MIGHTY EARTH

THE CASHEW CONUNDRUM

How global demand for superfood is driving nature loss and risking food security in Côte d'Ivoire

Cashew dominates the landscape near Bondoukou, northeast Côte d'Ivoire. *Source: Mighty Earth.*

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SUMMARY

Over the past 40 years, increasing global demand has driven a rapid expansion in cashew cultivation, mostly by smallholders, across the tropics. Between 1980 and 2020, the total land area under cashew is estimated to have grown from 526,250 hectares (ha) to 7,101,970ha. In terms of volume, global cashew yields leapt from 706,500 tons in 1990 to 3.9 million tons in 2018 and more than five million tons in 2022.[1] Much of this expansion has happened in Africa. According to the African Cashew Alliance (ACA), the continent's output now represents 58% of the global harvest, up from just 37% in 2008.[2]

Côte d'Ivoire has been at the epicenter of this boom in world cashew production. The west African country is now the number one exporter of raw cashew nuts in the world, earning over $961 million[3] from cashew exports in 2021, and producing more than one million tons of cashew in 2022.[4] In 2018, the country entered into a 30-year loan deal with the World Bank to boost domestic cashew production and processing.[5]

Rich in essential vitamins and minerals that support heart health and boost serotonin, cashew nuts are widely regarded as a superfood.[6] The nut is versatile and can be added to dishes, used as a milk drink, or enjoyed straight from the bag as a snack. But few consumers know much about the impact of cashew cultivation and processing on the environment and on people working in the industry within Côte d'Ivoire.

In this report, Mighty Earth, Regroupement des Acteurs Ivoiriens des Droits Humains (RAIDH), and Green Forest Africa reveal how "monoculture" cashew farming in the north of Côte d'Ivoire is eradicating the region's precious remaining areas of dryland savanna forest, much as cocoa farming has done to the humid tropical forests in the south of the country.[7,8] Like cocoa, cashew has provided a vital livelihood opportunity for rural communities. But the breathtaking expansion of cashew over hundreds of square kilometers has created "green deserts" lacking biodiversity. These cashew monocultures pose an existential threat to what little is left of the country's once-rich flora and fauna.

This expansion has also come with a human cost. In northern Côte d'Ivoire, cashew trees have rapidly and significantly reduced the cultivation of traditional food crops. This has transformed many parts of the region into almost a single crop economy. A supply glut in early 2023 caused the market to crash, leaving many rural households unable to sell their cashew, and hence vulnerable to food and nutritional insecurity.

Cashew processing can also be a laborious and often hazardous undertaking. When roasted, cashew shells release a caustic oil. Workers in processing facilities, who manually remove the cashew kernel from its shell, are exposed to this caustic oil, risking burns to their skin. Due to the lack of protective equipment, workers – most of them women – often conduct this work with their bare hands.

While the impacts of cashew cultivation and processing are felt most acutely in west Africa, the responsibility for addressing these problems lies partly with US and European supermarkets, as well as multinational food companies buying and selling cashew. Mighty Earth is calling for

industry actors across the cashew supply chain to work with local farmers, civil society, research institutions and government agencies to halt and reverse the degradation of biodiversity in cashew-dominated landscapes of Côte d'Ivoire. We call on them to invest in sustainable farming practices that allow native ecosystems and wildlife to flourish, reduce farmers' dependency on cashew, and to protect those working in the industry.

Specifically, Mighty Earth and RAIDH are calling on companies buying and selling cashew to develop, full (farm-level) traceability to understand the range of environmental and social issues present in the places where they are sourcing cashew, publicly communicate the precise origin of their cashew purchases, create action plans for sourcing zero deforestation/ ecosystem conversion cashew, and cultivation methods that encourage biodiversity to flourish.

In addition to private sector action, better regulation of the market is needed—both in Côte d'Ivoire itself and in consumer countries. Mighty Earth and RAIDH are therefore calling on The Conseil du Coton et de l'Anacarde, the public agency charged with overseeing cotton, the other cash crop in northern Côte d'Ivoire, and the cashew industry in Côte d'Ivoire, to initiate a multistakeholder dialogue about the environmental impact of cashew with a view towards strengthening standards and regulations for the cashew sector and promoting socially and ecologically responsible cashew supply chains. We are also calling on EU, UK, and US regulators to introduce measures that would ban the sale of cashew linked to deforestation and the destruction of natural habitats in their markets.

Cashew fruit ripening on tree, Bondoukou, northeastern Côte d'Ivoire
Source: Mighty Earth

METHODOLOGY

This report compiles primary research gathered during two recent investigations carried out by Mighty Earth, RAIDH and Green Forests Africa; alongside secondary data gathered from scientific journals articles, market intelligence briefings, media reports, publications, expert interviews, and official governmental and multilateral agency publications. Mighty Earth also carried out satellite data analysis of the distribution of cashew cultivation in Côte d'Ivoire and tree cover loss in cashew growing regions between 2019 and 2023, using the IMAGES platform.

The first field investigation took place in June 2022, in the cashew producing areas of Côte d'Ivoire including Korhogo, Tengrela, Kouto, Kolia, Katiola, Mankono, Daloa, Soubré and Duékoué. Through interviews, the research team gathered information about the experiences of cashew farmers and the impacts of cashew cultivation on local communities and landscapes. A second investigation in April 2023 comprising interviews with farmers, factory workers, representatives of cashew processing facilities, and government officials, documented the role of cashew farming in local livelihoods and the impacts on environmental quality in the areas of Dabakala, Korhogo, Sinématiali, Ferkessédougou, and Gontougou, and the stakeholder landscape of the Ivorian cashew industry. During this trip, the research team also conducted interviews with women working in cashew processing facilities. Where possible, excerpts from these interviews have been shared in this report. Consent to share this information was requested from all interviewees, with the option to be included anonymously.

