Solidaridad

BAROMETER

ON SUSTAINABLE PALM OIL PRODUCTION AND TRADE IN COLOMBIA

2022

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EXECUTIVE SUMMARY

GLOBAL OUTLOOK

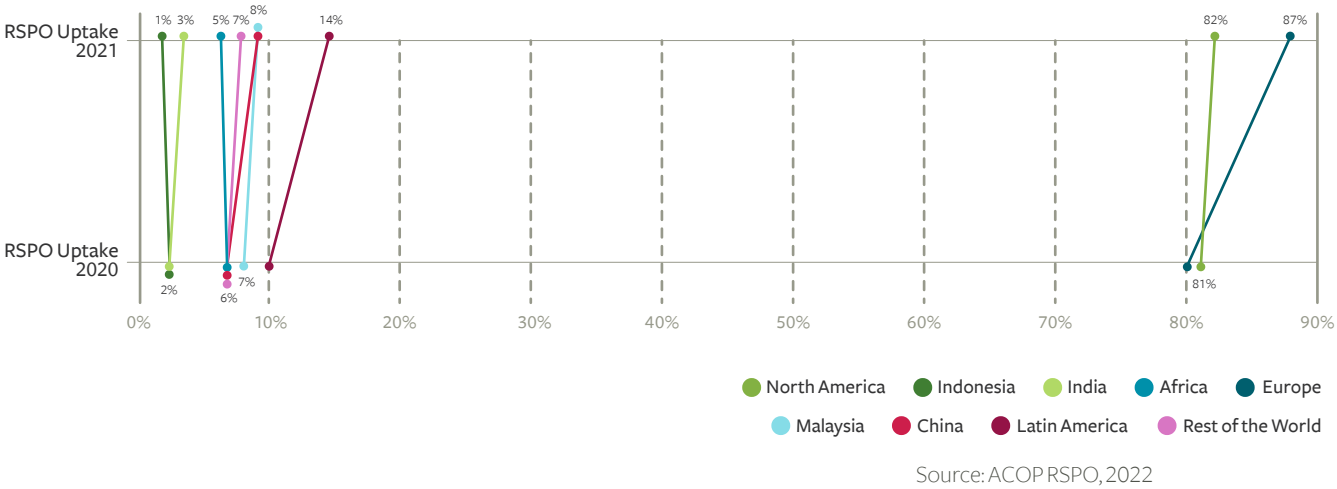
Global palm oil production reached 77.2 million tonnes in 2022, according to Oil World estimates, an increase of 1% compared to 2021. Additionally, production area increased from 23.8 million hectares in 2021 to 24.2 million hectares in 2022. The last 2 years have been characterized by constant uncertainty and volatility in the international oil and fat markets, mainly due to the conflict between Russia and Ukraine.

Global production and consumption of Certified Sustainable Palm Oil (CSPO) compliant with Voluntary Sustainability Standards (VSS) has continued to demonstrate favorable growth over the past two years. In the case of the Roundtable on Sustainable Palm Oil (RSPO), certified volume increased by 5.7% to 14.7 million tonnes, representing 19% of total palm oil production worldwide. The total area of certified land reached 4.45 million hectares, or 55% of the total estimated global area.

Global RSPO-certified sales also experienced substantial increases between 2021 and 2022: 13.5% with an estimated total of 9 million tons, adding up RSPO physical and credit volumes, representing 61% of total CSPO production in 2022. The key regions for RSPO-certified consumption are still Europe (87%) and North America (82%).

In the meantime, Latin American demand for RSPO-certified has increased to 14%, while the Indonesian, Malaysian, Indian, and Chinese markets exhibit much lower CSPO uptake between 1–8%. Although countries in Europe and North America have been pioneers in sustainability requirements while at the same time leading sustainable consumption, they are already close to 100% responsible sourcing, with little room for growth.

RSPO-CERTIFIED PURCHASE PERCENTAGE BY COUNTRIES AND REGIONS



Source: ACOP RSPO, 2022

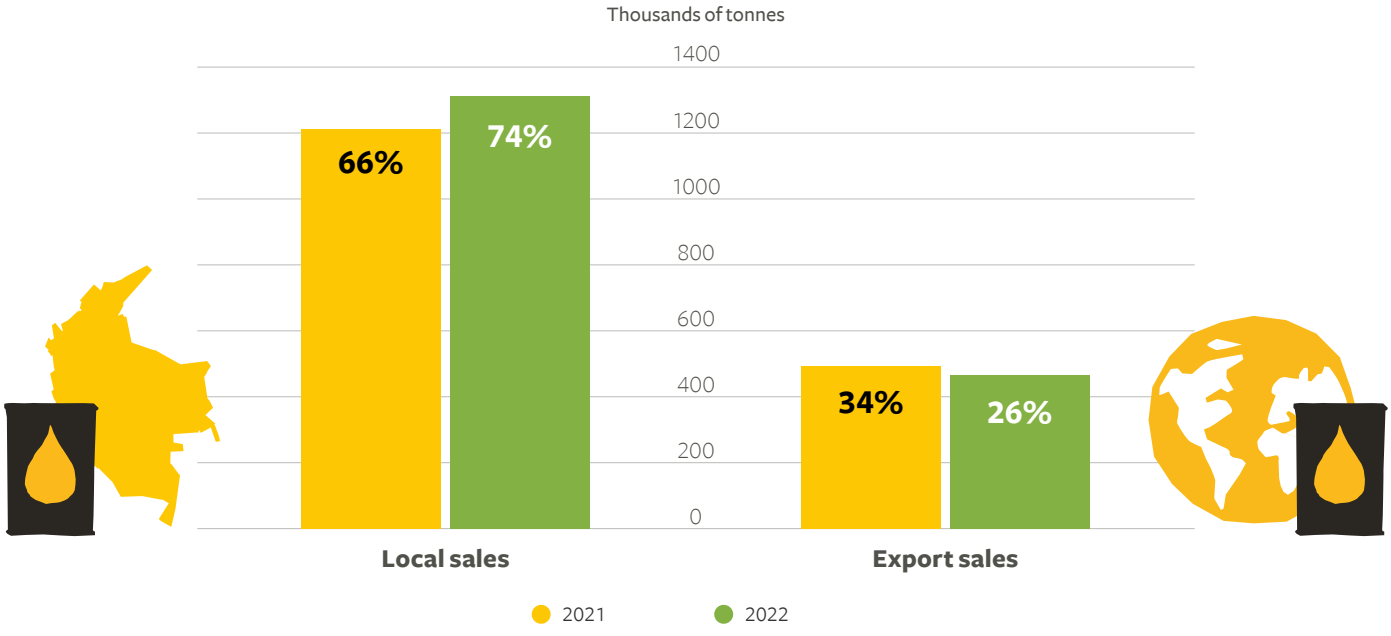
By contrast, more than 50% of palm oil produced in the world is being consumed by the domestic markets of emerging countries, in which it is sold as conventional palm oil, with less than 5% being recognized as sustainable. **It is now essential to focus efforts on domestic markets of production countries in Asia and Latin America where there are not yet strict sustainability requirements**. One factor that strengthens this trend is the fact that the European Union market share has dropped to less than 10% whereas Asian countries such as India and China represent more than 40% of world imports and continue to grow. The growing restrictions of European regulation could reduce import volumes in that region even further while simultaneously leaving an open window to furnish supply to emerging markets with less strict requirements in Asia, Africa and Latin America.

COLOMBIAN CONTEXT

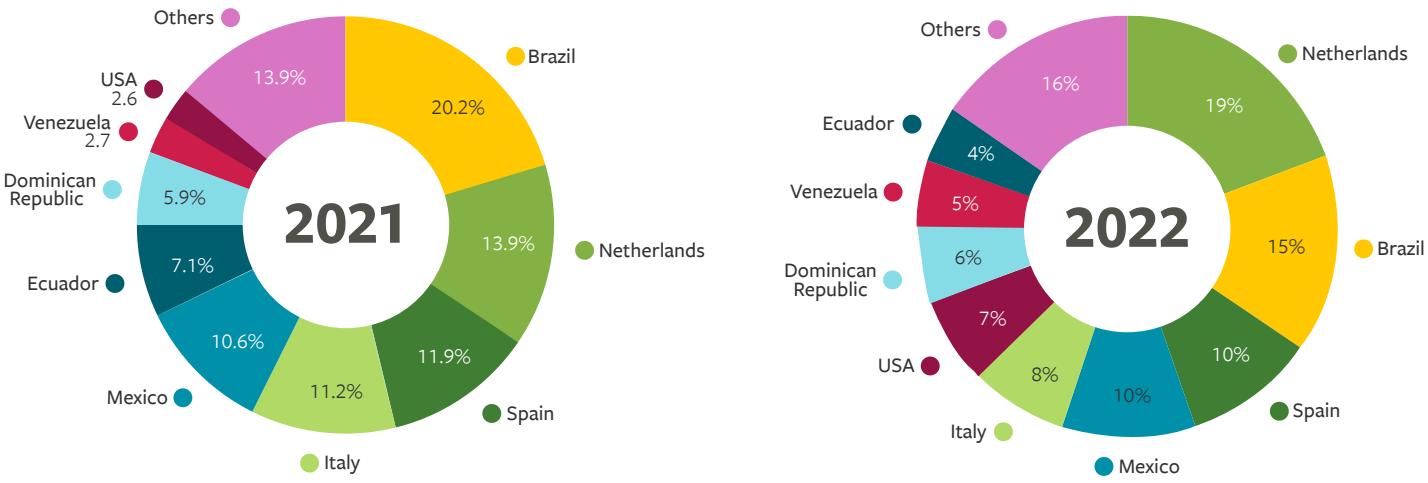
In 2021 and 2022, Colombian palm oil production reached record figures. From 1.5 million tonnes of palm oil produced in 2020, the sector showed an increase of more than 12%, reaching 1.7 million tonnes in 2021; and in 2022, an additional 78 thousand tonnes were produced, amounting to a total of 1.77 million tonnes.

Regarding trade flows, 74% of Colombian palm oil sales went to the domestic market and 26% to export markets. There are two key differences: First, purchases by the Netherlands have risen to 19%, a growth of 5 percentage points compared to the previous year. Second, purchases by the United States have increased from 2.6% to 7%. In absolute terms, domestic market palm oil sales reached 1.3 million tonnes, a growth of 8.6% compared to 2021. This behavior reaffirms the importance of incorporating the concept of sustainability into domestic markets to ensure that production practices continue to improve beyond the volumes that are sold to the foreign market.

DOMESTIC VS. INTERNATIONAL MARKET



DISTRIBUTION OF COLOMBIAN PALM OIL EXPORTS 1 / BY COUNTRY OF DESTINATION, 2021 (IN PERCENTAGE)



In 2021 and 2022, palm growers experienced favorable conditions due to internationally high palm oil prices, translating to a real value in Colombia of around $5,300,000 pesos on average per ton. This was a significant increase of 65.7% that was also encouraged by the devaluation of the Colombian peso. This increase in prices has offset the income of palm growers, mitigating the effect of the inflationary trend in Colombia, which in 2022 was 13.1%. It has also enabled greater cash flow, which in turn enabled efficient fertilizer application, which enabled productivity increases and investments in best sustainability practices.

The volume of certified palm oil increased 7% from 2021 to 2022, from 458 thousand tonnes in 2021 to an estimated 491 thousand tonnes of CSPO in 2022. The proportion of this sustainable volume over the total production in Colombia is 28%. This sustainability percentage has remained relatively stable in recent years and reflects Colombia's record production.

TOTAL QUANTITY OF CERTIFIED TONS 2014-2020

Source: Fedepalma and own estimates

In the last two years, 14 oil palm companies, including plantations and extraction mills, joined the RSPO and ISCC certification frameworks for the first time, an increase in certified companies of 48% compared to 2020. This confirms the sector's commitment to move toward implementing best practices.

For its part, Colombia launched the Sustainable Colombian Palm Oil Program near the end of 2021 through the APSColombia corporation in conjunction with the National Federation of Oil Palm Growers (Fedepalma). The aim was to create a national brand and to position Colombian palm oil as a unique oil differentiated by its business practices.

Deforestation associated with oil palm crops in Colombia has continuously decreased since the first measurements in 2017, going from 0.4% to 0.2% in 2018 and later to 0.03% for 2019, according to figures from IDEAM, which is the governamental entity tasked with overseeing Colombia's Forest Monitoring System. At global level, **these monitoring results set Colombia apart as an palm oil origin with a very low risk of deforestation in the face of the upcoming European Deforestation Regulation (EUDR)**.

DEFORESTATION LINKED TO COLOMBIAN PALM OIL INDUSTRY IN THE YEARS 2017, 2018, AND 2019

Source: Ideam, 2022

HOW COLOMBIAN PALM OIL FITS INTO THE INTERNATIONAL PALM OIL MARKET

GLOBAL PRODUCTION

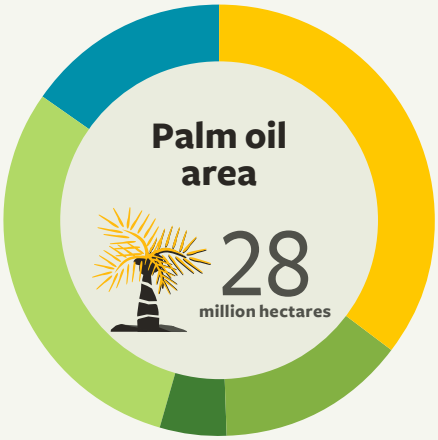
Global palm oil production was 77.2 million tons in 2022, according to the source Oil World estimates, an increase of 1% compared to 2021. Additionally, production area increased from 23.8 million hectares in 2021 to 24.2 million hectares in 2022.

