

Systems Mapping: Opportunities to Make China's Palm Oil Supply Chain More Sustainable

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REPORT LEAD AUTHOR

Katrina Gehman, Meridian Institute

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Introduction

The systems map and accompanying description of potential opportunities for constructive interventions are focused on making the palm oil supply chain in China more sustainable. A primary driver of global deforestation is land conversion related to the production of cattle, soy, timber, coffee, cocoa, and palm oil, with almost 90% of forest loss caused by agricultural expansion.¹ China is a key market for palm oil, as the world's second largest importer and third largest consumer thereof, with imports expected to increase.² Most of China's palm oil imports come from Indonesia and Malaysia, posing significant deforestation risk.

The palm oil supply chain is complex and some previous initiatives to reduce environmental impacts of unsustainable palm oil production have shifted deforestation elsewhere or precipitated unintended global consequences. For example, the European Union (EU) initially encouraged the use of biofuels to meet climate goals, but later studies demonstrated that emissions from deforestation to produce palm oil for biodiesel were significantly more harmful for the climate than fossil diesel.³ So, now the EU is planning to phase out palm oil-based biofuel by 2030, in line with new deforestation regulations. This decision will impact producer countries which depend on palm oil production for livelihoods.

Given these complex dynamics, it is necessary to examine potential global impacts of prospective interventions. The development of a systems map provides an effective way to examine key drivers of the palm oil supply chain while defining possible intervention opportunities.

METHODOLOGY

The systems map was developed based on review of over 40 articles and in-depth studies (cited in the "Sources Consulted" section at the end of this document). Most of these studies were completed over the last several years, so this research was augmented by recent articles, particularly from China Dialogue. Footnotes are listed throughout the document to cite statistics and other key findings. The map does not emphasize statistics except for occasional references to constraints in the system.

PURPOSE

Three important aspects of the systems map include:

1. The map traces **key drivers** of palm oil in the Chinese market, focusing on relationships between various factors, highlighting general trends/patterns derived from the research.
2. Palm oil supply chains are quite complex, so some connections on the map could be debated depending on context. As such, this is a living map that could serve as a basis for the facilitation of conversations to identify gaps, challenges, and possibilities. Building **shared understanding** between myriad stakeholders can contribute to collective global consensus and action to make soft commodity global value chains more sustainable, as

¹ [COP 26: Agricultural Expansion Drives Almost 90 Percent of Global Deforestation | FAO](#)

² [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

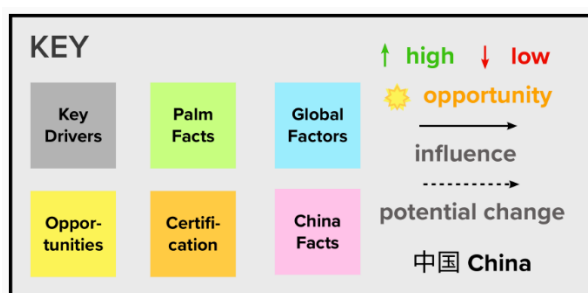
³ [Factsheet Palm Oil Biofuels | European Federation for Transport & Environment](#) | [Europe, in Bid to Phase Out Palm Biofuel, Leaves Fans and Foes Dismayed | Mongabay News](#)

noted by the World Economic Forum at the Convention on Biological Diversity (CBD COP15) in December 2022.⁴

3. The map delineates **potential opportunities** to address drivers of unsustainable palm oil in the Chinese market. Initial recommendations are summarized at the end of this report.

STRUCTURE OF MAP

This complex systems map is composed of seven smaller interconnected maps. The primary sections of the map focus on supply of and demand for palm oil in China, within the context of high demand for conventional palm oil and low demand for sustainable palm oil. Additional map sections focus on domestic palm oil production, the biofuel market in China, sustainability certifications, global dynamics between producer countries and the EU, and regenerative agriculture in palm oil production.



The systems map demonstrates “high” and “low” levels or amounts using red and green arrows fixed on grey boxes that represent drivers in the system. Solid connecting arrows indicate some type of correlation, causation, or influencing relationship between drivers. Multicolor boxes (blue, green, orange) represent facts or factors constraining the system. To assist the reader, potential opportunities are highlighted in yellow. These are

accompanied by dotted lines showing the potential to change system dynamics. On the accompanying descriptions of the map sections, these opportunities are highlighted in bold text. Recommendations at the end of this report summarize key opportunities that have emerged from mapping the system.

STAKEHOLDER ANALYSIS

There are numerous stakeholders involved throughout the palm oil supply chain, from national governments in producer and consumer countries to multinational organizations, financial institutions, civil society groups, and every stage of production spanning smallholders and industrial companies, processors, manufacturers, suppliers, and consumers. Increasing the sustainability of the palm oil supply chain requires the collective effort and creative thinking of those at all points along the supply chain.

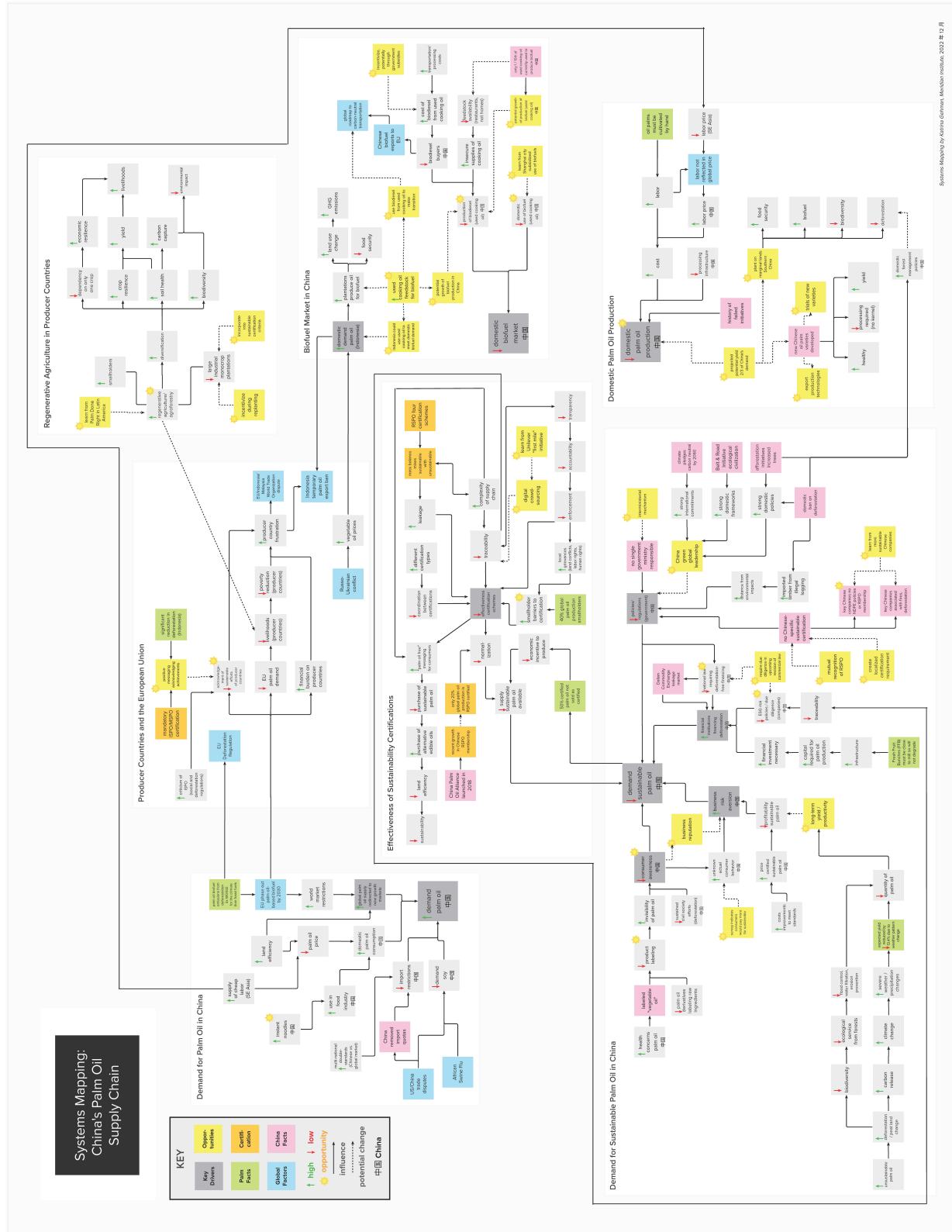
The systems map offers a menu of potential opportunities to make the palm oil supply chain more sustainable. The feasibility and prioritization of these proposed initiatives depends on the engagement and buy-in of the stakeholders who would implement them. The information in the map and the identification of potential opportunities for action will assist stakeholders to set priorities and focus and coordinate their efforts. As part of this process, stakeholders are encouraged to keep in mind the following questions while reviewing the map:

- What are your points of entry into the system, financial means, connections, and other types of power?

