UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

COMMODITIES AT A GLANCE

Special issue on cashew nuts

No. 14

UNITED NATIONS

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

COMMODITIES AT A GLANCE

Special issue on cashew nuts

No. 14

UNITED NATIONS
Geneva, 2021

United Nations publication issued by the United Nations Conference on Trade and Development.

UNCTAD/DITC/COM/2020/1

eISSN: 2522-7866

eISBN: 978-92-1-005383-9

ACKNOWLEDGEMENTS

The Commodities at A Glance series aims to collect, present and disseminate accurate and relevant statistical information linked to international primary commodity markets in a clear, concise and reader-friendly format.

This edition of Commodities at A Glance was prepared by Stefan Csordas, Economic Affairs Officer, Commodities Branch, Division on International Trade and Commodities, UNCTAD, under the overall guidance of Janvier Nkurunziza, Chief, Commodity Research and Analysis Section, Commodities Branch.

NOTE

The term “dollars” ($) refers to United States dollars unless otherwise specified.

The term “tons” refers to metric tons.

All prices are in nominal terms unless otherwise specified.

For further information about this publication, please contact the Commodities Branch, Division on International Trade and Commodities, UNCTAD, Palais des Nations, CH-1211 Geneva 10, Switzerland; email: commodities@unctad.org; tel: 41 22 917 6286/1648.

ABBREVIATIONS

CNSL	cashew nut shell liquid
ComCashew	Competitive Cashew Initiative
DCCD	Directorate of Cashewnut and Cocoa Development of India
FAO	Food and Agriculture Organization of the United Nations
OECD	Organization for Economic Cooperation and Development
RCN	raw (unshelled) cashew nuts

CONTENTS

FIGURES

TABLES

CHAPTER I

INTRODUCTION

1. INTRODUCTION

Cashew nuts are enjoying increasing popularity all around the globe. The top three cashew-consuming countries – India, the United States of America and Germany – are on three different continents. Cashews accounted for 17 per cent of world tree nut production in 2019/20, making it the third most popular tree nut after almonds and walnuts (International Nut and Dried Fruit Council Foundation, 2020). Cashew nuts are consumed in a variety of forms, including as salty or sweet snacks and as ingredients in desserts and savoury dishes, or are further processed into cashew butter or as ingredients in a variety of spreads, sauces, bars and drinks. Increasing demand for these products led global cashew production to more than double between 2000 and 2018.

This report takes stock of the global cashew market and gives an overview of cashew production, trade patterns and policies. It also highlights opportunities for the cashew sector, to foster value addition and diversification in cashew-growing countries, and its potential contribution to the achievement of the Sustainable Development Goals.

The cashew tree (Anacardium occidentale L.) is a tropical evergreen that originated in the semi-arid coastal areas of north-eastern Brazil. In the sixteenth century, traders from Portugal introduced the cashew tree to India and Mozambique and from there it spread further across tropical regions of Africa and Asia. Initially, cashew trees were planted to combat soil erosion in coastal areas, since they are fast-growing, tolerate salinity and thrive on sandy soils. Today, cashew trees are used primarily for cashew nut production in 46 countries across Africa, Asia and Latin America and the Caribbean.

Cashew trees typically bear fruit after three years and produce mature yields after seven or eight years. The economic lifespan of cashew trees is 20–25 years, after which yields begin to drop. The true fruit of the cashew tree is the cashew nut, which is attached to the bottom of a swollen stalk, known as the cashew apple (figure 1). The part commonly known as a cashew nut is the kernel, which is protected by a thin skin (testa) and a thicker outer shell. The latter contains an acidic oil, cashew nut shell liquid (CNSL), which is a key by-product of cashew nut production, with a variety of uses.

Cashew nuts became popular in Europe and the United States at the beginning of the twentieth century, spurring commercial, export-oriented cashew plantation. Today, the bulk of cashew nuts are grown in Africa and Asia, with a relatively small share of global production in Latin America and the Caribbean. All 46 countries producing cashew nuts on a significant scale are developing countries, with 18 of the least developed countries among them. However, not all cashew-growing countries participate in the global value chain in an equal manner. In particular, the majority of cashew nuts grown in the least developed countries are exported as raw nuts before deshelling, which takes place mainly in two countries: India and

Figure 1
Cashew nut or acajou (Anacardium occidentale L.): Flowering and fruiting branch with separate sectioned flowers and fruit, chromolithograph by P Depannemaeker, c. 1885, after B Hoola van Nooten

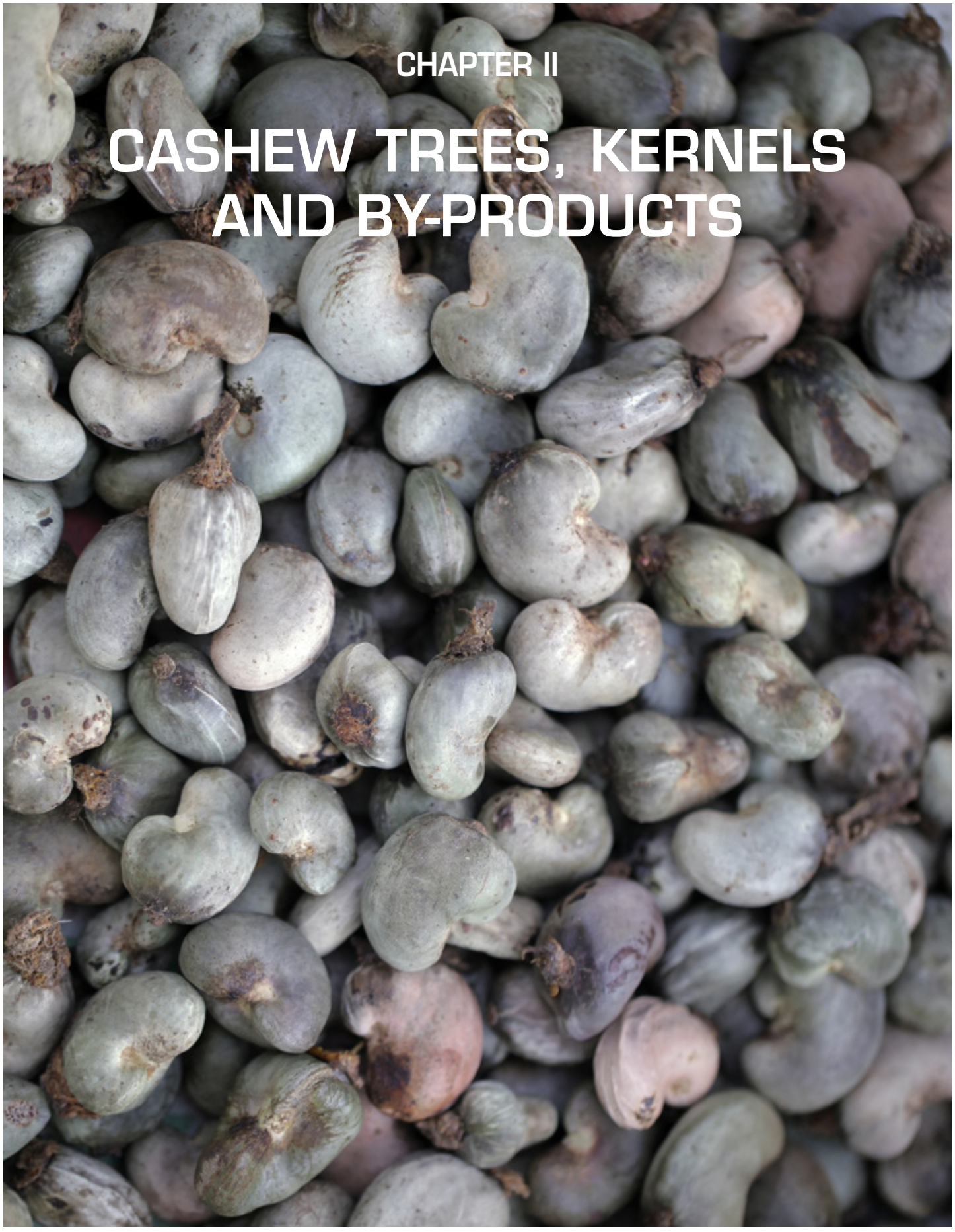
Source: Wellcome Library, No. 16303i. available at https://search.wellcomelibrary.org/iii/encore/record/C__Rb1174193__SDepannemaeker__P0%2C9__Orightresult__U__X6?lang=eng&suite=cobalt.

Viet Nam. Countries that grow cashew nuts but do not process them on a significant scale retain only a small share of the value created in the global cashew market. In these countries, value addition in the cashew sector holds significant potential to contribute to the achievement of the Sustainable Development Goals through poverty reduction, job creation and rural development. In addition, the commercialization of cashew by-products, which are often discarded as agricultural waste, can help diversify revenue sources and generate more value, employment and business opportunities in communities involved in cashew production and/or processing.

The remainder of this report is structured as follows. The growth of cashew trees, the uses of cashew nuts and the various by-products are highlighted in chapter 2. Cashew production, trade patterns and prices are reviewed in chapter 3. An analysis of policy options and opportunities to stimulate development and value addition in the cashew sector is contained in chapter 4. Finally, a conclusion is provided in chapter 5.

CHAPTER II

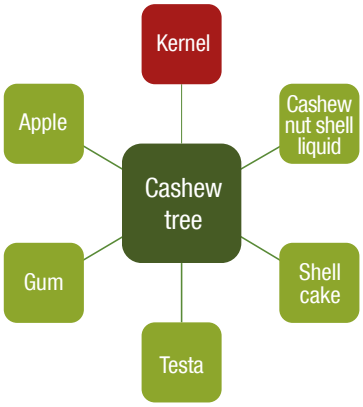
CASHEW TREES, KERNELS AND BY-PRODUCTS



2. CASHEW TREES, KERNELS AND BY-PRODUCTS

The cashew industry is based on and focused on the production of cashew kernels. However, the cashew value chain contains a number of by-products that have the potential to add value to and diversify revenue from cashew production (figure 2). This chapter reviews the value chains of the cashew kernel and its various by-products.

Figure 2
Cashew products



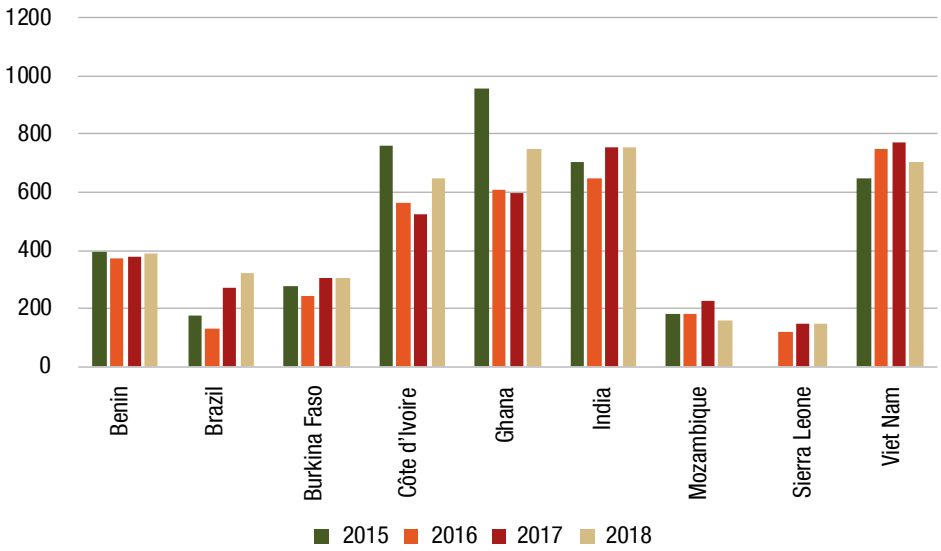
Source: UNCTAD.

2.1 TREES

Cashews are found in different climatic regions between the 27th parallel north and 28th parallel south, but the bulk of commercial plantation takes place between the 15th parallel north and 15th parallel south. Cashew trees thrive in moist tropical climates and do not tolerate frost. An average monthly temperature of 26–28°C is optimal for cashew tree growth (Paull and Duarte, 2011). Ideal climatic conditions also include 1,000–2,000 mm of rainfall during a rainy season of 5–7 months (Food and Agriculture Organization of the United Nations (FAO), 1988), as well as an extended dry season during flowering and fruit set. While cashew trees tolerate a broad range of soil types, they grow best on well-drained and deep sandy soils.

