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Sustainable development of the palm oil sector in the Congo Basin

The need for a regional strategy involving smallholders and informal markets

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Key messages

- The Congo Basin is rich in biodiversity and stores an estimated 25%–30% of the world's tropical forest carbon stocks. As agricultural land becomes increasingly scarce in Southeast Asia, and regulatory pressures continue to intensify, the Congo Basin could become the next frontier for oil palm expansion. Most of the roughly 280 million hectares (Mha) of additional land suitable for oil palm in the Congo Basin are found in the Democratic Republic of Congo (60%), Cameroon (11%) and the Republic of Congo (10%).
- Many heavily forested countries in the Congo Basin are setting national targets to increase production to meet national and regional demands. Land area allocated to oil palm increased by 40% in the Congo Basin and five additional top-producing countries in Africa between 1990 and 2017. Without intervention, future production increases in the region will likely come from expansion rather than intensification due to low crop and processing yields, possibly at the expense of forest.
- Sustainability strategies initiated by companies and aimed at certifying palm oil mills are unlikely to be effective at curbing deforestation in the Congo Basin. Smallholder farmers are an engine of growth in the region's palm oil sector, and recent evidence suggests they are actively clearing forest to expand. Because of the proliferation of non-industrial processing facilities (artisanal mills), a substantial fraction of the palm oil produced by smallholders never passes through a company's jurisdiction. Smallholders are also disadvantaged by power imbalances and limited access to technical and financial resources. Including smallholders in sustainability strategies offers opportunities to achieve multisectoral goals.
- Recommendations to improve the sustainability of the palm oil sector in the Congo Basin include (1) improving access to finance for smallholders and non-industrial mill managers; (2) implementing policies to safeguard natural resources and facilitate access to appropriate market opportunities that offer incentives to prevent future deforestation; (3) intensifying production by replanting aging plantations, rehabilitating abandoned plantations with disease-resistant and high-yielding varieties, and increasing fertilization, without further expansion into high conservation value or high carbon stock forest areas; and (4) improving processing capacity and extraction rates by upgrading mill technologies. Sustainable palm oil development in the Congo Basin will require careful consideration of the governance, institutional, environmental and socioeconomic factors that underpin the complex regional supply chains.

Oil palm expansion in the Congo Basin

Continued acceleration of agricultural expansion in the tropics is resulting in widespread deforestation, contributing to forest degradation, large-scale habitat loss and climate change.

Consumer-driven and regulatory pressures are prompting companies to commit to achieving zero-deforestation supply chains across many agricultural sectors (Lambin et al. 2018; Brown and Zarin 2013). Beef, soy and palm oil production have received increasing attention given their disproportionate contributions to tropical deforestation, with the spotlight increasingly focused on the oil palm *to* palm oil supply chain. Since 1961, global palm oil production doubled every 10 years on average, while the land area allocated to oil palm cultivation more than quintupled from 3.6 Mha in 1961 to over 21 Mha in 2017, 67% of which is concentrated in Indonesia and Malaysia (Koh and Wilcove 2008; FAO 2017).

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Most supply chain efforts to reduce deforestation in the palm oil sector are currently focused on improving the sustainability of production in Indonesia and Malaysia, which exploded in recent decades. Planted area increased by 150% in Malaysia between 1990 and 2010 (Gunarso et al. 2013; Koh et al. 2011), while Indonesia lost 6 Mha of old growth and logged forest between 2000 and 2012 (Margono et al. 2014). Oil palm expansion into peatland areas in the two countries increased nearly ninefold from 250,000 ha in 1990 to 2.15 Mha by 2010 (Miettinen et al. 2012). Although oil palm expansion in Africa is occurring at rates drastically below those in Southeast Asia, there is concern that increases in regional palm oil demand combined with poor management practices and foreign investment interest could constitute a threat to Congo Basin tropical forests and the biodiversity they harbor (Strona et al. 2018). Since 2000, land acquisitions by foreign investors increased markedly in the Congo Basin, with oil palm concessions accounting for the largest investment areas (Feintrenie 2014). Because the African palm oil sector is still in the early stages of development, there is a unique opportunity to heed the environmental repercussions of rapid expansion in Southeast Asia as motivation to advance sustainable development strategies and policies in African countries.