This volume represents nearly 33% of world vegetable oil production. Agro-climatic conditions made it possible for the world's main producers to increase their national production averages due to balanced rainfall patterns that favored productivity.

Indonesia and Malaysia remain the world's leading producers of palm oil. In 2022, Indonesia's production increased by 2% to 49.4 million tonnes, compared to 48.4 million tonnes in 2021. Malaysia's palm oil production reached18.8 million tonnes, 1.7% higher than in 2021, when it reached 18.12 million tonnes. (MPOB, 2022).

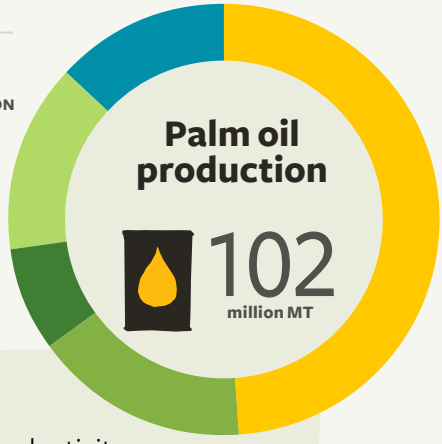
It is estimated that in 2050 the global area planted with oil palm will reach 28 million hectares, which is 16% more than planted area in 2022. It is also estimated that production volume will reach 102 million tons by 2050, an increase of 32% compared to current figures. Indonesia and Malaysia will continue to be the main global producers but it is estimated that their market share will decrease to 24% and 7%, respectively, by 2050. Latin America will slightly increase from 5% in 2022 to 6% in 2050, while Africa will increase its market share from 30% to 44% in the same period. Meanwhile, palm oil consumption will rise to 101 million tons, driven by population growth, especially in Sub-Saharan Africa (30%) and by greater trade flow to India (16%).

PALM OIL MARKET OUTLOOK: 2050



REGION	DISTRIBUCIÓN GLOBAL 2022	DISTRIBUCIÓN GLOBAL 2050
Indonesia	35%	24%
Malaysia	14%	7%
Latin America	5%	1%
Africa	30%	44%
Rest of Asia and Oceania	15%	20%

REGIÓN	DISTRIBUCIÓN GLOBAL 2022	DISTRIBUCIÓN GLOBAL 2050
Indonesia	49%	39%
Malaysia	16%	8%
Latin America	8%	10%
Africa	14%	23%
Rest of Asia and Oceania	13%	20%



Production trends

- Declining area in Indonesia and Malaysia. conversion to housing; focus on automation and yields to improve productivity.
- India and Nigeria have achieved a level of self–sufficiency.
- New frontier areas for development have emerged. including Dem. Rep. of Congo. Myanmar. Bangladesh. East Africa.

REGION	DISTRIBUCIÓN GLOBAL 2022	DISTRIBUCIÓN GLOBAL 2050
Europe	4%	0%
North America	1%	1%
Malaysia	4%	4%
Indonesia	21%	15%
China	6%	6%
India	14%	16%
Latin America	7%	8%
Africa	22%	30%
Rest of Asia and Oceania	21%	20%

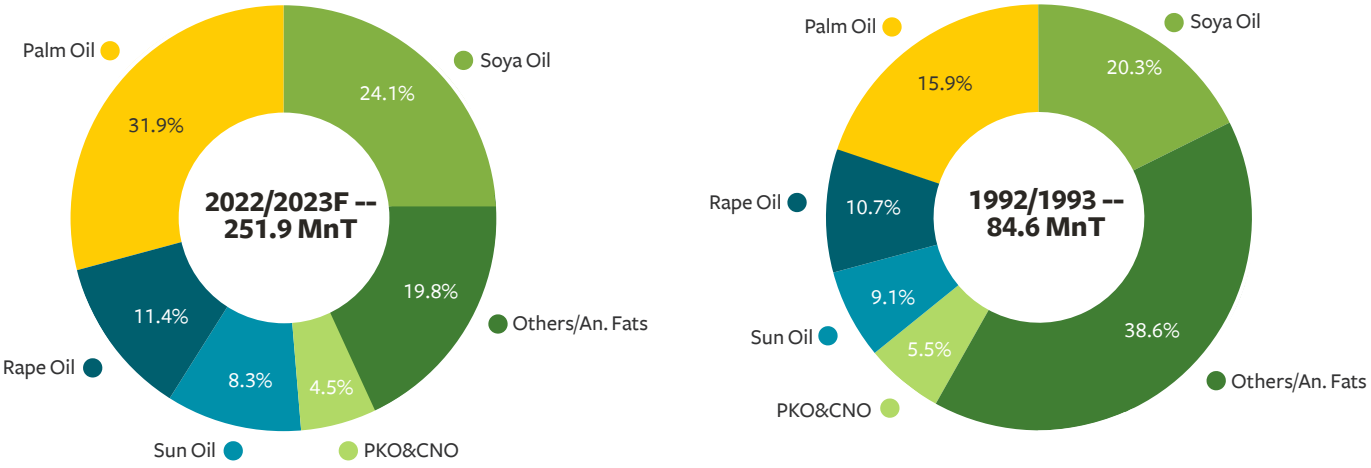
Consumption trends

- Europe and North America consumption has declined. entirely driven by food and oleochemicals.
- Sustainability in animal feed now a priority.
- Consumption in sub–Saharan Africa and South Asia has increased dramatically. driven by population growth.
- Trade structures have upended; India exports to Pakistan and Iran. West Africa near self–sufficiency.

Source: https://rt.rspo.org/ckfinder/userfiles/files/P3%2001%20Yen%20Hun%20Sung.pdf

The palm oil market is set to steadily increase, both in supply and demand. This situation will continue to exert pressure on prices and represent a challenge for new plantations, revived plantations, and new producing countries, which will make it difficult for these new developments to comply with criteria related to human rights, biodiversity protection, and zero deforestation goals. The challenge becomes even greater considering that the most biodiverse countries, located in the tropics, are the main producers; such is the case with Brazil, Indonesia, Colombia, and Mexico.

WORLDWIDE OIL AND FAT PRODUCTION TREND



Source: Oil World, 2023

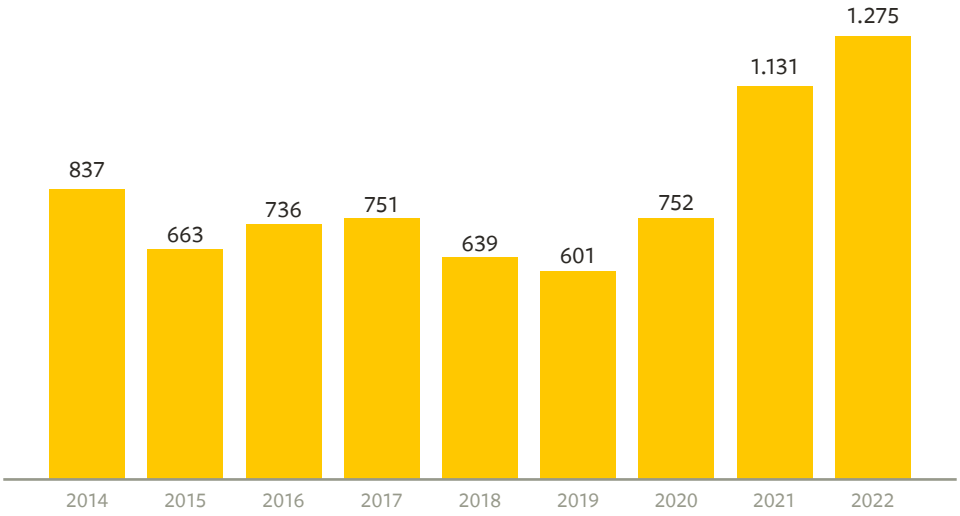
According to the distribution of worldwide vegetable oil production trends, it is clear that—in order to satisfy future demand for oils—palm oil is emerging as the main player compared to other oils and fats because of its main qualities (higher yield per hectare, versatile for different uses, competitive production costs). We can see proof of this in the last three decades: palm oil doubled its market share from 16% to 32% while the other vegetable oils remained relatively constant.

INTERNATIONAL PRICES: GEOPOLITICAL FACTORS THAT IMPACT THE VEGETABLE OILS SECTOR

In general, market trends for vegetable oils and fats are determined by a combination of the following factors: consumer demand and a growing population, climate factors in the main producer countries along with their own domestic use of oils, geopolitical tensions, and the global context following the COVID-19 pandemic.

The last 2 years have been characterized by constant uncertainty and volatility in international markets for oils and fats, a result of various factors that affected both supply and demand. The foremost causes stem from geopolitical factors, the limited supply of different vegetable oils, restrictive internal policies in the leading producer countries, and increased demand due to population growth. It was in this context that, in 2022, international prices fluctuated on average around USD 1,275 per ton of conventional oil, an increase of 12% compared to 2021.

AVERAGE WORLDWIDE PALM OIL PRICES FROM 2014 TO 2024 (IN NOMINAL US DOLLARS PER TON)



Source: https://www.statista.com/statistics/675813/average-prices-palm-oil-worldwide/

On the other hand, the ongoing global conflict between **Russia and Ukraine** has had a considerable impact on the agricultural sector, particularly on fertilizer exports, since it has generated trade restrictions and geopolitical tensions. Colombia imports about 42% of fertilizers for the agricultural sector directly from Russia and Ukraine, so the impact has been substantial, with fertilizer costs rising 200–300% due to scarcity and growing demand for perennial crops (La República).

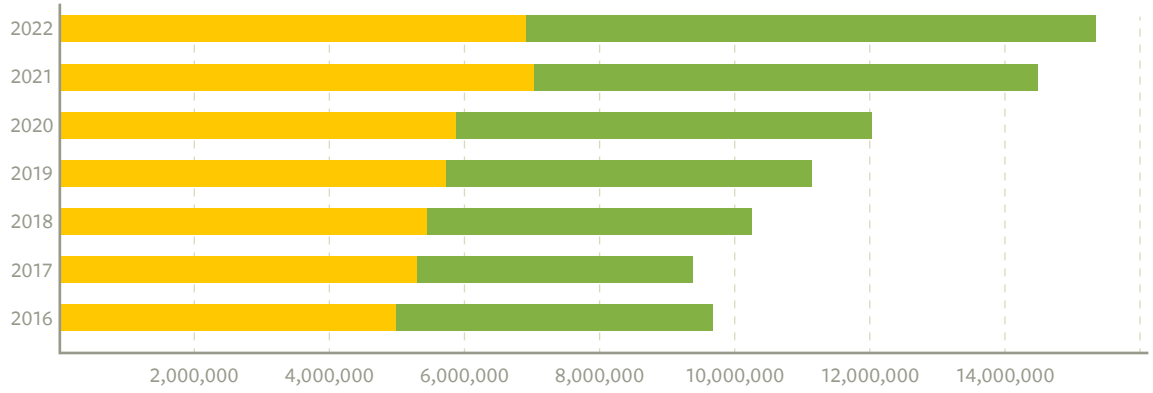
GLOBAL SUSTAINABLE PALM OIL TRENDS WITH VOLUNTARY SUSTAINABILITY STANDARDS:

ROBUST GROWTH IN SUSTAINABLE PRODUCTION AND CONSUMPTION

Global production and consumption of Certified Sustainable Palm Oil (CSPO) compliant with Voluntary Sustainability Standards (VSS) has continued to demonstrate favorable growth over the past two years.

In the case of the Roundtable on Sustainable Palm Oil (**RSPO**), certified volume increased by 5.7% to 14.7 million tonnes, representing 19% of total palm oil production worldwide. The total area of certified land reached 4.45 million hectares, or 55% of the total estimated global area.