⁴ [Preventing Global Deforestation: China's Actions and Opportunities | World Economic Forum](#)

- Where can you leverage relationships throughout the system, and where do you have geographic and regional influence?
 - Are you connected to consumer markets (including the EU or China) or producer nations (Indonesia, Malaysia, or elsewhere)?
 - Do you have links with government entities, civil society organizations, financial institutions, or sustainability certification schemes?
 - Do you have ties with the palm oil production industry itself, via smallholders or industrial plantations, processing plants, manufacturers, retailers of various industries (including instant noodles, beauty products, household goods), or consumers of these products in global markets?
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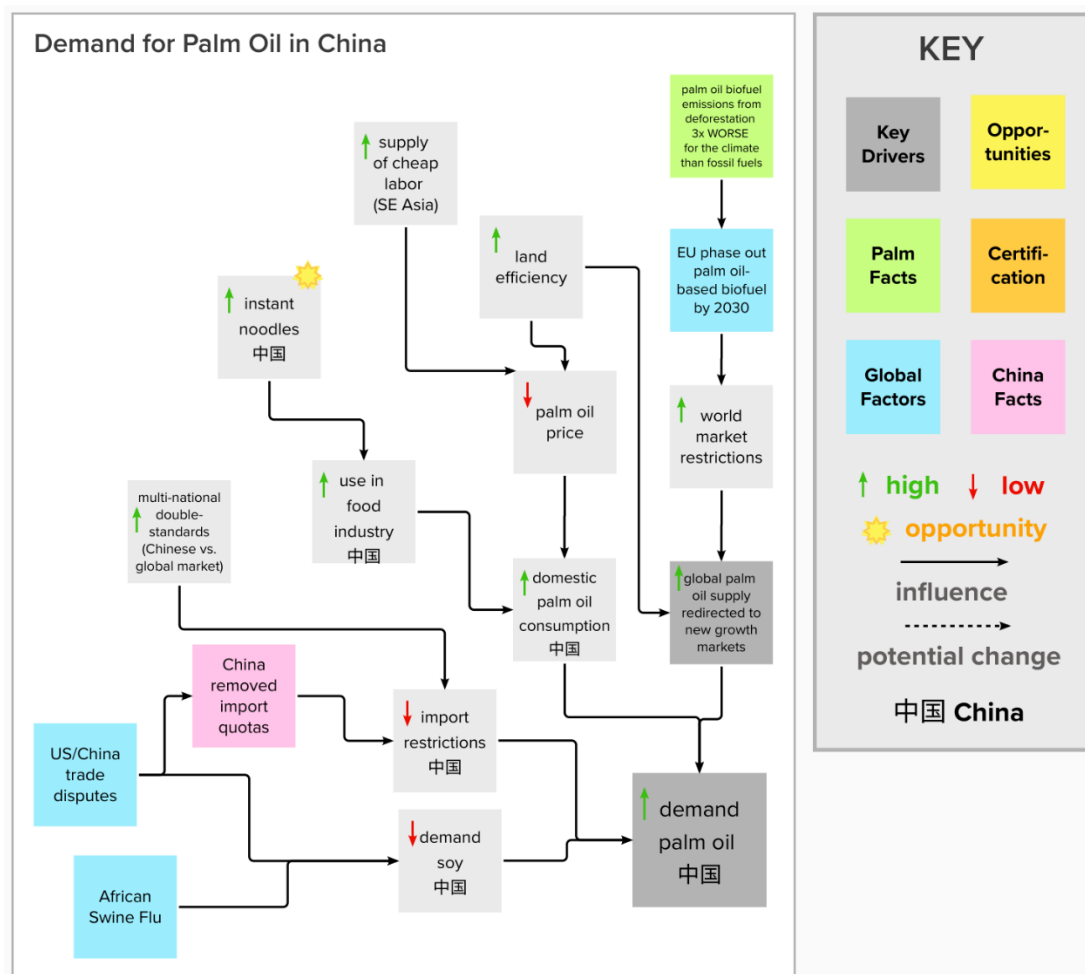
Systems Mapping



Entire Systems Map.

Map #1

DEMAND FOR (CONVENTIONAL) PALM OIL IN CHINA



Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

KEY INSIGHTS

China is the world’s second largest importer of palm oil and its third largest consumer.⁵ Imports of palm products grew by 48% in China from 2017 to 2019 (6.2 million tons to 9.1 million tons), with demand expected to increase.⁶ According to a 2021 report from Chain Reaction Research, 80% of palm oil imports in China are consumed as edible oil with 20% for industrial use.⁷

⁵ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

⁶ [Sustainable Palm Oil Uptake in Asia: Where Do We Go from Here? | World Wildlife Fund \(WWF\)](#)

⁷ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

The high demand for palm oil in China is driven mainly by internal factors such as the high level of domestic palm oil consumption (especially through the instant noodle industry which represents over a quarter of domestic edible palm oil consumption) and geopolitical factors which have reduced the demand for soy in China, an alternative edible vegetable oil.⁸

Key geopolitical factors include US/China trade disputes which reduced imports of soy from the U.S. and influenced China's 2019 decision to remove import quotas on palm oil (which precipitated a steep increase in crude palm oil imports, up to almost 50,000 tons that year).⁹ African Swine Flu also had a major impact. The loss of so many pig herds in China had resulted in less demand for soybean meal (a byproduct of extracting soybean oil), reducing the price advantage of soybean oil over palm oil.¹⁰ China needed another source of edible oil to meet high domestic consumption in the food industry, and palm oil was an inexpensive alternative due its high land efficiency (productivity per unit of land) and low labor costs in Southeast Asia producer countries. According to a 2018 study by International Union for Conservation of Nature (IUCN), palm oil produces nine times the oil per area than other edible oils.¹¹

A recent important global factor influencing the flow of palm oil to China is the EU's decision to phase out palm oil-based biofuel by 2030 due to studies that demonstrate that emissions from deforestation associated with production of palm oil-based biodiesel are approximately three times more harmful for the climate than the use of fossil diesel (according to a 2016 study from European Federation for Transport and Environment).¹² This decision was affirmed by the recent EU Deforestation Regulation, reinforcing due diligence and traceability for commodities including cattle, soy, coffee, cocoa, timber, rubber, and palm oil, to ensure deforestation-free supply to the EU.¹³

These factors will result in a surplus supply of palm oil from producer nations that depend on it for livelihoods, and they will be searching for new market opportunities. With China's relatively lowered import restrictions, China is a fertile ground for a redirection of this supply.

OPPORTUNITIES

Approximately one fourth of edible palm oil consumed in China is used to produce instant noodles.¹⁴ As of 2020, none of the instant noodle companies had committed to sourcing sustainable palm oil.¹⁵ **Thus, the sheer volume of unsustainable palm oil used in the instant noodle industry could provide an opportunity for focused interventions.** The Chinese company Master Kong currently dominates the instant noodle market with a market share of 45.7%. Recent sustainability reports from Master Kong indicate a growing awareness of UN Sustainable Development Goals and note that 36.8% of palm oil suppliers for instant noodles had obtained Roundtable on Sustainable Palm Oil (RSPO) certifications as

⁸ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

⁹ [Sustainable Palm Oil Seeks Breakthrough in China | China Dialogue](#)

¹⁰ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

¹¹ [Saying 'No' to Palm Oil Would Likely Displace, Not Halt Biodiversity Loss | IUCN | Palm Oil's High Yield Masks Environmental Impact | China Dialogue](#)

¹² [Biodiesel's Impact: Emissions of an Extra 12M cars on Our Roads, Latest Figures Show | European Federation for Transport & Environment | Factsheet Palm Oil Biofuels | European Federation for Transport & Environment | Europe, in Bid to Phase Out Palm Biofuel, Leaves Fans and Foes Dismayed | Mongabay News](#)

¹³ [Green Deal: EU Agrees to Law to Fight Global Deforestation | European Commission](#)

¹⁴ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

¹⁵ [Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP](#)

of 2021.¹⁶ If the entire instant noodle sector shifted to embracing sustainable sources of palm oil, it could have a substantial impact throughout the palm oil industry / supply chain in China.

Another potential entry point would be targeting other consumer goods such as beauty and personal care products that use palm oil derivatives. Nearly 60% of global palm oil consumption comes in the form of derivatives.¹⁷ During processing, both palm oil and palm kernel oil are refined and fractionized into oleins (liquids) and stearins (fats), producing fatty acid distillate and oleochemicals. Due to their versatile characteristics (including the ability to blend and stay stable at high temperatures as well as providing natural preservation), palm oil derivatives are used in a wide variety of products. Oleochemicals are used to produce many non-edible items including cleaning products, paints, pharmaceuticals, agrochemicals, and cosmetics.¹⁸ Thus a variety of consumer goods products could provide additional opportunities for focused interventions.

According to a CGIAR article, total oilseed demand/production around the world is projected to increase by approximately 85% from 2010 to 2050,¹⁹ and estimates from the China Chamber of Commerce for Import and Export of Foodstuffs, Native Produce, and Animal By-Products (CFNA) indicate that demand in China may increase to over 10 million tons by 2025.²⁰ Demand per capita has already increased and is expected to increase, which may be related to dietary habits. **Thus, another approach could be seeking to decrease overall demand for vegetable oil in China (not just palm oil).** Further research on this potential is recommended.