Africa's contribution to global palm oil supplies declined from 77% in 1961 to less than 4% in 2014, owing to the rapid emergence of Indonesia and Malaysia as global leaders in production. Despite a decline in contribution to global supply, Africa still holds roughly 22% (4.6 Mha) of the world's total oil palm cultivated area, spread across climatically suitable regions of West and Central Africa (FAO 2017). Nigeria has long been the continent's top-producing country. Production increases over the past two decades, however, have been concentrated in the Congo Basin (Figure 1). Of the 278 Mha of additional land suitable for oil palm in the Congo Basin, 60% is found in the Democratic Republic of Congo, 11% in Cameroon and 10% in the Congo (Table 1).

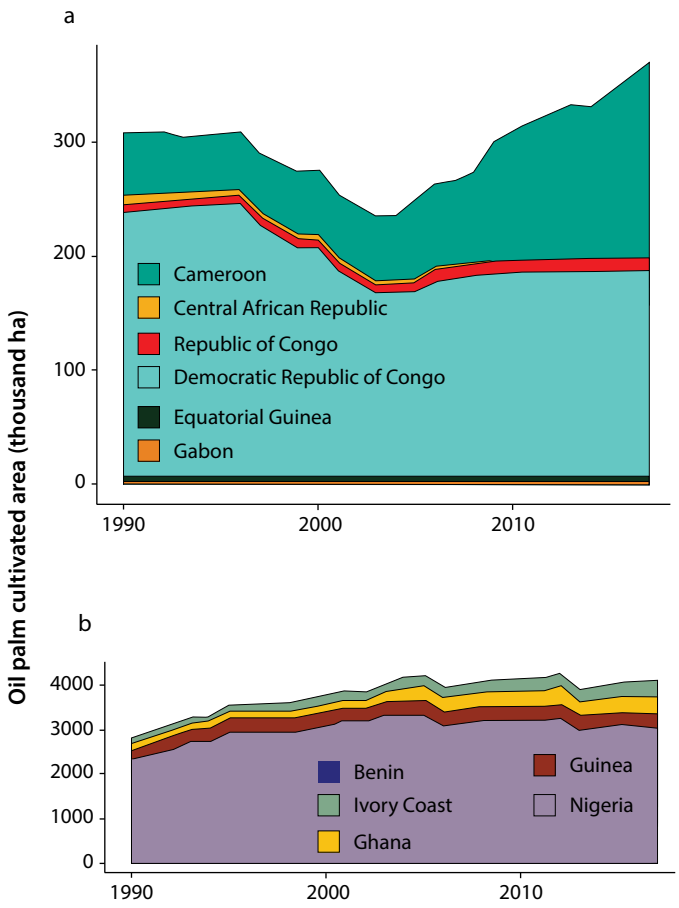

Figure 1. African palm oil production. Land area allocated to oil palm cultivation from 1990 to 2017 in Congo Basin countries (a) and five additional African countries with the greatest planted area in 2017 (b).

Source: FAO 2017.

Table 1. Land area suitable for future oil palm production in millions of hectares (Mha).

Location	Area under cultivation in 2017 (ha)	Suitable land area (Mha)	Percentage of suitable land in protected areas
Congo Basin country			
Cameroon	170,169	31.2	13%
Central African Republic	650	25.2	11%
Democratic Republic of Congo	178, 998	167.0	13%
Equatorial Guinea	3,508	2.5	22%
Gabon	4,460	23.1	20%
Republic of Congo	11,876	28.6	33%
Regional			
Congo Basin	369,661	277.5	16%
Africa (all)	4,600,000	363.7	16%
Central and South America	1,200,000	673.8	46%
Southeast Asia	15,200,000	267.6	12%
Global	21,000,000	1,367.1	30%

Sources: FAO (2017) and Pirker et al. (2016).

Edible oil consumption across Africa is projected to triple relative to 2013 by 2050 (Byerlee et al. 2017). Many Congo Basin countries currently rely on imports to curb vegetable oil deficits, although several have set ambitious targets to increase their production in the near future. Cameroon has a goal of doubling their palm oil production by 2035, relative to their 2010 baseline of 230,000 tons of crude palm oil per year (République du Cameroun 2009). Gabon, a country with very little area currently under cultivation, has ambitions of becoming a leading palm oil exporter. Its national goal is to increase production from 13,000 tons of crude palm oil in 2011 to 280,000 tons per year by 2025 (République Gabonaise 2012). These national efforts to increase production have resulted in expansion, which has accelerated in Cameroon since 2000 (Figure 1) (Ordway et al. 2017a). From 1990 to 2017, the land area under oil palm cultivation increased by 40% in Congo Basin countries and five additional top-producing countries in Africa (Figure 1). Even as production increases have occurred, however, on-farm yields across smallholder and commercial plantations in West and Central Africa, including the Congo Basin, remain far below yields in Asia and South America (Figure 2). Low crop yields and extraction rates suggest that future production increases in the region will likely continue to come from oil palm expansion (Hoyle and Levang 2012).