GROWTH IN ESTIMATED CSPO ACTUAL PRODUCTION (AP)

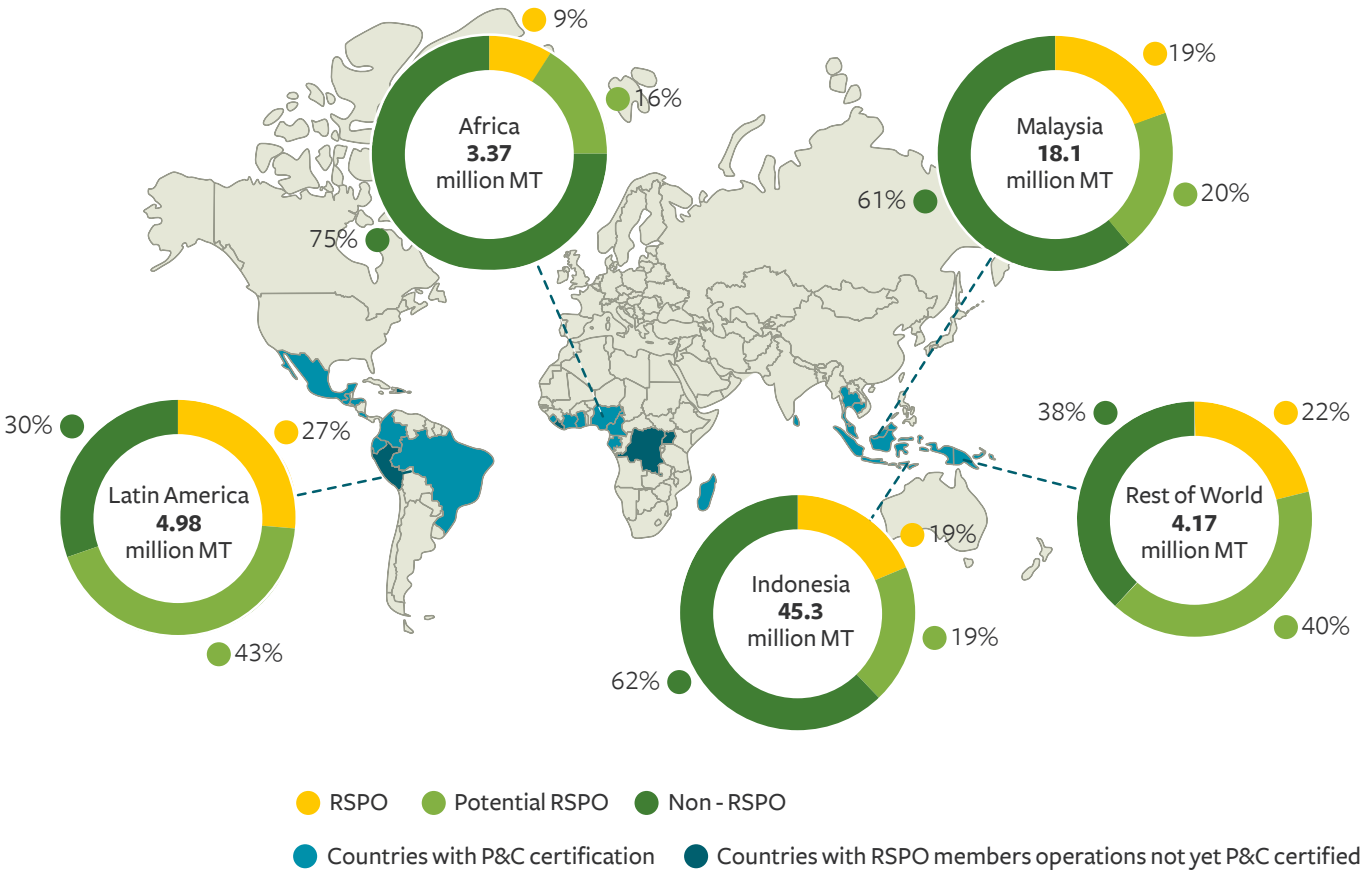


Note: all figures are cumulative of the calendar year (1 january to 31 december)

Source: RSPO Impact Report, 2022

Among palm oil-producing regions, Latin America showed strong growth in 2021 and 2022, exhibiting the highest proportion of RSPO-certified production at 27% of total volume produced. Likewise, the region continues to strengthen its approach to the inclusion of smallholders; 20% of certified palm oil in the region comes from small-scale farms associated with extraction mills. For their part, Indonesia and Malaysia continue to be the main producing countries, showing stable RSPO-certified results, totaling 19% of national production for both countries. Two milestones have been reached: Latin America crossed the 1 million ton mark in 2020, and Africa reached 300,000 certified tonnes in 2021.

GLOBAL DISTRIBUTION OF RSPO-CERTIFIED, POTENTIAL OF RSPO AND PALM OIL PRODUCTION



Source: RSPO Impact Report, 2022

Regarding the strategy for including smallholders, which is marked by implementing the specific standard for this group (independent smallholders (ISH), according to RSPO fund estimates in 2021, 22,017 palm smallholders were able to earn ISH certification. These smallholders were mainly in Indonesia and Africa (Sierra Leone). This feat was accomplished thanks to financing from the projects shown in the following graph. This shows considerable support to accelerate smallholder adoption of best practices, however it represents less than 1% of the global total, indicating that the inclusion of smallholders in sustainable supply chains is minimal up to the present date.

RSSF FUNDING FOR ISH GROUPS AND RESULTING IMPACT ON ISH CERTIFICATION

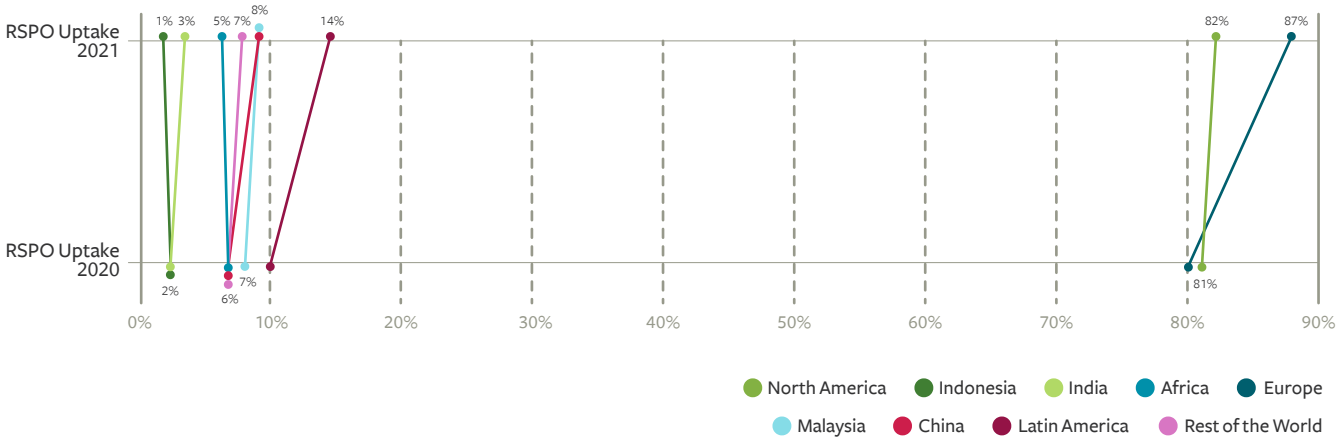
	Certified ISHs (Producers)	Certified Production Area (Hectares)	Certified FFB Production (Tons)
	22,017	**65,603**	**987,896**
Cretified ISH groups founded RSSF	71%	69%	64%
RSSF Project	**15,680**	**45,064**	**45,064**
Indonesia	5,980	13,902	230,669
Malaysia	1,324	6,225	90,338
Latin America	-	-	-
Africa	4,983	8,667	12,488
Rest of Asia and Pacific	3,393	16,270	299,542

Source: RSPO Impact Report, 2022

Global RSPO-certified sales also experienced substantial increases between 2021 and 2022: 13.5% with an estimated total of 9 million tonnes, adding up RSPO physical and credit volumes, representing 61% of total RSPO-certified production in 2022. Regarding sustainable palm oil consumption, it is estimated that 8.5 million tonnes were recognized as sustainable, that is, 94% of total sales, reflecting a significant increase of 12.2% compared to the previous year. This conveys an upward trend in RSPO consumption using RSPO credits or physical supply chains, up from 52% in 2019 and 57% in 2020. According to RSPO calculations, the remaining CSPO volumes were sold under other certification frameworks or as conventional palm oil.

The key regions for RSPO-certified consumption are still Europe (87%) and North America (82%). Meanwhile, Latin American demand for CSPO has increased to 14%, while the Indonesian, Malaysian, Indian, and Chinese markets exhibit much lower RSPO-certified uptake between 1–8%

RSPO-CERTIFIED PURCHASE PERCENTAGE BY COUNTRIES AND REGIONS



Source: ACOP RSPO, 2022

These figures send a clear message to the global sustainable palm oil market. Although countries in Europe and North America have been pioneers in sustainability requirements while at the same time leading sustainable consumption, they are already close to 100% responsible sourcing, with little room for growth.

By contrast, more than 50% of palm oil produced in the world is being consumed by the domestic markets of emerging countries in wich is sold as conventional palm oil, with less than 5% being recognized as sustainable.

This means that, it is now essential to focus efforts on domestic markets of production countries in Asia and Latin America where there are not yet strict sustainability requirements. Otherwise, true transformation of the supply chain toward environmentally and socially responsible production will not be fully realized on a global scale.

PALM OIL IMPORTS FROM KEY DESTINATIONS

	ESTIMATED IMPORTS (MIL TONNES)	
	2020/21	2021/22
India	8.5	8.6
China	6.8	7.2
EU-27	6.2	6.9
Others	26.1	27.9
World	47.6	50.6

Note: E - Estimates as of December
Source: The United States Department of Agriculture (USDA) & Refinitiv

We can see this in the fact that the European Union is the third largest importer of palm oil in the world, with an estimated volume of 6,9 million tons, which represents less than 10% of the global total, while Asian countries such as India and China represent more than 40% of global imports. In other words, the growing restrictions of European regulation could reduce import volumes in that region while leaving an open window to supply emerging markets with less strict requirements such as India, Bangladesh, Pakistan, and countries in Africa and Latin America.

Likewise, data from the International Sustainability and Carbon Certification (**ISCC**) indicate that by 2021 a total of 1.88 million hectares of oil palm were certified worldwide, an increase of 15% compared to the previous year. The largest amount of certified area mainly comes from Indonesia (1.39 million ha), and Malaysia (0.40 million ha).

According to ISCC auditors and this impact report, the main benefits of this standard have to do with reducing the environmental footprint by improving water management, increasing the use of renewable energies, and reducing deforestation.

The category of waste and residues stands out as the most representative in recent years, since 632,000 tonnes of effluents from palm oil extraction mills were certified in 2021, reflecting an increase of 100% compared to the previous year, all recognized as sustainable at time of sale. This also shows that the concept of circular economy is gaining attention in production chains because it makes a transition toward practices that reduce the pressure on agricultural land possible, taking advantage of residues to generate added value with less environmental footprint.

Likewise, it is important to mention that national standards coverage continues to increase. During 2021–2022, certification in Indonesia (**ISPO**) covered 42% of the palm oil production area out of a total 13.3 million hectares, while **MSPO** in Malaysia accounted for 98% of the palm oil production area out of a total 5.2 million hectares[1].

The Indonesian Sustainable Palm Oil (ISPO) standard was introduced in 2011 by the Indonesian government as a mandatory requirement for all plantations, including smallholders, with a goal of 100% compliance by 2025. ISPO does not include any traceability requirements, despite having been revised in 2020.

The Malaysian Sustainable Palm Oil (MSPO) certification framework is the national model and was made mandatory by the Malaysian government in 2017 with an compliance required by the end of 2019, although it was later extended until 2022 for smallholders. MSPO includes traceability back to fresh fruit bunch (FFB) suppliers and the plantation. Recently, the Malaysian Palm Oil Council (MPOC) has stated that it aims to achieve 100% traceability to plantation by 2025.

[1] https://www.tropicalforestalliance.org/assets/TFA-EU-deep-dives-Geolocation-traceability-session-palm-oil.pdf

COLOMBIAN PALM OIL OUTLOOK: 2021–2022:

RECORD PRODUCTION CONTINUES TO INCREASE SALES IN THE DOMESTIC MARKET WHILE UNDERPINNING SUSTAINABLE VOLUME GROWTH

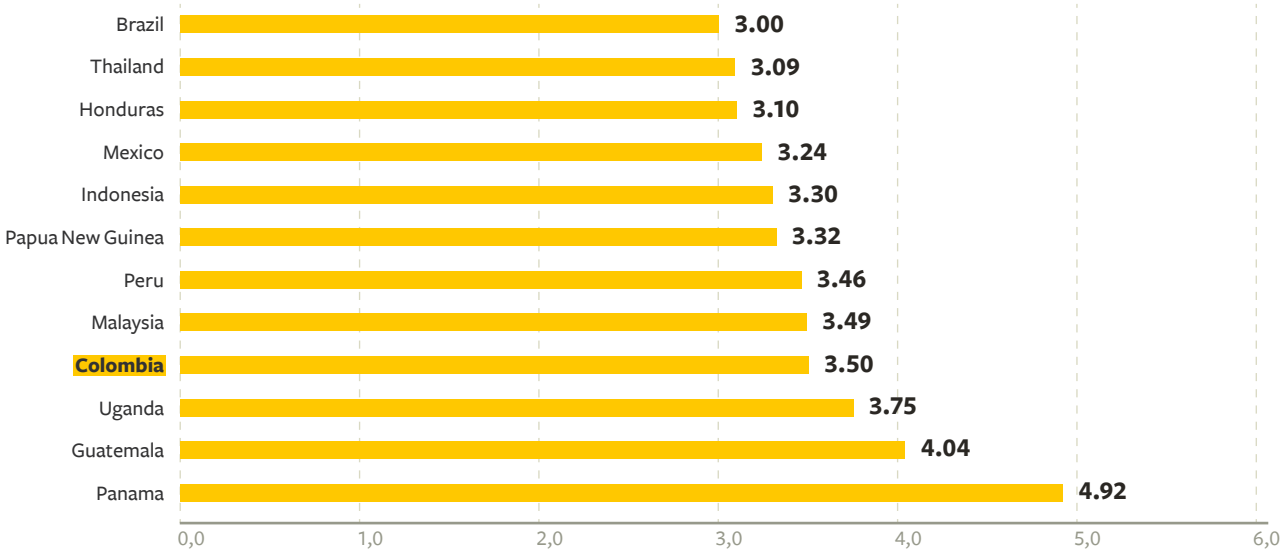
In 2021 and 2022, Colombian palm oil production reached record figures. From 1.5 million tonnes of palm oil produced in 2020, the sector showed an increase of more than 12%, reaching 1.7 million tonnes in 2021; and in 2022, an additional 78,000 tonnes were produced, amounting to a total of 1.77 million tonnes. Adding to the Fedepalma analysis, this significant growth is attributed to, among other reasons, great productivity both in fruit (3.5 tonnes/ha) and oil (15.7 tonnes/ha), which was especially the case with the OxG hybrid variant. Additionally, this productivity can be attributed to fertilization best practices that stemmed from implementing sustainability standards, which in turn were favored when oil prices began to improve in 2020. The productivity jump can also be attributed to greater rainfall that was also better distributed among the country's different palm-growing regions, which underscores the importance of water resources for crop productivity.