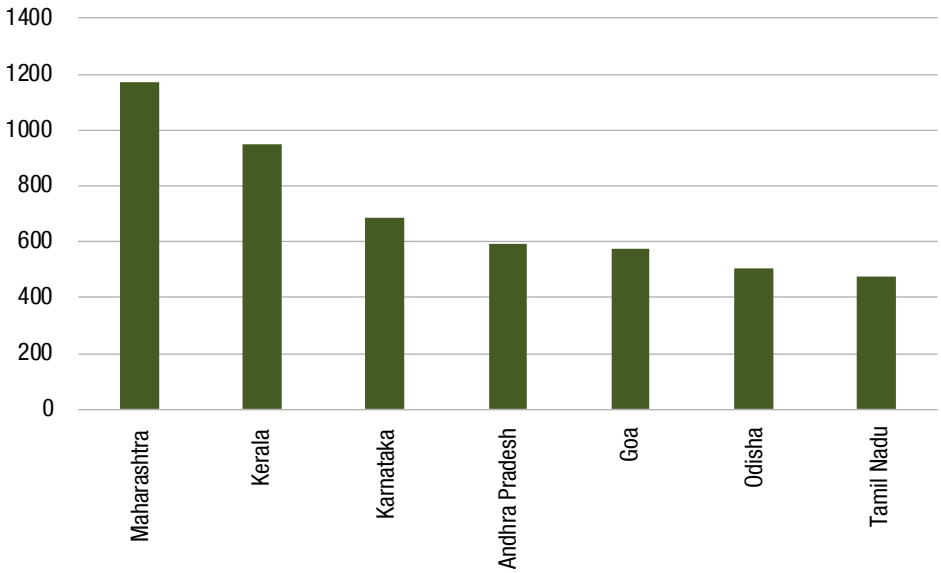
In addition to the natural soil and climatic conditions, cashew growth and yields are also linked to plantation management. For instance, water and soil conservation (Indian Council of Agricultural Research-National Research Centre for Cashew, 2008), appropriate fertilizer use and supplementary irrigation have been shown to have the potential to improve yields (Prabhakaran Nair, 2010). Cashew

Figure 3
Raw cashew nut yields, selected countries
(Kilograms per hectare)



Source: UNCTAD calculations, based on data from the Brazilian Institute of Geography and Statistics, the Competitive Cashew Initiative (ComCashew), the Directorate of Cashewnut and Cocoa Development (DCCD) of India and Viet Nam statistical yearbooks.

Figure 4
India: Raw cashew nut yields, selected states
(Kilograms per hectare)



Source: UNCTAD calculations, based on data from DCCD.

yields are also linked to average tree age, which makes replantation and rejuvenation key aspects of plantation management. Furthermore, pest and disease management also play important roles. Finally, cashew yields can differ between varieties.

Due to the factors highlighted above, cashew yields vary greatly between and within countries and fluctuate from season to season. Figure 3 shows the average yields of nine cashew producers in different regions in the period 2015–2018.

It should be noted that these average yield figures can mask large disparities between different areas within these countries. This is illustrated in figure 4, which shows yields across major cashew-growing states in India in the 2018/19 season, ranging from 476 kg/hectare in Tamil Nadu to 1,169 kg/hectare in Maharashtra.

The large disparities and fluctuations in cashew yields are partially due to differences in soil and climatic conditions that cannot be controlled by farmers. However, strengthening farm management practices and improving the genotypical composition of cashew orchards can contribute to higher and more stable cashew yields (Dadzie et al., 2014; Mangalassery et al., 2019; Nayak et al., 2018). In this context, the low average yields in many cashew-growing countries, including in many countries in Africa, point to a significant potential to boost productivity and increase revenues for cashew farmers. This potential appears greatest among smallholding farmers that grow the bulk of cashew nuts but have limited access to the finance, quality seed material and technical know-how required to enhance productivity.

2.2 KERNELS

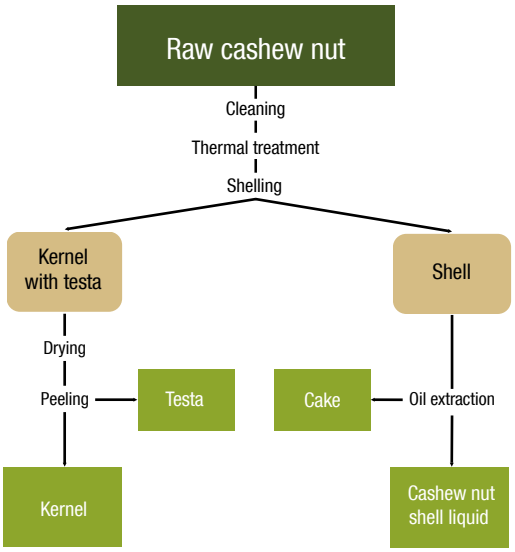
Cashew kernels represent the main product of the cashew industry. They are consumed in various forms, including as a salty or sweet snack or an ingredient in desserts and savoury dishes, or are further processed as cashew butter or as an ingredient in a variety of spreads, sauces, bars and drinks. In addition, cashew oil can be extracted from cashew kernels.

2.2.1 Shelling

A number of processing steps must be undertaken to extract the kernel from raw cashew nuts (RCN; figure 5). In the first step, RCN are exposed to thermal treatment in order to make the outer shells brittle. The three main methods are steaming, roasting and immersing RCN in a hot oil bath. In the second step, RCN are shelled, that is, the kernels are separated from

the outer shells. This process can be done manually, mechanically or in a fully automated manner. The next step involves drying the kernel, followed by peeling off the testa. The testa and cashew shell are by-products of the cashew-processing industry and can be further processed to generate numerous products. Cashew kernels are often sold in bulk and typically undergo secondary processing, including roasting, frying and the addition of salt, sugar or flavouring, and may also be mixed with other nuts before being packaged for retail sale.

Figure 5
Processing of cashew products



Source: UNCTAD.

2.2.2 Grading raw cashew nuts

The quality and therefore the price of RCN depends on several factors that are typically determined through a sampling process. A key quality indicator for RCN is their kernel outturn ratio, which is the weight in pounds of usable kernels per 80 kg of RCN. A higher kernel outturn ratio yields a higher price since it means that more kernels can be extracted from RCN. Another indicator for assessing the value of RCN is the nut count, which measures RCN/kg. A smaller nut count corresponds to larger kernels, which generally yield a higher price. Furthermore, the defective rate is an important indicator of RCN quality; it measures the share of nuts that are not usable for various reasons, such as missing, stunted or moth-eaten kernels. Sampling also includes the measurement of the moisture content of RCN using a moisture meter; the moisture content should not exceed 9 per cent to limit degradation during storage. Other indicators that determine the value of RCN are the share of foreign matter and the float rate, that is, the share of RCN that float in water, with a lower float rate corresponding to a higher quality.

2.2.3 Grading cashew kernels

There is a wide spectrum of cashew kernel qualities. The United Nations Economic Commission for Europe (2013) standards for the commercial quality of cashew kernels provide a system to categorize unprocessed kernels. The standards include a number of general quality requirements for commercial kernels, such as a maximum moisture content of 5 per cent. They also define characteristics to enable the categorization of cashew kernels into the three main quality classes of extra, class I and class II (table 1). Whole nuts are further classified into seven categories ranging from 150 to 500 according to the maximum number of kernels per pound. Broken nuts are classified according to the sizes of the pieces, ranging from large (not passing through a sieve with an aperture of 4.75 mm) to baby bits or granules (not passing through a sieve with an aperture of 1.70 mm).

Table 1
Cashew kernel classification

Class	Commercial designation	Description
Extra	White	White, pale ivory, pale ash-grey or light yellow
Class I	Scorched or lightly blemished	Light brown, light ivory, light ash-grey, deep ivory or yellow
Class II	Scorched seconds or dessert	Light brown, amber, light blue, deep brown, deep blue, discoloured, black spotted, immature, shrivelled, blemished or stained kernels are permitted

Source: United Nations Economic Commission for Europe, 2013.

In addition to the United Nations Economic Commission for Europe standards, there are other quality classification systems for cashew kernels. These include the industry standards of the Association of Food Industries, which apply to the United States market, as well as standards developed by kernel-exporting countries, including Brazil and India. These systems generally also grade the quality of cashew kernels based on colour and size and whether the kernels are whole or broken.

2.3 BY-PRODUCTS

2.3.1 Nut shell liquid

CNSL is a viscous liquid that represents 20–25 per cent in weight of RCN (ComCashew, 2019a) and is mainly composed of anacardic acid, cardol and cardanol (Kumar et al., 2009). CNSL-based polymers have numerous desirable properties such as low fade characteristics, water repellence, wear and electrical resistance, solubility in common organic solvents, compatibility with many other polymers and antimicrobial activity, which make them a suitable raw material for a range of industrial, chemical and pharmaceutical applications (Telascrêa et al., 2014).

One of the main uses of CNSL is in the manufacture of brake linings and clutch facings for the automobile industry (Lubi and Tchachil, 2000). CNSL is also used in the paint and coatings industries, in which it is a potential substitute for petroleum-based raw materials (Balgude and Sabnis, 2014). Furthermore, the potential use of CNSL as a biofuel or additive to biofuel has been demonstrated (Sanjeeva et al., 2014). In addition, CNSL has a range of applications in the production of rubber, adhesives and plastic materials. Finally, research has shown the potential of CNSL as a component of non-toxigenic insecticide (Vani et al., 2018).

There are various methods of extracting CNSL from the cashew shell. The two most widely used technologies are mechanical extraction with screw expellers and extraction through a hot oil bath before shelling. Other methods include solvent extraction (Tyman et al., 1989) and extraction through pyrolysis (Das et al., 2004). The chemical composition of CNSL depends on the extraction method (Srinivas and Anilkumar, 2017), which can yield CNSL with a high share of either anarcadic oil (natural CNSL) or cardanol (technical CNSL).

The biggest producers of CNSL are Brazil, India and Viet Nam. There is also some degree of commercialization of CNSL in many countries that process cashew nuts, including Benin, Burkina Faso, Côte d'Ivoire, Ghana, Indonesia and Mozambique.

2.3.2 Shell cake

Cashew shell cake is the de-oiled cashew shell and thus a by-product of CNSL production. It can be used as a raw material for several products. In particular, shell cake can be carbonized and mixed with a binder to produce briquettes that can be used to fire industrial boilers (Sawadogo et al., 2018). Shell cake can also be processed into vermiculite, a product used in gardening and hydroponics.

2.3.3 Apple

The cashew apple is often referred to as the false fruit or pseudofruit of the cashew tree. Botanically, the cashew apple is a swollen stalk, which carries the true fruit of the cashew tree: the cashew nut. Since the ripe cashew apple starts to ferment and degrade quickly after falling from the tree, it is often discarded during the cashew nut harvest. However, the cashew apple is rich in vitamin C and antioxidants and can be used to produce a range of food products, including pectin and juices, alcoholic beverages, vinegars, syrups and jams. In addition to these products, the fibrous residues of the cashew apple juice-making process can be further processed to produce animal feed (Gomes et al., 2018) and research has shown the potential of juice residue as a source of carotenoids for food supplements or natural food colourants (Abreu et al., 2013).

A small share of cashew apples is consumed directly on orchards or processed into artisanal food products for local consumption in cashew-growing regions, yet commercial utilization of the cashew apple remains low in most cashew-growing countries. Brazil has the highest cashew apple utilization rate, estimated at 15 per cent (Luciano et al., 2011). In Brazil, the majority of harvested cashew apples are processed into cashew apple juice, which is widely consumed domestically and also exported. Cashew apples are also sold as fresh fruit or processed into candy and cajuína, a clarified juice. In India, a small share of cashew apples is used to produce juices, candies, jams, pickles and chutneys. An alcoholic beverage known as feni is also made from cashew apples in Goa. In 2014, the Pepsi Company announced plans to add cashew apple juice to fruit juice blends for the market in India (Strom, 2014), which could increase the share of utilized cashew apples. Cashew apple juice production also takes place in Senegal and Viet Nam, as well as in Ghana, where a brandy is also produced from cashew apples. Finally, several initiatives that aim to add value to cashew apples have recently emerged in other cashew-growing countries, including Benin and Nigeria.