The findings of this report were presented to actors in the cashew supply chain in July 2022, including ALDI, Carrefour, Costco, CVS, Harris Teeter, Ofi, Target, and Walmart, who were asked to provide comment. Responses received have been published on Mighty Earth's website. The findings were also discussed with officials at the CCA in September 2023. Perspectives and additional information gathered through these conversations have informed the final findings, conclusions and recommendations of this report.

CASHEWS AT A GLANCE

- The global cashew market rached $7 billion in 2022.[9]
- The US is the world's largest consumer of cashew. In 2021, it imported nearly 30% of the world's cashew nut kernels, with Germany (10.5%) and the Netherlands (8.27%) being the next largest importers.[10]
- Côte d'Ivoire is the world's leading producer of cashew nuts, harvesting over 1.2 million tons of raw cashew nuts per year.[11]
- An area nearly the size of the Hawaiian islands (1.6 million hectares) is used to cultivate cashews in Côte d'Ivoire.[12] This is carried out by over 500,000 households, mostly in the north of the country.[13]
- 78.5% of Ivorian raw cashew nuts are exported to Vietnam and India for processing; while only 21.5% are processed locally in Côte d'Ivoire.[14] In 2021, cashew nut exports from Cote d'Ivoire yielded around 961 million U.S. dollars.[15]
- Côte d'Ivoire has lost as much as 90% of its forests over the past 30 years, with agriculture as the primary driver.[16]
- Dry forests in key cashew-growing regions are rapidly disappearing; some cashew-growing regions have seen as much as a 25% loss of primary forest cover between 2019-2023.[17,18]
- Manual cashew processing can cause painful burns to skin due to caustic oils released by the cashew nut shell.[19]
- Olam Food Ingredients (ofi) and Dorado Ivory are the largest processors of cashews in Côte d'Ivoire, with a cumulative capacity to process over 100,000 tons of raw cashew nuts per year.[20]
- Cashews imported from west Africa are sold by major retailers in the US, such as Costco, Harris Teeter, CVS, Target, Walmart; and by Europe-wide supermarkets including Carrefour and ALDI.

FROM FOREST SAVIOR TO NATURE DESTROYER

CHANGING LANDSCAPES

Côte d'Ivoire has lost as much as 90% of its forests over the past 30 years.[21] Although some of this has been caused by infrastructure development, urban sprawl, mining, tourism, and manufacturing, agricultural expansion is by far the largest driver, with cocoa cultivation to feed growing global demand for chocolate the main culprit of deforestation, particularly in the moist tropical forests of the south, reducing Côte d'Ivoire's portion of the great Upper Guinean forest to a tiny fragment of what it once was.

In the north and northeastern parts of Côte d'Ivoire, the climate is drier, and the native vegetation transitions from tropical rainforest into a savanna-forest "mosaic" landscape less suited to cocoa. Here, rural communities historically grew food crops such as yam, maize, and cassava, and benefitted from naturally occurring trees such as shea (karité in French) and parkia globosa (African locust bean), used for food flavoring, as well as commercial crops better suited to drier conditions, such as cotton.

Cashew trees were originally introduced into west Africa, from Brazil in the 1960s to combat deforestation and reverse soil erosion in the grassy and woody-savanna regions. Initially hailed as a great success, cashew cultivation became heavily promoted by both the Ivorian government and international donors. Due to its profitability and lower labor requirements compared to cotton, most farmers in the region readily adopted cashew, and over the past thirty years began to fill their farms with densely planted cashew trees. As demand for land for cashew increased, farmers began to encroach into uncultivated areas of dry savanna forest. This trend accelerated through the 2000s,[22] and has shown little sign of slowing down. Satellite imagery analysis conducted by Mighty Earth in April 2023 shows that land is continuing to be cleared for cashew production across northern Côte d'Ivoire (see Figure 1 and 2).

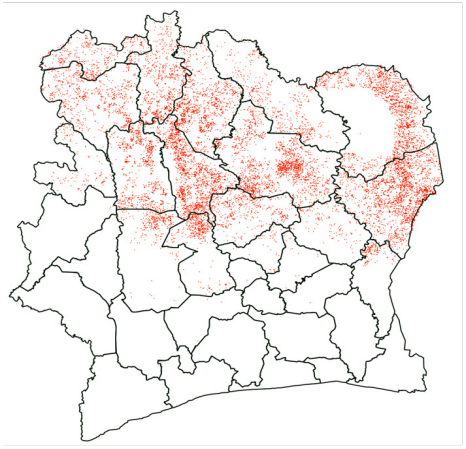


Figure 1: Distribution of cashew cultivation in Côte d'Ivoire
Source: IMAGES RSAC Landuse map, 2019

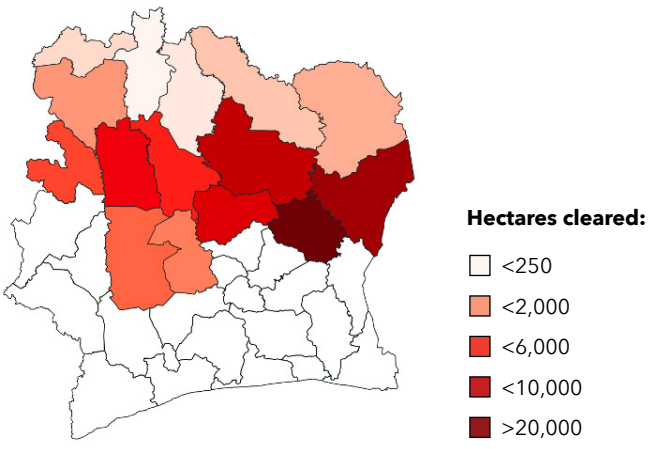


Figure 2: Primary Forest loss alerts in cashew growing regions 2019-2022
Source: IMAGES Canopy Disturbances

Recent clearance to make way for cashew, Bondoukou, northern Côte d'Ivoire
Source: Mighty Earth