Palm kernel production in 2022, for its part, reached 322,500 tonnes, a 3% rise compared to the previous year. This was a continuation of the growth seen in 2021 when production rose 8%, 23,800 tonnes more than the volume reported in 2020. In summary, the production of palm kernel oil reached 122,915 tonnes in 2021 and 135,200 tonnes in 2022, an increase of 7% and 10% respectively compared to the immediately previous years. Although these figures show us growth over the last two years, it is important to anticipate that this trend may change in the medium and long term due to increased planting of hybrid varieties.

Comparing Colombia's yield in 2021 and 2022 (3.5 ton/ha) in with the performance of leading Southeast Asian countries gives us a favorable picture: comparing to previous years, Colombia's 7% recovery put its productivity in a position to exceed the yields recorded by Malaysia (3.4 ton/ha) and Indonesia (3.3 ton/ha). Colombia

likewise surpassed other producing countries in the region such as Brazil (3.0 ton/ha) and Honduras (3.1 ton/ha). Guatemala, for its part, continues to lead with high productivity (4.04 ton/ha) despite experiencing a slight decrease of 2% in relation to previous periods (Fedepalma Statistical Yearbook, 2022).

PALM OIL YIELD BY COUNTRY (TONS BY HECTARE)



Source: Fedepalma Statistical Yearbook, 2022.

Regarding trade patterns, 74% of Colombian palm oil sales went to the domestic market and 26% to export markets. In absolute terms, domestic market palm oil sales reached 1.3 million tonnes, a growth of 8.6% compared to 2021.

This behavior reaffirms the importance of incorporating the concept of sustainability into domestic markets to ensure that production practices continue to improve beyond the volumes that are sold to the foreign market.

For their part, exports amounted to 575,000tons in 2022, an increase of 9% compared to the previous year. However, comparing to 2020 reminds us that current exports represent a 23% decrease over the last two years.

It is important to highlight that the palm sector's increase in exports between 2021 and 2022 is mainly due to products processed with palm oil or products that have palm oil as an ingredient. For example, the volume of palm oil to make soaps is noteworthy, which in 2022 rose 97% compared to the previous year, going from 7,046 to 13,905 tonnes. Likewise, exports of palm oil for processed products increased 10% and 2% for margarines.

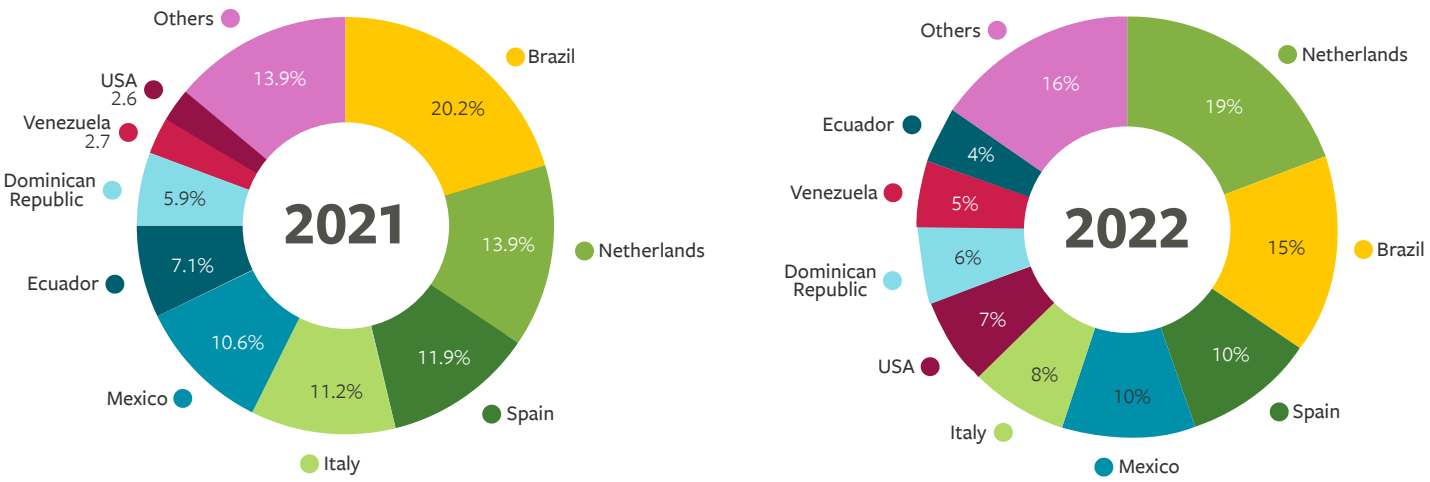
These volume export figures, once separated into different categories, hold an interesting message for the Colombian palm sector's trade and marketing efforts. They show that demand is oriented more towards a value added products, which, for example, is the case of the United States, which buys fractionated palm products—olein and stearin—instead of crude palm oil. This behavior also highlights the challenge Colombia will have to stay on par, not just with sustainability compliance, but also with quality standards demanded by the market.

In 2021, the main export destinations were Brazil (20.2%), the Netherlands (13.9%), Spain (11.9%), Italy (11.2%), and Mexico (10.6%), according to figures gathered by Fedepalma. It is important to note that these countries have favourable-access conditions when it comes to Colombian palm oil, thanks to set of free trade agreements (FTAs).

It is striking that in previous years Germany's share among Colombian palm oil export destinations was more evident, at around 4%. German purchases have been limited in recent years and are almost non-existent in 2022, because this type of vegetable oil is no longer an accepted feedstock for biofuel blending in Germany.

In 2022, we observed an interesting change in the export destination countries for Colombian palm oil. There are two main changes. First, purchases by the Netherlands have risen to 19%, a growth of 5 percentage points compared to the previous year. Second, purchases by the United States have increased from 2.6% to 7%. On one hand, this dynamic demonstrates Europe's eagerness to get its supply from sustainable sources and perhaps to gradually reduce dependence on Southeast Asian production. On the other hand, we see the growing interest of the United States to acquire fractionated palm products or end products that have palm oil as an ingredient. Undoubtedly, both trends represent attractive potential opportunities to the Colombian palm sector.

DISTRIBUTION OF COLOMBIAN PALM OIL EXPORTS 1 / BY COUNTRY OF DESTINATION, 2021 (IN PERCENTAGE)



Source: Fedepalma Statistical Yearbook, 2022.
Fedepalma Statistical Yearbook, Preliminary 2023

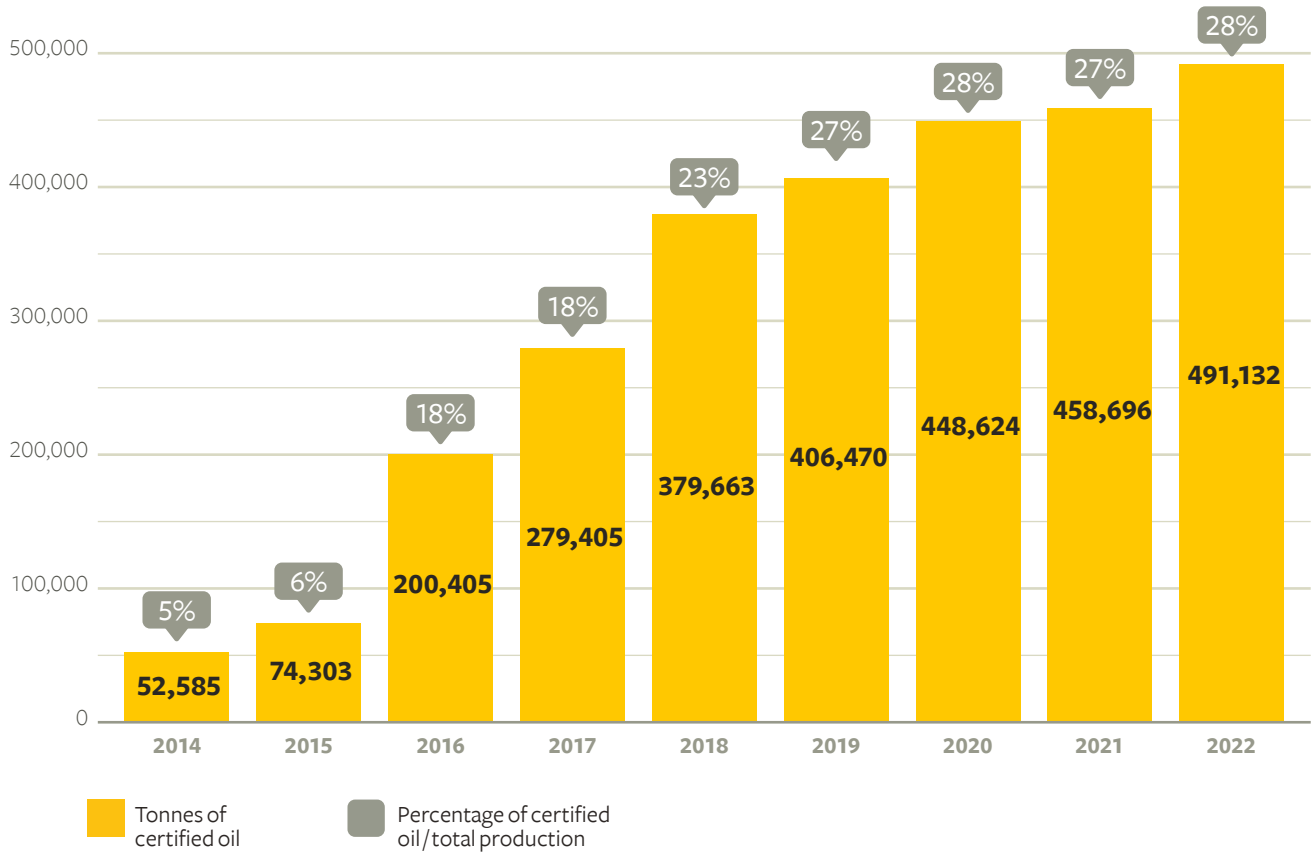
On the other hand, total imports of vegetable and animal oils and fats in Colombia decreased 13.8%, from 657,000 tonnes in 2021 to 566,000 tonnes in 2022. This downward trend comes amid an international market distorted by sudden export restrictions from Malaysia and Indonesia, as well as premiums stemming from high price differentials for soybean, sunflower, and canola oils. Another factor that has influenced this trend stems from high ocean freight prices that make shipping more expensive, the market more congested, and purchases from abroad less attractive.

Nonetheless, although Colombian imports of oils and fats have steadily decreased, in the case of palm oil, it is important to draw attention to changes in origin. Purchases from Peru and Ecuador have decreased 81% and 23% respectively, in line with general trends. By contrast, however, purchases from Indonesia in 2022 amounted to 78,000 tonnes of refined palm oil (56% of the total), while in 2020 there were no such purchases from Indonesia at all. The reason for this particular development is that the high rates imposed on crude palm oil in Asia have made refined palm oil more competitive, making it attractive for Colombian industry to acquire it to later incorporate it into finished products, as has been discussed previously (soaps, margarines, processed products, etc).

In 2021 and 2022, palm growers experienced favorable conditions due to internationally high palm oil prices, translating to a real value in Colombia of around $5,300,000 pesos on average per ton. This was a significant increase of 65.7% that was also encouraged by the devaluation of the Colombian peso. This increase in prices has offset the income of palm growers, mitigating the effect of the inflationary trend in Colombia, which in 2022 was 13.1%. It has also enabled greater cash flow, which in turn enabled efficient fertilizer application, which in turn enabled productivity increases and investments in best sustainability practices.