2.3.4 Testa

The cashew testa or husk is the thin skin covering the kernel. It contains a high concentration of tannins and can be used to produce tanning agents for the leather industry. There has also been research on the potential of the use of testa as animal feed (Fang et al., 2018).

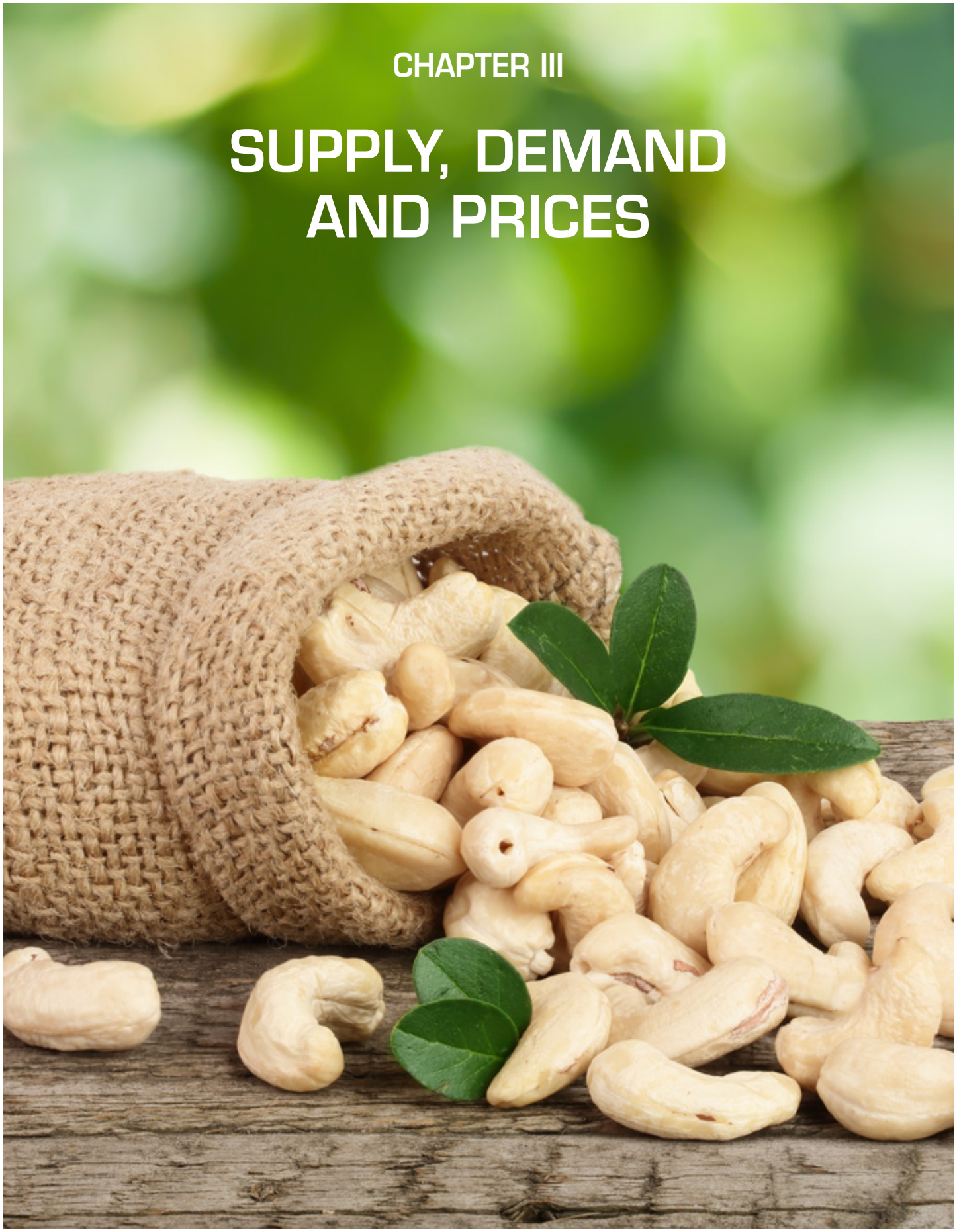
2.3.5 Gum

Cashew gum, also known as anacardium gum, is an exudate from the bark of the cashew tree. It can be harvested from natural exudate or after tapping, that is, incision of the trunk or branch. Cashew gum is a complex polysaccharide that has a range of industrial applications, including in pharmaceuticals and the food industry (Kumar et al., 2012). For instance, it can be used as a pharmaceutical excipient in drug delivery systems (Ribeiro et al., 2016). Research has also shown the potential of cashew gum as an encapsulating agent, clarifying agent and emulsifying agent in the food and beverages industry (Porto and Cristianini, 2014).

This section has highlighted that there are several by-products in the cashew kernel value chain that have the potential to contribute to diversification of the cashew-related economy and to value addition in communities involved in cashew production and/or processing. Overall, value addition to and utilization of cashew by-products remains low, except for in Brazil and India, which have actively promoted the development of cashew by-product industries. This is partly due to the fact that many cashew-growing countries such as most cashew producers in Africa export the bulk of their nuts as RCN, which also limits the availability of raw materials for shell-based by-products. In these countries, the promotion of cashew by-product utilization could go hand in hand with efforts to increase local processing.

CHAPTER III

SUPPLY, DEMAND AND PRICES



3. SUPPLY, DEMAND AND PRICES

3.1 PRODUCTION

Cashew nuts are grown in at least 46 countries across Africa, Asia and Latin America and the Caribbean, 18 of which are among the least developed countries (table 2).

In the past three decades, global production of RCN has experienced rapid growth (figure 6). The global output of RCN more than doubled, from 706,500 tons in 1990 to 1.53 million tons in 2000, and from there more than doubled again, to 3.9 million tons in 2018.

Africa accounted for 63 per cent of global RCN production growth after 2000 (figure 7), followed by Asia, with a share of 35 per cent. Production in Latin America and the Caribbean has not experienced significant growth since the mid-1990s and accounted for only 5 per cent of global output in 2018, half of its share of 10 per cent in 2000.

In the period 2014–2018, India was the largest producer of RCN, with an annual average output of 745,000 tons, followed by Côte d'Ivoire, with 675,000 tons, and Viet Nam, with 296,000 tons (figure 8).

Table 2
Cashew-growing countries by region

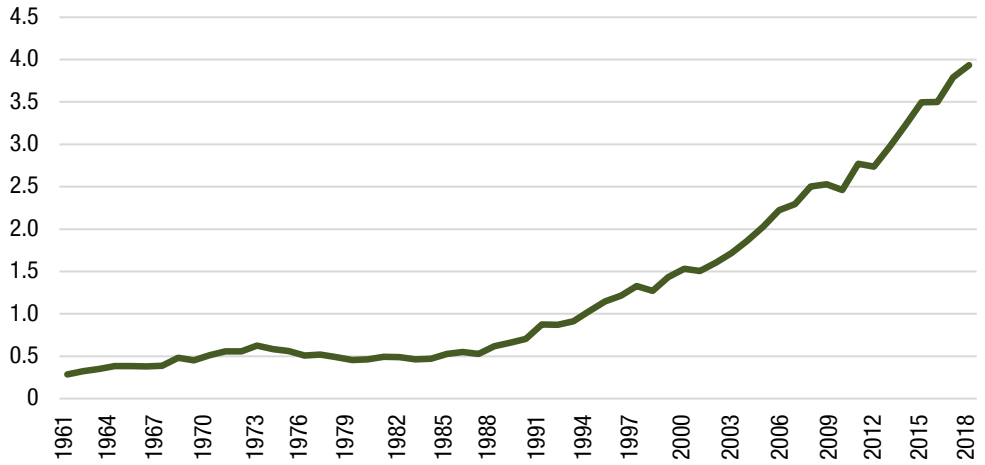
Region	Country	
Africa (20)	Angola*	Kenya
	Benin*	Madagascar*
	Burkina Faso*	Malawi*
	Cameroon	Mali*
	Côte d'Ivoire	Mozambique*
	Gabon	Nigeria
	Gambia*	Senegal*
	Ghana	Sierra Leone*
	Guinea*	Togo*
	Guinea-Bissau*	United Republic of Tanzania*
Asia (12)	Bangladesh*	Malaysia
	Cambodia*	Myanmar*
	China	Philippines
	India	Sri Lanka
	Indonesia	Thailand
	Lao People's Democratic Republic*	Viet Nam
Latin America and the Caribbean (14)	Belize	Jamaica
	Bolivia (Plurinational State of)	Nicaragua
	Brazil	Mexico
	Colombia	Panama
	Costa Rica	Peru
	Dominican Republic	Suriname
	Honduras	Venezuela (Bolivarian Republic of)

* Least developed country

Source: UNCTAD, based on data from the United Nations Comtrade database and FAOstat.

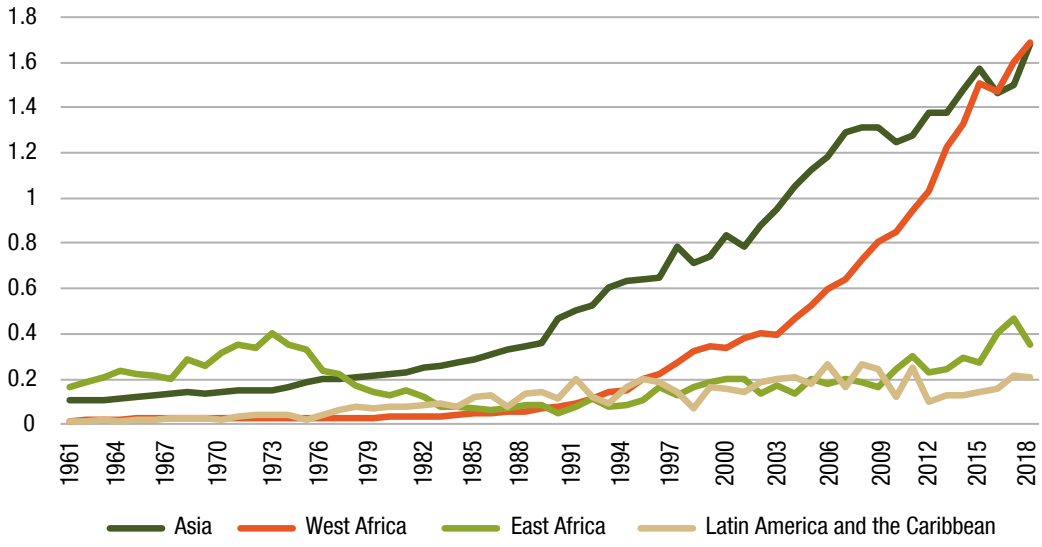
Notes: Includes countries that have either produced at least 100 tons of RCN in any year in the period 2010–2018 according to FAOstat data and/or are suitable for cashew farming and have exported at least 50 tons of RCN and/or at least 25 tons of cashew kernels in any year in this period according to Comtrade data. In addition to these countries, cashew trees are also found in other countries, where they are part of the natural vegetation or grown on a small scale and typically marketed locally for domestic consumption.