The Africa Palm Oil Initiative: Improving the sustainability of oil palm production

In anticipation of growth, countries in the Congo Basin are proactively working to develop sustainable development strategies

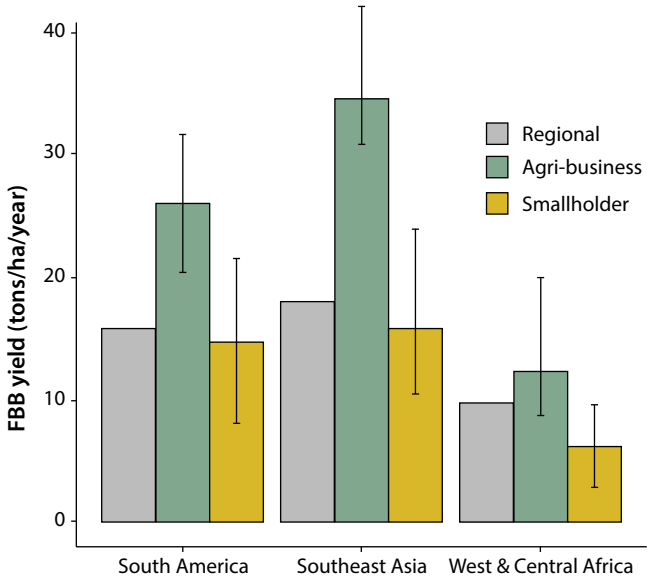

Figure 2. Average oil palm fresh fruit bunch (FFB) yields. Regional averages were quantified using data from FAO (2017). Agri-business and smallholder yields were calculated from yields reported in Euler et al. (2016), Potter (2015), Ofosu-Budu and Sarpong (2013), and Soliman et al. (2016).

Inside a palm oil processing facility.
Photo by M. Edliadi/ CIFOR

for their palm oil sectors. Eleven countries within the Economic Community of Central African States have collectively advanced a regional palm oil strategy in collaboration with the World Wide Fund for Nature (WWF 2019). As a next step, countries are defining their national strategies, principles and action plans with the goal of achieving deforestation-free palm oil production under the Africa Palm Oil Initiative (APOI), led by Tropical Forest Alliance 2020 (TFA 2019).

Achieving zero-deforestation commitments in heavily forested developing countries in the Congo Basin, however, presents a substantial challenge owing to direct trade-offs between protecting land areas for conservation and economic development dependent on land transformation. Existing sustainability strategies have been informed by knowledge of the palm oil sector in Southeast Asia as well as private sector supply chain commitments in other domains. Internationally, large companies are leading the transition to zero-deforestation palm oil supply chains in response to external pressures (Pacheo et al. 2018). As an example, in 2010, the Government of Gabon entered a Roundtable for Sustainable Palm Oil (RSPO), which is a certified joint venture with Olam International Ltd., a Singapore-based agri-business. Within the 50,000 ha first phase concession area, less than 7% was non-forested, indicating that deforestation will likely be necessary to meet production goals (Burton et al. 2017). RSPO allows clearance of forest areas not defined as primary, high conservation value (HCV) or high carbon stock (HCS) (RSPO 2018). However, Burton et al. (2017) found that even clearing logged forest areas within the concession will result in high gross carbon emissions, highlighting the difficulty of avoiding the clearing of HCS forest in the region. Additionally, beyond carbon emissions, issues of biodiversity conservation, profitability, land tenure and competing land claims substantially restrict the area of non-forested land available for sustainable expansion. Although it will remain critical to partner with the private sector, we recommend focused engagement with non-industrial producers in the Congo Basin, for reasons we outline below.