¹⁶ [Master Kong Sustainability Report 2021 | Master Kong](#)

¹⁷ [Palm Oil Derivatives Market Size, Share & Forecast 2029 | Fortune Business Insights](#)

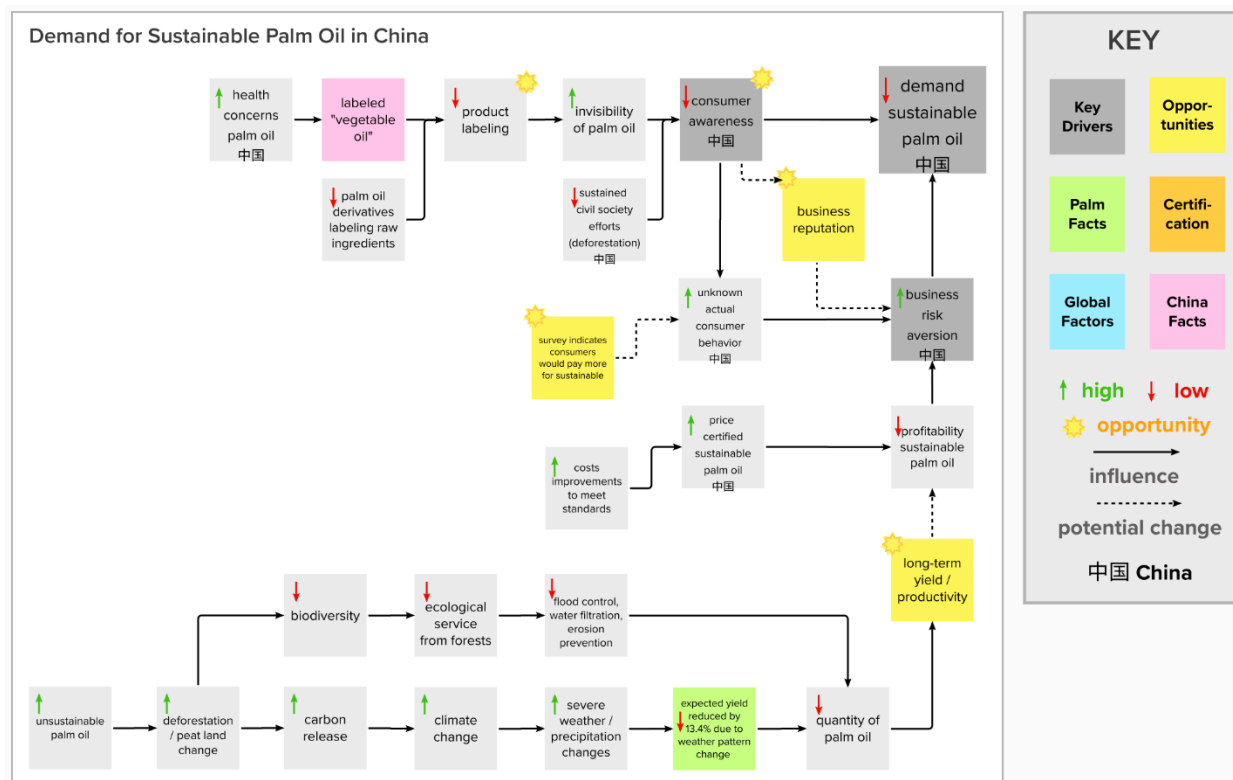
¹⁸ [Palm Oil Derivatives: Are Sustainability Promises Lost in the Supply Chain? | China Dialogue | Breaking Down Palm Oil | China Dialogue](#)

¹⁹ [Can Boosting Yields Slow the Global Palm Oil Expansion and Ease Its Environmental Impacts? | CGIAR](#)

²⁰ [Sustainable Palm Oil: Trade and Key Players Between Indonesia and China | Proforest & WWF Indonesia](#)

Map #2

DEMAND FOR (SUSTAINABLE) PALM OIL IN CHINA



Map #2: Demand for Sustainable Palm Oil in China (Part 1)

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

KEY INSIGHTS

Despite the high demand for palm oil in China, there is a low demand for sustainable palm oil. Only about 1% of palm oil imports to China were certified sustainable as of a 2020 report from the United Nations Development Programme (UNDP).²¹ Likewise, a 2021 study by World Wildlife Fund (WWF) indicated that only about 4-7% of palm oil consumed in China was RSPO certified.²² Limited market demand was identified by CDP interviews in 2020 as the most challenging barrier to Chinese companies sourcing sustainable palm oil (vs. supply chain complexity which is cited as the most common challenge globally, thus indicating different perceived barriers for Chinese businesses than other companies operating worldwide).²³ Why is there such limited demand for sustainable palm oil in China? This is due to a variety of key factors including lack of consumer awareness, business risk aversion, financial regulations, and Chinese government policies.

²¹ [Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP](#)
²² [Sustainable Palm Oil Uptake in Asia: Where Do We Go from Here? | World Wildlife Fund \(WWF\)](#)
²³ [Sustainable Palm Oil in China | CDP Consultation](#)

One of the main reasons the demand for sustainable palm oil in China is so low is the lack of consumer awareness. **Consumers are largely not aware of the existence of palm oil in products nor of the link between unsustainable palm oil and deforestation.**²⁴ This lack of awareness is driven in part by vague labels which contribute to invisibility of the commodity. Due to the common Chinese cultural perception of palm oil being unhealthy (due to its high level of saturated fat), palm oil is usually labeled and sold as “vegetable oil.” Furthermore, the palm oil industry produces many complex derivatives that are often not labeled clearly to indicate palm oil as an original ingredient (especially in household goods and personal care products), a factor that is not unique to China. In addition, there has been a lack of coordinated, sustained civil society efforts in China to raise awareness of unsustainable palm oil’s connection to deforestation.²⁵

Lack of consumer awareness also contributes to business risk aversion. Certified sustainable palm oil costs more than uncertified (3%-30% higher) due to investments that must be made to bring company processes up to standard.²⁶ Companies do not want to risk profitability by investing in higher priced sustainably certified products when they do not have enough confidence that consumers would be willing to pay more for these products. However, surveys have shown that consumers would be willing to pay more for sustainable products (according to results from consumer inquiries by WWF China in 2018),²⁷ which provides an opportunity for Chinese companies to make changes.

OPPORTUNITIES

CDP interviews with Chinese companies in 2020 indicate that **businesses are becoming more aware of the potential long-term costs of unsustainable palm oil in terms of environmental impacts on supply chain resilience.**²⁸ As unsustainable palm oil contributes to deforestation and climate change, the resulting changes in precipitation and severe weather are likely to significantly affect palm oil quantity and quality, with an expected 13.4% reduction of yield.²⁹ This awareness could shift the balance of risk aversion in favor of sustainable palm oil over time.

In addition, **as consumer awareness increases, there is an additional risk to business reputation if businesses do not source sustainable products.** This reputational risk is domestic as well as international as Chinese companies seek to compete with international brands on the foreign market. Risks to business reputation are an important driver and present a key opportunity for Chinese companies to source from sustainable supply chains.

²⁴ [Sustainable Palm Oil Seeks Breakthrough in China | China Dialogue](#) |

[RSPO’s Anne Rosenbarger on the Push for Sustainable Palm Oil | China Dialogue](#)

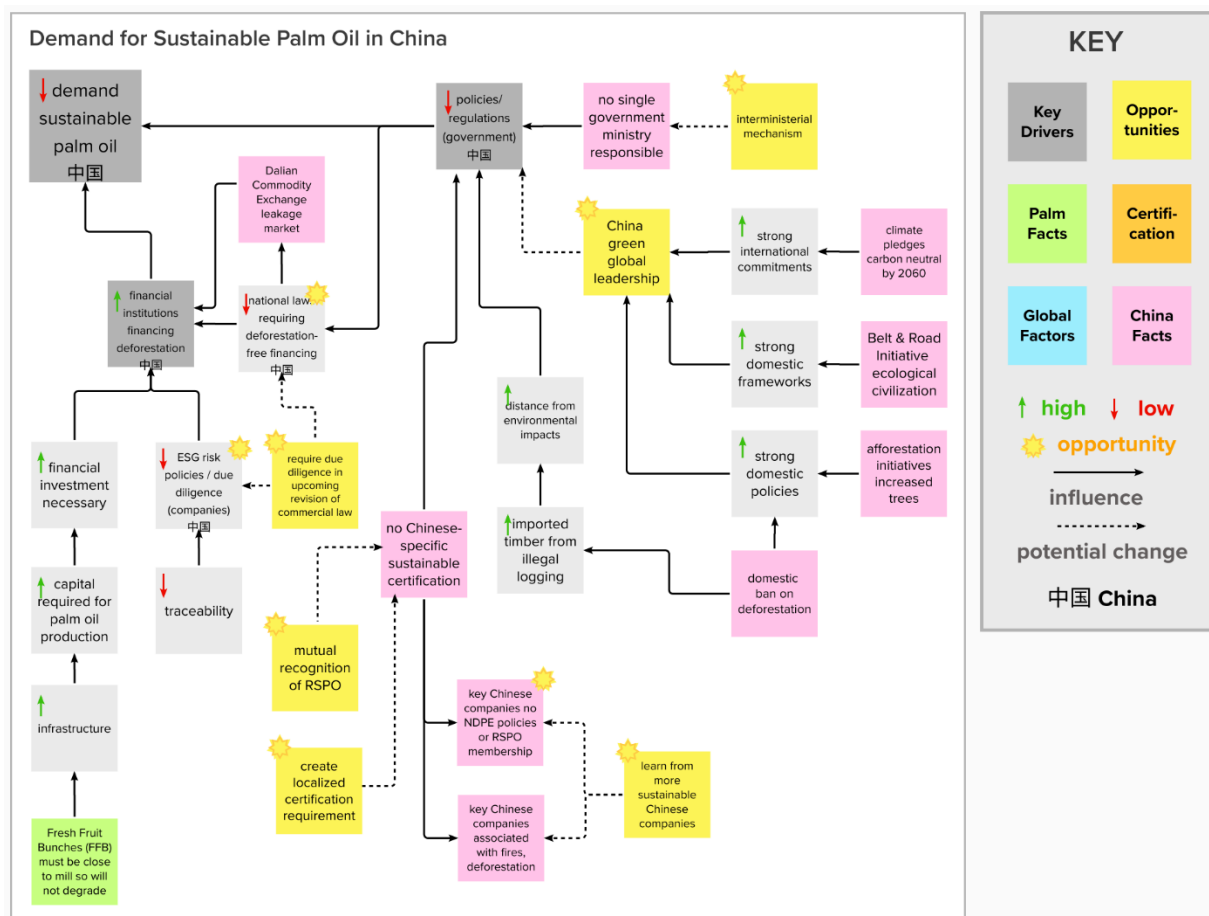
²⁵ [Stalemate: Sustainable Palm Oil Struggles to Take Off in China | China Dialogue](#)