Figure 6
World production of raw cashew nuts
(Millions of tons)



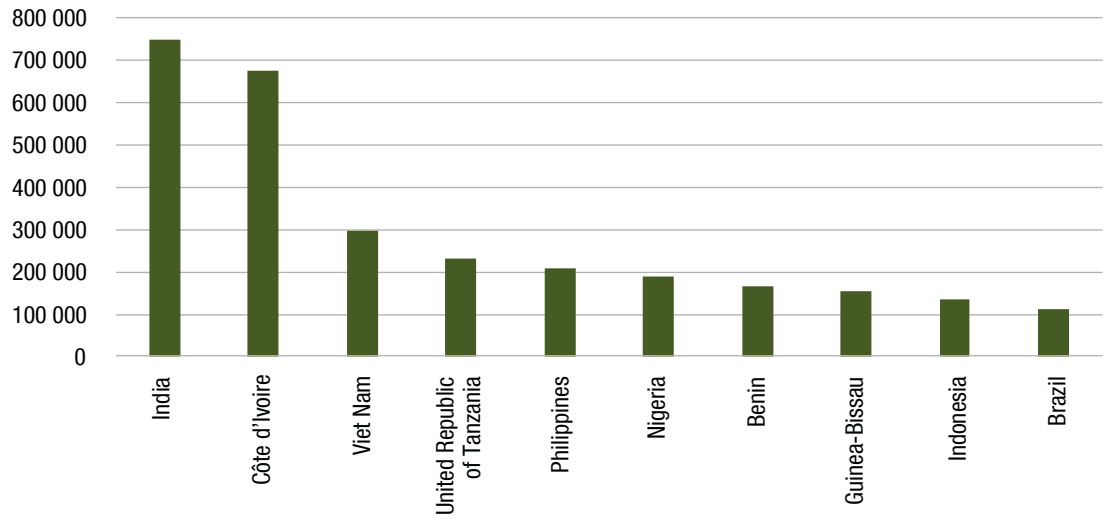
Source: UNCTAD calculations, based on data from Comtrade, DCCD, FAOstat, the United Republic of Tanzania Cashewnut Board, the General Department of Viet Nam Customs and Viet Nam statistical yearbooks.

Figure 7
Raw cashew nut production by region
(Millions of tons)



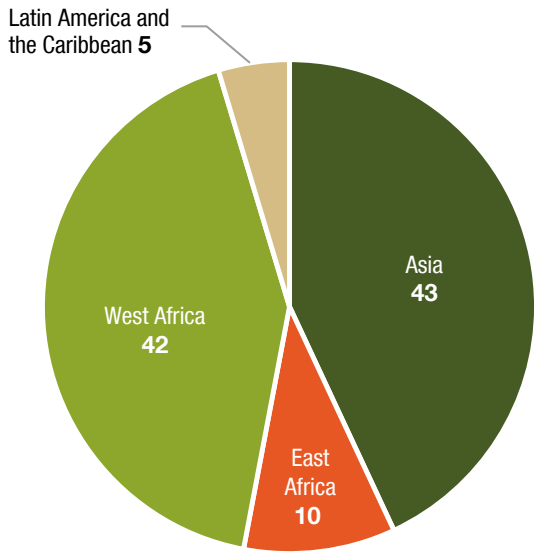
Source: UNCTAD calculations, based on data from Comtrade, DCCD, FAOstat, the General Department of Viet Nam Customs and Viet Nam statistical yearbooks.

Figure 8
Top 10 raw cashew nut producing countries, average production 2014–2018
(Tons)



Source: UNCTAD calculations, based on data from Comtrade, DCCD, FAOstat, the General Department of Viet Nam Customs and Viet Nam statistical yearbooks.

Figure 9
Share of global cashew nut production, average 2014–2018
(Percentage)

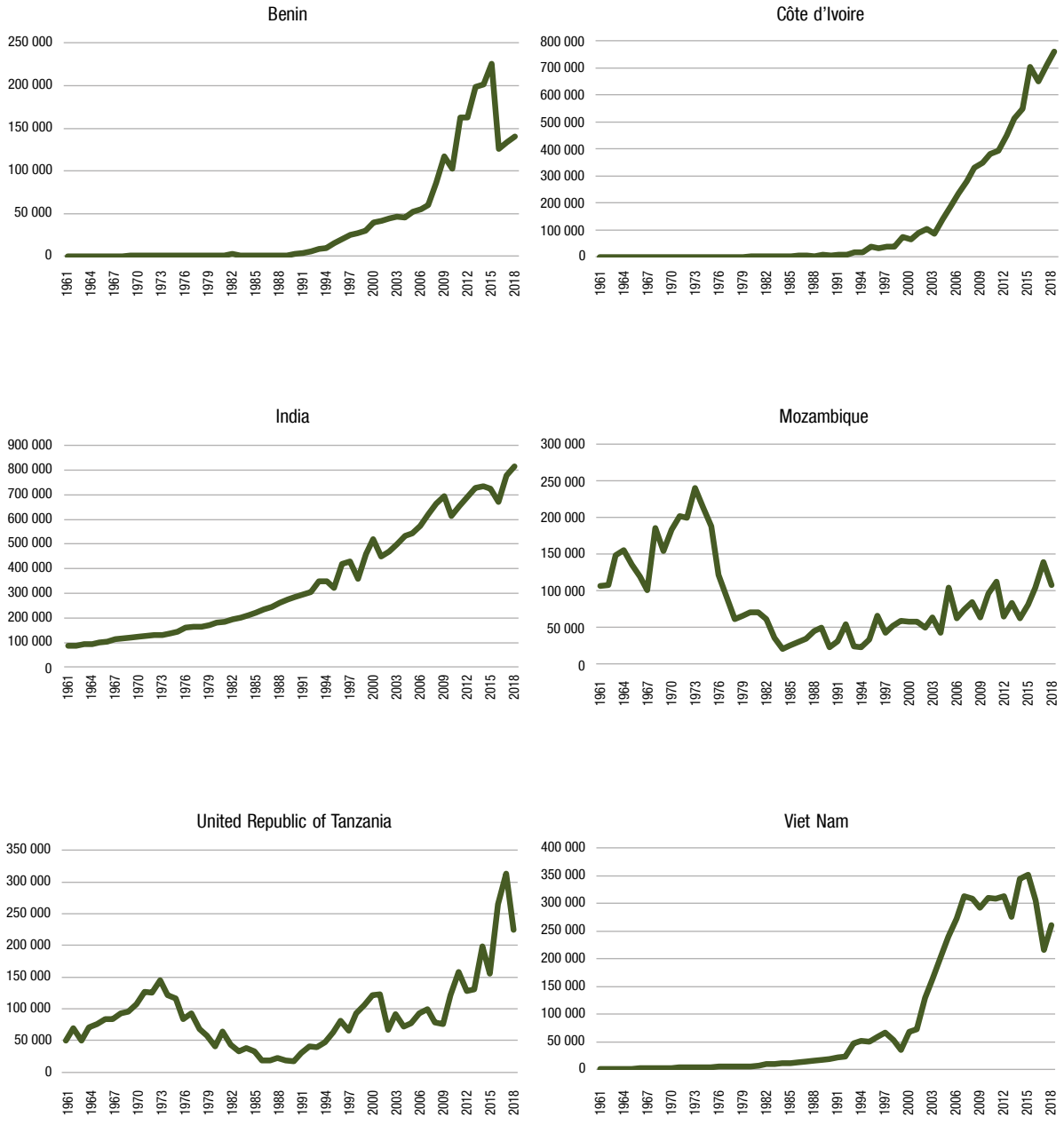


Source: UNCTAD calculations, based on data from Comtrade, DCCD, FAOstat, the General Department of Viet Nam Customs and Viet Nam statistical yearbooks.

Africa produced more than half of the global cashew nut output in the period 2014–2018, with West Africa and East Africa accounting for average annual shares of 42 per cent and 10 per cent of global RCN production, respectively. Asia accounted for an average annual share of 43 per cent and Latin America and the Caribbean, for the remaining 5 per cent (figure 9).

While cashew production has increased steadily at the global level since the 1960s, it has followed different paths in individual countries (figure 10). For instance, Benin and Côte d'Ivoire only began large-scale cashew production in the 1990s, but have since recorded high growth rates, which put them among the top 10 producers in the period 2014–2018. Production in India has followed a path of steady growth since the early 1960s. Mozambique was the world's largest cashew producer in the early 1960s, but production declined significantly in the early 1970s and, as a consequence, production in 2018 was at the same level as in 1962 (see chapter 4). The United Republic of Tanzania experienced a similar decline in cashew output throughout the 1970s and 1980s but has seen a revival since 2010. Viet Nam did not grow cashew nuts on a significant scale before the 1980s, when the Government began to promote the development of the cashew sector.

Figure 10
Raw cashew nut production, selected countries
(Tons)



Source: UNCTAD calculations, based on data from DCCD, FAOstat and Viet Nam statistical yearbooks.

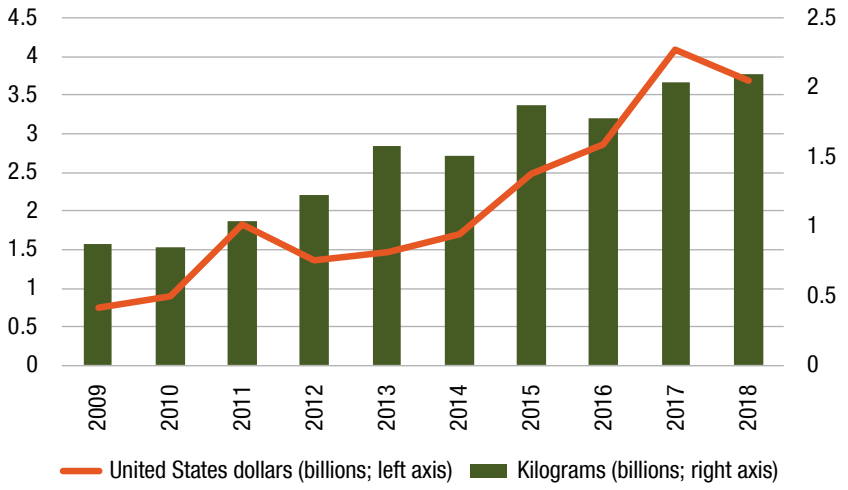
3.2 TRADE

3.2.1 Raw cashew nuts

Global trade in RCN has more than doubled, from 872 million kg in 2009 to 2.1 billion kg in 2018 (figure 11). In value terms, trade in RCN increased almost fivefold in this period, reflecting increasing RCN prices in the 2010s.

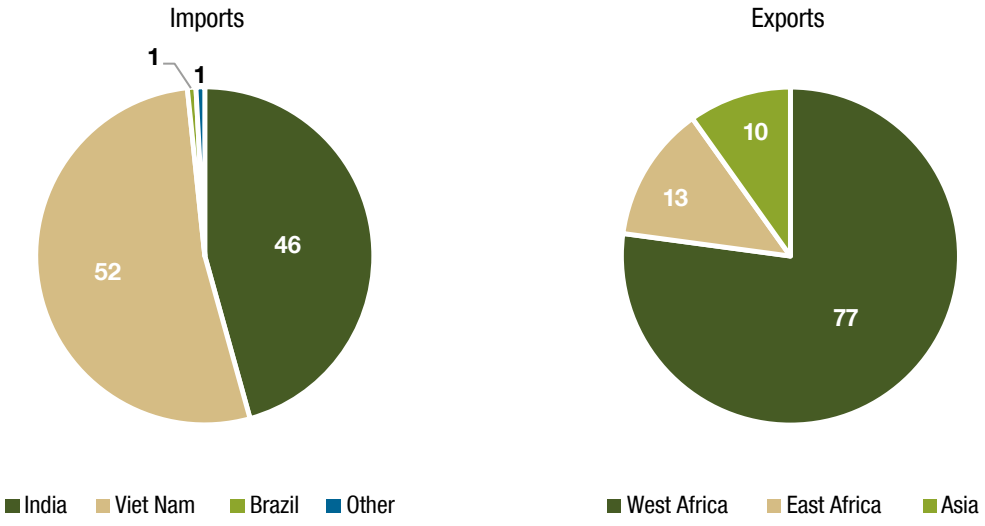
India and Viet Nam are, by a wide margin, the largest importers of RCN. Together they accounted for an average share of 98 per cent of global RCN imports by volume in the period 2014–2018. The main sources

Figure 11
Global trade in raw cashew nuts, imports
(Billions of dollars and billions of kilograms)



Source: UNCTAD calculations, based on data from Comtrade and the General Department of Viet Nam Customs.
Note: RCN corresponds to Harmonized System 080131: Cashew nuts, fresh or dried, in shell.