ANALYSIS OF SUSTAINABLE PALM OIL PRODUCTION AND TRADE IN COLOMBIA

TOTAL QUANTITY OF CERTIFIED TONS 2014-2020

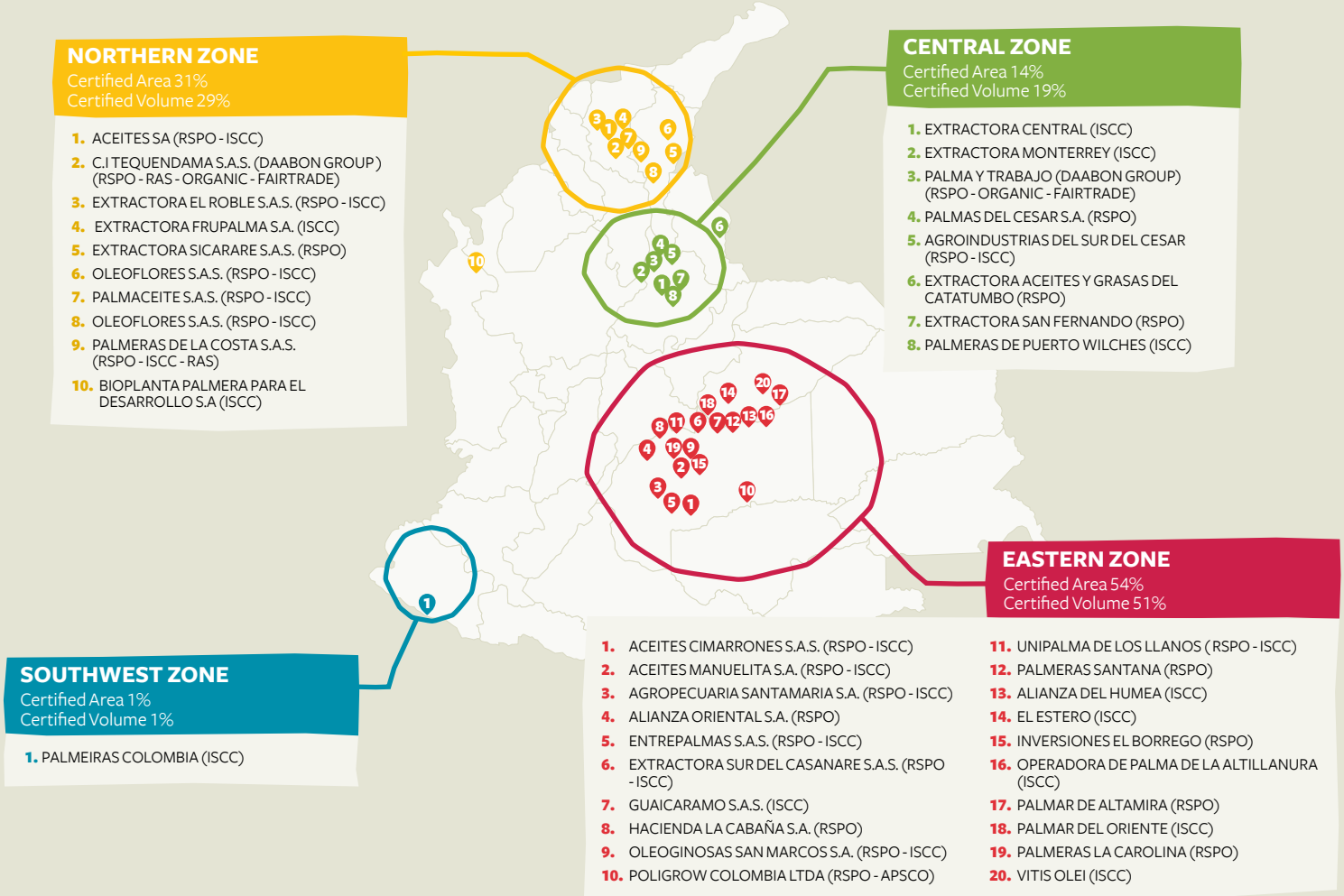


Source: Fedepalma and own estimates

The volume of certified palm oil increased 7% from 2021 to 2022, from 458,000 tonnes in 2021 to an estimated 491 thousand tonnes of CSPO in 2022. The proportion of this sustainable volume over the total production in Colombia is 28%. This sustainability percentage has remained relatively stable in recent years and reflects Colombia's record production.

In the last 2 years, 14 oil palm companies, including plantations and extraction mills, joined the RSPO and ISCC certification frameworks for the first time, an increase in certified companies of 48% compared to 2020. This confirms the sector's commitment to move toward implementing best practices.

SUSTAINABLE PALM OIL PRODUCTION IN COLOMBIA



Source: Solidaridad, 2023

During the last 2 years, the number of companies in the eastern region certified under some VSS (mainly RSPO and ISCC) increased by 100%, going from 10 companies in 2021 to 20 companies in 2022. This trend positions the area with the highest production of both conventional and certified oil in the country.

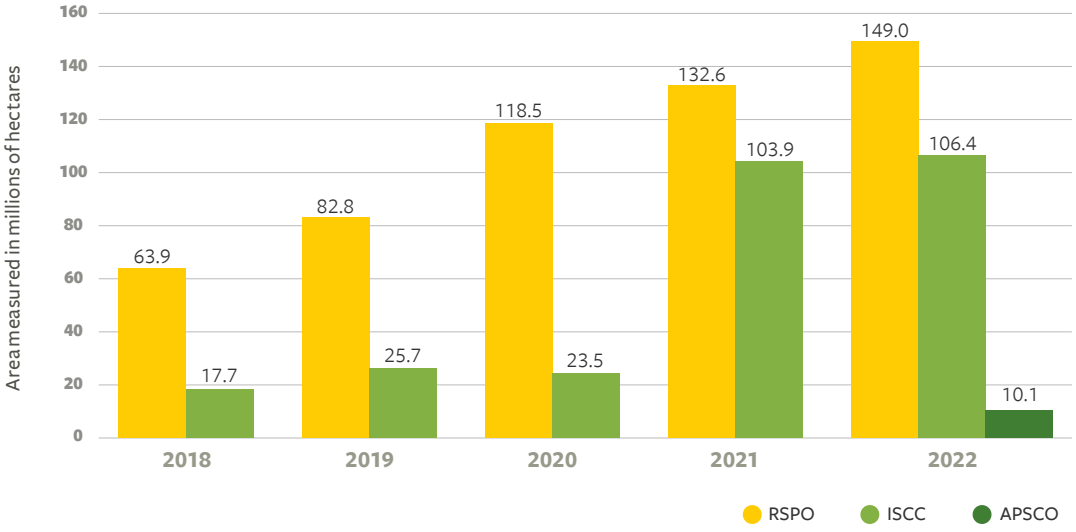
For its part, the central region in Colombia, including the departments of Santander, Norte de Santander, south of Cesar, and south of Bolívar, is the region where there is the greatest potential for growth both in area and volume certified under some type of VSS. To date, 8 of 19 extractors (42%) are already certified.

The southwestern region, meanwhile, has kept its share of the country's sustainable production constant, with 1% of the country's certified volume and 1 company participating in a VSS.

The northern region, which has been a pioneer in developing its certification potential, already has 75% of Colombia's certified extraction mills.

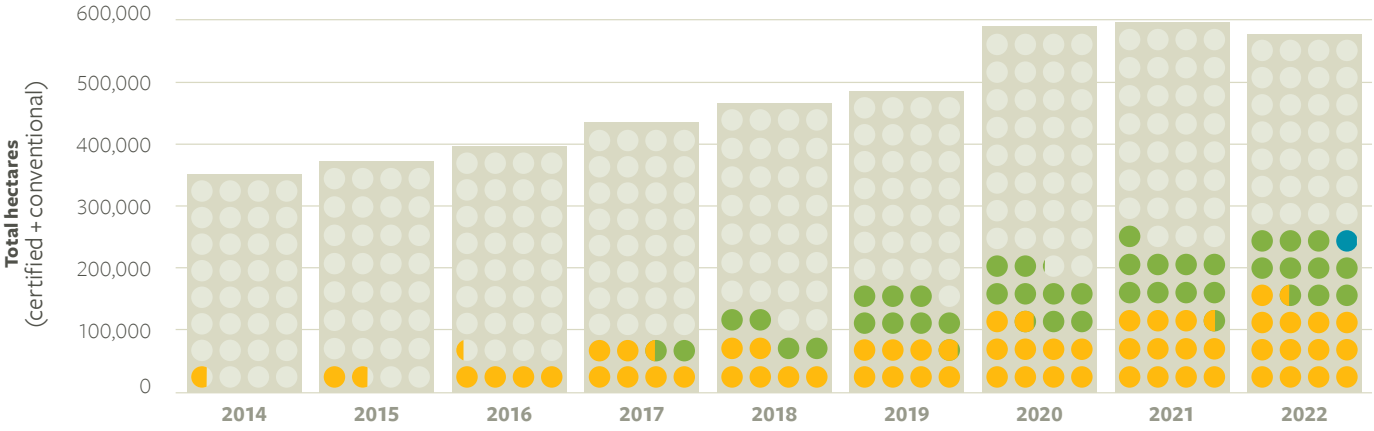
For its part, Colombia launched the Sustainable Colombian Palm Oil Program near the end of 2021 through the APSColombia corporation in conjunction with the National Federation of Oil Palm Growers (Fedepalma). The aim was to create a national brand and improve positioning Colombian palm oil as a unique oil differentiated by its business practices.

CERTIFIED PLANTED AREA BY VOLUNTARY SUSTAINABILITY STANDARD



Source: Fedepalma, 2023

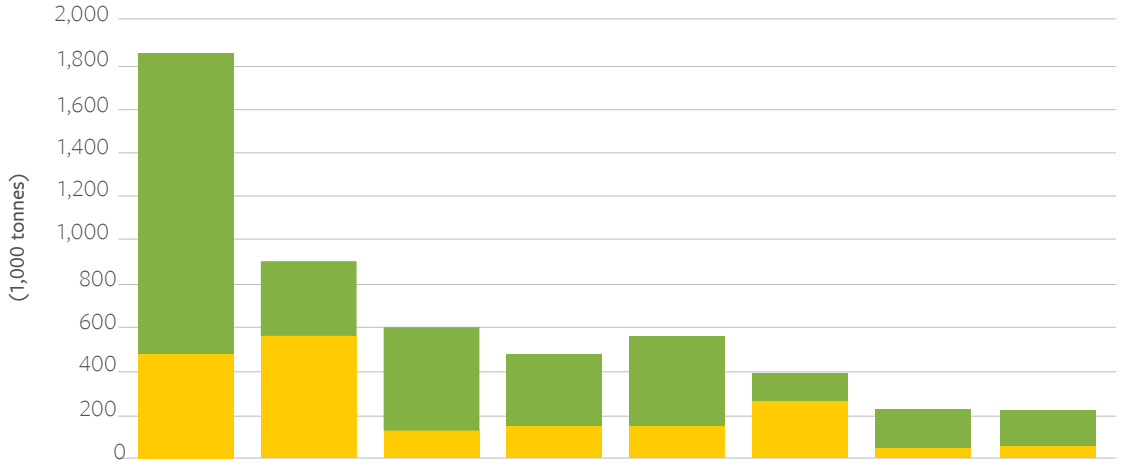
This certified volume produced represents a total certified area of 174,435 hectares, 30.2% compared to the total planted area in Colombia in 2022. Unlike the previous year, RSPO reported the largest growth in certified hectares due to newly certified companies, bringing it up to 26% of the planted area in the country. ISCC, for its part, represented 18% of the total hectares with oil palm in Colombia with a certified area of 106,400 hectares.



	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total RSPO **Total*/%**	8,448 **2%**	17,391 **5%**	46,368 **12%**	70,819 **16%**	63,903 **15%**	86,779 **18%**	95,312 **19%**	132,600 **22.3%**	149,000 **25.8%**
Total ISCC **Total*/%**	-	-	-	17,965 **4%**	44,783 **10%**	78,497 **16%**	79,740 **16%**	103,900 **17.4%**	106,400 **18.4%**
Total APSCOLOMBIA **Total*/%**	-	-	-	-	-	-	-	-	10,100 **1.8%**
National area	-	-	-	-	-	-	-	595,722	576,800

Referring to the Latin American region's producing countries, it is evident that Colombia leads palm oil production; however, upon calculating the sustainable volume ratio as a proportion of total production, it is important to highlight that 66% of Costa Rica's and 61% of Guatemala's palm oil is RSPO certified. The region's commitment can also be seen in the progress of Ecuador (32%), Brazil (27%), Peru (26%), Honduras (22%), and Mexico (21%). The different levels of progress can be explained by the supply base's diversity: the more smallholders in the value chain, the more difficult it is to implement the standard.

CRUDE PALM OIL VS CERTIFIED OIL RSPO (1.000 TON)



	Colombia	Guatemala	Honduras	Ecuador	Brazil	Costa Rica	Mexico	Peru
2022	1,359	352	466	316	412	131	180	164
RSPO	479	558	134	154	158	259	50	60

Source: Market data RSPO - USDA

PROGRESS MADE WITH THE SUSTAINABLE COLOMBIAN PALM OIL PROGRAM – APSCOLOMBIA:

THE TIME IS NOW TO ACT IN RESPONSE TO ENVIRONMENTAL AND SOCIAL CHALLENGES

The Sustainable Colombian Palm Oil Program—APSColombia—has been a protagonist in recent years in recognizing sustainability efforts and challenges in the Colombian palm sector. In 2021 and 2022, implementing this strategy has been key to raising the level of sustainability at the level of the sector to show the progress of producers.

To track and publicize results, a verification and recognition system for the sustainability of Colombian palm oil was established through the APSColombia Protocol. This system is based on promoting the adoption of a set of sustainable principles and practices, using instruments such as Sustainability Indices, and defining national standards for the Production of Sustainable Palm Oil in Colombia (outlined in the NE001 and NE002 standards). (APSColombia, 2022).

In this way, the Sustainable Colombian Palm Oil Protocol is a gradual framework for validating and verifying compliance with economic, environmental, and social practices associated with the 10 Principles of Sustainable Colombian Palm Oil. This framework makes it easier for small, medium and large-scale palm growers to demonstrate their commitment to comply with the principles of sustainability, in line with the Sustainable Development Goals (SDGs) and in accordance with the Voluntary Sustainability Standards (VSS) and European regulations.