DESTROYING NATIVE HABITATS

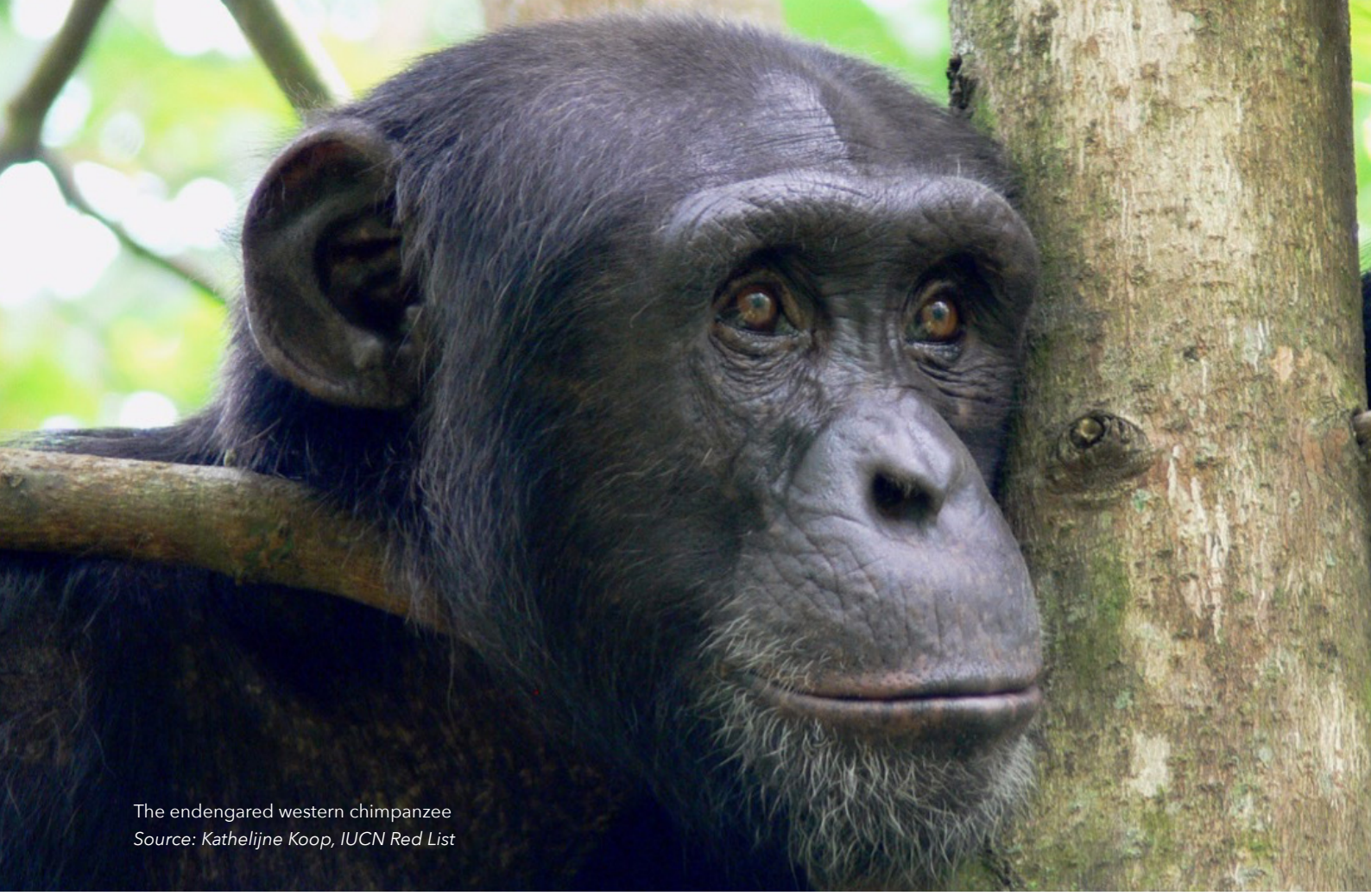
Côte d'Ivoire now produces more than one million tons of raw cashew nuts per year, from smallholdings on more than 1.6 million hectares of land—an area nearly the size of Hawaii. Much of this farming has taken place on formerly forested savanna landscapes, vital to local wildlife. Whilst most cashew cultivation has historically taken place in the north of the country, Mighty Earth's satellite imagery analysis shows that the crop is gradually moving south as central and southern regions, where cocoa is traditionally grown, are becoming drier (see figure 1).

Research into the cashew industry's environmental impacts is lagging, but the warning signs are clear. In 2021, Cathy Watson from the Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF), sounded the alarm in her article *Forests falling for cashew monocultures: A 'repeated mistake' in Côte d'Ivoire*, highlighting the detrimental impacts of monoculture cashew farming on forests, biodiversity, and food crops.[23]

Preliminary research by Ivorian academics over recent years, shows the growing severity of the problem. A study on the changes to the landscape and rural areas to the southwest of Côte d'Ivoire's Comoé National Park (PNC), a World Heritage Site, showed a 160% increase in land used for cashew cultivation between 2002-2014 and a 76% decline in forest areas.[24]

Furthermore, academics from Université Jean Lorougnon Guédé in Côte d'Ivoire found that cashew cultivation "profoundly modified the floristic and structural characteristics of the vegetation in the PNC region", with bush fires, used to clear land for cashew, threatening the park's lower forests. Such activities, they argue, "could lead to a severe reduction in forest area and a loss of biodiversity."[25] Meanwhile, officials at UNESCO – the international agency tasked with protecting globally important sites of biodiversity – have expressed concern about the encroachment of cashew into the Comoé National Park, which is one of the most important remaining wildlife reserves in west Africa.[26]

What was originally introduced as a reforestation program to address desertification in west Africa's savanna landscapes has quickly become so dominant in many localities in north and northeastern Côte d'Ivoire, that it is now destroying native ecosystems. Cashew is an allelopathic plant, meaning its stem, leaves and fallen nut residues release chemical compounds hostile to other plants around it.[27] As a result, very little else can grow in the shadow and proximity to cashew. This, coupled with the high



The endengared western chimpanzee
Source: Kathelijne Koop, IUCN Red List

pesticide use to protect the crop and boost yields, is causing a sharp decrease in biological diversity across cashew-growing regions.