Figure 12
Global trade in raw cashew nuts, average shares, 2014–2018
(Percentage of volume traded)



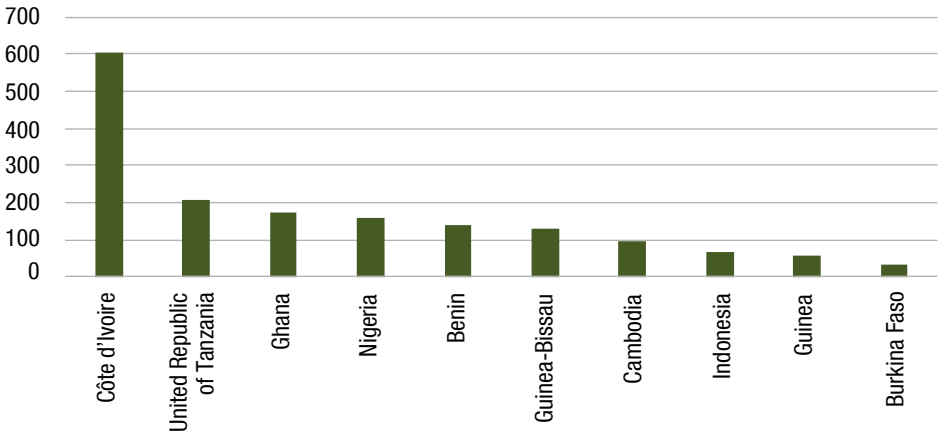
Source: UNCTAD calculations, based on data from Comtrade and the General Department of Viet Nam Customs.
Notes: To maximize data coverage and consistency, RCN exports are based on data reported by the main importers, namely, Brazil, India and Viet Nam, which jointly accounted for an average share of 99 per cent of global RCN imports in the period 2014–2018. Cashews are not grown in the United Arab Emirates but significant quantities of RCN are re-exported, mainly sourced from Africa. Therefore, in the figure, under exports, data from the United Arab Emirates is excluded. However, including the United Arab Emirates would have a negligible effect on the aggregate shares.

of RCN imports were West Africa, East Africa and Asia, accounting for average shares of 77, 13 and 10 per cent of globally traded volumes, respectively (figure 12). Africa as a continent therefore accounted for 90 per cent of global RCN exports.

Côte d'Ivoire was the largest exporter of RCN in the period 2013–2018, with 605,000 tons of average annual exports, followed by the United Republic of Tanzania, with 208,000 tons, and Ghana, with 172,000 tons (figure 13).

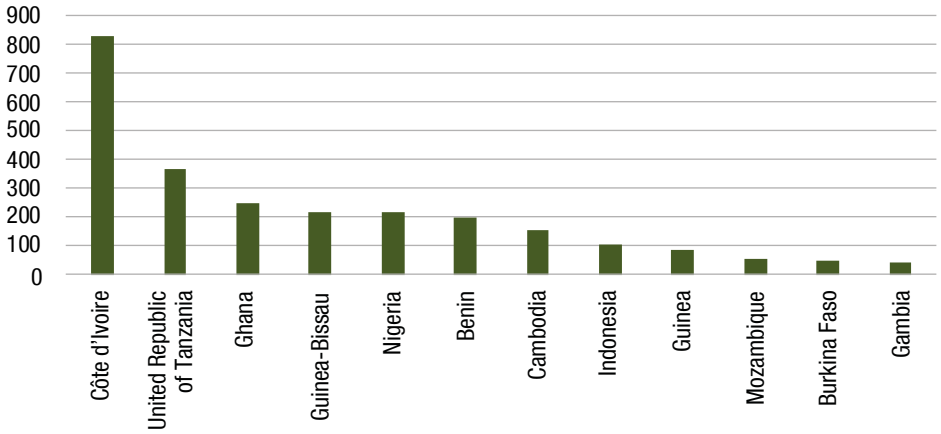
With regard to RCN exports by value, Côte d'Ivoire recorded the highest revenue in the period 2014–2018, with estimated average annual exports of $827 million, followed by the United Republic of Tanzania, with

Figure 13
Top 10 raw cashew nut exporters by volume, average 2014–2018
(Thousands of tons)



Source: UNCTAD calculations, based on data from Comtrade and the General Department of Viet Nam Customs.
Notes: To maximize data coverage and consistency, RCN exports are based on data reported by the main importers, namely, Brazil, India and Viet Nam, which jointly accounted for an average share of 99 per cent of global RCN imports in the period 2014–2018.

Figure 14
Top 10 raw cashew nut exporters by value, average 2014–2018
(Millions of dollars)

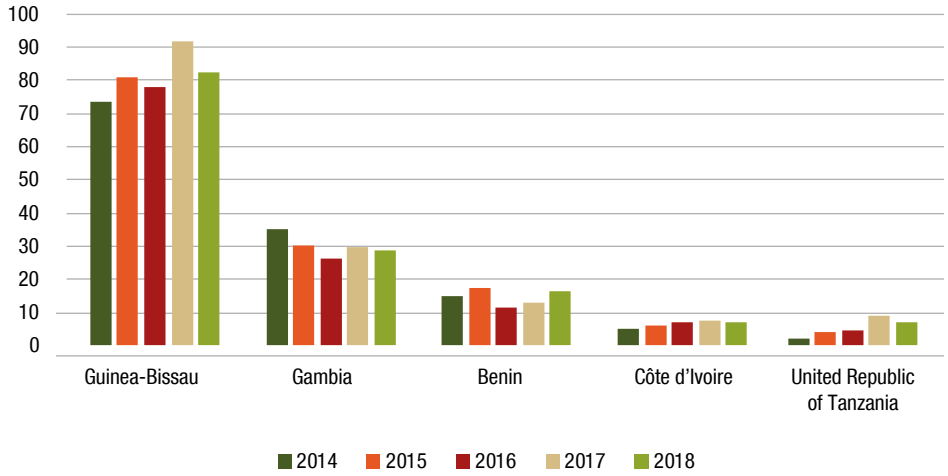


Source: UNCTAD calculations, based on data from Comtrade, the General Department of Viet Nam Customs and OECDstat[Organization for Economic Cooperation and Development].
Notes: To maximize data coverage and consistency, RCN exports are based on data reported by the main importers, namely, Brazil, India and Viet Nam, which jointly accounted for an average share of 99 per cent of global RCN imports in the period 2014–2018. Since imports as reported in Comtrade include cost, insurance and freight, free on board export values have been estimated using, where available, cost, insurance and freight/free on board ratios from the OECD International Transport and Insurance Costs of Merchandise Trade database (Miao and Fortanier, 2017).

$364 million, and Ghana, with $247 million (figure 14). The 10 largest exporters of RCN in terms of value comprise the same countries as the 10 largest in terms of volume except for Mozambique, which is on the list instead of Burkina Faso. Guinea-Bissau is in fourth place (sixth place in terms of volume), indicating that the country receives a higher average price for RCN than Benin and Nigeria. The latter may be explained by differences in kernel outturn ratio, since the kernel outturn ratio of Guinea-Bissau is estimated to be among the highest in the world (United States Department of Agriculture, Foreign Agricultural Service, 2018).

In Guinea-Bissau, RCN are the main export good, representing an average share of 81.3 per cent of total merchandise export value in the period 2014–2018 (figure 15). RCN also represent substantial shares of total merchandise exports in the Gambia (30.0 per cent), Benin (14.6 per cent), Côte d'Ivoire (6.6 per cent) and the United Republic of Tanzania (5.5 per cent).

Figure 15
Share of raw cashew nut exports in total merchandise exports, selected countries
(Percentage)



Source: UNCTAD calculations, based on data from Comtrade, OECDStat and Zignago and Gaulier, 2010.
Notes: To maximize data coverage and consistency, RCN exports are based on data reported by the main importers, namely, Brazil, India and Viet Nam, which jointly accounted for an average share of 99 per cent of global RCN imports in the period 2014–2018. Since imports as reported in Comtrade include cost, insurance and freight, free on board export values have been estimated using, where available, time-varying, country pair-specific cost, insurance and freight/free on board ratios from the OECD International Transport and Insurance Costs of Merchandise Trade database (Miao and Fortanier, 2017).

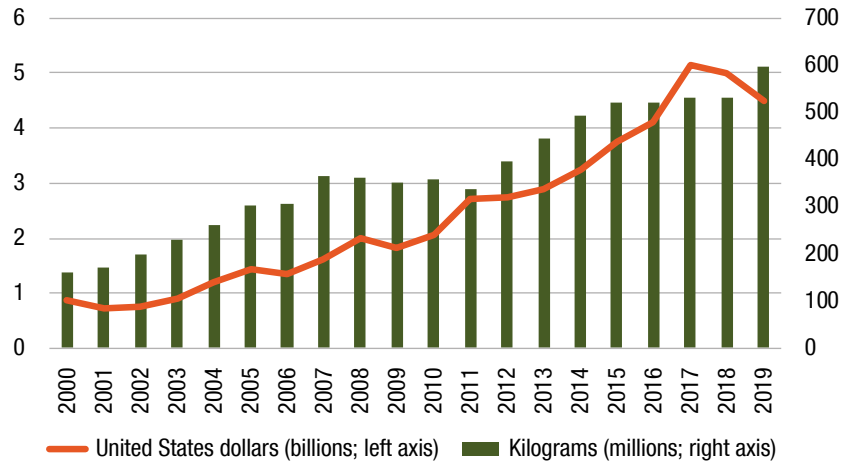
3.2.2 Kernels

Increasing demand for cashew nuts has led to a steep increase in trade in cashew kernels since 2000 (figure 16).

The main importers of cashew kernels are the United States and the European Union (including the United Kingdom of Great Britain and Northern Ireland, unless otherwise specified), which jointly accounted for 61 per cent of global imports by volume and 64 per cent of imports by value in the period 2015–2019. The main exporters of cashew kernels are India and Viet Nam, which together accounted for 77 per cent of global cashew kernel exports by volume and by value in the period 2015–2019 (figure 17).

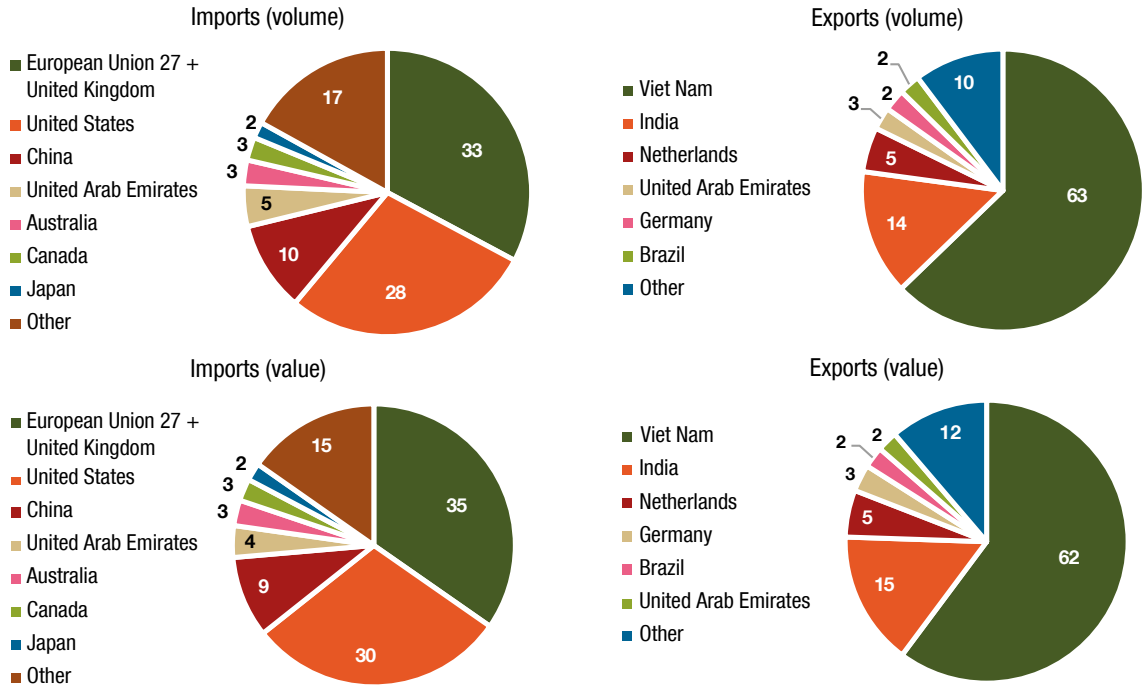
The main sources of cashew kernel imports to the European Union are India and Viet Nam, which jointly accounted for 84 per cent of total imports in 2019 (figure 18). Viet Nam overtook India as a major source of cashew kernel imports to the European Union in 2008 and increased its cashew kernel exports to the region by 156 per cent, from 41,000 tons in 2008 to 106,000 tons in 2019. Cashew kernel imports from Africa represented 5.9 per cent in 2019, more than five times greater than the 1.15 per cent share in 2000. In terms of volume, cashew kernel exports from Africa to the European Union increased more than twentyfold, from 445 tons in 2000 to 9,125 tons in 2019. In the period 2000–2019, the intra-European Union

Figure 16
Global trade in cashew kernels
(Billions of dollars and millions of kilograms)



Source: UNCTAD calculations, based on data from Comtrade and the General Department of Viet Nam Customs.

