



*Impact assessment of lending
to the palm oil industry*

March 2020
External report



About this report

This pilot impact measurement report is one of the first steps DBS is taking towards more comprehensively understanding and measuring its impacts. It is the result of a collaboration between DBS and Impact Institute to provide insight into the impacts of a bank's lending activities in the palm oil sector.

Where applicable, impact measurement definitions, principles and criteria presented in this report follow the [Integrated Profit & Loss Assessment Methodology](#).

About DBS

DBS is a leading financial services group in Asia with a presence in 18 markets. Headquartered and listed in Singapore, DBS has a growing presence in the three key Asian axes of growth: Greater China, Southeast Asia and South Asia. The bank's "AA-" and "Aa1" credit ratings are among the highest in the world.

<https://www.dbs.com/default.page>

Outline of this report

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About Impact Institute

Impact Institute is a social enterprise with a mission to contribute to an economy that creates value for all. We do that by helping organisations to quantify, value and improve their impact on society. Impact Institute assists multinationals, SMEs, NGOs and governmental organizations in risk management and strategic decisions, by providing insight into their impacts and related risks and opportunities.

<https://www.impactinstitute.com/>



1 *Introduction*

DBS has started measuring its impact to better steer portfolios towards sustainability

DBS is committed to creating long term value for its stakeholders

As a purpose-driven bank, DBS is committed to creating long term value by managing its business in a balanced and responsible way. It recognises its obligations to multiple stakeholders and strives to consistently deliver value to all of them, now and in the future. This is reflected in the three pillars of DBS' sustainability approach: responsible banking, responsible business practices and creating social impact (see Figure 1).

Creating more value requires DBS to better understand the impact of its clients' activities

The impact of DBS' lending depends on the activities of its clients. Understanding the types and magnitudes of the impacts that DBS creates is an important step towards better-informed lending decisions. This can help to steer the bank's corporate lending portfolio to create more long-term value for the economy, society and the environment. Impact measurement is a developing field that can provide this information both in absolute and relative measures.

DBS has started measuring impact through two pilot studies focusing on the palm oil and automotive sectors. These pilot studies use the Integrated Profit & Loss methodology developed by Impact Institute and aim to deepen DBS' understanding of its impacts, specifically in its institutional banking business. Ideally impact measurement is based entirely on specific client data. Our current pilot studies are an initial step towards such a goal. *The report on the impact of lending to the automotive sector can be found [here](#).*

Figure 1: The DBS approach to sustainability



Impact measurement enables DBS to better understand value creation in the palm oil sector

The palm oil sector has large positive and negative effects on society and the environment

Palm oil is the world's most popular vegetable oil, and due to the demand in several sectors such as food and energy, the most rapidly increasing crop. The global annual demand is projected to keep increasing, with Asia-Pacific being the largest and fastest growing market.¹ It is a key driver for economic development, as it is a highly productive crop and used in many different end products. As beneficial as it is, its production is also known to have environmental and social external costs.²

As a lender to the sector, DBS wants to better understand and improve its impact

As a lender to the palm oil sector, DBS wants to better understand the impact of its lending activities and identify levers for improvement. While DBS' total lending to the palm oil sector is not material compared to its total lending activities, DBS recognises that it can play a role in achieving a more sustainable palm oil sector. DBS is already active in this respect, for example, by requiring new clients to demonstrate alignment with its No Deforestation, No Peat and No Exploitation (NDPE) policies.

This impact measurement pilot on the palm oil sector allows DBS to further increase its understanding of value creation in the palm oil sector in terms of economic (e.g. salaries), social (e.g. employment) and environmental (e.g. climate change) impacts. In addition, this study provides insights into how effective NDPE policies are in reducing negative environmental and social impacts.



¹Strategyr. (2019). Focus on biofuels made from palm oil production waste as an energy security solution drives healthy market growth.

²Raynaud, J., Fobelets, V., Georgieva, A., Joshi, S., Kristanto, L., de Groot Ruiz, A., Bullock, S., Hardwicke, R., (2016). Improving Business Decision Making: Valuing the Hidden Costs of Production in the Palm Oil Sector. A study for The Economics of Ecosystems and Biodiversity for Agriculture and Food (TEEBAgriFood) Program.

Impacts are assessed using the Integrated Profit & Loss (IP&L) methodology

Impact is the measurable economic, social and environmental effect of an activity

Impact is about *effects* – not intentions. Impact goes beyond inputs and outputs and focuses on the difference an organisation makes for society and the environment. An impact can be positive or negative. An impact can be, for example, a contribution to the well-being of people (for example, through job creation or medicine production), a contribution to the stock of assets in society (where assets can be, for example factories, data or forests) or a breach of a right (such as child labour).

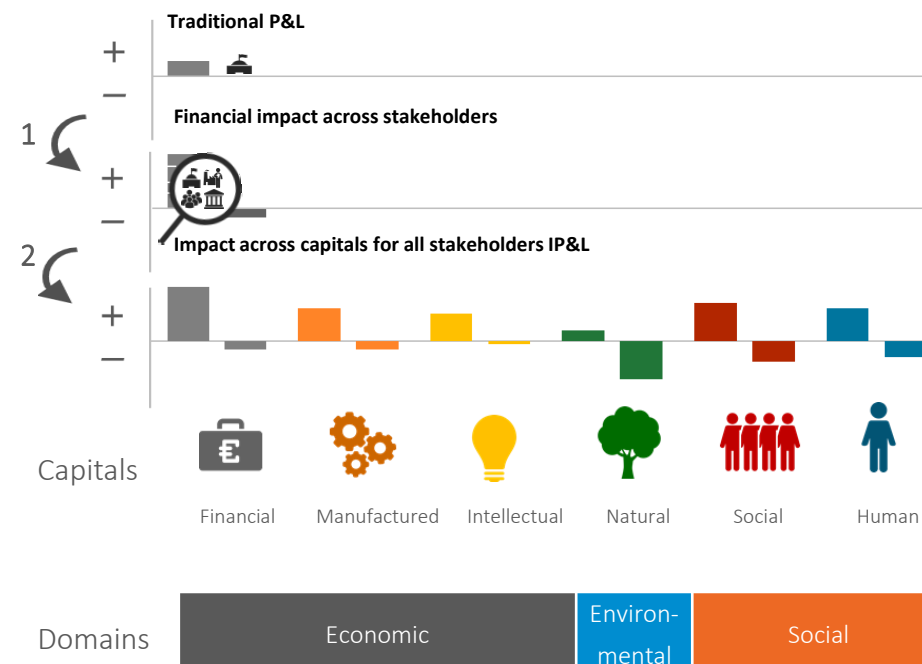
The Integrated Profit & Loss (IP&L) methodology is used to assess impacts

The IP&L methodology provides a novel and rigorous approach to measure and value impact, by extending the traditional profit and loss (P&L) in two steps (see Figure 2):

1. It takes into account the value created for all stakeholders of an organisation – such as their clients and society – in addition to the value created for investors.
2. It includes both financial and non-financial value creation. In particular, the IP&L methodology includes value in the form of six capitals, following a rigorous categorisation based on [The International <IR> Framework](#). The six capitals can be mapped to three intuitive impact domains: economic, social, and environmental.

As a result, the IP&L methodology provides a complete overview of an organisation's impact on all its stakeholders through all the capitals. The foundation and principles used in the IP&L methodology for impact measurement and valuation are built upon, among other documentation, the [Integrated Profit & Loss Assessment Methodology](#) and [Framework for Impact Statements](#).