> *Natural vegetation sustainably maintains more pollinators because it consists of a diversity of melliferous plants, some of which flower even in the dry season, [whilst cashew monocultures] support only a few bee species.*
>
> –Drissa Coulibaly, Professor and Researcher, University of Korhogo, Côte d'Ivoire[28]

PUSHING ICONIC SPECIES TO THE BRINK

The replacement of vegetation with densely packed cashew orchards threatens ecosystems by destroying the multitude of species above and below the soil that are vital to the survival and health of local wildlife. A global study found that, in some landscapes, cashew production had caused a reduction in the species richness of fungi, plants, butterflies, birds and terrestrial mammals by up to 84%.[29] In another study predicting the biodiversity impacts of land use change for global food production, cashew cultivation is estimated to contribute to the loss of 54 endemic species around the world.[30]

Côte d'Ivoire has one of the highest deforestation rates in sub-Saharan Africa. Little primary forest exists even within protected areas, and what remains is at risk of being taken for agriculture. This deforestation is having a drastic impact on wildlife. Côte d'Ivoire's National Biodiversity Strategy and Action Plan warns that "threats to species and ecosystems have never been so serious… the disappearance of species due to human activities continues at an alarming rate".[31]

In northern Côte d'Ivoire's cashew growing regions, species such as Shea or karité (vitellaria paradoxa) – a critically important tree widely used for medicine and nutrition – are becoming

increasingly rare due to cashew expansion. The region is home to a diverse array of wildlife including leopards, servals, duikers, and unique species of birds, such as bustards. The crop is even threatening one of west Africa's most important wildlife reserves, the Comoé National Park, which is surrounded to the east, south and southwest by cashew. The park is home to the critically endangered western chimpanzee, and is one of the species' last remaining intact habitats, with forest fragmentation isolating populations and pushing them ever closer to extinction.[32]

In recent years, international development agencies have pledged their support to improve Côte d'Ivoire's cashew sector. In 2019, the United States Department of Agriculture (USDA) launched a $47.3 million 'PRO-Cashew project', aiming to boost the competitiveness of west African producers and build capacity of cashew farmers.[33] However, such projects are yet to indicate how they will ensure that native ecosystems are not damaged; seemingly overlooking the environmental risks of the expanding cashew production.

PESTICIDE POLLUTION AND THE RISK TO HUMAN HEALTH

In order to establish farms of densely packed cashew trees, many producers have had to use a significant amount of insecticides, herbicides and fungicides to stop the rapid spread of pests and diseases, creating an alarming level of dependency on hazardous agrichemicals. In a survey of 386 cashew farmers from Côte d'Ivoire's main cashew growing areas, researchers found that over 63% of participants used synthetic pesticides on their farms.[34] The toxicity of some of these pesticides destroys ecosystems in the soil, home to insects and animals. Thanks to recent training programs by the government's National Rural Development Support Agency (ANADER), use of the most harmful pesticides for cashew has been recently declining. However, the lasting damage and biodiversity loss caused by land conversion to cashew monocultures and pesticide use over past decades is still felt across the country.

Dramane, a farmer from Hambol, a cashew growing region of northern Côte d'Ivoire, shared his concerns with the research team, in an interview conducted in June 2022:

"Unfortunately, cashew cultivation causes animals to flee and plant species to disappear. Even medicinal plants are becoming increasingly rare because the environment is threatened with the abusive use of pesticides."[35]

The sale and use of these pesticides are unevenly regulated in Côte d'Ivoire, posing risks not only to nature but also the farmers that use them. Exposure to the agrichemicals present in many synthetic pesticides can have severe health impacts including skin damage, respiratory issues and chronic illnesses.[36]

FOOD AND LIVELIHOOD SECURITY: A DOUBLE-EDGED SWORD

Like cocoa, cashew has proven a double-edged sword for Côte d'Ivoire. On the one hand, it has brought much needed livelihood opportunities to people in the north and northeast of the country, increasing farmer incomes and enabling rural households greater access to education and health services.[37] Over 500,000 households across Côte d'Ivoire rely on cashew farming for income, meaning that close to 2.5 million people are supported by the industry.[38]

However, the explosion of cashew over the past twenty years, which has been welcomed by government, international development agencies and private sector entities, has created a stark overreliance on this cash crop, with the majority of farmers reducing the quantity and range of native food crops and medicinal plants that used to typify this region.

In the Seguela region of northwestern Côte d'Ivoire, the vast expansion in cashew farming over the past two decades has driven a reduction in food crop cultivation, raising concerns about food insecurity and land conflicts.[39] In Bondoukou, a 2020 study carried out amongst 384 farmers, found that 20.3% of farmers no longer had cultivatable land dedicated to growing food crops; and this figure was predicted to rise in the following

Colorful cashew apples hang on trees in the Gontougo region. The raw cashew nut (known as 'drupe') grows at the bottom of the cashew apple. *Source: Mighty Earth*

years.[40] Similarly, in the northern department of Niakaramandougou, land devoted to food crops such as rice, maize, yams, peanuts and sorghum, is also becoming increasingly rare as more and more cashew orchards are planted, posing a threat to crop diversity as well as food security.[41]

In Gontougo, a region famed nationally for producing the best yams, most farmers have given up producing the nutritious tuber and now buy it with income from cashew. This means any sudden drop in the price of cashew – or a bad harvest or sudden uncontrollable pest or disease outbreak – could have disastrous consequences for both the food security and livelihoods of rural households in the region, which are now solely dependent on cashews as the main source of income.