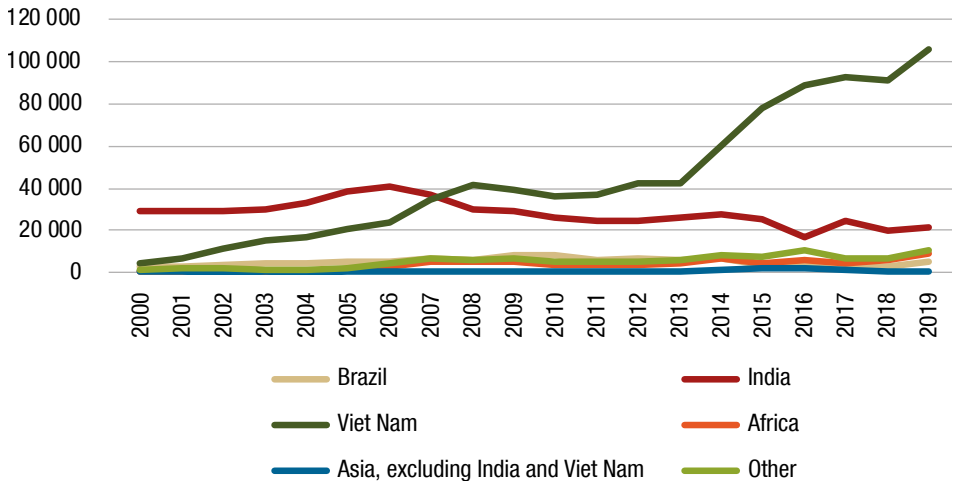
Figure 17
Global cashew kernel trade shares, average 2015–2019
(Percentage)



Source: UNCTAD calculations, based on data from Comtrade and the General Department of Viet Nam Customs.

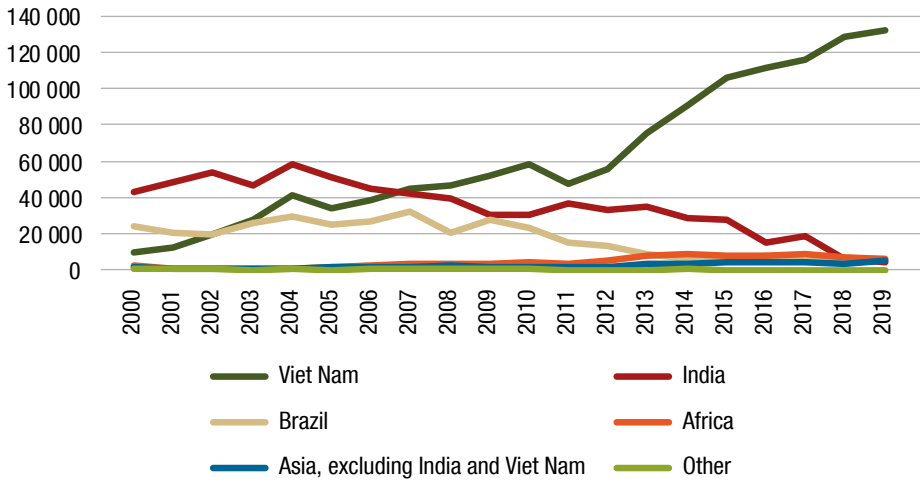
Notes: Kernels correspond to Harmonized System 080132: Cashew nuts, fresh or dried, shelled. European Union 27 + United Kingdom refers to the 27 member States of the European Union and the United Kingdom. Import figures for China are based on export data reported by India, Indonesia, Myanmar and Viet Nam, which accounted for an average share of 99 per cent of reported cashew kernel exports to China in the period 2015–2019. Data on the volume (weight) of cashew kernel imports into Canada in 2017 and 2018 is missing in Comtrade and has been replaced by manually cleaned mirror data. Percentages may not add to 100 due to rounding.

Figure 18
Sources of cashew kernel imports to the European Union
(Tons)



Source: UNCTAD calculations, based on data from Eurostat.
Notes: Based on data on cashew kernel imports originating outside the European Union 27 + United Kingdom. "Africa" refers to the following countries: Burkina Faso, Benin, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Kenya, Madagascar, Mali, Mozambique, Nigeria, Togo, United Republic of Tanzania. "Asia, excluding India and Viet Nam" refers to the following countries: Cambodia, Indonesia, Sri Lanka, Philippines, Thailand.

Figure 19
Sources of cashew kernel imports to the United States
(Tons)



Source: UNCTAD calculations, based on data from the United States International Trade Commission dataweb.
Notes: "Africa" refers to the following countries: Burkina Faso, Benin, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Madagascar, Mali, Mozambique, Nigeria, Togo, United Republic of Tanzania. "Asia, excluding India and Viet Nam" refers to the following countries: Cambodia, China, Hong Kong (China), Indonesia, Lao People's Democratic Republic, Malaysia, Philippines, Republic of Korea, Sri Lanka, Thailand.

trade of cashew kernels represented an average of 31 per cent of total cashew kernel imports to the European Union, with the Netherlands as the largest re-exporter in the European market.

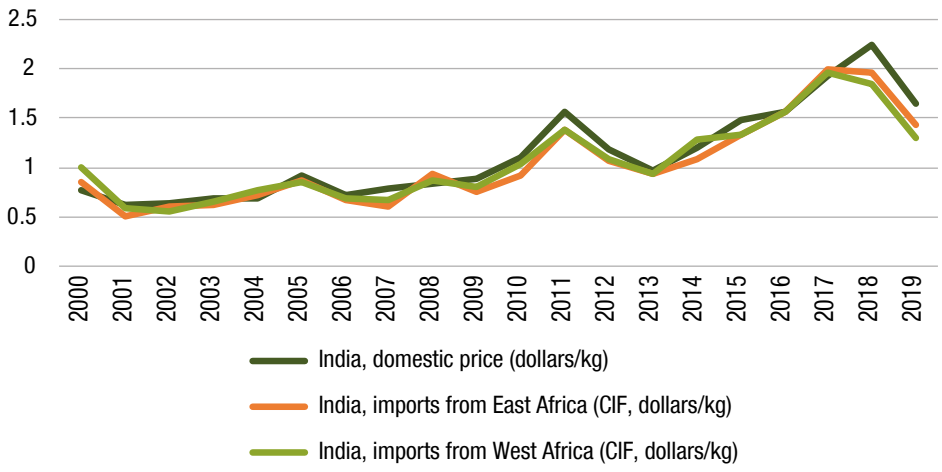
In the United States market, the picture is similar, but Viet Nam plays an even more dominant role, accounting for 85 per cent of cashew kernel imports in 2019 (figure 19). Cashew kernel imports from Viet Nam to the United States increased by 154 per cent, from 52,000 tons in 2009 to 133,000 tons in 2019. The joint share of Brazil and India decreased from 82 per cent in 2000 to 7 per cent in 2019. Cashew kernel exports from Africa to the United States increased significantly, from an annual average of 2,053 tons in the period 2000–2009 to 6,862 tons in the period 2010–2019.

3.3 PRICES

Prices of RCN went through three phases in the period 2000–2018 (figure 20). In the first phase (2000–2009), prices were volatile but stayed roughly within the range of $0.5–1/kg. The second phase (2009–2013) was characterized by a steep increase of prices caused by strong competition for RCN in global markets due to rising demand and limited supply. The price spike in 2011 caused demand to weaken, which corrected prices downwards to below $1/kg in 2013. In the third phase, prices doubled from below $1/kg in 2013 to around $2/kg in 2017. This price spike was due to a combination of increasing demand and a crop shortfall in Viet Nam, which gave rise to strong import demand for RCN. Prices dropped sharply in 2019 due to an oversupply in international markets.

In the period 2000–2019, cashew kernel prices in the main import markets (the United States and the European Union) followed the same general trends as prices of RCN (figure 21). In 2000–2009, cost, insurance and freight import prices for cashew kernels remained roughly within the range of $4–6/kg. Cashew kernel prices then increased in 2011 to over $8/kg before declining in 2013 to around $7/kg. In 2014–2017, cashew kernel prices increased to over $10/kg but dropped thereafter, to $7.8/kg in 2019.

Figure 20
Average raw cashew nut prices, India
(Dollars per kilogram)

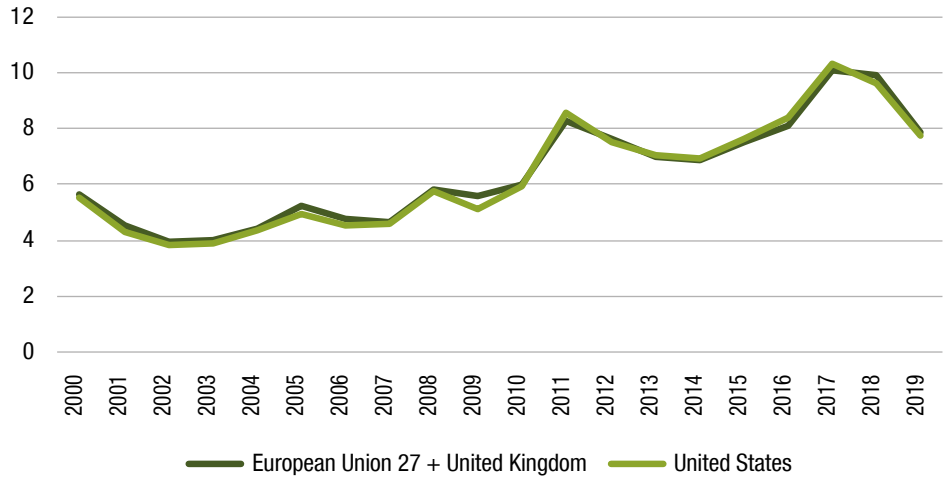


Abbreviation: CIF, cost, insurance and freight.

Source: UNCTAD calculations, based on data from Comtrade and DCCD.

Notes: "India, domestic price" shows the simple average of prices in the five cashew-growing states for which data are available (Andhra Pradesh, Goa, Karnataka, Kerala, Tamil Nadu). Prices in rupees have been converted to dollars using exchange rates from UNCTADstat. "India, imports from East Africa" shows unweighted average cost, insurance and freight import prices for RCN from Madagascar, Mozambique and the United Republic of Tanzania. "India, imports from West Africa" shows unweighted average cost, insurance and freight import prices for RCN from Benin, Côte d'Ivoire, Ghana, Guinea-Bissau and Nigeria.

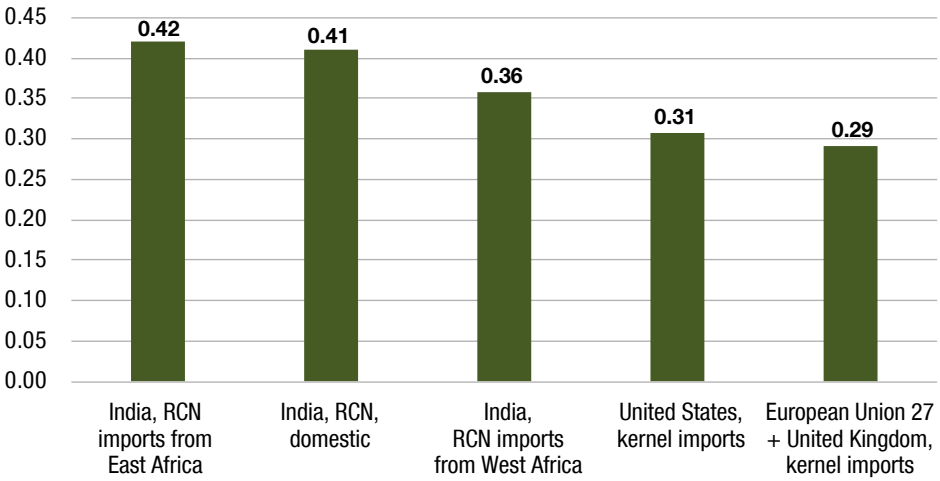
Figure 21
Cashew kernel import prices, United States and European Union
(Cost, insurance and freight prices, dollars per kilogram)



Source: UNCTAD calculations, based on data from Eurostat and the United States International Trade Commission dataweb.
Notes: Data on the European Union 27 + United Kingdom include only imports that originated outside of this area, that is, intra-European exports are excluded. Prices in euros have been converted to dollars using exchange rates from UNCTADstat.