Figure 2: Two-step extension of the traditional P&L to IP&L



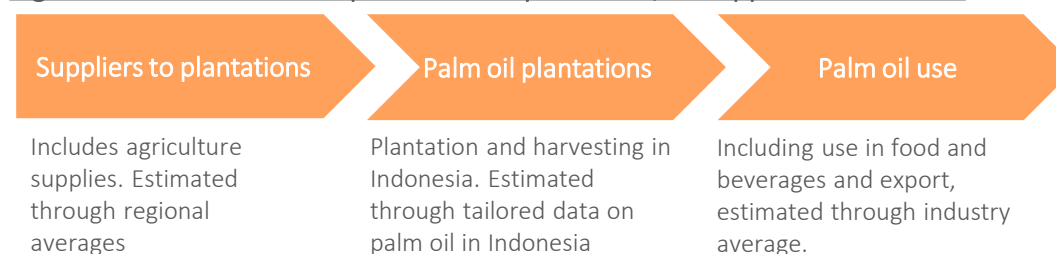
The focus of this assessment is crude palm oil produced at plantations in Indonesia

This pilot study aims to assess the impacts of the entire palm oil sector. While it considers the entire value chain of palm oil, the analysis focuses on its cultivation, as this has larger negative impacts than other stages of the value chain.

The value chain under review therefore covers the entire value chain of crude palm oil (CPO) up to and including the use (domestic and export) of CPO but excluding the use of final products containing palm oil (e.g. the burning of biodiesel). In other words, this covers the plantation, its suppliers and clients (see Figure 3). The end product considered is CPO. Palm kernel oil is not a part of the scope of this study.

This study makes its assessment of the impacts of lending activities based on industry average data, which means it does not focus on specific segments (e.g. certified or non-certified plantations), nor does it utilise actual data from clients, including DBS' corporate clients.

Figure 3: Value chain in scope covers the plantation, its suppliers and clients



Impact assessment on industry average data includes a range of economic, social and environmental impacts

The impacts under review were chosen according to the Impact Institute Standard Impact List 2019 (see [Appendix](#) for definitions) and were determined based on a materiality and feasibility assessment. Based on this, intellectual capital impacts are beyond the scope of this assessment. Similarly, impacts outside the main value chain, impact multipliers of financial impacts (e.g. the impact of the use of tax payments by governments) and higher order effects (e.g. effects of economic activity on institutions) are also excluded from the study.

For visualisation purposes, the impacts of each capital are classified according to the ESE (economic, social, and environmental) domains (see Table 1 and 2). The economic domain contains (net) positive impacts, the environmental domain contains negative impacts, and the social domain contains both positive and negative impacts. Results are then expressed as impacts incurred for every Singapore dollar (SGD) lent to the palm oil sector. These impacts are converted to a monetised form in equivalent Singapore dollars (SGD-eq) so as to allow the comparison of financial and non-financial impacts (see [Appendix](#) for further explanation). The results are shown as SGD-eq/SGD lent. The year of measurement is 2018.

Table 1: Impacts in scope (benefits)

Domain	Impact Category
Economic	Salaries, taxes and profits
	Other financial impacts
	Contribution to consumer goods
	Other manufactured impacts
Social	Well-being effects of employment
	Creation of human capital
	Value of employee time

Table 2: Impacts in scope (costs)

Domain	Impact Category
Social	Occupational health and safety breaches
	Gender skill gap
	Underpayment
	Child labour
Environmental	Contribution to climate change
	Air pollution
	Water pollution
	Scarce water depletion
	Fossil fuel depletion
	Scarce materials depletion
Land use	

Detailed information on the impacts covered by the assessment is included in the [Appendix](#).

2

*Impacts of
lending to the
palm oil sector*

Lending to the palm oil sector has large economic benefits, but also large costs to environment and society

Lending to the palm oil sector has significant economic and social benefits

Benefits are observed primarily in the economic domain (see Figure 4). The positive economic impact is driven by salaries, taxes, profits and the inherent value for consumers of products that include palm oil (e.g. cooking oil, soap). In addition, the palm oil sector has positive social effects, including the well-being effects of employment throughout the value chain and increases in human capital (e.g. experience and work-related skills).

However, there are also substantial environmental and social costs

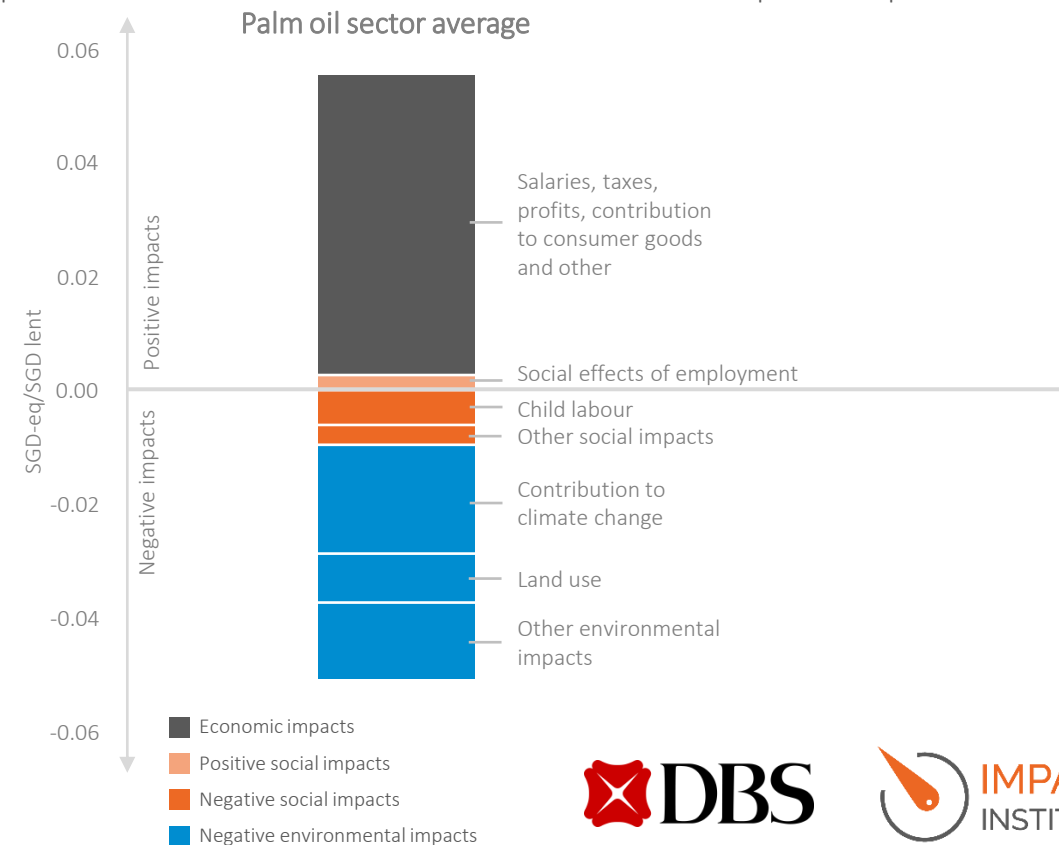
The largest negative impacts are environmental, with the main drivers being the contribution to climate change – predominantly due to deforestation – followed by biodiversity loss related to land use, and air pollution. Negative impacts in the social domain are mainly occurrences of child labour, for which evidence is found both on palm oil plantations and in other steps in the value chain. In addition, significant underpayment may occur in the value chain.