This risk is not simply theoretical. In March of 2023, Mighty Earth researchers interviewed farmers and cashew cooperative managers in the town of Flakiédougou (Gontougo region), who expressed rising concerns that the cashew selling season, which begins in February, had gotten off to a sluggish start. By June of 2023, this situation had developed into a full-blown crisis, with Reuters reporting that farmers and small business traders around major cashew marketing towns such as Bouake, Katiola, Korhogo, Odienne and Bondoukou – where 80% of the country's cashew output is produced – were sitting on unsold stocks from the past two seasons due to a lack of industrial buyers. The news agency cited a representative of Olam Food Ingredients (ofi), who blamed the depressed state of the local market on the recent boom in farming acreage in cashew-producing countries, which had created a stock surplus that depressed prices.[42]

Cashew farmer livelihoods are also beholden to the vagaries of seasonal changes in the weather, which have become increasingly unpredictable across the country due to climate change.

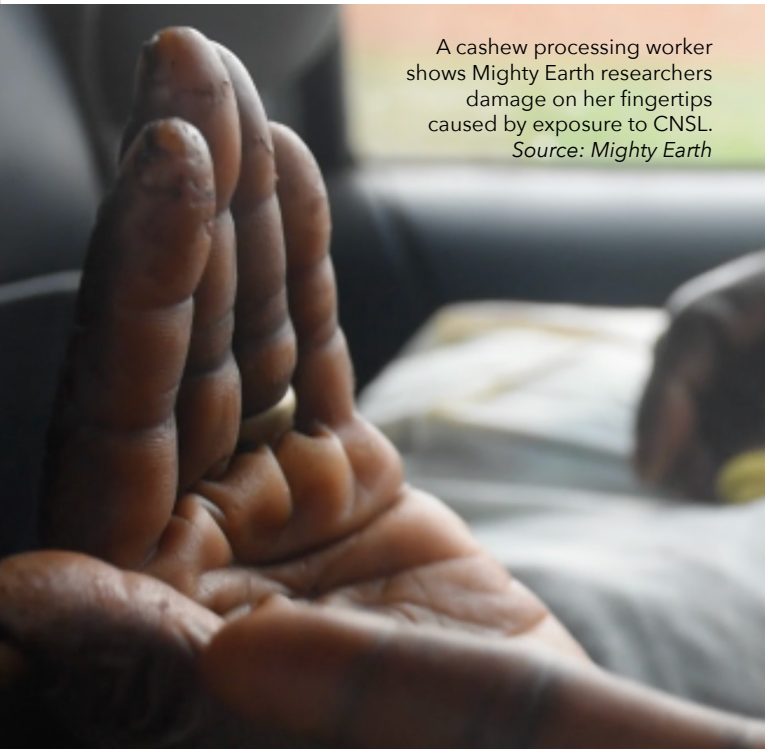
> *"Arable lands are now hard to find here because of cashew cultivation. We can no longer grow other crops as before. Even the large shea trees that were here have been cut down. Due to the rainfall change cashew have not yielded this year. We know that the origin of the change in rainfall and climate is caused by deforestation. Here, the trees that held back the wind no longer exist.*
>
> –Tuo, a local youth leader from the city of Korhogo, northern Côte d'Ivoire.[43]

CAUSTIC CASHEW

The expansion of local cashew processing, while bringing employment and income opportunities to Ivorians, particularly women, has also created a risky environment for workers in that part of the supply chain.

When raw cashew nuts are roasted, they release a caustic oil, known as 'cashew nut shell liquid' or 'CNSL'. Workers then manually remove the cashew kernel from its shell, before sorting and packaging them. Handling recently roasted cashew nuts without protective equipment exposes workers to this highly hazardous oil, which can cause burns, rashes and blisters to workers' hand, nails and forearms.

Measures to prevent and treat these injuries are often inadequate and skin damage is a fact of life for many workers that manually de-shell cashew nuts. Despite the risks, many women workers will accept the painful consequences of cashew shelling work because they need the income.



A cashew processing worker shows Mighty Earth researchers damage on her fingertips caused by exposure to CNSL. *Source: Mighty Earth*

> *I have had my fingers like this since the day before yesterday because of handling cashew nuts. We are told not to do it but we are the ones who persist.*
>
> –A woman worker, interviewed by the research team in June 2022, at a processing plant in central Côte d'Ivoire.[44]

At a cashew cooperative in Korhogo, northern Côte d'Ivoire, a co-op manager confirmed that workers in processing plants, mostly women, experience burns.

> *They usually do this with their bare hands. At times, they protect their fingers with bags or gloves and their feet with socks or plastic shoes to avoid coming into contact with the product. When they notice burns or injuries, there is nothing particular to do because they tell themselves that the injury will end on its own, "it will pass".*
>
> –Cashew co-operative manager, Korhogo, northern Côte d'Ivoire.[45]

As a result of these injuries, many workers are forced to take time off work until symptoms subside, meaning they lose out on days or even weeks of pay.

FEEDING THE PROBLEM
GLOBAL DEMAND FOR IVORIAN CASHEWS

Global demand for cashew continues to accelerate. The value of European cashew nut imports increased by an average of 2% a year in the 2017-2021 period, and volumes increased 6.5% annually over the same time period.[46] Similar patterns can be seen in the United States and the United Kingdom, while the increase in the rate of demand has been even steeper in countries such as China and the United Arab Emirates.[47]

In Côte d'Ivoire, cashew trees are primarily grown to produce raw cashew nuts for commercial export. In 2022, the country earned 961 million U.S. dollars from cashew nut exports.[48] Farmers sell the raw nuts to local businessmen or cooperatives, who in turn dry the nuts, bag them, and store them in small warehouses. These raw nuts are then sold on to industrial processors, who roast, shell, dry, peel, and grade the nuts, ready for export to consumer markets. In Côte d'Ivoire, only 21.25% of this happens within the country,[49] with the majority sold to companies in other countries – notably Vietnam or India – where they are then processed and re-exported to consumer markets in the US, Europe, China, Canada, Japan, and elsewhere. The largest buyer, industrial processor, and exporter of cashew in Côte d'Ivoire is Olam Food Ingredients (ofi), which has invested in several large processing facilities in the country.