Smallholders: The engine of growth in the Congo Basin's palm oil sector

In both the Congo Basin and Southeast Asia, smallholders are an engine of growth in the palm oil sector. In the Congo Basin, however, oil palm production and supply chains differ from Southeast Asia in two key ways: Non-industrial actors process the oil independent of companies and consumers are mostly local. This has implications for zero-deforestation strategies. Smallholders cultivate up to 80% of the Congo Basin's planted area on plantations ranging from one to hundreds of hectares (Wich et al. 2014), and they are not obligated to supply to large companies to meet their processing needs given the widespread use of non-industrial milling facilities. The vast majority of palm oil mills across the Congo Basin are unregulated non-industrial facilities that vary widely in scale and the quality of oil produced, ranging from manual to fully mechanized systems. As a result, many mills and third-party suppliers operate entirely independent of large public and private companies. Given the prolific role of non-industrial actors in oil palm cultivation and processing, a substantial fraction of the palm oil produced never passes through a company owned mill, let alone any company's jurisdiction (Figure 3). In the context of widespread non-industrial participation in the sector, sustainability strategies initiated by companies and aimed at certifying palm oil mills owned by agri-businesses are unlikely to be effective at curbing deforestation.

Second, palm oil produced in the Congo Basin is primarily consumed by local and regional consumers in African countries. To date, international civil society organizations have been some of the most vocal leaders calling for improved sustainability of the sector, using campaigns targeting overseas consumers in the United States, Europe and China to pressure companies in Southeast Asia into changing their practices at various points along their international supply chains (Ivancic and Koh 2016; Thorlakson et al. 2018; Carlson et al. 2018). Although international pressure appears to be moving the needle toward more sustainable practices in Southeast Asia, especially in cases where oil palm companies work directly with independent smallholders to promote sustainable production practices, it is not readily apparent whether sustainability approaches developed with international supply chains in mind will translate to local and regional supply chains in the Congo Basin context.

A key question that arises is, how can non-industrial producers and processors in heavily forested countries in the Congo Basin transition to zero-deforestation supply chains? We argue that any approach will require working closely with smallholders and non-industrial mill owners. Sustainable development efforts that engage these actors offer opportunities for addressing related issues pertaining to food security, economic development and broader environmental conservation agendas.

Sustainable development opportunities lie in working with smallholders

In Cameroon, where oil palm expansion is occurring most rapidly in the Congo Basin, smallholder farmers collectively cultivate oil palm on roughly twice as much land as large agri-businesses. Despite

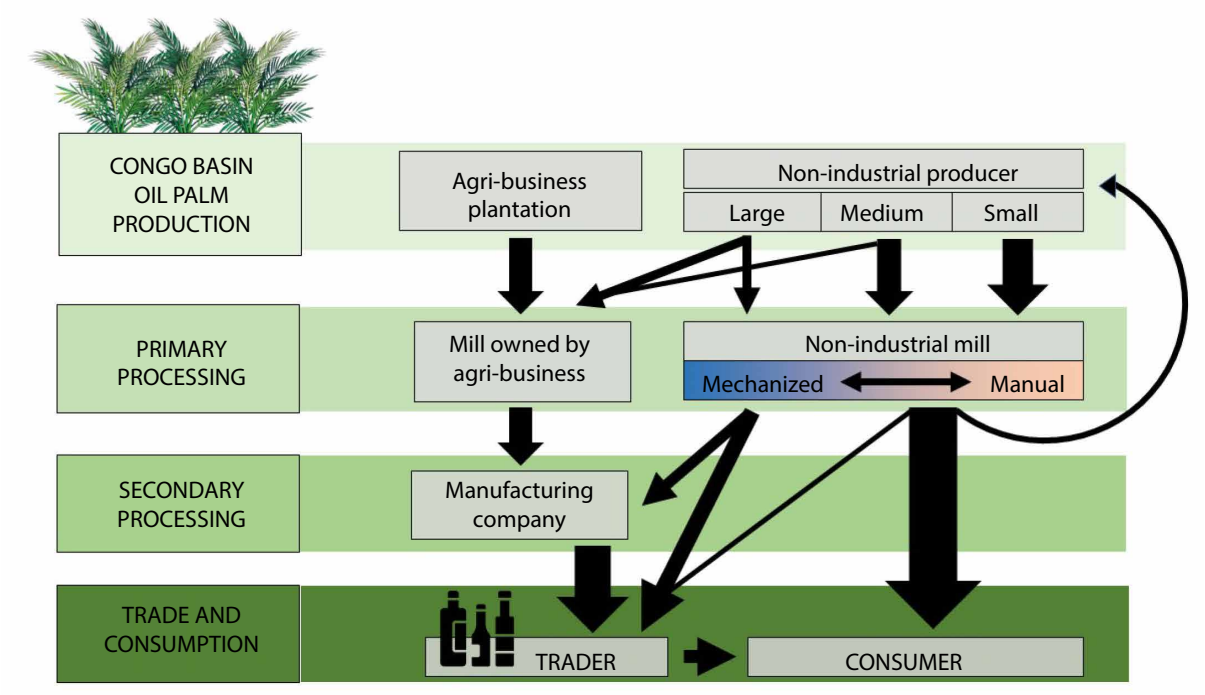

Figure 3. Schematic of Congo Basin palm oil supply chain.
Source: Adapted from Ordway et al. (2017b).

