

8 Opportunities to address subsidies and shift investment toward REDD+

There is an increasing focus on the role that public and private resources can play in supporting activities that reduce forest loss as part of wider efforts to address climate change and ensure sustainable development. This report highlights the role of subsidies in shaping the investment climate in a country, and how they are (and can be) used to drive or avoid forest loss.

This report highlights the growing role that key commodities play in driving forest loss (palm oil, timber, soy and beef), and the wide range of subsidies that governments currently use to support investment in and development of these commodities. Based on early analysis, we find that these subsidies dwarf current climate finance in support of REDD+, both globally, and in key countries with high levels of forest loss including Brazil and Indonesia. As a result, these subsidies are likely to have a far more significant impact on private investment in activities that drive deforestation, than current REDD+ finance. However, in spite of the significant levels of subsidies in these countries and opportunities for reform, a recent review of REDD+ readiness finance to these countries found that there is not a focus on identification, estimation and reform of these subsidies; nor is the provision of REDD+ finance conditional on addressing subsidies.

Any efforts to shift investment towards REDD+, be it public or private must therefore take into account governments' existing use of subsidies, to 1) identify opportunities to phase out or reform current subsidies that encourage forest loss; 2) support the design of any new incentives for REDD+, so they complement domestic efforts to shape private investment; and 3) ensure subsidy reform protects the poor and most vulnerable.

Based on an initial review of subsidies to beef and soy in Brazil, and timber and palm oil in Indonesia we find that there are significant opportunities for REDD+ finance to support identification, estimation and designing the reform of these subsidies – in a manner that would shift incentives and resulting investment away from forest loss and toward REDD+. We would also welcome the opportunity to test whether these findings would be equally applicable to other countries and other commodities.

Our key findings from an initial desk review across four commodities are that subsidies are/have:

- hard to identify and harder to quantify – meaning that additional resources are required to enable reform
- rarely commodity specific – meaning that they could be selectively focused on activities that decrease, rather than increase forest loss, while continuing to support commodity production
- provided through a wide range of tools – meaning there are many instruments that governments can use to increase investment for REDD+
- less focused on access to land (or land clearing) than might be expected – meaning that there are multiple steps between commodity production and consumption and forest loss, and these links can be broken
- only found to be focused on productivity in a handful of cases (which could benefit REDD+) – meaning that there is scope to refine subsidies so that they continue supporting commodity production while avoiding additional forest loss
- already been reformed in a select number of cases in manner that supports REDD+ – meaning these early examples might be scaled up or replicated.

This report has shown that there are numerous subsidies to the commodities which drive forest loss; that REDD+ readiness finance can be used to support subsidy identification, estimation and reform; and that REDD+ finance might also be made conditional on subsidy reform. The use of REDD+ finance to support the reform of subsidies to key commodities driving deforestation is a critical step in a transition to economic development which increases agricultural productivity while avoiding forest loss.

There is current momentum on subsidy reform, through existing and emerging commitments under the UNFCCC, UN Sustainable Development Goals, and at the UN Climate Summit in September 2014, and the recommendations of the New Climate Economy report. There is an opportunity to take advantage of these opportunities and the climate finance resources made available through the GCF and other channels, to shift subsidies and investment in developing countries toward REDD+ with speed and at scale.

Appendix 1

Full details on all the subsidies referred to in this report can be found in Appendix 1 at: http://www.odi.org/publications/9286-subsidies-commodities-deforestation-Brazil-Indonesia-REDD

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Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0)20 7922 0300
Fax +44 (0)20 7922 0399

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