Once processed, cashews make their way onto the shelves of supermarkets across the world, with the US and Europe taking the lion's share. In 2021, the US imported $1.2 billion worth of cashew, nearly 30% of the world market share. In terms of value of cashew imports, the US is followed by Germany ($435 million), the Netherlands ($342.7), China ($191.1m), UAE ($171.3m), the UK ($151.5m), France ($133.1m), Canada ($108.9m) and Japan ($102.7m).[50] Between them, the US and Europe account for approximately two-thirds of the global consumer market.

From in-store and online research, Mighty Earth's findings show that many of the cashew brands sold at popular European and US retailers, including ALDI, Carrefour, Costco, CVS, Harris Teeter, Target and Walmart, derive from Côte d'Ivoire. But traceability and transparency of the global cashew supply chain is poor, leaving consumers in the dark. Many leading retailers, such as Tesco in the UK, simply state on their packaging that they source cashew from "around the world". In other cases, packets of cashew nuts sold by retailers in the UK, US, and EU are labelled as originating from Vietnam or India, but may in fact originate from Côte d'Ivoire.

Some supermarket chains are taking steps to trace their cashew supply chains. Aldi is one of several companies (retailers and food manufacturers) that have joined together under the Sustainable Nut Initiative to trace and tackle sustainability issues in cashew, with multinational retailers Ahold and Lidl also taking part.[51] Other multistakeholder initiatives have also been implemented with the aim to promote growth in the cashew sector, such as the German-government funded ComCashew program and the African Cashew Alliance.[52] However, it is not clear whether these initiatives are addressing issues such as maintenance of

indigenous trees or preventing clearing of the northern dry forest, as discussed in this report.

Some cashew cooperatives are also making efforts to connect to organic and fair trade markets, particularly in Europe. One such cooperative is COPABO, located in the town of Bondoukou, which has been selling FairTrade certified cashew since 2006, and organic cashew since 2010. Out of its 895 members across the Gontougo region, three hundred are now organic certified, with these farmers earning an average of 10% more for their cashew harvests. The cooperative is working to diversify farms and reduce pesticide use. It is also doing some small-scale processing of cashew—including both ready to eat nuts, as well as other products such as juice from the cashew 'apple' and cashew nut butter—although these processed goods still only represents 5% of their total sales.[53] Such initiatives hint at the possibility for more sustainable models for the Ivorian cashew industry.

> *Despite the great potential of cashews, there can be many challenges that arise throughout the value chain. Increasing transparency of the value chain and the traceability of our nuts is a steppingstone for us to improve our business practices and promote sustainability within our cashew supply chain. By knowing where our cashews are grown, we are better equipped to support our business partners and ensure that our cashew products are of ultimate quality and sustainability.*
>
> —Michael Peer, Manager of Value Chain Optimization at ALDI SOUTH Group[54]

A truck loaded with bags of cashew nuts hauls its load in north-eastern Côte d'Ivoire.
Source: Mighty Earth