While palm oil has economic benefits, it is important to note that these cannot be set off against environmental and social costs. The goal is therefore to bring the costs as close to zero as possible, while striving to maintain or increase existing benefits.

The results, based on industry average data, suggest that there is a need to strengthen and expand current industry efforts to reduce environmental and social costs, such as through NDPE policies. This would enable society to enjoy the economic benefits of palm oil without harming society and the environment.

Figure 4: Impacts of lending to the palm oil sector (SGD-eq/SGD lent) categorised per ESE domain.

Impacts are monetised to make financial and non-financial impacts comparable.

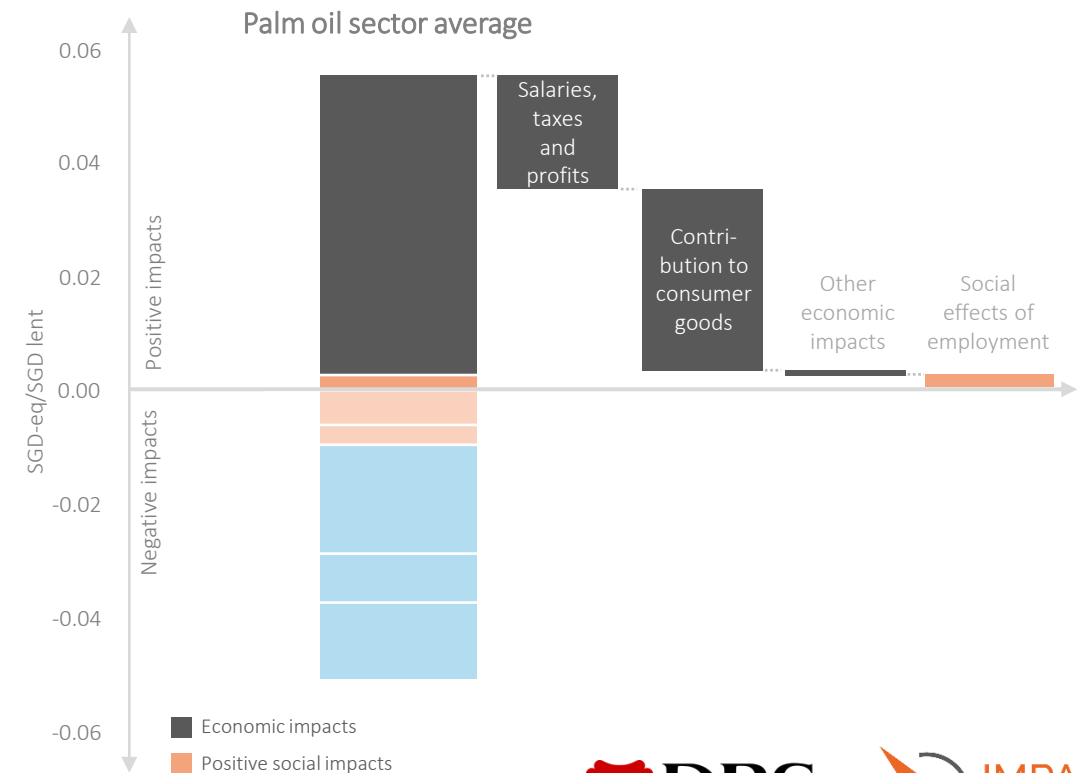


Lending to the palm oil sector stimulates economic and social benefits in the value chain

The results indicate that the key driver for absolute³ economic benefits relates to consumers buying and using products that contain palm oil, which may include cooking oil, soap and biodiesel, followed by direct financial benefits such as salaries to employees, tax payments and profits (see Figure 5).

Lending to the palm oil sector also has social benefits as palm oil production involves labour. The social effects include the well-being effects of employment and increased human capital, such as work experience that increases productivity in the future. These impacts are primarily present in the domestic palm oil sector and domestic value chain (e.g. the processing of food products containing palm oil, producing agricultural supply products for the plantations, etc.).

Figure 5: Breakdown of net social and economic benefits



³This study does not consider the relative value of palm oil vis-à-vis other substitutes. Palm oil is known to be a highly productive crop, see Saifuddin, N.M. & Salman, Bello & Hussein, Refal & Ong, Mei Yin. (2017). Microwave pyrolysis of lignocellulosic biomass—a contribution to power Africa. *Energy, Sustainability and Society*. 7. 10.1186/s13705-017-0126-z.

Environmental and social impacts of the palm oil value chain occur predominantly at the plantations

Palm oil plantations are the biggest driver of most negative impacts in the palm oil sector

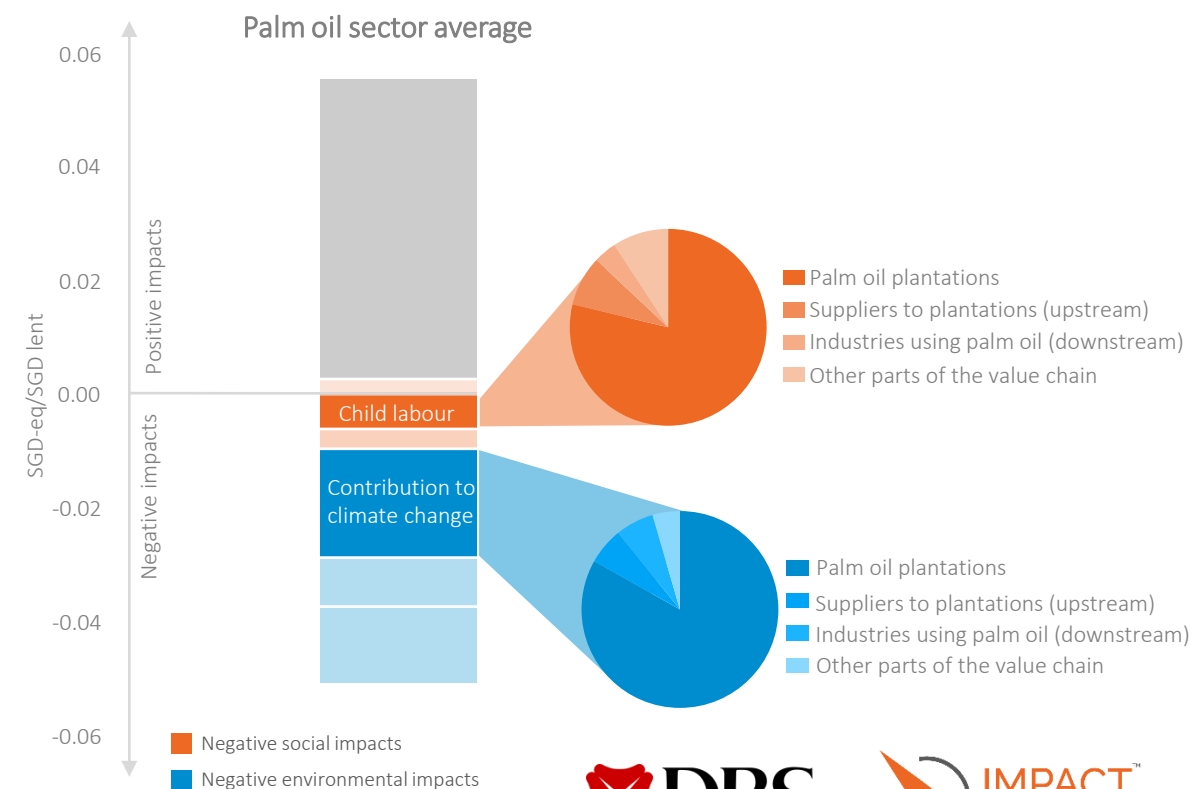
The largest environmental and social costs in the palm oil value chain are (respectively) contribution to climate change and child labour (see Figure 6). Observations include:

- The contribution to climate change is mainly caused by deforestation occurring at plantations. In contrast, less than 20% of the contribution to climate change occurs in the other analysed parts of the value chain, such as the use of palm oil in the food and beverages sector in India, or in the energy sector of Indonesia.
- There is evidence of child labour in the Indonesian palm oil sector.⁴ Child labour in Indonesia is a problem not restricted to palm oil plantations: there are incidents in the entire Indonesian agriculture sector. Although less than what occurs on the plantations, incidence of child labour is also observed in other sectors of the palm oil value chain, which also contributes to the impact of palm oil.