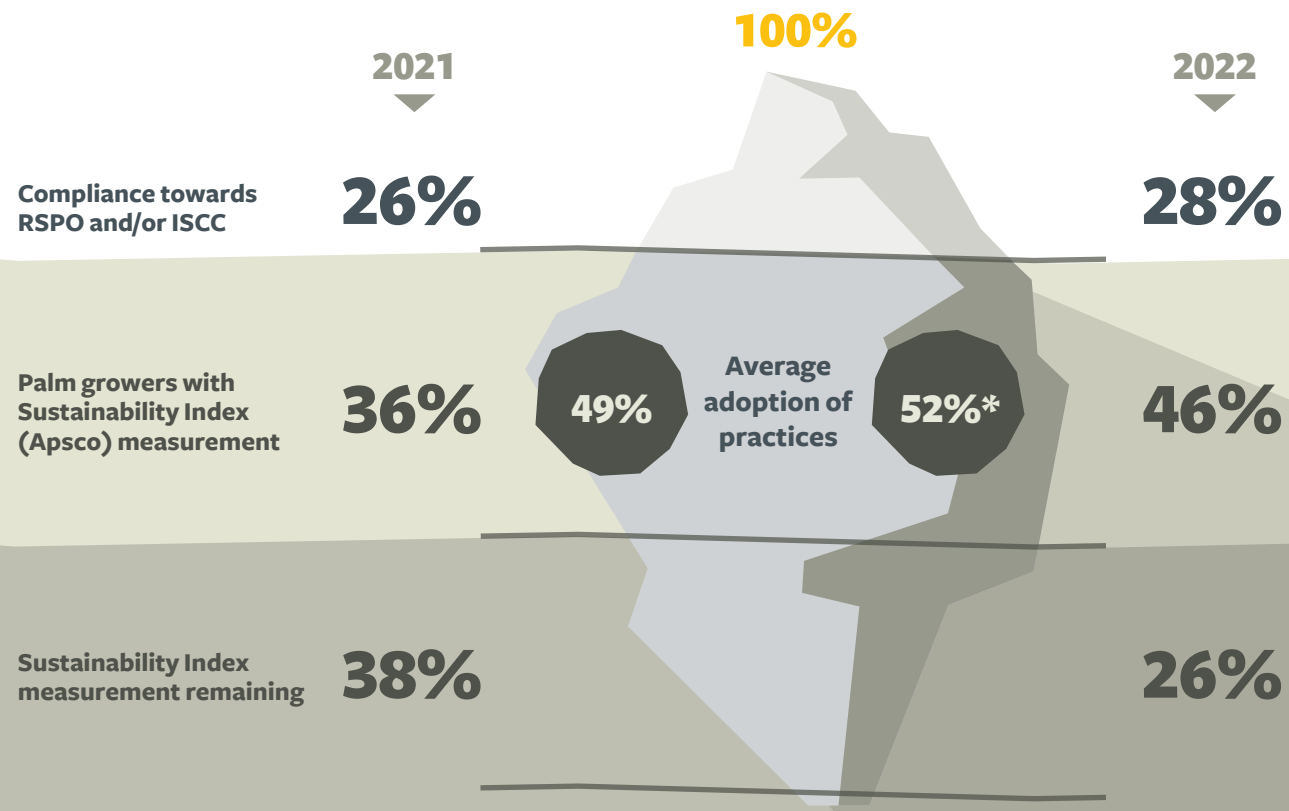
According to the APSColombia Corporation, the Protocol is applied starting from when the producer voluntarily registers. The producer then undergoes the second-phase validation stage, where they work with personnel from the APSColombia Corporation on adopting Principles of Sustainable Colombian Palm Oil. The process then ends with third-party verification of the NE001 or NE002 standards, with the ICONTEC team as an independent certification body. Applicants are then recognized as producers of Sustainable Colombian Palm Oil. (APSColombia, 2022).

Source: APSColombia Corporation, 2022

26% and 28% of total palm oil production in Colombia, in 2021 and 2022, respectively, demonstrated compliance towards RSPO and/or ISCC. Furthermore, in 2022, 46% of oil palm growers in Colombia, in addition to those already certified by RSPO or ISCC, had the opportunity to measure their Sustainability Index according to the principles of Sustainable Colombian Palm Oil (APSColombia), which rendered an aggregate result of 52%. This exercise was also done in 2021 for 36% of oil palm producers with an average level of 49% in the adoption of sustainable practices.

Labor formalization, the occupational health and safety system, and managing regular and hazardous waste are the practices that represent the greatest challenges to improving the sector's sustainability performance.

For next year the goal is to measure the Sustainability Index for the remaining 26% of oil palm producers, for whom there is not an assessment in place. In 2021, it represented 38%.



52%* according to the Sustainability Index
Source: Solidaridad and Cenipalma (2022)

2022 also marked an important milestone in terms of the APSColombia Protocol: the first company in the country successfully completed third-party verification and was recognized for adopting the Sustainable Colombian Palm Oil producer principles. It is also interesting to note that there are at least 15 more palm oil nuclei in the country (25% of the total) that are involved in the program and in the verification process that identifies them as APSColombia producers in the short term.

FIRST GROUP OF INDEPENDENT SMALLHOLDERS CERTIFIED TO THE RSPO INDEPENDENT SMALLHOLDERS (ISH) STANDARD

The "Unión temporal Entrepalmeros" (Entrepalmeros Seasonal Palm Growers Union)—located in the rural area of San Alberto and San Martín in the department of Cesar and in the Municipalities of Sabana and Rionegro in the department of Santander—received its certification under the 2019 RSPO ISH standard, through the certification body SCS Global, after meeting all the milestones of the standard (Identity Preserved).

This first group of 41 smallholders started the certification process in 2020 and has been implementing sustainability best practices in the area of influence with the support of Palmas del Cesar. Other contributions from allies such as Solidaridad, Unilever, Team Foods, among others, have also been key to achieving this goal.

Thanks to the support of these institutions, it was possible to identify the foremost gaps to achieving certification and establish an action plan tailored to each producer so they could overcome these gaps and attain certification. The main challenges were: mapping farms and production parcels, establishing training cycles for producers and workers, organizing the group, carrying out the respective studies on High Value Conservation Areas (HVCAs), implementing socio-environmental management plans, and the implementing the occupational health and safety management system.

Source: Palmas del Cesar, 2023

DESTINATIONS AND SALES OF SUSTAINABLE PALM OIL PRODUCED IN COLOMBIA

Of the total sales abroad, 440,147 correspond to crude palm oil for which the export market is predominantly European countries, followed by Brazil and Mexico. According to the Dutch Industrial Agency for Oils and Fats (MVO), it is estimated that around 241,000 tonnes and 249,000 tonnes respectively were absorbed by the European market in 2021 and 2022.

The downward trend in foreign sales from Colombia to Europe has continued over the last two years. Compared to 2020, there has been another steep decrease of 42%, with sales in the region of 435,000 tonnes, which is in line with the general trend of lower exports from Colombia and higher consumption in the domestic market.

It is also evident that Colombia has subtly regained ground as a country of origin in the European Union, increasing from 4% in 2021 to 5% in 2022, while Indonesia is down 6 percentage points, with a 38% share. Meanwhile, purchases from Malaysia (25%), Guatemala (11%), Papua New Guinea (6.6%) and Honduras (6%) remain steady.

RSPO presents the highest export volumes from Colombia to Europe (84%), followed by ISCC (16%).

Although the volume of exports has decreased, the Netherlands continues to be the largest importer of Colombian palm oil, with certified volumes representing 100% of sales. According to estimates based on the marketing statistics shared by the MVO, 124,000 tonnes of certified palm oil of Colombian origin were absorbed by the Dutch market, representing a 40% decrease compared to the previous year.

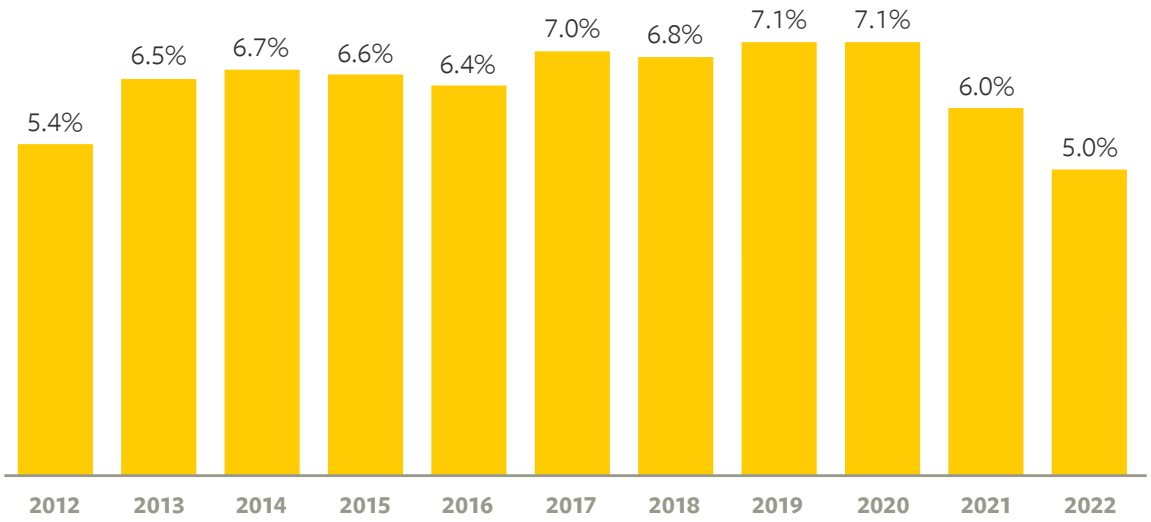
Other countries, such as Spain and Italy, have also a susbtantial part of the European imports of certified palm oil from Colombia, amounting to around 64,000 and 52,000 tonnes respectively, for the preceding year, mostly with RSPO certification. However, in both cases, this is on average 30% lower than for the previous year. Meanwhile, purchasing by Germany, which has a preference for ISCC, decreased by 60% in 2022 compared to the previous year, down to 7,000 tonnes.

This behavior reflects two major trends: (1) Colombia offers a limited supply of palm oil which meets sustainability criteria and simultaneously shows signs of diversification towards commercialization in the US and Latin American markets, plus increased domestic consumption.

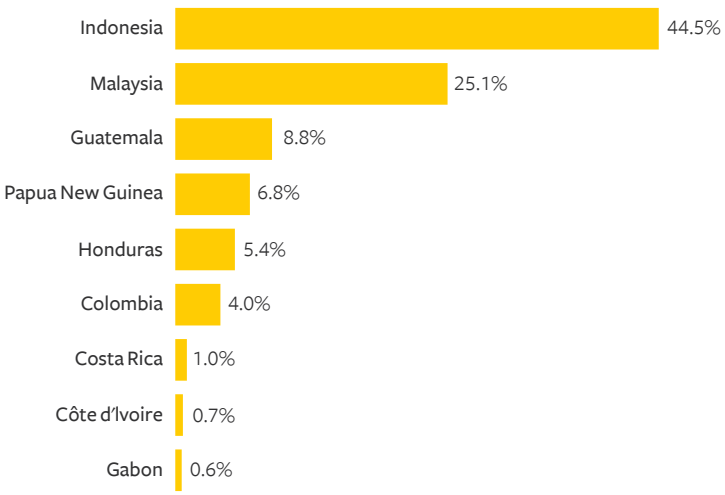
(2) According to information shared by market players in Europe, in a global context of decreased imports, the Netherlands currently has a lower capacity for refining crude palm oil, possibly due to a lack of industrial labor as a result of the Covid-19 pandemic. Another factor is anti-palm movements, which have influenced the food and oleochemical industry to replace this particular vegetable oil with alternative raw materials. The foregoing is aggravated by the EU Renewable Energy Directive, which restricts the use of palm oil in biofuels, primarily affecting consumption in Germany. And finally, it is a sign that Europe is supplying 100% of its need for palm oil consumption determined by demographics, and the restrictions imposed on this vegetable oil by governments and final consumers in terms of responsible production practices.

TOTAL EU27 PALM OIL IMPORTS

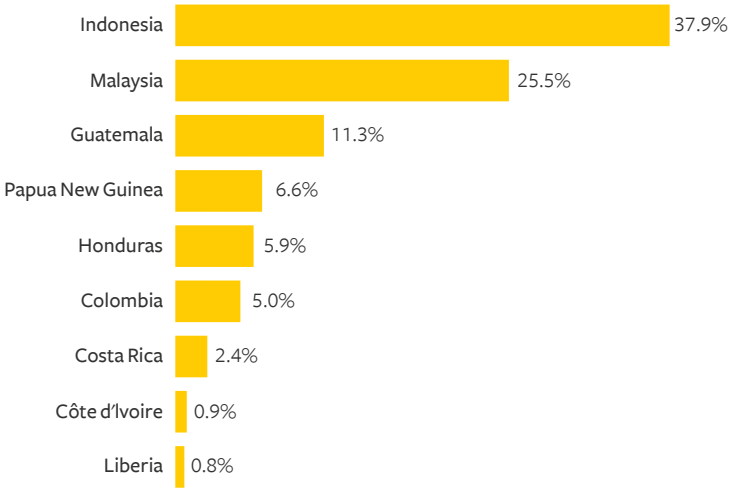
EU27 - Import (1.000 kg)
1511 - Palm oil - Countries outside the EU27



EU27 - Import partners (1.000 kg). 2021
1511 - Palm oil



EU27 - Import partners (1.000 kg). 2022
1511 - Palm oil



Source: MVO, 2023

Conversely, domestic purchasers for the manufacture of margarines, vegetable oils, biodiesel and raw materials by Colombian companies are key players in regional socioeconomic development. In 2022, they incorporated 1.3 million tonnes (74%) of supplies produced by Colombian palm growers into their supply chain. These players in turn play an important role in marketing by informing the consumer about the origin of the palm oil used in the final product.