²⁶ [Stalemate: Sustainable Palm Oil Struggles to Take Off in China | China Dialogue](#) | For more detailed information on price premiums for certified sustainable palm oil, see: [Business Case for Certified Sustainable Palm Oil | World Wildlife Fund \(WWF\)](#)

²⁷ [New Pathways to Sustainable Palm Oil | China Dialogue](#)

²⁸ [Sustainable Palm Oil in China | CDP Consultation](#)

²⁹ [Climate Change Has Likely Already Affected Global Food Production | PLOS ONE](#)



Map #2: Demand for Sustainable Palm Oil in China (Part 2)

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

KEY INSIGHTS

China is the sixth largest global financier of deforestation. According to Global Witness, between January 2013 and April 2020, over US \$22.5 billion was provided by Chinese financial institutions to companies that produce and trade forest-risk commodities (including palm oil as well as rubber, timber, soy, beef, and pulp/paper).³⁰ Chinese financial institutions are the fifth largest financiers of palm oil,³¹ and five of China’s biggest commercial banks have weak or no deforestation-free commitments (according to a 2021 investigation by Forest 500).³²

Furthermore, Chinese companies operate and finance palm oil plantations in producer nations such as Indonesia. No Deforestation, No Peat, No Exploitation (NDPE) policies are in use by 7/10 of the top suppliers of Indonesian palm oil to China (according to a 2021 report from Chain Reaction Research).³³

³⁰ [Chinese Banks' Risky Agribusiness Portfolio | Global Witness](#)

³¹ [Reducing the Forest Footprint of Chinese Soft-Commodity Financing | China Dialogue](#)

³² [China's New Green Finance Guidelines Have a Deforestation Blind Spot | China Dialogue](#)

³³ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

However, four large Chinese companies that operate plantations in Indonesia (including Julong Group, ZTE, Henan Jiujui Chemical Co., and Shanghai Xinjiu Chemical Co.) do not have NDPE policies, are not members of RSPO, and have documented environmental damage.³⁴

OPPORTUNITIES

Fresh fruit bunches (FFBs) of palm oil deteriorate rapidly, and so mills and processing plants must be located physically proximate to plantations to process FFBs in a time-sensitive manner.³⁵ Due to the initial costs of mill construction as well as the initial costs of planting oil palm trees, palm oil operations typically require significant financial investments. This renders financial institutions necessary for palm oil production which provides banks an opportunity to intervene with green financing.

In June 2022, China Banking and Insurance Regulatory Commission (CBIRC) issued green guidelines with expectations for Chinese banks to monitor environmental, social, and governance (ESG) risks. While this represented some progress, some financial institutions still have weak implementation of deforestation risks. **The revision of China's commercial law may provide an opportunity to require financial institutions to include deforestation in due diligence for companies in which they invest.**³⁶

Furthermore, sustainability indicators could be incorporated into the Dalian Commodity Exchange. In December 2020, foreign investors were given access to trade palm oil futures without requiring that the oil be certified sustainable, which contributed to leakage of uncertified palm oil. **Incorporating sustainability indicators into commodity exchanges could reduce the drain of unsustainable palm oil on the market while strengthening sustainable global supply chains.**³⁷

Many different Chinese government agencies oversee various aspects of agricultural production (including the Ministry of Agriculture, Ministry of Commerce, Ministry of Ecology and Environment, and the Ministry of Industry and Information Technology, as well as CFNA). However, there is not one leading authority taking responsibility for palm oil and coordinating the effort to promote and implement regulations concerning this commodity. As such, **a high-level inter-ministerial mechanism could improve consensus, action, and policy regulations to drive implementation of sustainable palm oil in China** (as recommended by the China Council on International Cooperation on Environment and Development (CCICED)).³⁸

³⁴ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

³⁵ [Study on the Environmental Impact of Palm Oil Consumption and on Existing Sustainability Standards | EU](#)

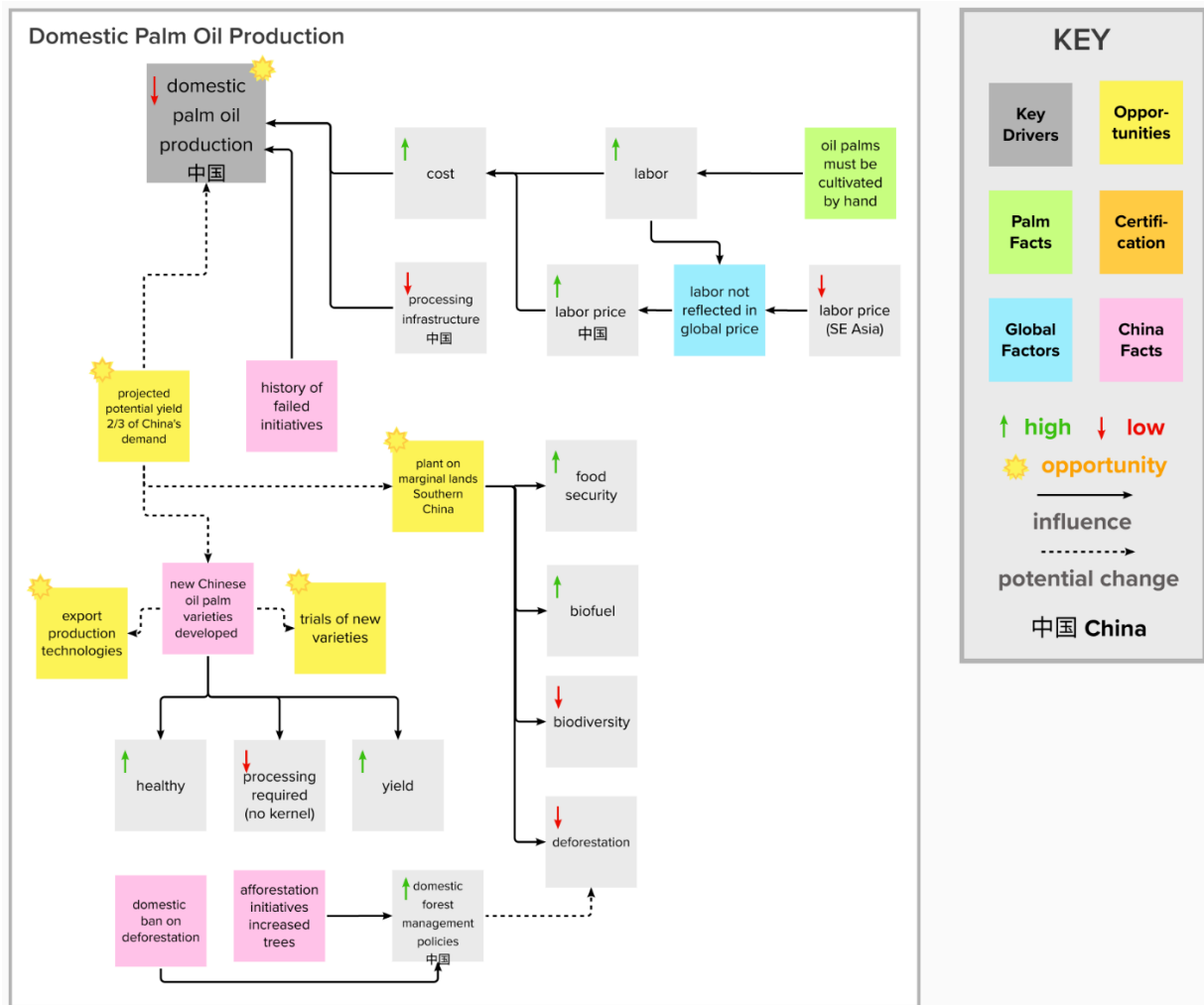
³⁶ [China's New Green Finance Guidelines Have a Deforestation Blind Spot | China Dialogue](#)

³⁷ [China's Market Influence Can Make or Break Green Supply Chains | China Dialogue](#)

³⁸ [Stalemate: Sustainable Palm Oil Struggles to Take Off in China | China Dialogue](#)

Map #3

DOMESTIC PALM OIL PRODUCTION IN CHINA



Map #4: Domestic Palm Oil Production

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

KEY INSIGHTS

Another approach to meeting the high demand for palm oil in China could be to develop China’s domestic palm oil production industry since China typically imports all of its palm oil.³⁹ There are significant challenges to this possibility, including a history of failed initiatives. However, the opportunities are significant enough to warrant further consideration.