Focus for improvement is at plantations, but negative impacts exist at other steps

The analysis shows that the greatest negative impacts occur at plantations. Therefore, an effective approach for lenders to improve the sustainability of palm oil value chains would be a clear (but not exclusive) focus on plantations. However, such an approach should still take into account that other sections of the value chain also contribute to costs (albeit to a smaller degree).

Figure 6: Sources of material impact contributions



⁴U.S. Department of Labor. (2018). List of goods produced by child labor or forced labor.

The way forward: effective implementation of NDPE policies can reduce negative impacts by up to 49%

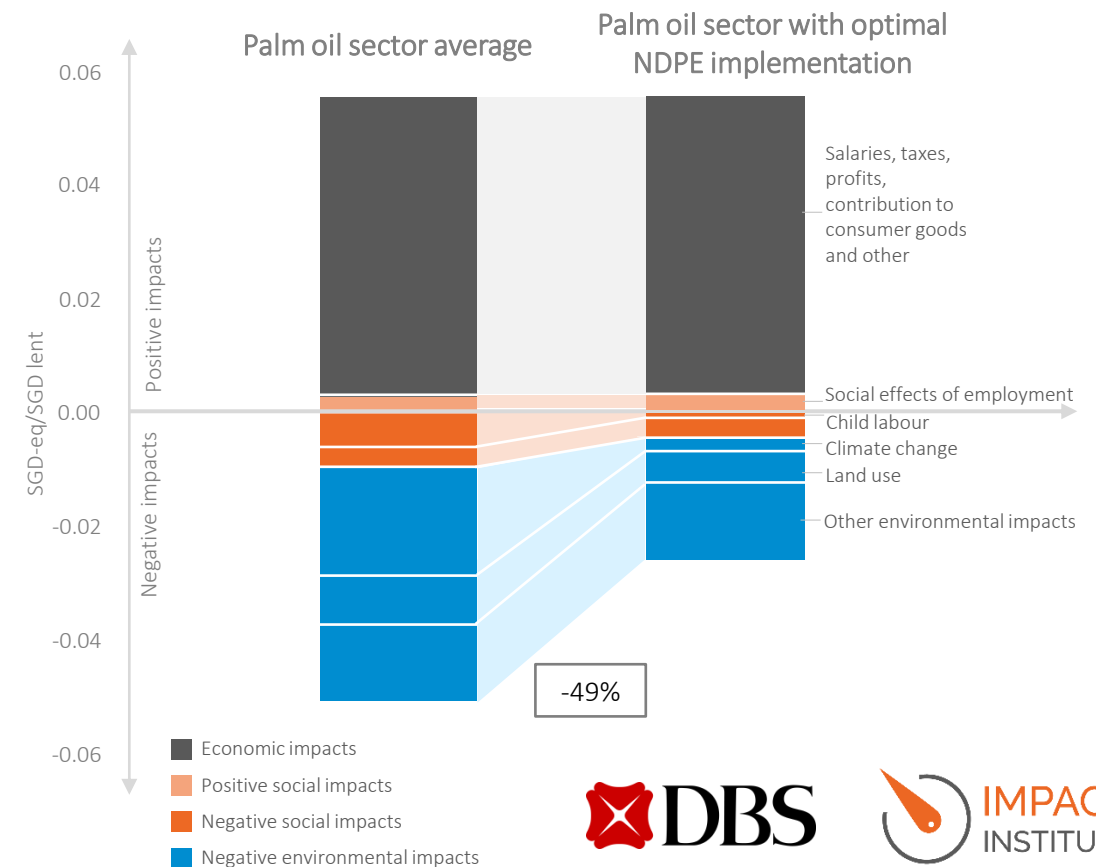
As a lender, DBS requires new lending relationships in the palm oil sector to demonstrate alignment with sustainability-related policies that reduce negative impacts of palm oil. These include the NDPE policies. For more information refer to [DBS' approach to the palm oil sector](#), which also discusses certification standards such as the Indonesian Sustainable Palm Oil (ISPO) and Roundtable on Sustainable Palm Oil (RSPO).

NDPE policies are designed to reduce social and environmental costs and there is evidence that supports this at the plantation-level. However, despite the large-scale adoption of NDPE policies at many plantations, many have not yet achieved optimal NDPE implementation, which refers to an outcome in which there is zero deforestation, zero peatland degradation and zero exploitation of any kind. This implies that with improved enforcement of NDPE policies, there may be potential to further reduce social and environmental costs. More information on the impact of NDPE implementation is given in the [Appendix](#).

The results of this assessment show that optimal NDPE policy implementation can reduce the negative impacts arising from the palm oil sector by up to 49% (see Figure 7). The greatest potential is on the contribution to climate change through avoiding peatland degradation and deforestation. In addition, the existence of child labour can also be reduced significantly through adequate monitoring of the policy.

Note that this analysis is based on average palm oil sector data and results are not reflective of any clients of DBS and its NDPE policies.

Figure 7: Impacts of lending to palm oil sector industry average vs optimal NDPE implementation



3

Concluding insights

Lending policies for the palm oil sector can reduce social and environmental costs and preserve economic benefits