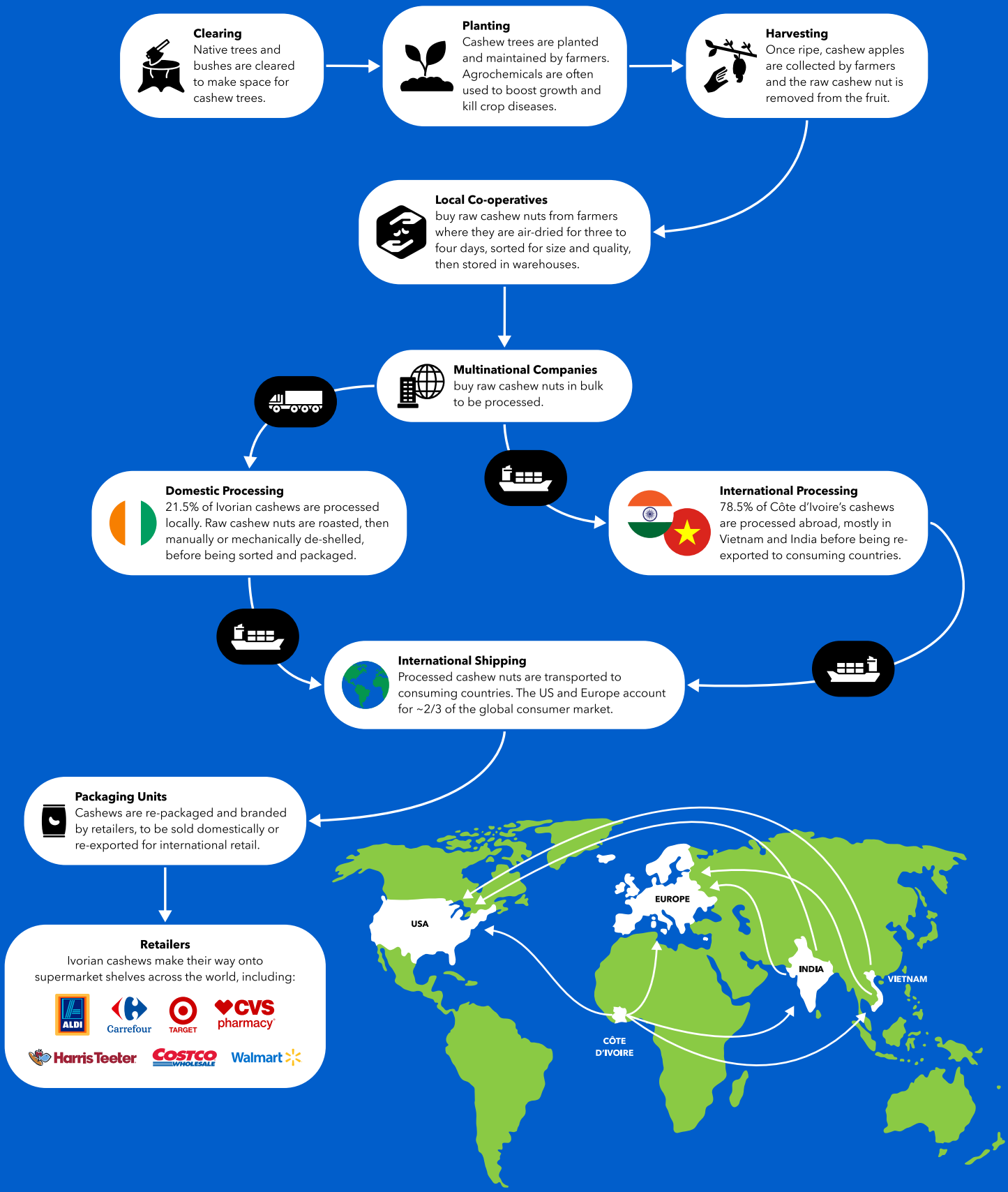


Figure 3: The Cashew journey from farm to shelf
Source: Mighty Earth

CONCLUSION

When cashew was introduced to Côte d'Ivoire in the 1960s, the hope was that the crop would help to halt desertification and control soil erosion in the arid northern regions of the country. The tree's hardiness and ability to survive in dry conditions and poor soil made it the ideal candidate for creating a natural barrier to the southern encroachment of the desert. As cashew grew in popularity as a global consumer food, farmers also began to reap the benefits of cashew as a commercial crop.

With encouragement from the government, international donors, and the private sector, cashew rapidly expanded across the northern, eastern and central regions of the country, a trend that has continued to accelerate. Cashew production in Côte d'Ivoire rocketed over a twenty-year period, from 100,000 tons in 2002, to over 1.2 million tons by 2022.[55] This boom led to a huge increase in the area of cashew covering the landscape of these northern regions, and helped to alleviate poverty and drive economic growth in areas that had previously been less prosperous than the southern part of the country, where other commodity crops such as cocoa, coffee and rubber thrived in the moist tropical climate conditions.

But the runaway success of cashew cultivation in the northern and central regions has created unintended consequences for both the natural environment, and local people. While cashew has helped to stabilize soil conditions in the far north, in other regions it has expanded into areas of dry wooded savannah forest, replacing these important natural landscapes with cashew orchards that stretch for many miles in every direction. This has important consequences for wildlife, which needs diverse mosaic landscapes of native trees and shrubs to thrive. Importantly, and despite its initial profitability, it also creates economic vulnerabilities for rural households, whose increased reliance on cashew as a sole source of income has left many vulnerable to downturns in the market, as has been witnessed in 2022/23. This is a situation which could continue to arise as rapidly increasing cashew production saturates the market, and as cashew production simultaneously grows in neighboring countries. Because cashew trees have, on many farms, largely replaced food crops, this vulnerability also carries with it a growing risk of food and nutritional insecurity for farmers reliant on income from cashew to buy food for their families.

Fortunately, there are a number of ways in which the Ivorian cashew industry could continue to thrive, whilst creating better outcomes for the environment, and more long-term livelihood and food security for rural households. Below we list a number of recommendations for actors in the cashew supply chain, and other relevant stakeholders, that could help drive forward a more sustainable future for cashew production and processing in Côte d'Ivoire.

RECOMMENDATIONS

Solving the problems in the Ivorian cashew sector will require efforts from both private and public sector, working in conjunction with civil society organizations to support farmers and factory workers to be able to grow, process and sell cashew in ways which are economically beneficial whilst also protecting nature and human health.

FOR COMPANIES BUYING AND SELLING CASHEWS

1. Develop full (farm-level) traceability for their cashew supply chains and publish this information on their websites.

2. Carry out due diligence, in consultation with academic experts and local civil society, to understand the range of environmental and social issues present in the places where they are sourcing cashew.

3. Consult on, create, and publish action plans for sourcing zero deforestation/ecosystem conversion cashew, supporting cultivation methods that encourage biodiversity to flourish, and ensuring processing happens under decent working conditions.

4. Collaborate with governments, traders, and cashew producers to carry out research and develop programs to halt the expansion of cashew production into native ecosystems, and restore native habitats degraded by cashew production.

FOR THE GOVERNMENT OF CÔTE D'IVOIRE

The Ivorian government has set a target to have 20% of the country under forest cover by 2030.[56] But the current rate and manner of cashew expansion, combined with ongoing deforestation for crops like cocoa and rubber, makes reaching this target unlikely. Mighty Earth suggests:

1. The Government of Côte d'Ivoire should commit to halting the expansion of cashew production into native ecosystems.

2. The Conseil du Coton et de l'Anacarde, the public agency charged with overseeing the cashew industry in Côte d'Ivoire, needs to initiate a multistakeholder dialogue about the environmental impact of cashew, with a view towards strengthening standards and regulations for the cashew sector; as well as promoting socially and ecologically responsible cashew supply chains.

3. Strengthen the dedicated sustainability division of the CCA, and transparently share the steps they are taking to protect biodiversity and restore landscapes in cashew growing regions.

CONSUMER MARKET COUNTRIES

1. The European Commission should take the opportunity of the 2024 review process to expand the EU Deforestation Regulation (EUDR) to include cashew amongst an expanded list of commodities covered by the regulation, as well as to include other wooded lands (OWL) within the scope of the regulation.

2. The United States Congress needs to accelerate efforts to enact similar legislation to the EU, which would aim to ban cashew sales linked to the destruction of natural habitats, alongside similar rules for other agricultural products such as beef and cattle, cocoa, coffee, palm oil, pulp & paper, soy and natural rubber.

3. The UK government should use existing powers under the 2020 Environment Act to introduce secondary legislation that would have the same effect as the EUDR.

FOR CASHEW SECTOR DONORS AND INVESTORS

1. Multilateral agencies and international donors supporting the cashew sector in Côte d'Ivoire should set aside dedicated funding for research into how to "green" cashew farming to encourage on-farm biodiversity.

2. These agencies should also support Ivorian and international research organizations to investigate how to raise productivity of existing cashew orchards to reduce the expansion of farms into native vegetation.