It is important to note that, while prices of RCN and of cashew kernels showed a similar pattern, the former were more volatile than the latter in the period 2000–2018 (figure 22). One reason for this could be that cashew processors with access to multiple sources of supply of RCN are better equipped to react to market signals and limit supply and demand gaps than are individual cashew-producing countries that supply RCN to the two main importers.

Figure 22
Coefficient of variation of raw cashew nut and cashew kernel prices, 2000–2018



Source: UNCTAD calculations, based on data from Comtrade, DCCD, Eurostat and the United States International Trade Commission dataweb.

CHAPTER IV

POLICIES AND DEVELOPMENT OPPORTUNITIES

4. POLICIES AND DEVELOPMENT OPPORTUNITIES

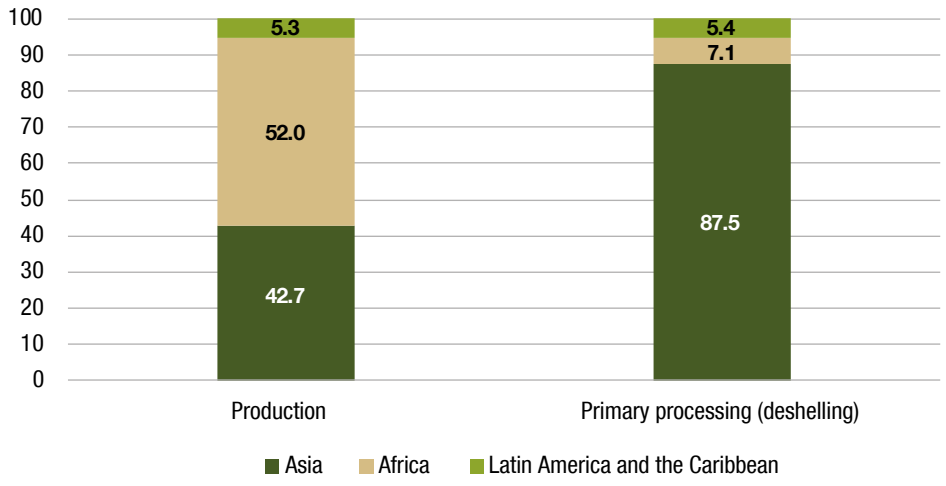
4.1 ADDING VALUE TO RAW CASHEW NUTS AND CASHEW BY-PRODUCTS

The cashew value chain is largely divided between cashew-growing countries that produce RCN mainly for export and countries that have a processing industry. Countries that produce RCN but do not process them on a significant scale retain only a small share of the value that is generated in the cashew industry. This represents a significant potential in terms of local value creation, employment and rural development. This potential exists in all cashew-growing regions, but the bulk of it is located on the African continent. While Africa accounted for 52 per cent of global RCN production in 2018, it only processed 7.1 per cent of this share (figure 23). On the other hand, Asia produced 42.7 per cent of global output of RCN but processed 87.5 per cent. However, within the group of cashew producers in Asia, there are countries that largely export RCN, notably Cambodia. Latin America and the Caribbean essentially processed its own production of RCN in 2018, plus a small volume of RCN imported to Brazil from Côte d'Ivoire and minus a smaller quantity exported from Central America to India.

Since most global cashew production takes place on small farms in rural areas, local value retention can directly benefit the achievement of the Sustainable Development Goals through poverty reduction and various other channels. For instance, in Africa in 2018, an estimated 3.06 million smallholding farmers generated income from cashew production (African Cashew Alliance, 2019).

There is also an important gender dimension in cashew production and processing, in which women play an important role. For instance, in India, more than 90 per cent of labourers employed in cashew processing are women who consequently bear the brunt of health hazards related to cashew processing (VV Giri National Labour Institute, 2014). In Africa, manual processing tasks such as peeling and cleaning are predominantly performed by women (African Cashew Initiative, 2012; Root Capital, 2018). However, there is evidence that most cashew processing plants in Africa are headed by men (Centre for the Promotion of Imports from Developing Countries, 2018) and that most cashew plantations are owned by men (African Cashew Initiative, 2010). These inequalities in the cashew value chain highlight that policy interventions in the cashew sector need to take a gender-aware approach and include measures to strengthen the role of women throughout the cashew value chain.

Figure 23
Shares in cashew production and primary processing by region, 2018
(Percentage)



Source: UNCTAD calculations, based on data from Comtrade, DCCD, FAOstat, the General Department of Viet Nam Customs and Viet Nam statistical yearbooks.

4.1.1 Raw cashew nuts

The processing of cashew nuts has a long history on the African continent. Mozambique was the first country in Africa to process cashew nuts on an industrial scale. In the 1960s, Mozambique was the world's largest producer of cashew nuts, accounting for an average annual share of 35 per cent of global production (based on data from FAOstat). In parallel, a local cashew-processing industry emerged. At its peak in 1973, there were 14 large mechanized cashew processing facilities in Mozambique (Aksoy and Yağcı, 2012). In the same year, cashew kernel exports were 29,960 tons (FAOstat), an amount close to the kernel export volume of the entire African continent in 2018. From the mid-1970s onwards, a rapid decline in cashew production began due to an ageing tree stock caused by a lack of replanting. Following independence in 1975, the Government established an export ban on RCN in order to support domestic cashew processors. However, the processing industry took a downturn during the civil war (1977–1992) and struggled amid liberalization policies that Mozambique undertook as part of World Bank structural adjustment programmes from 1987 onwards (McMillan et al., 2003). Such policies included the privatization of the cashew-processing industry and the removal of the export ban on RCN and its replacement with a quota, which was subsequently eliminated, and an export tax, which was gradually lowered, from 60 per cent in 1991 to 14 per cent in 1996. More recently, the cashew-processing industry in Mozambique has begun to re-emerge and, in 2018, ranked second in capacity and output in Africa (table 3).

Table 3
Processing capacity and utilization, selected cashew-growing countries

	Estimated processing capacity, 2018 (tons)	Processed, 2018 (tons)	Utilization rate (percentage)
India	2 000 000	1 675 000	83.8
Viet Nam	1 800 000	1 450 000	80.6
Côte d'Ivoire	140 100	68 000	48.5
Mozambique	105 700	53 517	50.6
United Republic of Tanzania	42 073	10 000	23.8
Ghana	45 750	23 300	50.9
Nigeria	48 000	20 000	41.7
Benin	35 000	18 750	53.6
Burkina Faso	18 000	8 701	48.3

Source: UNCTAD calculations, based on data from ComCashew, DCCD and United Republic of Tanzania, 2020.

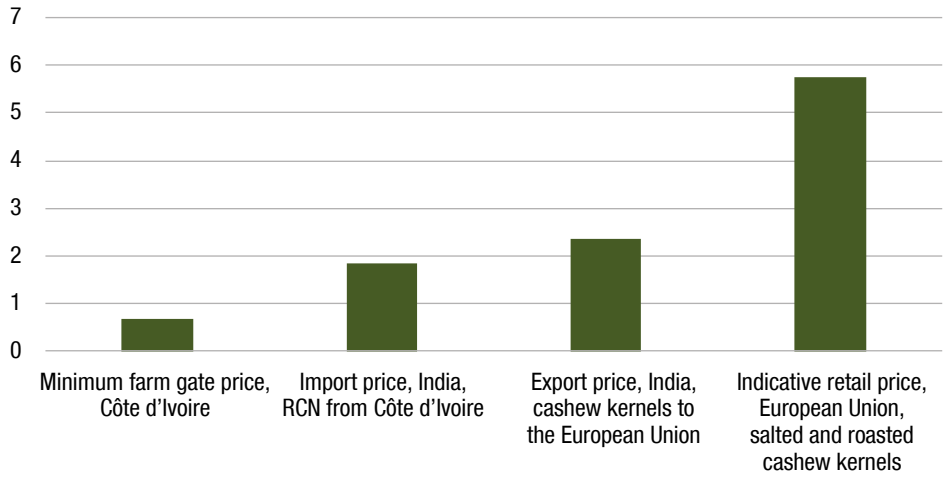
Côte d'Ivoire is the country with the largest cashew-processing industry on the African continent, with a capacity of 70,000 tons per year. Other countries in Africa with significant cashew-processing industries include Benin, Burkina Faso, Ghana, Mozambique, Nigeria and the United Republic of Tanzania. However, the capacity of these countries is still much lower than their respective production of RCN.

The opposite is the case in India and Viet Nam, which have the largest processing capacities in the world. In both countries, the domestic processing capacity is far larger than cashew nut production, which gives rise to their strong import demand for RCN in international markets.

A common feature of the processing industries in Africa is the high level of disparity between capacity and utilization. Among the main cashew-processing countries in Africa featured in table 3, the average ratio of capacity to utilization was less than 50 per cent in 2018, which indicates that they face difficulties in securing a stable and sufficient supply of raw materials to keep their operations going throughout the year (see section 4.2.2). This suggests that policies aimed at increasing cashew processing in Africa need to focus not only on adding new processing sites but also on increasing the utilization rates of existing units.

Another way of highlighting the potential for value addition that is foregone if cashew nuts are exported as RCN is to consider the prices paid at different stages of the value chain. Figure 24 illustrates this using the example of RCN exported from Côte d'Ivoire (the largest exporter of RCN in the world in 2018), processed in India (the largest importer of RCN from Côte d'Ivoire in 2018) and roasted in the European Union (the largest market for cashew kernels in 2018). The farm gate price of RCN in Côte d'Ivoire was 67.5 cents/kg, while the export price of cashew kernels from India to the European Union was $2.35/kg of RCN equivalent. This means that cashew farmers in Côte d'Ivoire received less than 30 per cent of the price paid for processed cashew nuts exported from India. After secondary processing in the European Union, name-brand roasted and salted cashew kernels yielded retail prices in the area of $25/kg, corresponding to about $5.75/kg of RCN equivalent.

Figure 24
Côte d'Ivoire, India and European Union: Farm gate to retail prices, 2018
(Dollars per kilogram of RCN equivalent)



Source: UNCTAD calculations, based on data from Comtrade and UNCTADstat.
Notes: Prices in other currencies have been converted to dollars using exchange rates from UNCTADstat. A ratio of 0.23 is applied to convert kernel volumes to RCN equivalent volumes, that is, 100 kg of RCN yield 23 kg of cashew kernels. The export price from India to the European Union is based on exports to the five largest importers of cashew kernels from India (Belgium, France, Germany, the Netherlands and Spain). There is a wide range of retail prices for roasted and salted cashew kernels. For instance, there is a significant difference between prices for store brands and name brands. The indicative retail price used in the figure is based on prices for name-brand conventional (without an organic or fair-trade label) cashew kernels.

4.1.2 Cashew by-products

Countries that export RCN forego opportunities to add value not only to cashew kernels, but also to cashew shells. Therefore, the development of cashew shell-based by-products can go together with the expansion of deshelling operations. In addition, cashew apple-based products have great potential for value addition and employment generation in cashew-growing countries (see section 2.3).