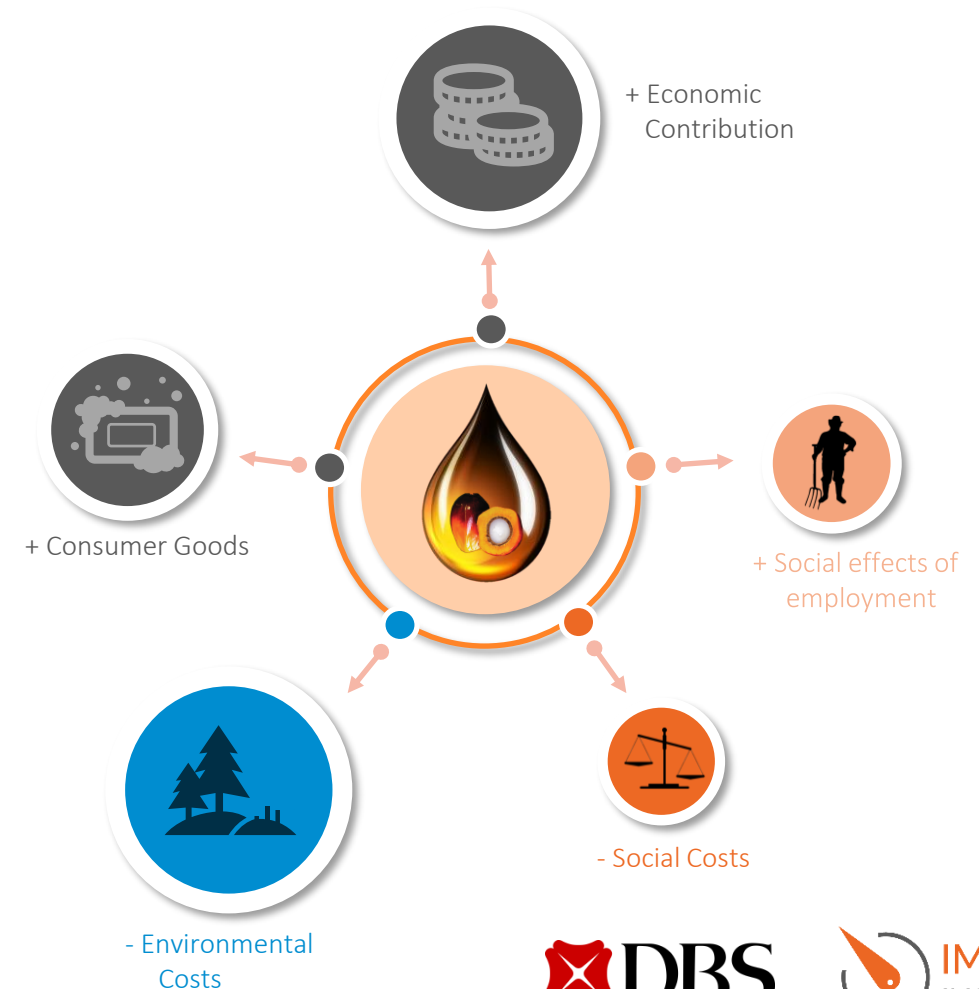
This study has contributed to key insights in the palm oil sector in Indonesia by quantifying the magnitude and types of positive and negative impacts across the value chain. Furthermore, this study has indicated that NDPE policies have the potential to improve the impact of the sector.

Insights on palm oil

Palm oil is a key ingredient in many products that are widely used by consumers. Therefore, the economic value to end-users of such products may be considered high. This is reflected in this study by the large positive economic impact it has. On the other hand, the palm oil sector in Indonesia takes a significant toll on the environment, mainly driven by carbon dioxide (CO₂) emissions from land-use change (deforestation and plantations on peatland). Within the social domain, there is evidence of child workers still active on palm oil plantations. Lastly, workers on plantations are often underpaid, even though there is evidence that the wages in the palm oil sector are already higher than the average in the Indonesian agriculture sector.

Insights for future actions

The negative environmental and social impacts of palm oil production can be further reduced significantly by strengthening and expanding current NDPE policies in the sector. The two biggest costs – contribution of palm oil cultivation to climate change and child labour – can be significantly reduced with optimal implementation of NDPE policies. Presently, DBS already requires new lending relationships to demonstrate alignment with NDPE policies.



4

Appendices

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IP&L is a methodology to assess impact in a structured way using impact pathways

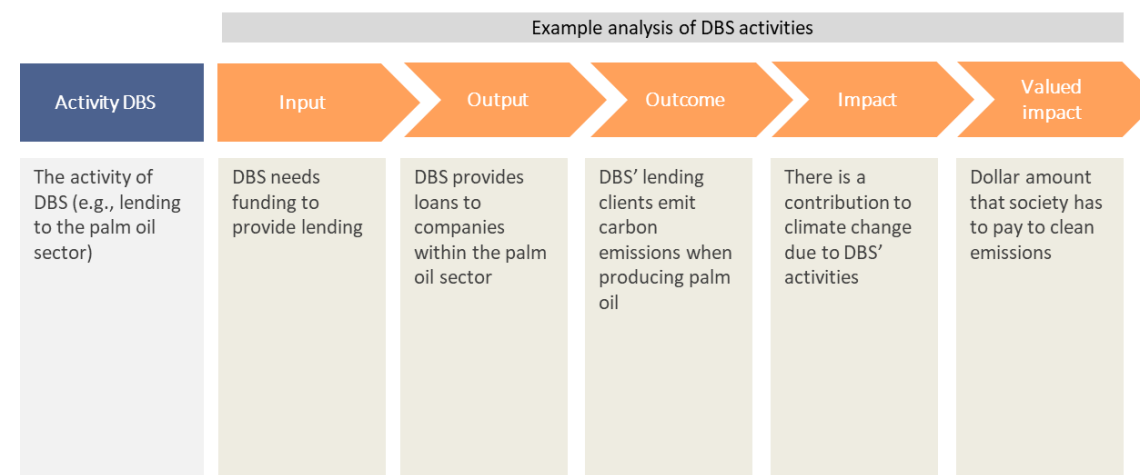
The IP&L framework measures and values impacts following an impact pathway approach: a structured step-by-step approach providing a link between an activity and the resulting impacts. Figure 8 provides a visual representation. The pathway approach incorporates three key concepts for measuring and valuing impacts:

Impact measurement. Impacts were measured using extended input-output models with trade data, environmental and social footprints and combined with additional desktop research. Here, Impact Institute's Global Impact Database (GID)⁵ was used as the basis and enriched with specific palm oil data.

Impact contribution. An impact is typically not the sole responsibility of the organisation where it occurs; most impacts in the palm oil value chain are shared amongst organisations active in the value chain, such as DBS. The IP&L shows the specific contribution of the organisation under review to the value creation for society.

Impact valuation. The results of an impact assessment are expressed in monetary terms (e.g. Singaporean Dollar equivalents) to allow comparison amongst impacts for communication (reporting) and decision-making (steering) purposes. In this way, for example, the non-financial benefits of employment (such as autonomy and social status) are translated into monetary terms and can be compared to the financial benefits of employment (such as salaries). Similarly, by expressing carbon emissions as the costs required to take these emissions out of the air, the societal cost-efficiency of measures to reduce the carbon footprint can be assessed.

Figure 8: Illustration of impact pathway approach, from activity to impact



⁵The GID contains specific impact data across the whole economy, covering 189 countries with 26 sectors. It is built by Impact Institute, based on the interconnectedness of industries in various countries and their economic, environmental and social impact from a range of global databases.