³⁹ [Sustainable Palm Oil Seeks Breakthrough in China | China Dialogue](#)

The most significant challenge to the development of domestic palm oil production in China is the price. Oil palms must be cultivated and harvested manually. Therefore, this industry requires an enormous amount of labor. However, the amount of labor required to produce palm oil is not reflected in the global price of this commodity. The labor price in Southeast Asia, where most palm oil is produced, is very low compared to China. Labor rates required for workers in China would be much higher, making domestic palm oil production significantly less competitive and less economically advantageous for companies.

The other significant obstacle to the development of domestic palm oil production is the lack of infrastructure. Due to the quick deterioration of FFBs (increase of acid causing them to become rancid), plantations must be located physically proximate to processing mills. This would require a significant investment in new infrastructure which is currently lacking in China.⁴⁰

OPPORTUNITIES

One expert at the Chinese Academy of Tropical Agricultural Sciences estimated that planting oil palms on marginal lands in Southern China could produce a projected yield high enough to meet almost two-thirds of China's current import demand.⁴¹ Using marginal lands would not take away agricultural area from other food crops (thus not negatively affecting food security in China). However, one potential environmental drawback would be the possible decrease of biodiversity that is usually present in such marginal lands.

There are also potential environmental advantages to domestic palm oil production. For example, China has been a global leader in domestic afforestation through increase of trees planted as well as domestic policies banning deforestation. China's forested areas have increased from 12% to 22% since 1978, with China and India leading the world in additional foliage cover between 2000 and 2017 (according to NASA data).⁴² Furthermore, China's 2020 Forestry Law revision established protections for forests following a nationwide ban on felling natural forests.⁴³ While this domestic ban may have shifted logging elsewhere to meet China's demand (to regions with high risk of exporting illegal timber), **China's domestic forest management policies could have a positive influence going forward.**

If Chinese domestic palm oil production truly accelerated, this could potentially negatively impact livelihoods in producer countries. However, if demand per capita continues to increase, there might be sufficient demand to reduce this possibility. **Increasing domestic production of palm oil on marginal lands could potentially meet some of China's increasing demand, assisting in the effort to reduce deforestation pressure in Southeast Asia.**

In addition to the possibility of increasing domestic palm oil production in China, **there is the possibility of exporting new Chinese oil palm tree varieties.** Numerous oil palm varieties have been developed in recent years, such as "Re-you 6" with a yield higher than 3 tons per hectare and "Re-you 40" which is shorter and has no kernel (thus requiring less infrastructure for processing). "Re-you 40" is also healthier; its oil has less than 30% fatty acids and saturated fats, as opposed to the 50% found in typical

⁴⁰ [Will China Produce Its Own Palm Oil? | China Dialogue](#)

⁴¹ [Will China Produce Its Own Palm Oil? | China Dialogue](#)

⁴² [Can China's Afforestation Knowledge Green the World? | China Dialogue](#)

⁴³ [From Ending Deforestation in China, to Ending It Everywhere | China Dialogue](#)

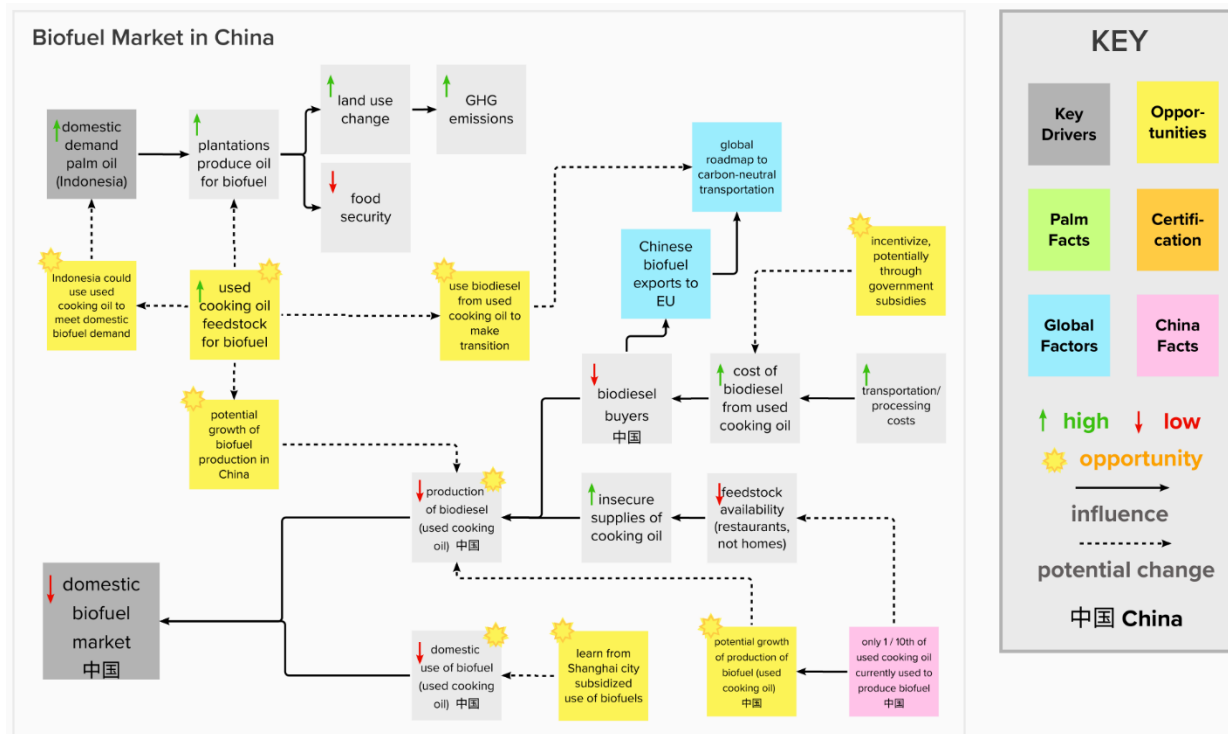
palm oil.⁴⁴ These varieties may need additional refinement, including larger-scale testing on agricultural plots, similar to trial plantings of Chinese varieties over the past decade on Vanuatu island in the Pacific which were successful enough for commercial planting to begin there in 2019.⁴⁵

⁴⁴ [Will China Produce Its Own Palm Oil? | China Dialogue](#)

⁴⁵ [Fifteen Years \[...\] to the Development of Vanuatu's Oil Palm Industry | Chinese Academy of Tropical Agricultural Sciences](#)

Map #4

BIOFUEL MARKET IN CHINA



Map #5: Biofuel Market in China

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

KEY INSIGHTS

Another key element of the palm oil supply chain is the role of biofuel in the world market. Currently, the majority of biodiesel produced in China is exported to the EU,⁴⁶ and approximately 65% of imported palm oil in the EU is used for biofuel.⁴⁷ Only one Chinese city, Shanghai, has incorporated B5 biodiesel (diesel with 5% biodiesel added) in public buses and filling stations through a citywide subsidized plan.

Making biofuel directly from palm oil comes with significant climate costs in terms of deforestation and emissions, which is why the EU has plans to phase out imports of palm oil-based biofuel by 2030. However, using used cooking oil as feedstock is one way to recycle oil without driving further deforestation. The higher cost of producing biodiesel from used cooking oil (due to transportation and processing required for restaurant and industrial kitchens) discourages its domestic sale in China. Yet, industry estimates indicate that only about 1/10th of the used cooking oil in China is currently being used

⁴⁶ [The Place of Biodiesel as China Eyes Carbon Neutrality | China Dialogue](#)

⁴⁷ [New Pathways to Sustainable Palm Oil | China Dialogue](#)

to produce biofuel, which means China has the potential to develop significantly more biofuel than its current production.⁴⁸

OPPORTUNITIES

While a long-term global roadmap to carbon neutral transportation prioritizes the use of electricity and hydrogen by 2050, **biofuel made from used cooking oil could serve as a transition fuel, especially if B5 biodiesel was adopted across China.** Other Chinese cities can learn from Shanghai's successful incorporation of biodiesel citywide through the city's climate subsidies.

Indonesia has been concerned about how to meet its own domestic demand. During spring 2022, Indonesia temporarily banned the exports of palm oil (including exports of used cooking oil) amidst vegetable oil price increases due to the Russian-Ukrainian conflict.⁴⁹ Encouraging the production and domestic use of biofuel from used cooking oil in Indonesia could help meet high demand in a sustainable way. Thus, **used cooking oil could be used as feedstock for biofuel production and consumption in both China and Indonesia.** This could also lead to **consumer-producer country partnership** as an issue on which both China and Indonesia could potentially benefit.