COLOMBIA BUYS SUSTAINABLE PALM OIL

Thus, in 2022, major players in the domestic market, with the support of the German Cooperation Agency GIZ, demonstrated their commitment to supporting, purchasing, and promoting sustainable palm oil in Colombia, by signing the Joint Declaration: *Colombia compra sostenible* [Colombia buys sustainable]. The main objectives of this long-term strategy are to improve the competitiveness of suppliers and facilitate the adoption of sustainable practices by producers and workers in the production of palm oil, promote the supply of sustainable palm oil from the Colombian countryside, and boost the offer in the domestic market with awareness marketing strategies aimed at the final consumer.

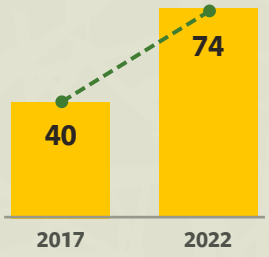
ZERO DEFORESTATION AGREEMENT: COLLECTIVE ACTION TO DEMONSTRATE SECTORAL EFFORTS

The oil palm agro-industrial sector in Colombia, within the framework of the "Voluntary Agreement for Zero Deforestation in the Palm Oil Chain in Colombia", has for the last five years defined specific actions such as: georeferencing the properties from which fresh crops are obtained, seeking transparency in the supply chain, periodic monitoring of the deforestation associated with palm cultivation endorsed by government organizations, reporting and verifying the deforestation analysis for each linked organization, and in general, compliance with Colombian environmental legislation. These actions are implemented by all organizations linked to the Zero Deforestation Agreement (ZDA) to guarantee responsible production within the chain to allow it to meet the upcoming EU Deforestation Regulation (EUDR) and other market requirements.

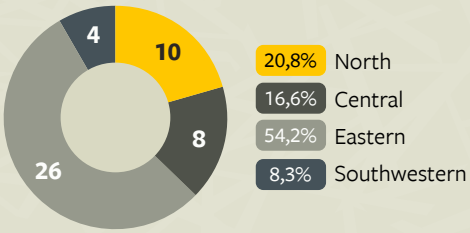
In the last two years, the number of members increased to 74 organizations, up 46% compared to the initial membership, grouped into the following categories: 48 agro-industrial companies that grow oil palm, five wholesale and industrial companies and buyers, four entities of the national government, three unions, two supermarket chains, six civil society organizations and six international observers.

31 of the signatory companies (56% of the total) began their self-analysis processes in 2022, reporting a total area of 140,295 hectares of oil palm, i.e., 25% of the total in the country, in 45 municipalities across Colombia. On the other hand, 12 organizations have started the process of establishing quantitative corporate goals, implementing good practices in the corporate governance.

GROWTH OF PRODUCTION CLUSTERS THAT SIGNED CD 2017-2022

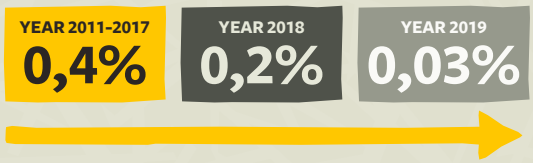


PRODUCTION CLUSTERS THAT SIGNED BY OIL PALM ZONE



Source: Solidaridad, 2022

DEFORESTATION LINKED TO COLOMBIAN PALM OIL INDUSTRY IN THE YEARS 2017, 2018, AND 2019



Source: Ideam, 2022

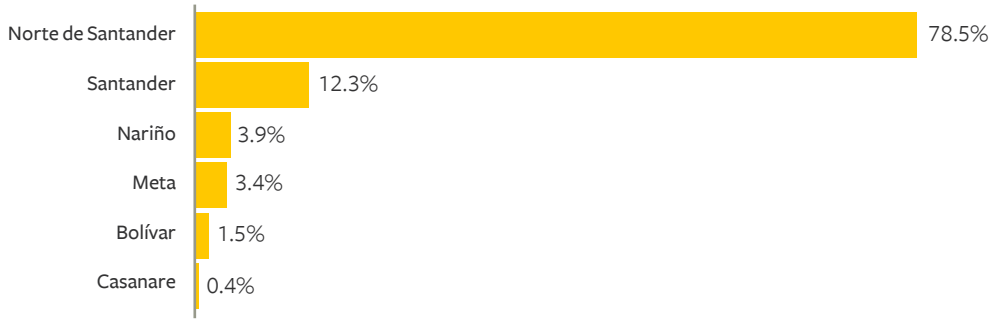
Regarding deforestation associated with oil palm crops in Colombia, with the support of IDEAM as the official entity in charge of the Forest Monitoring System in Colombia, there has been a reduction since the first measurement in 2017 from 0.4 % to 0.2% in 2018, and subsequently to 0.03% for 2019.

IDEAM, in the first analysis of deforestation for the palm sector carried out between 2011 and 2017, studied 1,955,198 hectares, which included plots with oil palm and properties where oil palm is grown. For this period, only 0.4% of the total deforestation in Colombia corresponded to deforestation for palm crops.

In this first analysis, which included hectares of palm plots plus areas outside the palm plot on the property, 5.8% (993.6 ha) of the deforestation associated with properties with oil palm plots occurred in the North Zone.. This area had the lowest deforestation, which was primarily concentrated in the Montes de María. The Central Zone had 55.3% (9.473,9 ha) of the deforestation associated with oil palm crops, especially in the municipalities of Santander, Sur de Cesar and Sur de Bolívar. 10% (1,713.2 ha) of the deforestation detected in properties with palm plots was in the Eastern Zone, and less than 0.1% (17 ha) of the deforestation detected in the Southwestern Zone was associated with the palm sector.

In the second deforestation analysis for the palm oil chain, carried out by IDEAM in 2018, the study included 2,255,944 hectares, once again including plots with oil palm and land where oil palm is grown. According to this assessment of the total deforestation for Colombia, only 0.2% corresponds to oil palm crops.

DEFORESTATION BY DEPARTMENT (2018)



Source: IDEAM

In the third analysis, with the support of IDEAM, 4,740,448 Ha were examined in 2019, a period in which deforestation related to oil palm cultivation continued to decrease, with a favorable result of 0.03% of the total deforestation in Colombia. From this analysis, 90% of the deforestation recorded in oil palm plots was concentrated in two departments: Norte de Santander and Santander.

DEFORESTATION BY DEPARTMENT (2019)

Source: IDEAM

The fourth and final deforestation analysis carried out by IDEAM relates to 2020. This organization has delivered preliminary results for the deforestation associated with oil palm cultivation, in which 4,114,686 Ha were analyzed, including oil palm plots and properties where oil palm is cultivated, yielding a result of between 500 and 1,000 hectares deforested for the cultivation of oil palm, with more than 90% in the department of Norte de Santander (Municipalities of Tibú and Sardinata)

It is important to note that these municipalities have been strongly affected by the armed conflict, with the presence of illegal armed groups whose economic activity is derived from illicit crops.

At the same time, thanks to the financial support of the German Cooperation Agency (GIZ), the Dutch Ministry of Foreign Affairs (RVO) and the multinational Henkel, Solidaridad, in collaboration with the satellite image provider Satelligence, has been able to obtain precise information on the deforestation in the areas of Bolívar, Casanare and Norte de Santander, related to the production of palm oil in Colombia. The results of this monitoring confirm that the percentage of deforestation associated with palm oil is negligible (0.03%), when directly contrasted with the specific dimensions of the palm properties in the areas of influence.

Satellite imaging and geospatial analysis technologies, when used with specific information on each property, have facilitated accurate and up-to-date information on cultivation expansion, deforestation, and changes in land use, which helps the various stakeholders to adopt sustainable practices and comply with national and international regulations.

The Colombian palm sector can demonstrate that 99.97% of deforestation in Colombia is not related to the palm sector. The Zero Deforestation Agreement as a sector roundtable is a vehicle that facilitates the linking of players in the value chain, including the government, official environmental bodies, voluntary sustainability standards and civil society organizations, to ensure transparency and the consolidation of Colombia as a deforestation-free source.

In 2023, the work plan aims to define collaboration mechanisms and tools for satellite monitoring. This Agreement represents a common framework and definitions on the subject, which facilitates the implementation of accurate and reliable monitoring throughout the country. In addition, the members of the Agreement are highly committed to combating deforestation and promoting sustainable practices in the palm oil supply chain.

CONCLUSIONS

Within a global landscape affected by geopolitical conflicts and volatile prices, palm oil production continues to experience steady growth. **Global production and consumption of Certified Sustainable Palm Oil (RSPO) compliant with Voluntary Sustainability Standards (VSS) has continued to demonstrate favorable growth over the past two years**. In the case of the Roundtable on Sustainable Palm Oil (RSPO), certified volume increased by 5.7% to 14.7 million tonnes, representing 19% of total palm oil production worldwide. Global RSPO-certified sales also experienced a substantial increase of 13.5% between 2021 and 2022. An estimated total of 9 million tonnes of global RSPO can be attributed to the sum of RSPO physical and credit volumes, which represents 61% of total RSPO production in 2022. These increases leave enough volume to supply an increase in demand from emerging countries.

The key regions for RSPO-certified consumption are still Europe and North America, but these regions are already close to 100% responsible sourcing, with little room for growth. Asia and Latin America, which absorb more than 50% of the palm oil produced in the world, by and large purchase conventional oil, with less than 5% of these regions' purchases being recognized as sustainable. **It is now essential to focus efforts on national markets where there are not yet strict sustainability requirements**. Factors that strengthen this trend are increasingly restrictive European regulations, which could further shrink this segment of the worldwide market. Meanwhile, the importance of emerging markets with less stringent requirements such as India, Nigeria, and Mexico will increase.

Colombian palm oil production reached record figures, and Colombian palm oil sales increasingly ended up in the domestic market (74%). With regard to exports, there are two main changes. First, purchases by the Netherlands have risen to 19%, a growth of 5 percentage points compared to the previous year. Second, purchases by the United States have increased from 2.6% to 7%. The uptick in domestic-market palm oil sales reaffirms the importance of incorporating the concept of sustainability into local value chains to ensure that production practices continue to improve beyond the volumes that are sold to the foreign market.

The volume of certified palm oil (under VSS certifications such as RSPO, ISCC, and Rainforest Alliance) increased 7% from 2021 to 2022, from 458 thousand tonnes in 2021 to an estimated 491,000 tonnes of RSPO in 2022. The proportion of this sustainable volume over the total production in Colombia is 28%. This sustainability percentage has remained relatively stable in recent years and reflects Colombia's record production. **In the last 2 years, 14 oil palm companies, including plantations and extraction mills, joined the RSPO and ISCC certification frameworks for the first time, an increase in certified companies of 48% compared to 2020. This confirms the sector's commitment to move toward implementing best practices**.

Meanwhile, potential growth could come mainly from the APSColombia national standard, which has promoted the inclusion of smallholders in a sustainability framework tailored for Colombian circumstances. Since its launch in 2021, there has been a promising rise in growers and hectares adopting the new framework, providing a springboard to reach VSS compliance with organizations such as RSPO, ISCC, and Rainforest Alliance.

Deforestation associated with oil palm crops in Colombia has continuously decreased since the first measurements in 2017, going from 0.4% to 0.2% in 2018 and later to 0.03% for 2019, according to figures from IDEAM, which is the official entity tasked with overseeing Colombia's Forest Monitoring System. This sets Colombia apart as an origin with a very low risk of deforestation in the face of the upcoming EU Deforestation Regulation (EUDR).

REFLECTIONS
ON HOW TO CONTINUE ADVANCING SUSTAINABLE PRODUCTION AND TRADE

Sector-wide cooperation in Colombia continues to be essential to implement best practices that ensure an inclusive supply chain in Colombia that respects human rights and is deforestation-free. To continue strengthening advances in sustainability, efforts must be focused strategically on the following areas:

I. TRACEABILITY TO PLANTATION

Mechanisms must be developed so that Colombian smallholders (84% of the total) are able to demonstrate legal land ownership through traceable, reliable, and transparent documentation. At the same time, maintaining detailed data on oil palm plantations is essential in order to validate changes in land use (deforestation monitoring) and provide downstream extraction mills and suppliers with timely alerts. Likewise, it is important to continue developing robust information systems that make it possible to prove the origin of each producer's fresh fruit bunches so that it can be checked by national and international buyers.

II. BUSINESS CASE

It is essential to carefully assess the effect of market regulations on businesses' long-term viability, especially smallholders, since such market regulations establish practices that must be implemented at the level of the grower. These practices can generate additional costs, hindering profitability and economic sustainability for palm growers.