Forest transition.
Photo by Mokhamad Edliadi/CIFOR

cultivating more land area, smallholders produce only one-third of the country's palm oil due to low on-farm yields and various factors that incentivize milling at a mounting number of low-yielding palm oil processing facilities. To increase their production, smallholder farmers often expand in area rather than increasing yields on their existing land due to low incomes and limited access to finance, technology and information. Across diverse groups of smallholders, ranging from small-scale subsistence producers to large-scale contract and independent producers, more than three-fourths of new plantations in Southwest Cameroon were reportedly established in areas previously forested (Figure 4). Area expansion has been shown to result in deforestation (Ordway et al. 2019) as well as subsequent financial costs incurred by farmers and environmental costs felt by local and regional communities.

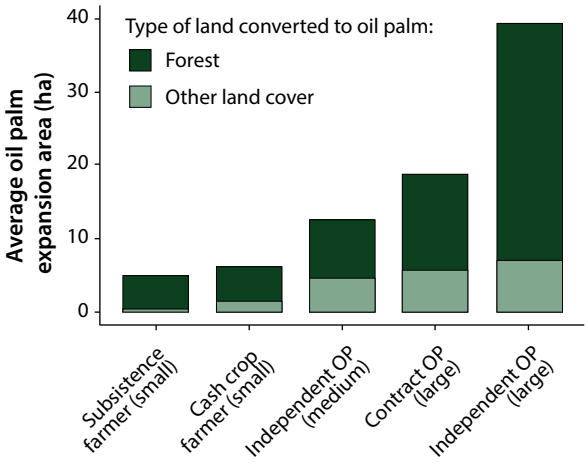

Figure 4. Average area of forest clearing by smallholders in Southwest Cameroon. Non-industrial oil palm (OP) smallholder producer groups are categorized based on farm structure characteristics and production scale (in parentheses).

Source: Adapted from Ordway et al. (2017b).

Across the Congo Basin, smallholders make up the majority of the oil palm producers. Market access, scale of production, motivation for producing oil palm, land tenure security and access to resources can vary substantially from one smallholder to the next. Including smallholders in sustainability improvements to the palm oil sector in the Congo Basin offers an opportunity to achieve both environmental and development goals. Major increases in production can be achieved from existing smallholder plantations already under cultivation by increasing on-farm crop yields as well as improving milling technologies to achieve greater capacity and higher yields at the processing stage. Intensification that results in these on-farm and processing-related yield increases could contribute to the following:

- achieving national production goals and reducing the regional vegetable oil deficit
- poverty alleviation efforts in rural communities by increasing smallholder farmer incomes and supporting investment in mills managed by farmers and entrepreneurs
- reducing deforestation pressures by alleviating the need to expand to increase production

A man working at a palm oil mill on the outskirts of Douala, Cameroon.
Photo by Mokhamad Edliadi/CIFOR

These efforts align with multiple goals in the forestry and agriculture sectors aimed at addressing climate change and biodiversity conservation in the Congo Basin. More specifically, if intensification is carried out effectively, the palm oil sector has the potential to contribute to goals outlined in the Nationally Determined Contributions (NDC) for several countries in the region that are focused on 'greening agricultural policy' through intensification and improving the sustainability of forest management.

One major potential caveat lies in a commonly cited theory known as the Jevons paradox, which warns that increased profitability from intensification can ultimately incentivize further expansion. In practice, intensification efforts and deforestation impacts are nuanced. Research suggests that technology-driven intensification, particularly aimed at local markets, can effectively curb deforestation only if adequate natural resource protection policies are in place (Byerlee et al. 2014).

Recommendations

We offer the following recommendations with the aim of encouraging sustainability in the Congo Basin palm oil sector. To achieve the goals outlined below, it will be important to align policy objectives with incentives for sustainable palm oil development, which requires strong leadership from the highest levels of government as well as coordination across ministries of finance, planning, agriculture, forestry, land tenure, trade and rural development. Success will also rely on active engagement with civil society organizations as well as public and private companies.