⁴⁸ [The Place of Biodiesel as China Eyes Carbon Neutrality | China Dialogue](#)

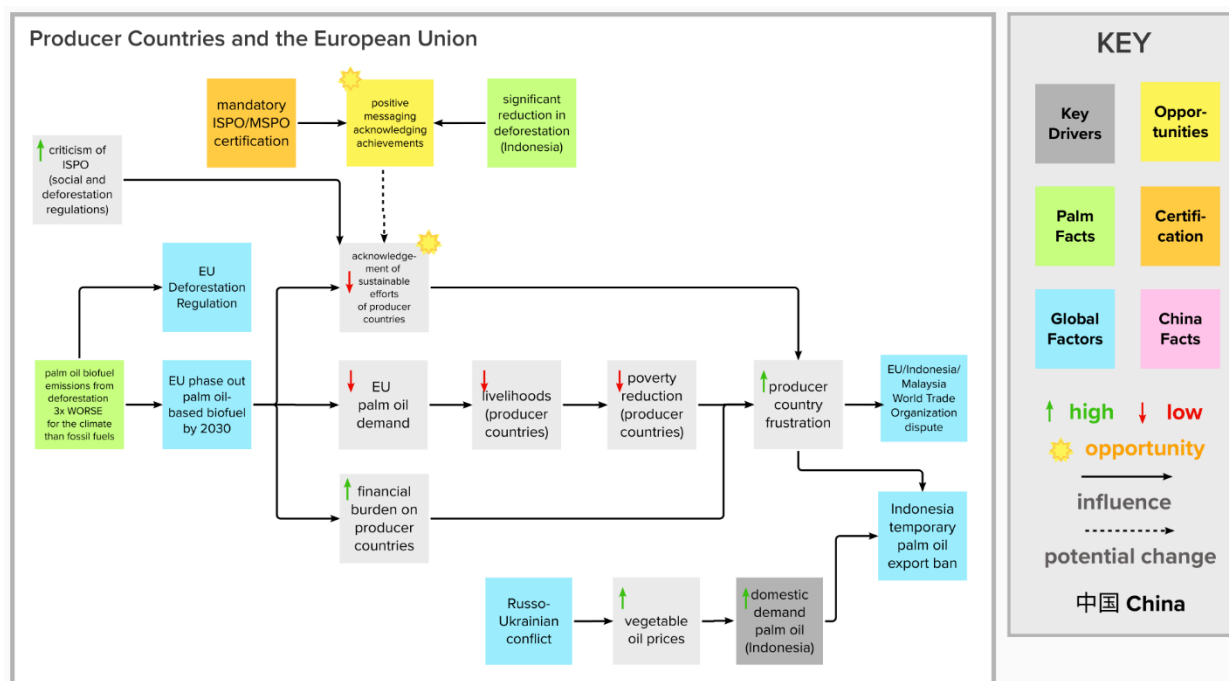
⁴⁹ [As War Drives Up the Price of Palm Oil, is Sustainable Production at Risk? | China Dialogue](#) |

[Indonesia Bans Palm Oil Exports as Global Food Inflation Spikes | Reuters](#) |

[Indonesia Lifts Temporary Ban on Palm Oil Exports | Food and Agriculture Organization of the United Nations \(FAO\)](#)

Map #5

PRODUCER COUNTRIES AND THE EUROPEAN UNION



Map #6: Producer Countries and the European Union

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

Efforts to green palm oil supply chains require an examination of global dynamics of producer nations. China is reliant on imports of edible oils, and 95% of Chinese palm oil supply comes from Indonesia and Malaysia.⁵⁰ China is currently the world’s largest importer of palm oil from Indonesia. Approximately 61% of Indonesia’s deforestation risk comes from Indonesia, India, and China sourcing from palm oil supply chains with 2.4x (per ton) greater risk of deforestation than sourcing to the EU (due to stricter regulations in the EU).⁵¹

The new EU Deforestation Regulation and decision to phase-out palm oil-based biofuels by 2030 will significantly affect key producer countries. Thus, Indonesia and Malaysia have been in a dispute with the EU at the World Trade Organization over the EU’s planned reduction in imports.⁵² These producer nations feel that they are being asked to bear the financial brunt of increasing sustainability while wealthy consumer nations are poised to reap the economic benefits, having failed to act sustainably in the past. This is compounded by what producer nations feel is a lack of adequate recognition and acknowledgement for their ongoing efforts and achievements to improve sustainability.

⁵⁰ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)
⁵¹ [Can Indonesia Continue to Reduce Palm Oil Deforestation? | Trase Insights](#)
⁵² [New Pathways to Sustainable Palm Oil | China Dialogue](#)

A significant accomplishment is that there has been an 82% reduction in deforestation in Indonesia over the past decade despite an increase in palm oil production (according to Trase Insights).⁵³ The Indonesian government had issued temporary moratoriums on new oil palm plantations, deforestation of primary forest, and peatland development.⁵⁴ In addition, both Indonesia and Malaysia have developed their own mandatory certification schemes, Indonesia Sustainable Palm Oil (ISPO) and Malaysian Sustainable Palm Oil (MSPO), in addition to founding the Council of Palm Oil Producing Countries (CPOPC). However, there has been some criticism of these schemes despite recent revisions. A human rights organization who evaluated these various certification schemes identified weaknesses in ISPO due to social factors such as lack of protection for human rights and community livelihoods (2017 assessment by Forest Peoples Programme (FFP)).⁵⁵ Furthermore, the level of ISPO commitment to deforestation has been a concern for the EU.

OPPORTUNITIES

It is very important to **provide positive and politically sensitive messaging about palm oil**. Negative messaging about producer countries in the EU has deteriorated the relationship between the EU and producer countries, making future collaboration more challenging. **Acknowledging producer country efforts** (not only in terms of reduced deforestation but also strides made in certification schemes and land allocation) could assist in improving these important relationships.

China is in a unique position as a consumer nation which has not been involved in these trade-related dynamics. Thus, there is an opportunity for **China to potentially form partnerships to support Indonesia and Malaysia with shared goals** around improving smallholder livelihoods, producing and using biofuel from used cooking oil, and promoting deforestation-free finance.

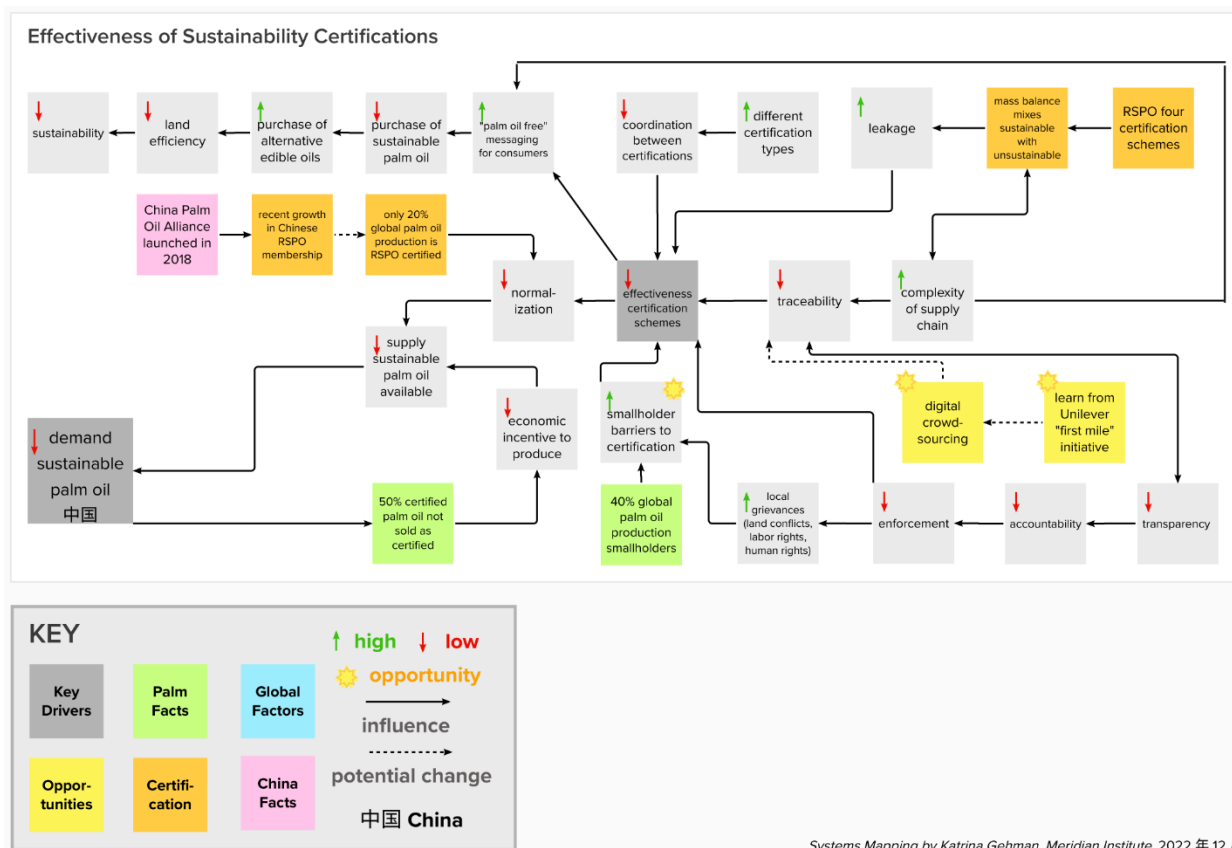
⁵³ [Can Indonesia Continue to Reduce Palm Oil Deforestation? | Trase Insights](#)

⁵⁴ [Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP](#)

⁵⁵ [How Palm Oil Is Certified 'Sustainable' | China Dialogue](#)

Map #6

EFFECTIVENESS OF SUSTAINABILITY CERTIFICATIONS



Map #6: Effectiveness of Sustainability Certifications

KEY INSIGHTS

A significant element in increasing the sustainability of palm oil supply chains is the effectiveness of certification schemes. Currently, certification contributes to the capacity to understand where sustainable palm oil has been produced. However, several factors undermine the effectiveness of certification schemes and thus affect the supply of and demand for sustainable palm oil in the market.