On the other hand, it would be advisable to conduct a study specifically to determine the living wage of palm oil plantation workers. Since this industry requires a great deal of labor, showing evidence that all those involved in Colombian palm oil production have opportunities for a dignified life is essential. A study on living wages would provide valuable information to support these efforts and ensure that workers in the palm oil industry receive fair compensation for their work.

The more we are able to reinforce success stories that showcase risk mitigation, optimum crop yields, better quality of life for growers and workers, access to markets, and other benefits, the more we will be able to achieve a greater production volume while simultaneously moving toward economic, environmental, and social sustainability.

III. BOOSTING DEMAND FOR SUSTAINABLE PALM OIL IN THE DOMESTIC MARKET

The time is now to stimulate demand for sustainable palm oil in Colombian industrial sectors, in part by promoting awareness among end consumers through marketing campaigns that highlight the origin of sustainably produced ingredients of end products. Efforts such as these will in turn promote shared responsibility among all stakeholders in the value chain. Due to the large percentage of national sales, successfully transforming the sector according to sustainability practices will depend in the near future on the efforts of the Colombian market's major buyers.

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ANNEXES

ANNEX 1. EUROPEAN REGULATION: DEALING WITH HUMAN RIGHTS AND ZERO DEFORESTATION ISSUES

The last two years have also been marked by continuing conversations and advances surrounding internationally impactful national legislation that aims to promote responsible and sustainable corporate behavior.

On the one hand, the **Corporate Sustainability Due Diligence Directive** on human rights and the environment, approved by the European Commission in April 2023, is a way in which companies that feed supply chains headed to the European community—such as soybeans, oil palm, livestock, timber, cocoa, and coffee—must proactively demonstrate their management of real and potential risks that adversely affect human rights, deforestation, and waste management.

Indeed, the Guiding Principles make it clear that all business enterprises have an independent responsibility to respect human rights and the environment. Currently, countries such as Germany, France, the United Kingdom and the Netherlands have developed due diligence through legislative processes that are soon to come into effect. In Germany's case, the law was approved on June 11, 2021, under the name "German Supply Chain Due Diligence Act," in German: Lieferkettensorgfaltspichtengesetz, abbreviated as "LkSG." This act entered into force on January 1, 2023, and it has been mandatory from this date onward.

Regarding the requirements of **deforestation-free supply chains**, the directive will require that exporters of basic products that are relevant in the European Union market guarantee due diligence in order to ensure that their products have not been grown on deforested or degraded land after December 31, 2020, and that the products have been produced in compliance with the legislation of the producing country.

In practical terms for the palm oil value chain, this directive from the European Union carries with it the following requirements: i) geo-referencing all parcels of land feeding into fresh fruit bunch suppliers in order to demonstrate that the production origin is free of deforestation. In other words, products must be traceable to the plantation; ii) compliance with national legal regulations by all stakeholders in the value chain; iii) respect for human rights and prohibition of child labor.

Any products that have been found not to comply with any of these requirements will not be allowed to be sold or traded within the European Union. This strict traceability aims to ensure that only deforestation-free products enter the European Union market and that the enforcement authorities of EU member states have the necessary means to verify that this requirement is met.

This will also lead to a reduction of at least 31.9 million metric tonnes of carbon emissions into the atmosphere each year stemming from the consumption and production of these kinds of basic goods within the European Union, which could entail economic savings of at least €3.2 billion per year. (Source: European Parliament, 2021).

For more information consult comparative document between this regulation and the Voluntary Sustainability Standards.

ANNEX 2. NATIONAL SUSTAINABILITY STANDARDS IN THE LEADING PRODUCING COUNTRIES

For more than 10 years, Indonesia has implemented its national standard that guarantees sustainably produced palm oil "ISPO" (Indonesian Sustainable Palm Oil). ISPO seeks to support Indonesia's sustainable economic, social, and environmental goals.

ISPO is currently the largest palm oil certification framework in the world, covering close to 5.45 million hectares (an area larger than the Netherlands) and enjoys adoption by more than 800 plantation organizations, including collectives of smallholders (less than 75 hectares in production area).

https://www.indonesiapalmoilfacts.com/ispo/

The Malaysian Sustainable Palm Oil (MSPO) Certification was created in 2014 and is the national framework in Malaysia for oil palm plantations, mills, independent and organized smallholders, and palm oil processing facilities who wish to be certified according to MSPO Standards.

Fadillah Yusof (Deputy Prime Minister of Malaysia) assured that by the start of 2023, more than 97% of oil palm plantations and more than 98% of palm oil mills in Malaysia were MSPO certified.

https://www.mpocc.org.my/about-mspo

These two national standards are born from private initiatives to use a national seal to demonstrate the best environmental, social, and economic practices in the palm oil value chain; it should be noted that there are currently no premiums or economic incentives that are paid for selling under these standards like there are for certifications like RSPO and ISCC.

ANNEX 3. RAINFOREST ALLIANCE POLICY: PALM OIL CERTIFICATION PHASE OUT

The Rainforest Alliance VSS has worked for more than 30 years to promote best practices in agriculture, driven by a belief that making agriculture more sustainable is fundamental to halting deforestation and combating climate change. However, since their certification program for palm oil was launched 11 years ago, they have not witnessed the impact and growth that was expected. In terms of the supply chain, market uptake has been slow, which is why the strategic decision was made to progressively phase out palm oil certification and not include it in the scope of the new Rainforest Alliance 2020 Certification Program.

Although the 2020 Rainforest Alliance Standard took effect on July 1, 2021, existing palm certificate holders, in recognition of their commitment and dedication, were offered the option to remain certified to the 2017 Rainforest Alliance Standard until the final date of December 31, 2022.

Certified organizations are responsible for informing their buyers of this policy, specifically that Rainforest Alliance Certified palm oil will no longer be sold from their plantation starting on January 1, 2023. (Rainforest Alliance Policy: Palm Oil Certification Phase Out, 2021).

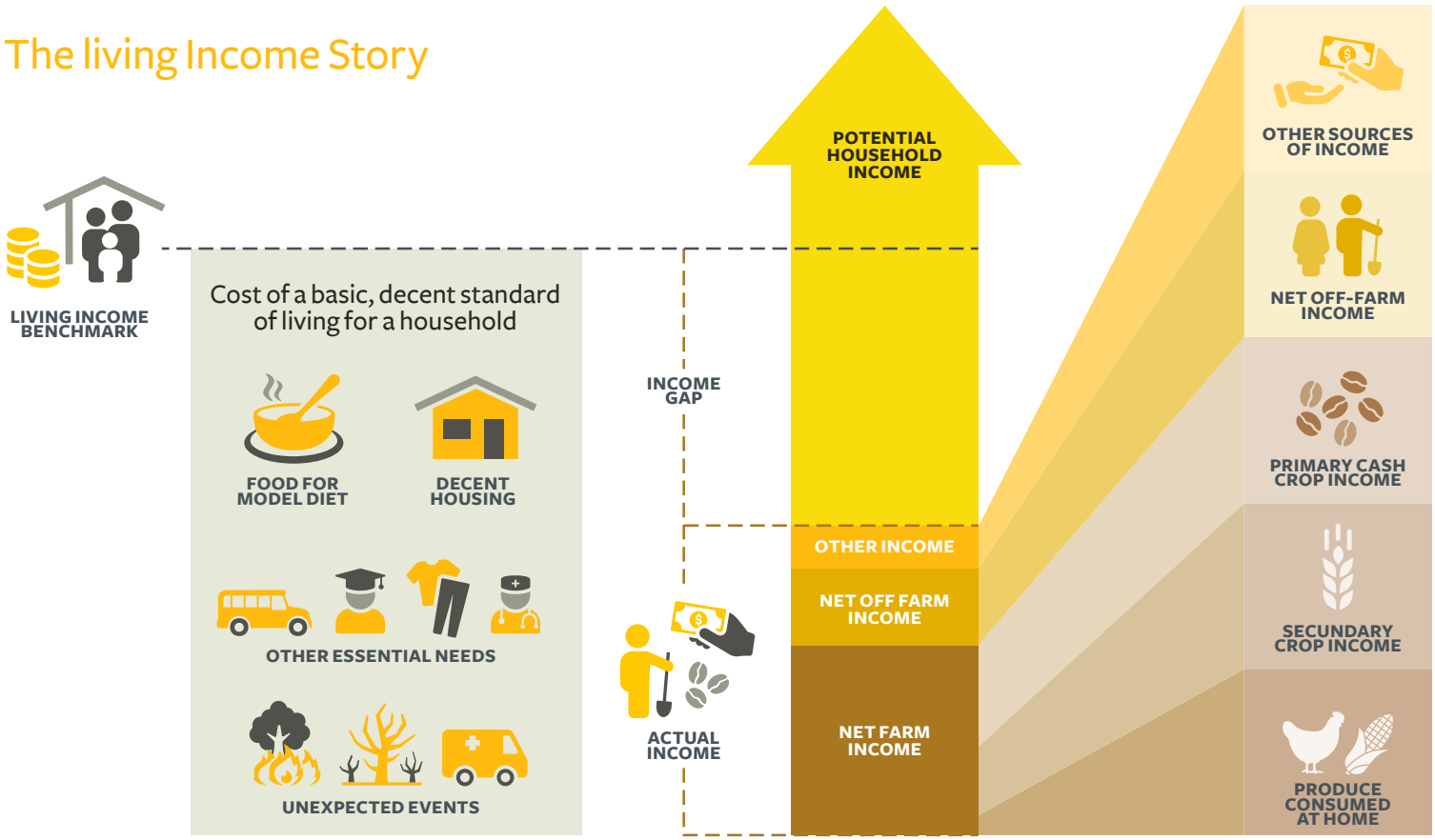
ANNEX 4. LIVING INCOME SECTORAL ANALYSIS: RECOMENDATIONS ON HOW TO STRENGHT THE SECTOR

In parallel, a living income case study was carried out for small palm growers in the departments of Magdalena and Norte de Santander. Ensuring a decent income for producers is crucial since it is a determining factor in the resilience of producer families and in the continuity of their businesses. Guaranteeing a fair and sustainable income for producers is one way to protect food security and rural development in regions where agriculture is practiced. Although, under the right conditions, oil palm cultivation can generate a sustainable income for farmers, it is important to assess whether these conditions are met in Colombia, and whether the income of producing families is sufficient to guarantee a dignified and resilient living. This is particularly relevant in the national context in which the majority of palm growers are small producers.

For this study, primary information for the year 2021 was collected through surveys and focus groups and supplemented with data from the aforementioned production cost study. Through these surveys, information was collected from a sample of 40 producers regarding the characteristics of the palm grower, their nuclear family, the family economy, and supplementary information on production costs. In addition, the focus groups provided information on living conditions, including housing, public services, food, transportation, and clothing. Moreover, secondary sources were consulted to obtain information on decent housing costs and to verify food prices.

The decent income analysis was carried out using the information collected and following the Anker methodology, which was contextualized to the aforementioned departments. This methodology was developed by Richard and Martha Anker in 2017 and has since been applied and endorsed by the Living Income Community of Practice (LICOP) and the Global Living Wage Coalition (GLWC). The following image shows the different components taken into account in the analysis of decent income according to this methodology. The main objective of the study was to determine whether there is a gap between the benchmark living income value and the real income of small palm growers.

LIVING INCOME CONCEPT - ANKER METHODOLOGY



Source: The Living Income Community of Practice (2021)

The living income benchmark is "the annual net income that a family in a particular location needs to afford a decent standard of living for all family members" (The Living Income Community of Practice, 2021, p.1). A decent standard of living encompasses various elements, such as: food, housing, education, medical care, transportation, clothing, and other essential needs, including a provision for unexpected events. Whereas the real income corresponds to the net income, in kind or cash, that is received or produced by the household over a 12-month period, including all providers of income within the household, and all sources of income (De Los Ríos y Tyszler, 2020). To calculate the decent income gap, which determines whether or not palm growers achieve an income that allows them to afford a decent life, the difference between the decent income benchmark value and the families' real income is calculated.

In this study it was found that, **in 2021, the majority of producer families (87%) achieved a decent income**. These families had an average productivity of 19.6 Ton/Ha and cultivated an average of 9.5 Ha of palm. In contrast, the families that did not achieve a decent income had an average productivity of 6.9 Ton/Ha and cultivated an average of 5.7 Ha of palm.

Regarding dependence on palm cultivation, it was observed that, in Norte de Santander, 75.2% of real income came from palm, while, in Magdalena, off-farm income represented 53.8% of real income, and the net income from palm cultivation corresponded to 35.2%. Therefore, **achieving a decent income in Magdalena was more dependent on off-farm income**. In addition, the families that did not achieve a decent income produced less food for self-consumption than those that did .

Finally, it is advisable to carry out a specific study on the living wage of the workers of the farms that participate in the production of palm oil. Since this industry is highly labor intensive, it is essential to guarantee a decent life for everyone involved in production. Although initiatives have been created to improve working conditions, especially on small producer farms, much remains to be done to ensure that workers receive fair working conditions. A study on the living wage would provide valuable information to support these efforts and ensure that workers in the palm oil industry receive fair remuneration for their work.

[2] It is important to note that the conclusions presented in this case study are based on a sample of around 40 producers, so it is not recommended to generalize the results obtained. To obtain more reliable and generalizable results, it is suggested to carry out a future study with representative samples ,taking into consideration the specific conditions of each zone.

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