1. Improve access to financing. Achieving yield improvements on existing plantations and improving the capacity and extraction rates at processing facilities will require access to finance for smallholders and non-industrial mill managers. Improved access to finance could be achieved in several ways. We recommend 1) encouraging micro-finance organizations, credit unions and rural development banks to play a role in financing smallholder oil palm producers; 2) incentivizing smallholders to form cooperatives or associations; 3) working with nongovernment organizations to provide smallholders with knowledge and training on financial management; and 4) creating funding mechanisms from the Green Climate Fund (GCF), drawing on Project Preparation Facility guidelines for implementation.

2. Establish policies to safeguard natural resources. Intensification alone is not inherently a sustainability strategy. Existing tools that remain actively under development, including the HCV and HCS frameworks , have the potential to offer valuable starting points. However, the conservation effectiveness and additionality of these strategies is an area of ongoing research, and they will require adaptation and alteration as information accrues. To ensure reduced deforestation and prevent future clearing, we strongly recommend that intensification efforts be accompanied by complementary natural resource policies that incorporate 1) establishing strong governance to regulate and monitor land use practices and 2) incentivizing or rewarding zero-deforestation commitments and adherence to sustainability standards.

Monitoring and regulating land use practices would benefit from the use of remote-sensing tools for monitoring and verification, but would also require regular interaction with producers and plantation visits. Strategies for incentivizing zero-deforestation commitments and adherence to standards could be achieved several ways. We recommend implementation using climate or development funds (e.g. Green Climate Fund or the African Development Bank's Agricultural Value Chain Project). Financing and resources could be made available to smallholder organizations to intensify production contingent on no forest clearing. Offering financial incentives would improve lending opportunities for smallholders and mill managers, while providing a mechanism for regulating and monitoring land use practices.

Targeted investment in the sector, improved access to financing and resources for smallholders, and the establishment of well-defined environmental policies to prevent future deforestation can pave the way for production gains on existing plantations, without the need for continued expansion.

3. Intensify production on existing plantations, without further expansion. Low oil palm yields across the Congo Basin indicate that yields can be substantially improved on existing oil palm plantations, enabling increased production without the need to clear more land. Intensification can be achieved by 1) planting higher-yielding and disease-resistant seedling varieties; 2) replanting old farms and rehabilitating abandoned plantations; 3) increasing the targeted use of inputs; and 4) improving agronomic and land management practices. Examples of improved practices include routine phytosanitary checks to prevent disease spread, soil and foliar analysis to detect fertilizer needs, and also pertain to pruning, tree spacing and weeding. Accomplishing these goals will require the following resource allocation and governance improvements: 1) securing quality seedling supplies, fertilizer and pesticides; 2) subsidizing smallholders for purchases of these supplies;

Two men traditionally procesing oil fruit. The oil will be sold locally and used personally.
Photo by M. Edliadi/ CIFOR

3) coordinating funds for subsidies provided by the Ministry of Agriculture with approval from the Ministry of Finance; and 4) providing vastly improved agricultural extension support.

4. Improve processing capacity and extraction rates of palm oil mills. Major opportunities also exist for increasing production by improving milling capacity and palm oil extraction rates. Most processing facilities in the Congo Basin (99% in Southwest Cameroon) are non-industrial, artisanal mills that hold a high potential for processing-related yield gains. We recommend upgrading milling machinery and technology to improve milling capacity and oil extraction rates, which also offers the co-benefit of improving oil quality. Ensuring that smallholder producers benefit from improved extraction rates will be critical for their continued engagement in sustainability strategies. We therefore also recommend creating opportunities that will allow smallholders to participate in controlling the redistribution of benefits, especially smallholders operating at small- and medium-scales who typically have more restricted access to resources, and we recommend encouraging partnerships between smallholder groups, mill managers and palm oil companies. Strategies could include supporting mills run by smallholder cooperatives or agri-business mills that allow smallholders to own shares.

Ultimately, for any regulations to be effective, it is important that they align with local goals and preferences as well as national government regulatory frameworks. In the future, as countries in the Congo Basin expand their palm oil sectors internationally, it will be important for sustainability strategies and policies to scale with market expansion. Scaling can be achieved by integrating existing international corporate sustainability policies and consumer country government regulations that support sustainable sourcing practices.

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