There has been conflicting evidence about the effectiveness of various sustainability commitments. A study in Indonesian Borneo, for example, showed that areas with RSPO certification resulted in the shifting of deforestation to adjacent areas (according to Environmental Research Letters, June 2020).⁵⁶ However, new data published in a 2022 article from Trase Insights demonstrated that companies with

⁵⁶ [Deforestation Spillovers from Oil Palm Sustainability Certification | Evidensia | Certification Fails to Transform the Palm Oil Industry – What Next? | China Dialogue](#)

zero deforestation commitments (ZDCs) had 30% less deforestation risk than those without such policies.⁵⁷

Two key issues that impact the effectiveness of certification are the complexity of palm oil supply chains and the complexity of certification schemes. Palm oil supply chains are notoriously complex, with myriad smallholders and plantations feeding into mills, refineries, processing plants, manufacturing facilities, and retailers. This makes it very difficult to trace palm oil to its source and thus verify that it was produced sustainably.

There are numerous sustainability certifications including RSPO, ISPO, and MSPO, as well as the High Carbon Stock Approach (HCSA), International Sustainability & Carbon Certification (ISCC), Palm Oil Innovation Group (POIG), and Rainforest Alliance standards (among others), each which have different requirements and focus on different aspects of palm oil production and processing.⁵⁸ RSPO, the most well-known certification scheme, includes four certification options, one of which is called “mass balance.” For this option, both certified and uncertified palm oil can be mixed throughout the supply chain and still labeled and sold with an RSPO ecolabel (albeit one marked “mixed”).⁵⁹ This arrangement does result in some leakage of unsustainable palm oil into sustainable palm oil streams. “Mass balance” is the most commonly used certification option in five key Asian markets (including China, India, Indonesia, Malaysia, and Singapore).⁶⁰ Approximately 8% of palm oil consumed in China is RSPO certified.⁶¹

Some of these certification standards focus on larger industrial plantations and are not designed to address smallholder production. This is a significant issue with about 40% of the global palm oil supply produced by smallholders.⁶² While RSPO, ISPO, and MSPO have made strides to improve pathways to smallholder certification and certification use has increased, there are still significant barriers. In addition to traceability challenges, there are also issues associated with enforcement of these standards including the need to address local grievances such as land conflicts, labor rights, and human rights.⁶³ **Sector-wide jurisdictional approaches (where an entire region is certified) offer a potential alternative** and efforts are underway to implement these approaches.⁶⁴

One of the challenges with certification schemes is not only the sustainability of palm oil that results from certified operations, but also the need for more widespread adoption of certification. Only almost 20% of global palm oil is RSPO certified.⁶⁵ A critical mass is needed to ensure industry-wide recognition and adherence to this standard.

⁵⁷ [Can Indonesia Continue to Reduce Palm Oil Deforestation? | Trase Insights](#)

⁵⁸ [How Palm Oil Is Certified 'Sustainable' | China Dialogue](#)

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⁶⁰ [Sustainable Palm Oil Uptake in Asia: Where Do We Go from Here? | World Wildlife Fund \(WWF\)](#)

⁶¹ [RSPO Faces Challenges of Post-Pandemic Palm Oil | Eco-Business](#)

⁶² [RSPO Faces Challenges of Post-Pandemic Palm Oil | Eco-Business](#)

⁶³ [Study on the Environmental Impact of Palm Oil Consumption and on Existing Sustainability Standards | EU](#)

⁶⁴ [Study on the Environmental Impact of Palm Oil Consumption and on Existing Sustainability Standards | EU | Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP |](#)

[Palm Oil Roadmap | Consumer Goods Forum](#)

⁶⁵ [RSPO Impact Report 2022 | Roundtable on Sustainable Palm Oil](#)

It is also important to note that even when oil is produced as certified, there is not a consistent market for it. Thus, about half of certified palm oil is not sold as certified sustainable (although this may be slightly inflated due to the potential for palm oil to be registered under multiple certification schemes without clear traceability).⁶⁶ An important feedback loop to focus on is what happens to this surplus supply of sustainable palm oil. When certified sustainable palm oil is not sold as such, it decreases the economic incentive to produce certified sustainable palm oil, which in turn lowers supply of and demand for sustainable palm oil.

OPPORTUNITIES

Improving traceability would greatly increase the effectiveness of certification schemes. Fortunately, **traceability can be increased through digital crowdsourcing**. Unilever, one of the largest palm oil buyers in the world for the manufacture of consumer goods (including foods, cleaning, beauty, and personal care products) with a commitment to sourcing a deforestation-free supply chain,⁶⁷ has pioneered a “first mile” initiative where local stakeholders upload digital images from phones of local palm-oil collection points to verify and identify which plantations feed into which mills.⁶⁸ These techniques could potentially be developed and used by other companies seeking to make their supply chains more sustainable and eliminate deforestation.

There has been tremendous growth in the number of Chinese RSPO members since the establishment of the China Sustainable Palm Oil Alliance in 2018. (This measure was launched by WWF, CFNA, and RSPO, and it has contributed to key companies in the supply chain making sustainability commitments, including COFCO, Sinograin, and Yihai Kerry.) This is promising and indicates growing awareness.⁶⁹

⁶⁶ [Study on the Environmental Impact of Palm Oil Consumption and on Existing Sustainability Standards | EU | Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP](#)

⁶⁷ [Deforestation-Free Supply Chain | Unilever | Sustainable and Deforestation-Free Palm Oil | Unilever](#)

⁶⁸ [Unilever Sustainable Sourcing Director: ‘First-Mile Data is Critical’ | China Dialogue](#)

⁶⁹ [China, the Second-Largest Palm Oil Importer, Lags in NDPE Commitments, Transparency | Chain Reaction Research](#)

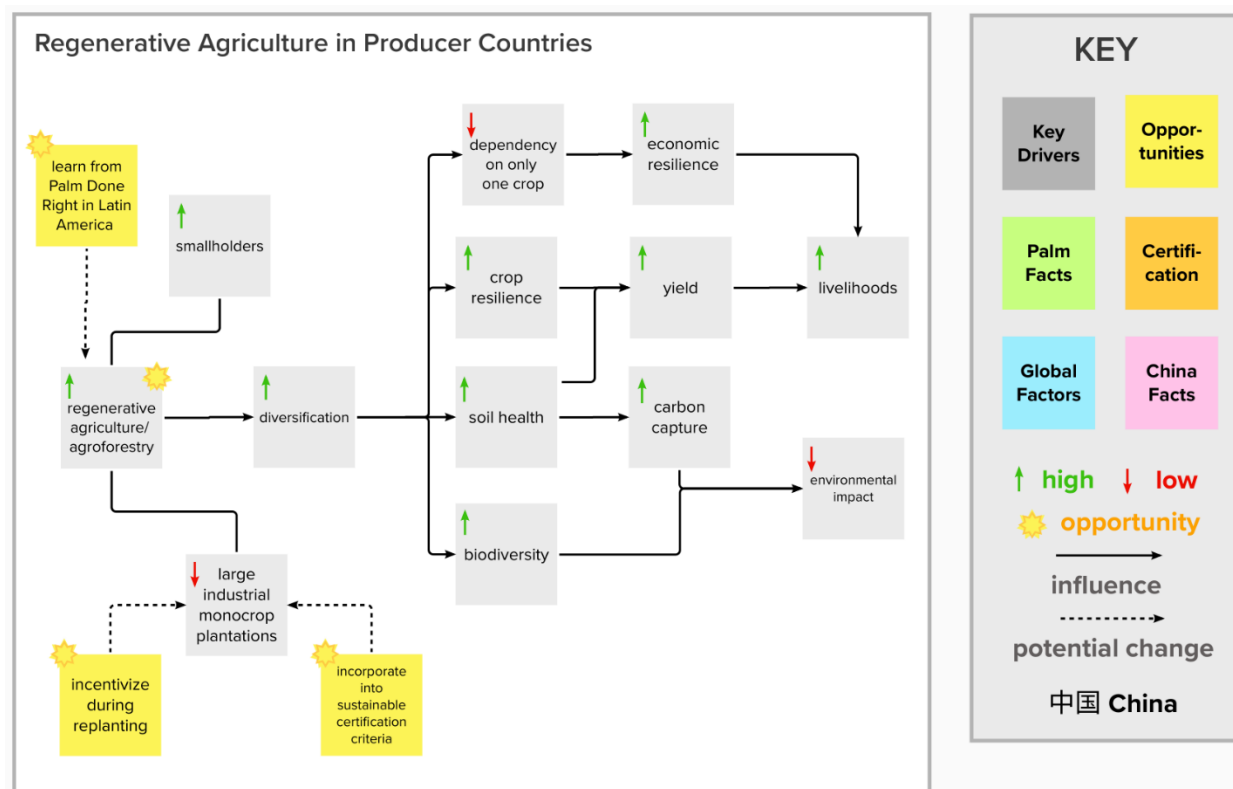
Map #7

REGENERATIVE AGRICULTURE IN PRODUCER COUNTRIES

KEY INSIGHTS

One of the most important considerations in the palm oil supply chain system is the impact of any proposed initiatives on the economies of producer countries, especially Indonesia and Malaysia (which produce the majority of the world’s palm oil (85%)).⁷⁰ Palm oil production, through a combination of industrial plantations and smallholders (producing approximately 40% of the global palm oil supply),⁷¹ is a significant source of livelihoods and poverty reduction in these countries.