3. In all funding, donors should encourage landscape planning for where cashew should or should not be planted; and raise awareness that a healthy cashew sector depends on ecosystem services provided by forests and biodiverse landscapes.

4. Donors should make funding to the cashew sector conditional on no further expansion into forests reserves, parks or other protected areas, and dedicate funds to restore essential ecosystems in cashew growing landscapes.

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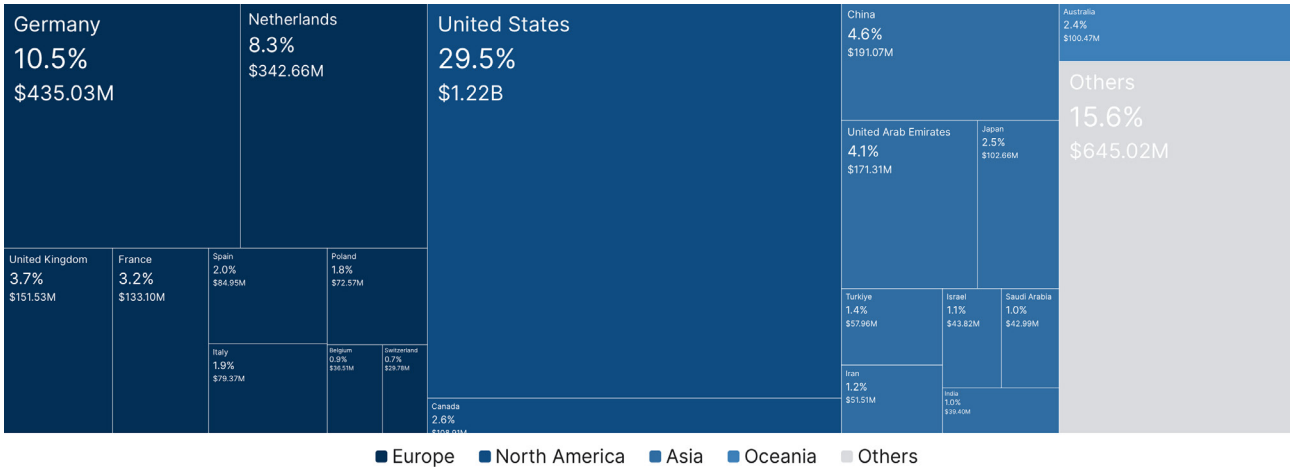
APPENDIX

1. Global imports of cashew kernels

Share of top importing countries

Discover the share of top 10 importing countries of Cashew Nut Kernel in 2021.



Country	Share in Import Value 2021	Import Value 2021, USD	1-Year Growth in Import Value 2020-2021	3-Year Growth in Import Value 2018-2021	5-Year Growth in Import Value 2016-2021
United States	29.52%	$1.22B	+9.34%	-16.59%	-1.00%
Germany	10.50%	$435.03M	-12.86%	-13.56%	+7.05%
Netherlands	8.27%	$342.66M	-0.08%	-10.85%	+2.45%
China	4.61%	$191.07M	+26.42%	+108.88%	+731.09%
United Arab Emirates	4.13%	$171.31M	+55.38%	-0.90%	+2.35%
United Kingdom	3.66%	$151.53M	+1.00%	-24.09%	-12.95%
France	3.21%	$133.10M	+10.66%	+3.82%	+58.09%
Canada	2.63%	$108.91M	+14.83%	-16.30%	+2.82%
Japan	2.48%	$102.66M	+13.74%	-5.93%	+45.11%
Australia	2.42%	$100.47M	-9.20%	-19.36%	-23.26%

Source: Tridge[57]

2. % Primary Forest Loss in Côte d'Ivoire's cashew growing regions 2019-2023

Region	2019 Primary Forest Coverage (ha)	Forest Disturbance Alerts 2019-2023 (ha)	% Primary Forest Loss 2019-2023
Béré	12,415.12	3,143.59	25.35%
Worodougou	25,873.80	5,153.13	19.93%
Yamoussoukro	6,207.76	1,.195.94	19.27%
Gbeke	41,404.00	7,384.73	17.84%
Bélier	48,493.60	7,512.95	15.52%
N'zi	64,380.64	9,264.45	14.39%
Bafing	17,410.88	2,489.63	14.31%
Haut-Sassandra	15,784.52	2,206.33	13.98%
Hambol	63,818.36	8,656.59	13.63%
Marahoué	15,977.56	2,173.41	13.63%
Moronou	73,461.96	8,485.99	11.55%
Poro	2,437.72	276.73	11.40%
Iffou	244,999.16	21,232.21	8.67%
Bagoué	2,893.24	241.33	8.34%
Indénié-Djuablin	68,261.76	5,668.22	8.31%
Folon	6,833.32	480.52	7.03%
Kabadougou	29,119.12	1,769.23	6.09%
Tchologo	9,013.40	530.84	5.90%
Gontougo	407,822.56	20,852.25	5.12%
Bounkani	27,305.16	1,184.87	4.35%

Source: IMAGES Canopy Disturbance Alerts

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Green Forests Africa is an Ivorian non-profit organization, based in Abidjan, Côte d'Ivoire. <greenforestci@gmail.com>

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to officials at the Conseil du Cotton et de l'anacarde (CCA) and the Ivorian Ministry for Water and Forests, with a request for comment. Responses received from stakeholders informed the findings, conclusion and recommendations in this report, and separately on Mighty Earth's website.

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For regional estimates of forest loss, we draw on the Primary Forest Disturbance Alerts dataset, produced by Vivid Economics and adopted by the Ivorian government through the IMAGES platform. This dataset displays the disturbances detected in the primary forests of Côte d'Ivoire since the beginning of 2019 where: Primary forest is defined as land with more than 70% canopy cover, consisting of trees reaching a height of at least 15 meters; alerts are updated every six weeks. Forest loss is not always synonymous with deforestation; forest loss can be the result of different factors, including deforestation, logging, fires, mining, or uprooted trees.

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