NDPE policies can improve social and environmental costs of the palm oil sector

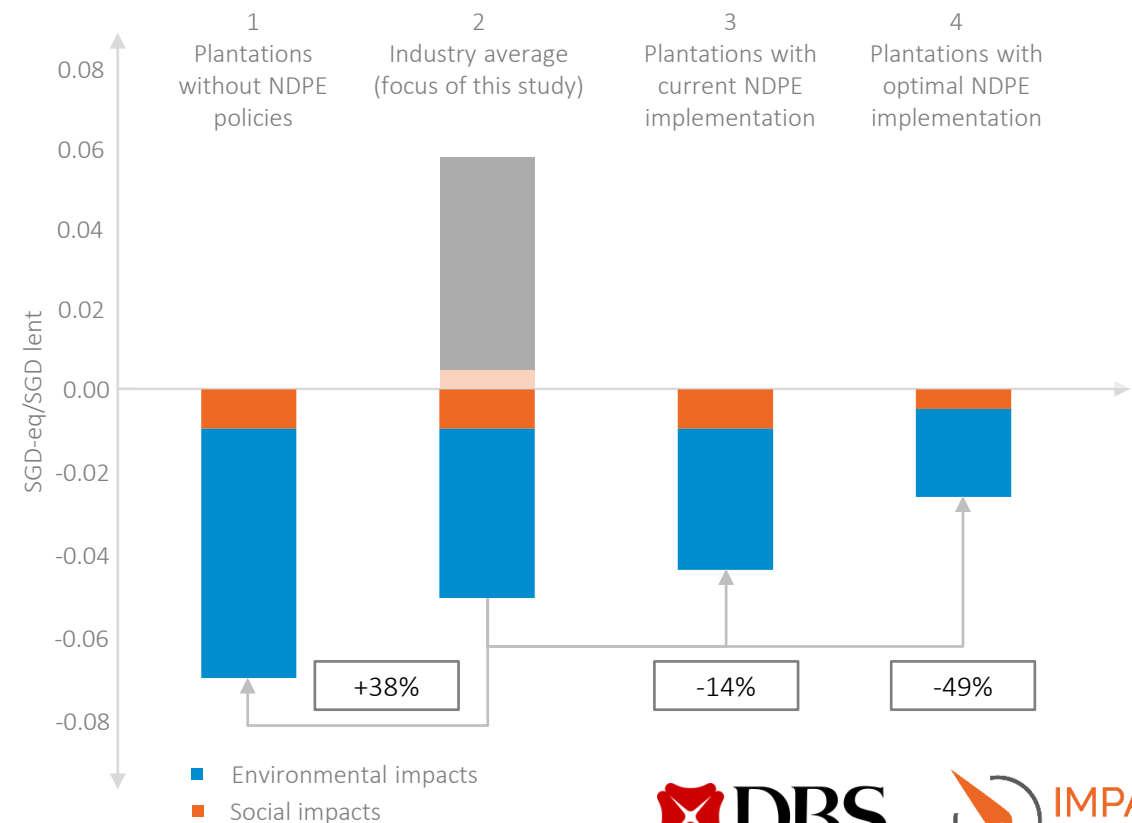
To understand the effect of NDPE lending policies, the study considered four scenarios, with differing levels of NDPE implementation. For each scenario, the social and environmental costs due to lending were considered. *This estimate is based on industry average data and results are not specific to DBS' policies or clients.*

1. Plantations without NDPE policies.
2. The industry average, comprising approximately 74% of plantations with NDPE and the remaining without.⁶ This study focuses on this scenario.
3. Plantations that currently have NDPE policies (based on 2018, the year of measurement). However these plantations are not deemed to have achieved full implementation. This could be due to weak enforcement or monitoring.
4. Plantations with optimal, or full, NDPE implementation. This is the ideal, with plantations causing no deforestation, no peatland degradation, and no exploitation of workers.

Given that many plantations *have* already adopted NDPE policies (and that implementation is generally imperfect), it can be concluded that current NDPE lending policies have a limited effect. Nonetheless, it is worth noting that current adoption levels are already a success of lending policies in the past.

The analysis shows that in comparison with the industry average (Scenario 2), the current effect of NDPE lending policies (Scenario 3) is an estimated 14% improvement, while the potential effect of optimal NDPE policy implementation (Scenario 4) could be up to approximately 49% (see Figure 9).

Figure 9: Potential changes on environmental and social costs depending on extent of NDPE implementation



⁶Steinweg, T., Drennen, Z., & Rijk, G. (2017). *Unsustainable palm oil faces increasing market access risks: NDPE sourcing policies cover 74 percent of southeast Asia's refining capacity*. Chain Reaction Research.

Detailed analysis of impacts of the palm oil sector: current vs optimal NDPE implementation

Current NDPE implementation (Scenario 3) still has limited effect in reducing environmental and social costs within the palm oil sector. This result is in line with the report by the [Environmental Investigation Agency](#),⁷ which states that because of inadequate enforcement and ineffective monitoring, NDPE policies (as currently implemented) cannot completely stop deforestation or breaches of human rights.

In contrast, plantations that implement NDPE policy optimally (Scenario 4) can potentially reduce the environmental and social costs of the palm oil industry average (Scenario 2) by up to 49%. The largest potential for improvement is on climate change through the avoidance of peatland degradation and deforestation. The latter (i.e. the avoidance of deforestation) is also expected to reduce environmental costs significantly through the reduction in air pollution. (However, because of the limited availability of data, this has not been estimated in this assessment.) Furthermore, optimal NDPE implementation can also significantly reduce child labour impact (see Figure 10).

Figure 10: Potential improvement to environmental and social costs depending on extent of NDPE implementation

	Affected impact categories*	Effect of NDPE policy	Scenario 2 to 3*	Scenario 2 to 4*
Environmental	Contribution to climate change	No peat	9%	28%
		No deforestation	2%	6%
	Land use	No deforestation	3%	5%
	Air pollution	No peat	<1%	<1%
	Water pollution	No peat	<1%	<1%
Social	Child labour	No exploitation	<1%**	9%
	Underpayment	No exploitation	<1%**	1%
Total impact reduction (%)			14%	49%

*Numbers are a high-level estimation and only provide an indication of impact improvement possibilities by using best-available data. The estimation of actual impact improvements requires primary data directly from the plantations of clients.

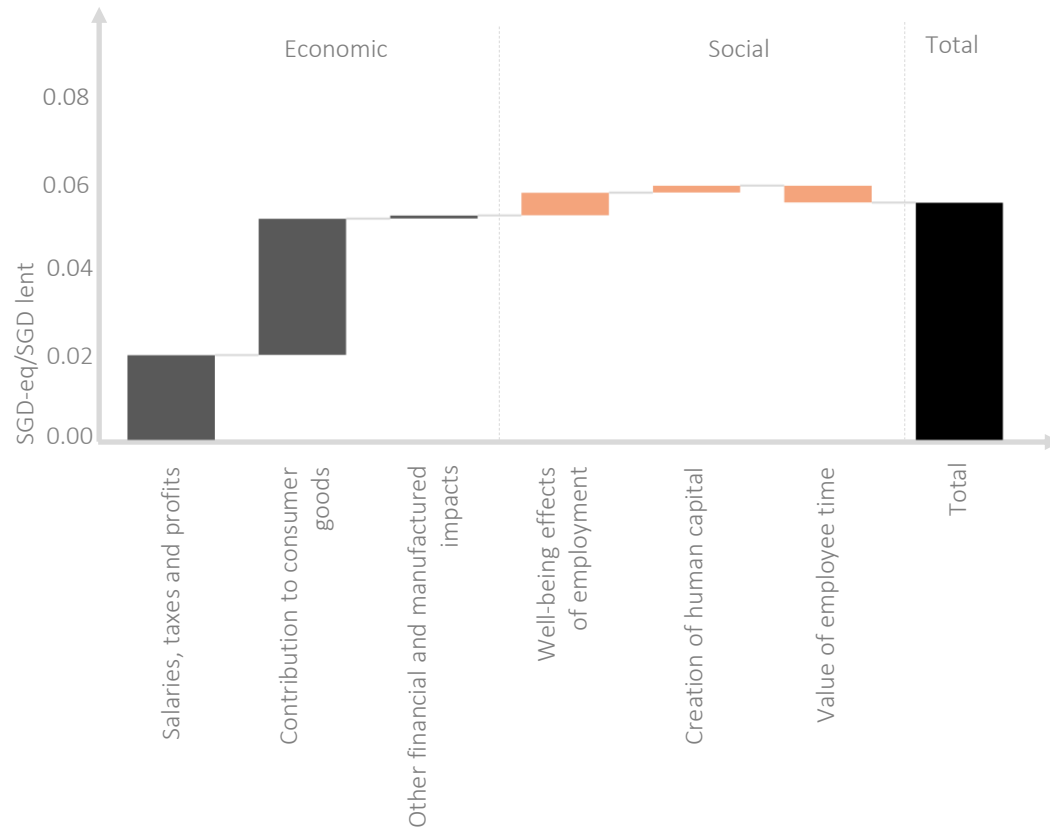
**There is no quantitative data regarding the reduction of negative social impacts. Conservative assumption is taken (<1%) due to the evidence of existence of human rights' abuse in palm oil plantations (EIA, 2019).