Therefore, it is important to focus on ways to make palm oil production more profitable for these nations without expanding land conversion, even though production has traditionally increased due to greater land allocation, not higher yields (according to UNDP).⁷² The following map and diagram showcase ways in which introducing regenerative agriculture and recycling biomass could reduce environmental impacts while boosting economic development.



Map #7: Regenerative Agriculture in Producer Countries

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

⁷⁰ [Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP](#)

⁷¹ [RSPO Faces Challenges of Post-Pandemic Palm Oil | Eco-Business](#)

⁷² [Mapping the Palm Oil Value Chain: Opportunities for Sustainable Palm Oil in Indonesia and China | UNDP](#)

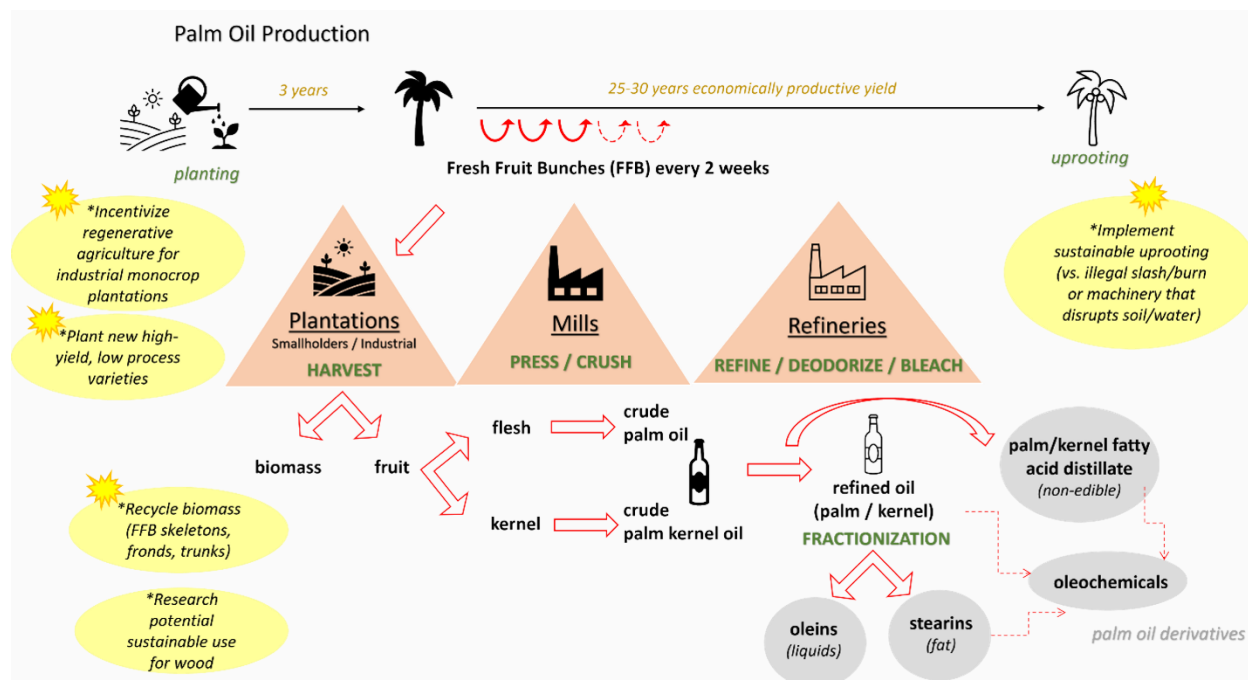


Diagram: Windows of Opportunity in Palm Oil Production Cycles

Systems Mapping by Katrina Gehman, Meridian Institute, 2022 年 12 月

OPPORTUNITIES

Regenerative agriculture contributes to biodiversity and soil health as well as livelihoods.⁷³ The palm oil production cycle can become more sustainable by **recycling biomass and incorporating regenerative agriculture practices** at key windows of time in the production process:

Planting

- The ideal time to introduce regenerative agriculture is during planting. This is feasible for many smallholder plantations. However, larger industrial monocrop plantations may need additional incentives to incorporate these practices. For lessons learned, smallholders and larger companies can turn to the organic initiatives from Palm Done Right in Latin America.⁷⁴
- Planting is also a time when new high-yield, low-process varieties could be introduced. Some new Chinese oil palm varieties have been developed (such as “Re-you 40” which is shorter and has no kernel, thus requiring less infrastructure for processing).⁷⁵ These varieties and planting technologies could be incorporated in producer nations.

Harvesting

- After the harvested FFBs are threshed (which separates the skeletons from the fruit), these skeletons and fronds could be recycled. For example, if the fronds are layered properly on plantation floors, they provide an environment for biodiversity to thrive. Skeletons could be recycled into mulch or used in biofuel production (although this process can be costly, especially for smallholders).

⁷³ [Can Regenerative Agriculture Transform Palm Oil? | China Dialogue](#)

⁷⁴ [Organic Palm Oil Benefits: Palm Done Right | New Pathways to Sustainable Palm Oil | China Dialogue](#)

⁷⁵ [Will China Produce Its Own Palm Oil? | China Dialogue](#)

Uprooting

- During uprooting at the end of the 25-30 year productive cycle, harmful use of heavy machinery and illegal slash-and-burn techniques can lead to soil erosion, increased risk of flooding, and anaerobic soil conditions that cannot support nutrients.⁷⁶ Shifting uprooting practices could improve these detrimental environmental impacts.
- Uprooting also provides an opportunity for recycling of the palm wood trunks. The governments of producer countries could support research in this area, potentially in partnership with consumer nations such as China.

SPOTLIGHT:

Consumer Awareness Campaign in China

Encourage consumption of sustainable palm oil in China with an awareness campaign on social media to inform consumers about unsustainable palm oil and its links to deforestation. This campaign could be connected with the instant noodle industry since it represents one fourth of edible oil imported in China. There is thus the possibility for significant impact.

Important Considerations:

- Use a positive (not negative) approach to raise awareness without condemning the industry.
- Promote certified sustainable palm oil, not “palm oil-free” products.
- Employ a unifying motto with myriad stakeholders to promote collective consensus and action.

Slogan Idea:

There is a Chinese phrase that could be used as a play-on-words to encourage awareness and use of sustainable palm oil in China.

- 加油! *Jiāyóu!* | Add Oil! (*literal*) | Stay strong! (*metaphorical*)

加油! 加可持续棕榈油!
Jiāyóu! Jiā kě chíxù zōnglǔ yóu!
 COME ON, WE CAN DO IT!
 Add Sustainable Palm Oil!

Spotlight: Consumer Awareness Campaign in China

⁷⁶ [Anatomy of an Oil Palm | China Dialogue](#)

Recommendations

Key Recommendations from Systems Mapping China's Palm Oil Supply Chain

CONSUMER AWARENESS

- Raise awareness for consumers in China about unsustainable palm oil to increase market demand for sustainable palm oil in the context of helping China achieve its climate commitments for ecological civilization. Focus on the instant noodle industry and other consumer goods that use palm oil derivatives. Promote certified sustainable palm oil, not “palm oil-free” products.

FINANCIAL POLICY

- Build on China's global leadership for strong domestic forest management policies to pave the way for green financial regulations. Revise China's commercial law to require financial companies to include deforestation in due diligence for companies in which they invest.

DOMESTIC PRODUCTION

- Consider cultivating domestic palm oil production on marginal lands in China to meet some of China's rising demand while reducing deforestation pressure in Southeast Asia. Export Chinese oil palm varieties that are healthy, high-yield, and less processing-intensive.

BIOFUEL

- Employ biofuel from used cooking oil to serve as a transition fuel to carbon-neutral transportation through domestic production/consumption in China and Indonesia.

PRODUCTION CYCLE

- Recycle biomass and incorporate regenerative agriculture practices during key windows of time in the palm oil production cycle, such as planting, harvesting, and uprooting. Prioritize the well-being of smallholders by addressing grievances and reducing barriers to sustainability certifications using sector-wide jurisdictional approaches. Improve the traceability of palm oil supply chains through digital crowdsourcing.

PARTNERSHIPS

- Form strategic partnerships between China, Indonesia, and Malaysia with shared goals around improving smallholder livelihoods, producing and using biofuel from used cooking oil, and promoting deforestation-free finance. Acknowledge producer country efforts and accomplishments through positive and politically sensitive messaging about palm oil.

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