⁷EIA (Environmental Investigation Agency). (2019). *Promises in practice – the limited reliability of voluntary “No deforestation” commitments in Papua’s palm oil plantations.*

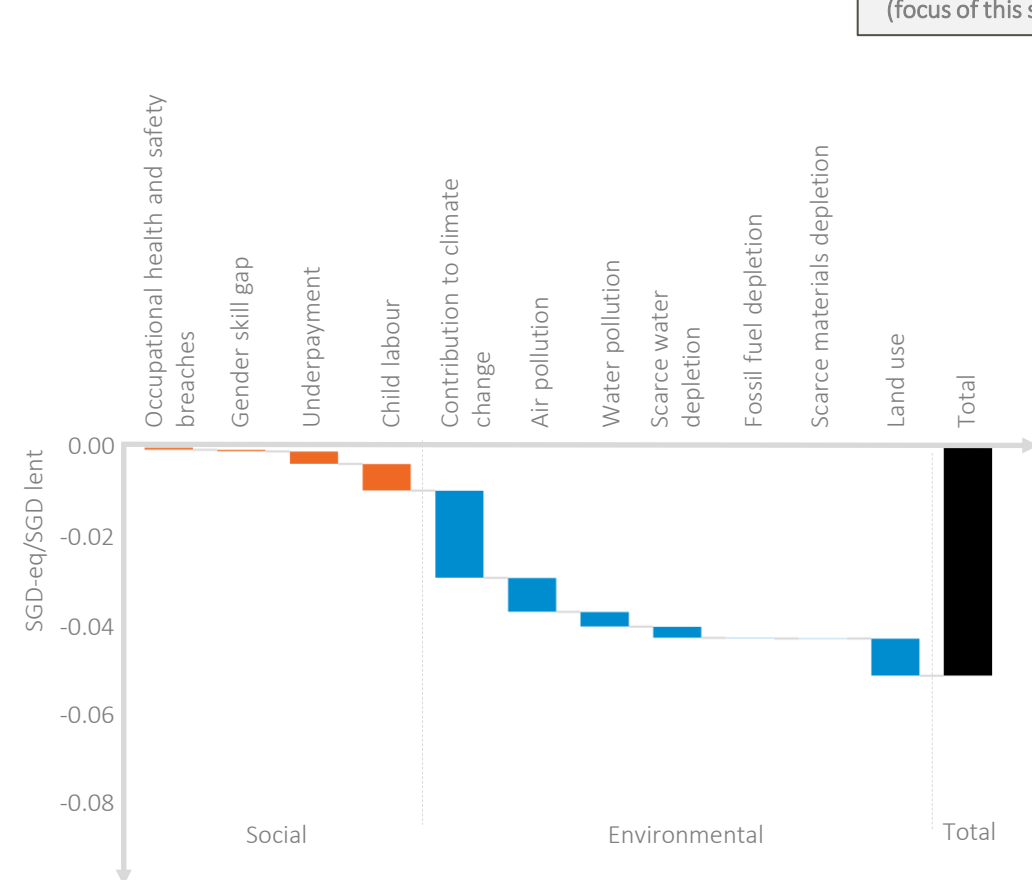
Breakdown of industry average social and net economic benefits vs social and environmental costs

Scenario 2
Industry average
(focus of this study)

Social and net economic benefits of lending to the palm oil sector



Social and environmental costs of lending to the palm oil sector



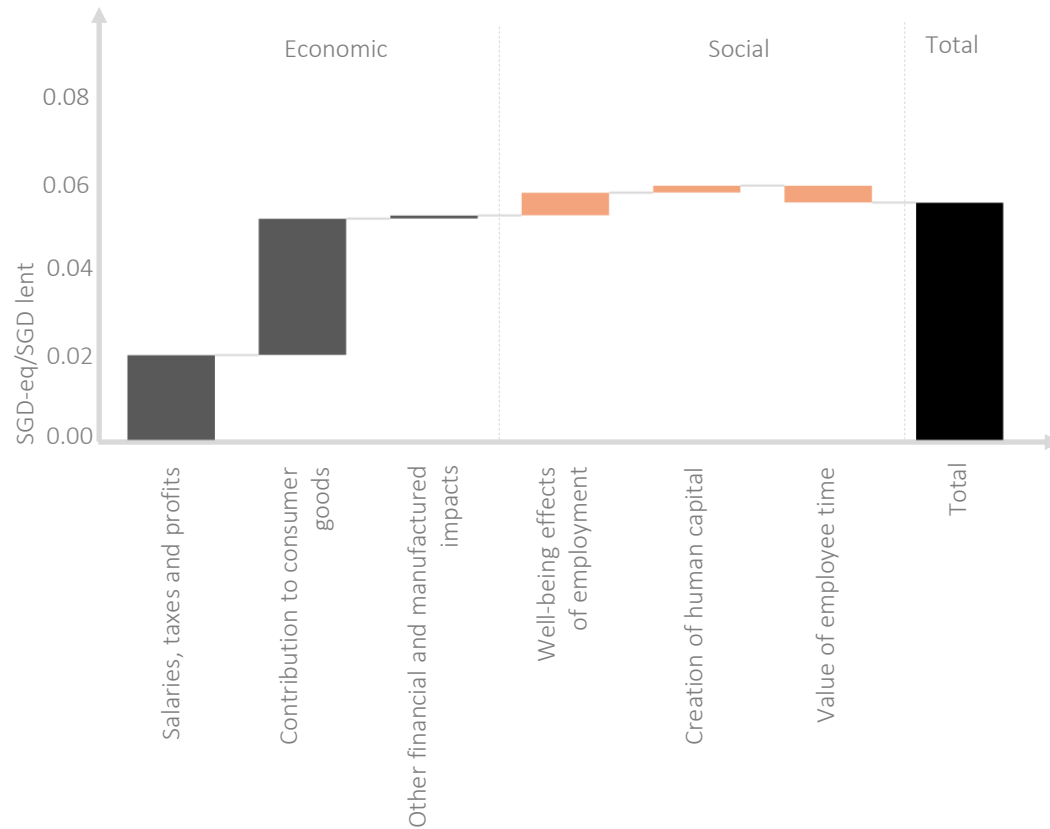
Impacts related to a well-being contribution and respecting rights are presented separately, because a breach of human or environmental rights can never be offset (netted) by a positive contribution to well-being, following the No Offsetting of External Costs principle stated in FIS (2019).



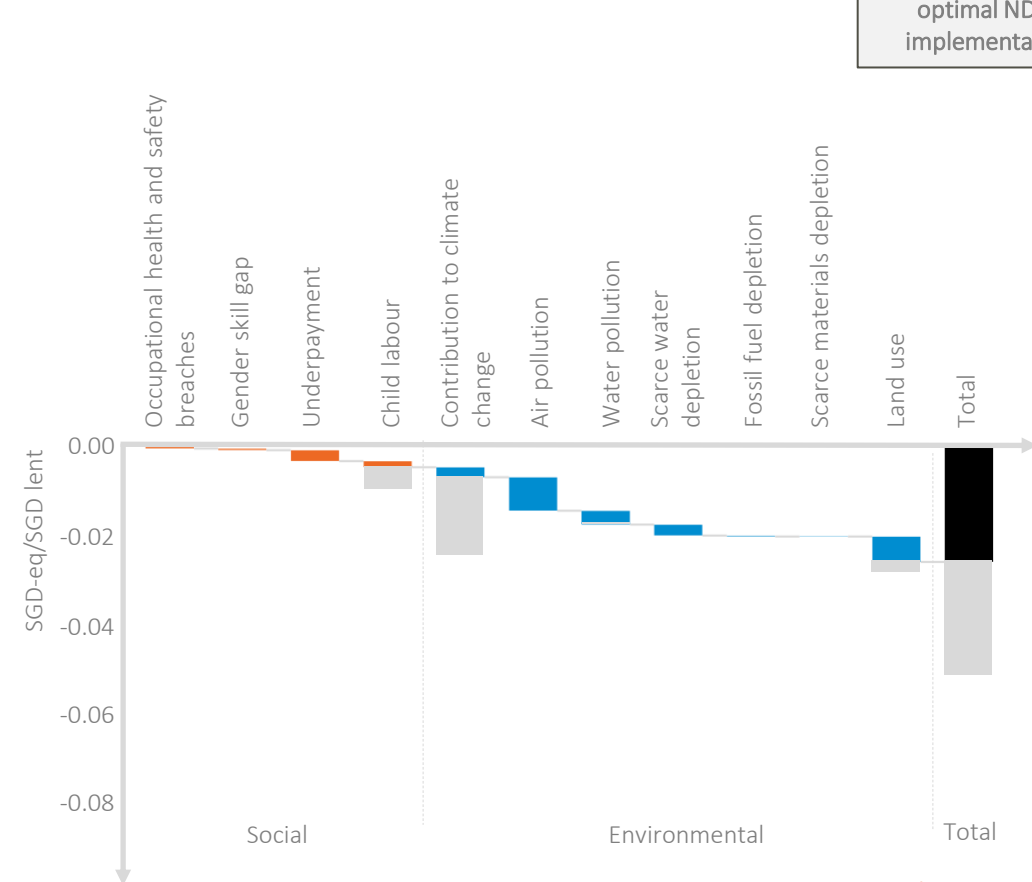
Breakdown of optimal NDPE implementation social and net economic benefits vs social and environmental costs

Scenario 4
Plantations with
optimal NDPE
implementation

Social and net economic benefits of lending to the palm oil sector









Social and environmental costs of lending to the palm oil sector



Impacts related to a well-being contribution and respecting rights are presented separately, because a breach of human or environmental rights can never be offset (netted) by a positive contribution to well-being, following the No Offsetting of External Costs principle stated in FIS (2019).

Definitions of capitals used in the IP&L

	Capital	Definition
	Financial	All assets consisting of a form of money and other financial assets
	Manufactured	All tangible assets including goods delivered to consumers and the value created by the services
	Human	The increase in well-being of employees caused by employment through effects on, i.a. self-esteem, autonomy, social relations, and social status
	Social	All value relating to communities, groups of people, including trust, networks, and norms
	Natural	Natural assets such as water, air and scarce resources
	Intellectual	All value relating to individual people, including health and competences

The six capitals defined in the IP&L methodology follows a rigorous categorisation based on [The International <IR> Framework](#).

Definition of impact categories: Social and net economic benefits

Domain	Capital	Impact Category	Definition
Economic	Financial Capital	Salaries, taxes and profits	The financial value created due to lending which contributes to the economy (GDP).
		Other financial impacts	The impacts created due to money-flow throughout the value chain. They represent money exchanges between stakeholders (e.g. business and consumer or between two businesses) in the value chain. Note that the net effect of these exchanges is zero.
	Manufactured Capital	Contribution to consumer goods	The value to consumers of the final goods and services produced in the value chain (e.g. products containing palm oil).
		Other manufactured impacts	The net effect of investments in property and equipment and the consumption (depreciation) of this.
Social	Human Capital	Well-being effects of employment	The increase in well-being of employees caused by employment through effects on, among others, self-esteem, autonomy, social relations, and social status.
		Creation of human capital	The value of an increase in productivity of employees as a result of being employed (e.g. through gaining experience and learning on the job).
		Value of employee time	The value of the time employees spent on work, representing the opportunity cost.

Definition of impact categories: Social and environmental costs

Domain	Capital	Impact Category	Definition
Social	Human Capital	Occupational health and safety breaches	The loss of healthy life years due to fatal and non-fatal occupational accidents in the workplace
	Social Capital	Gender skill gap	Presence of discrimination (e.g. unequal access to highly skilled jobs) based on gender
		Underpayment	Insufficient financial compensation for work, expressed as the difference between the actual income received by the workers and the living wage (which provides a decent standard of living)
		Child labour	Presence of child labour throughout the value chain
Environmental	Natural Capital	Contribution to climate change	Contribution to climate change via the emissions of greenhouse gases
		Air pollution	Negative effects of pollution to air quality
		Water pollution	Negative effects of pollution to water quality
		Scarce water depletion	The use of scarce water resources, such that these become unavailable to others
		Fossil fuel depletion	The use of scarce energy resources, such that these become unavailable to others
		Scarce materials depletion	The extraction of scarce, non-renewable resources besides fossil fuel (e.g. minerals, metals), such that these become unavailable to others
		Land use	The occupation of land, harming the natural habitats and ecosystems, leading to biodiversity loss and loss of ecosystem services

Key assumptions and limitations

Key assumptions:

- The impact that is attributed to DBS is determined by its net interest income (amongst other factors). In this assessment, a 2% net interest income is assumed as a proxy.
- The impact assessed is the impact of DBS' lending activities as compared to a reference scenario in which no lending is provided.
- The suppliers of the palm oil sector are approximated by the suppliers of the Indonesian agriculture sector, taking into consideration the sectors that supply the palm oil sector and the relative sizes of the sales.
- For some impacts that are not considered material, industry average data for agriculture is used as a proxy.
- RSPO is a comparable certification to NDPE policy to estimate the impact of NDPE policy in practice.

Key limitations:

- Impacts with high uncertainty and complexity are beyond the scope of this study:

they include impacts outside of the organisation's value chains (e.g. how lending policies of DBS influences other banks or government policies), multipliers (e.g. to which degree a dollar in tax income generates more or less well-being than a dollar in income to households) and higher order effects (e.g. whether higher salaries can lead to more consumption and CO₂ emissions).

- For some countries, the best available data is not from the desired year of measurement. Therefore, adjustments are made through for example conversion that may lead to uncertainties.
- Only absolute impacts were measured. Marginal impacts were beyond the scope of the study, as they would entail an analysis of policies of other banks and their effectiveness.
- Only the top ten export countries and domestic sales are considered. Doing this, 99% of all exports are covered. Within each country, only the most important sectors are considered. Where data was not available, the average global relative size was used.
- The use of industry averages for several impacts and part of the value chain leads to approximation of the actual impacts. Therefore, the estimates are approximations and contain uncertainties.

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