Cashew shelling consists of separating cashew kernels from their outer shell. The shell contains CNSL, which has a range of industrial applications. In addition, dried cashew shells can be used as fuel. However, it is estimated that only 5–25 per cent of cashew shells are used in Africa, mainly as fuel to heat boilers on processing sites. The remaining 75–95 per cent of cashew shells are burned in open pits or otherwise discarded as waste, which represents both a financial cost for cashew processors and an environmental cost in terms of greenhouse gas emissions and soil and surface water contamination (Technoserv, 2020). Increasing the share of cashew shells utilized for CNSL extraction and/or energy generation can improve the competitiveness of cashew processing businesses by reducing energy and waste disposal costs and generating additional revenue. In addition, cashew shell utilization can contribute to limiting the environmental footprint of cashew processing plants.

The shell represents about 70–75 per cent of the cashew nut in weight. Based on an estimated 279,000 tons of RCN shelled in Africa in 2018, shelling generated about 195,000–209,000 tons of cashew shells in Africa in 2018. A report identified a number of examples of cashew shell utilization in countries in Africa, including, in Burkina Faso, a cashew shell pyrolizer heating a boiler of a cottonseed oil factory and, in Guinea-Bissau, a power generator running on a steam turbine fed by cashew shells (Away4Africa, 2018).

Challenges limiting cashew shell utilization on a larger scale include some of the same challenges faced by cashew processors, such as the lack of a continuous supply of feedstock due to the seasonality of cashew nuts and limited access to technological know-how, market information and training. Given that cashew-growing countries in Africa aspire to increase nut production and the share of RCN processed on the continent, the volume of cashew shells produced in

Africa is bound to increase significantly. This further increases the importance of addressing challenges related to the wider utilization of cashew shells.

Another cashew by-product with significant potential is the cashew apple. Currently, Brazil is the only cashew-growing country that adds value to cashew apples on a large scale. A key challenge in cashew apple processing is the high level of perishability and short shelf life of the cashew apple and its juice. However, with appropriate post-harvest practices and processing techniques, it is possible to commercialize a range of cashew apple products. For instance, there are a range of preservation methods, including thermal treatment, high-pressure processing and low-temperature storage (Das and Arora, 2018).

In addition to the inherent seasonality of the cashew market, a key challenge to the wider utilization of cashew apples is a lack of awareness among farmers and potential processors about the economic value, processing technologies and marketing channels for cashew apple products. Furthermore, in many cashew-growing countries, consumers are not used to cashew apple products. Therefore, strategies to promote cashew apple processing need to include both capacity-building and market development. There are examples of areas in which these challenges have been addressed, often through donor-funded initiatives, which have led to the establishment of successful cashew apple processing businesses. For instance, in 2017, a company in Benin produced about 200,000 bottles of cashew apple juice (Centre for the Promotion of Imports from Developing Countries, 2018).

4.2 POLICIES FOR VALUE ADDITION IN THE CASHEW SECTOR

Most cashew-growing countries have implemented policy measures aimed at promoting domestic cashew processing. This section reviews cashew sector policies that have been applied in the main cashew-processing countries, India and Viet Nam, as well as more recent policy initiatives undertaken in the main cashew-producing countries in Africa.

4.2.1 India and Viet Nam

India has a long history of cashew processing and trading, which started in the south in the 1920s. Soon after independence in 1947, the Government began to promote cashew production, cashew processing and the export of processed cashew products through targeted policies and the establishment of dedicated agencies. For instance, in 1955, the Government established the Cashew Export Promotion Council of India, which promotes exports of cashew kernels and CNSL and, in 1966, established DCCD under the Ministry of Agriculture, which is focused on domestic cashew production and processing. The mandate of DCCD includes monitoring of the cashew sector; promotion of new planting and replanting; and dissemination of research results and information on new technologies, by-product utilization and market information to farmers and entrepreneurs. In 1971, the Government initiated a research programme on cashew nut cultivation, which led to the establishment of the Directorate of Cashew Research. The research undertaken by the directorate is focused on improving productivity and quality in cashew cultivation, enhancing processing efficiency and increasing value addition in the cashew sector.

India levies an import duty on cashew kernels, which supports the domestic cashew-processing industry.[1] The Government aims to expand domestic cashew nut production and reduce its reliance on imported RCN. In this context, an import tariff on RCN was introduced in 2006. However, the import tariff on cashew kernels remains significantly higher than that on RCN. Cashew kernel exporters have also benefited from an export incentive under the Merchandise Exports from India Scheme. In 2018, the scheme was the subject of a complaint under the dispute settlement mechanism of the World Trade Organization; the decision of the dispute panel to recommend the withdrawal of export subsidies under the scheme was appealed by India in 2019.[2]

The cashew industry in Viet Nam emerged later than that in India. While cashew nuts were introduced to Viet Nam in the nineteenth century, it was not until the late 1980s that commercial production and processing intensified. In this context, government support played an important role. The Government recognized cashew nuts as an industrial crop in 1989 and established the Viet Nam Cashew Association in 1990. The mandate of the association is to support cashew production, processing, trade and marketing

[1] The import duties on RCN and shelled cashew nuts were at 30 and 70 per cent, respectively, in May 2020 (based on data from the Indian Customs Compendium on Codes and Compliance).

[2] As at May 2020, the appeal remained open; see https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds541_e.htm.

in Viet Nam. This includes technical support and training for farmers and businesses in the cashew sector, as well as the signing of agreements with trade associations of key RCN-exporting countries such as the Exporters Council of Benin, the Cashew Exporters Association of Côte d'Ivoire and the Nigeria Cashew Association.

The area under cashew cultivation has expanded by more than fivefold, from 79,000 hectares in 1992 to 407,000 hectares in 2008 (based on Viet Nam statistical yearbooks). In addition, the capacity of the cashew nut processing industry has increased rapidly. Viet Nam exported RCN, mainly to India, in the early 1990s, since it could not process all of its domestic production, yet in 2007, Viet Nam overtook India as the largest exporter of cashew kernels (based on Comtrade). With regard to financial incentives, the cashew nut processing industry benefits from a reduced import tax of 5 per cent on RCN, compared with 30 per cent for the Harmonized System 0801 group. The vision of the Government for the cashew sector includes the expansion of cashew production through new plantations and higher levels of productivity, an increase in the domestic consumption of cashew kernels and the expansion of secondary processing of cashew kernels (roasting, salting and coating).

The paths of India and Viet Nam to becoming major cashew exporters differed in many ways, but they both suggest that government support through well-designed, targeted policies can play an important role in promoting a cashew-processing industry. Policies need to take a holistic view of the cashew industry, including cashew production and trade, and policies also need to be tailored to local circumstances, such as the availability of labour and investment costs. Finally, both India and Viet Nam have supported their cashew industries in meeting quality and production standards that are needed to comply with requirements in the main cashew consumer markets, which is a precondition for a successful cashew-processing industry.

4.2.2 Challenges for cashew processors in Africa

Cashew processors in Africa face a range of challenges that put them at a disadvantage vis-à-vis their counterparts in Asia and limit the continent's capacity to process a higher share of the cashew nuts it grows.

A key issue for cashew processors in Africa consists of ensuring a continuous supply of quality raw materials and in bridging the supply gap between harvest seasons. For instance, the harvest season in Côte d'Ivoire lasts from February through early June, so that for 7–8 months of the year, a fresh supply of RCN is not available. As a consequence, processors need to pre-finance and stockpile large volumes of RCN to keep their plants running continuously. This implies a significant financial burden due to credit costs, the need to build and maintain storage facilities and the loss of quality and weight in stored RCN. High credit costs can render these requirements prohibitive for processors. In comparison, processors in Asia are at an advantage since they import RCN from different regions and therefore pre-finance and store RCN over shorter periods.

High business and investment costs, as well as infrastructure deficits, weigh on the competitiveness of cashew processors in Africa. For instance, while India and Viet Nam are at 63 and 70, respectively, in the ease of doing business rankings, Côte d'Ivoire and the United Republic of Tanzania, the largest cashew producers in West Africa and East Africa, are at 110 and 141, respectively (World Bank, 2020). The profitability of processors in Asia is also strengthened by their access to markets for broken and lower-grade cashew kernels. India has a significant domestic demand for broken and lower-grade kernels, which are used as ingredients in sweets and savoury dishes. Viet Nam exports broken and lower-grade kernels to China. However, the main export markets for cashew kernels from Africa are the United States and the European Union, where cashews are largely consumed as snacks, so that most of the demand is for high-grade whole cashew kernels.

Another key aspect in entering consumer markets for cashew kernels is the ability to meet the prevailing quality standards. The majority of cashew kernel trade flows are destined to OECD member countries, in particular the United States and European Union member States (see section 3.2.2). These countries generally have high food safety standards. This includes limits on pesticide residues, microbial contamination and the presence of aflatoxins and other mycotoxins. While food safety certification is not a legal requirement to enter European markets, it has become a de facto condition for market entry (Centre for the Promotion of Imports from Developing Countries, 2020). Standards and requirements also apply to the packaging and labelling of cashew nuts. Capacity constraints in meeting such

quality standards and certification requirements need to be addressed to enable the growth of the cashew-processing industry in Africa.

4.2.3 Policies in cashew-growing countries in Africa

Many cashew-growing countries in Africa have identified the cashew sector as a priority in the context of their agricultural or industrial development programmes. For instance, the development of the cashew value chain was included in the National Development Plan 2016–2020 of Côte d'Ivoire, which targeted a processing rate of 40 per cent in 2020.[3] In addition, cashew nuts are among the 22 strategic products identified by the Government of Nigeria under its Zero-Oil Plan.[4] In this context, cashew producers in Africa have implemented numerous policy interventions to promote the domestic processing of cashew nuts. These include, in particular, export restrictions on RCN and incentives for cashew processors.

Export taxation and export bans

Export taxation and other restrictions on exports of RCN are common in Africa. Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mozambique, Togo and the United Republic of Tanzania had export taxes on RCN in place in 2019. Kenya has banned the export of RCN since 2009, but lifted the ban for 90 days in 2010 since the domestic processing industry could not absorb the full yield of RCN. Other countries have banned exports of RCN temporarily or partially. For instance, Benin and Côte d'Ivoire have prohibited the export of RCN by land transportation to avoid smuggling and ensure the collection of the export tax at seaports. Ghana briefly banned the export of RCN in early 2016. The United Republic of Tanzania banned the trading of RCN in late 2018 as the prevailing market price was considered too low. The Government bought the entire yield of over 200,000 tons and deployed military personnel to collect RCN in rural areas. However, the domestic shelling industry did not have the capacity to process the full volume.[5] The Government faced difficulties in finding buyers for the excess RCN and private traders were reallowed into the market for the 2019/20 season.[6]

The primary objective of such export restrictions is to increase domestic processing, which lags far behind production across countries in Africa. However, export taxation or export bans on RCN can have a range of static and dynamic impacts that need to be considered. An export tax drives a wedge between the domestic price and the free on board export price of RCN. This reduces the price of raw materials for domestic cashew processors and generates revenue for the Government. However, an export tax can also lead to a lower average producer price, which harms cashew farmers. An outright ban on exports of RCN is equivalent to a prohibitive export tax and is thus the most extreme form of export restriction. An export ban leads to an increase in the domestic availability of RCN in the short term, which benefits the cashew-processing industry. However, an export ban, similar to an export tax, can depress producer prices, since it cuts foreign demand out of the market. This can not only cause hardship and an increase of poverty among cashew farmers but also discourage investment and replanting in cashew orchards. This can ultimately lead to lower productivity and declining production, which harms the processing industry. Therefore, export restrictions of any kind need to take into account impacts along the entire cashew value chain, to ensure that any unwanted effects are accounted for and remedied.

Export restrictions need to be enforceable to be effective. Any trade restriction creates incentives for smuggling and informal trade that can undermine the objectives of the policy intervention. For instance, as noted, Benin and Côte d'Ivoire have banned exports of RCN by land in order to limit informal trade seeking to avoid the payment of export taxes. Such a measure is only effective if trade across land borders can be adequately monitored. However, if land borders can be monitored, an export ban may be unnecessary, as the export tax could also be collected at such borders. Research suggests that, despite restrictions, there was significant smuggling of RCN out of Côte d'Ivoire and across several land borders in West Africa in

[3] A See https://www.cabri-sbo.org/en/documents/national-development-plan-2016-2020-1.

[4] See https://guardian.ng/appointments/zero-oil-plan-to-lift-20m-out-of-poverty-create-500000-additional-jobs-yearly/.

[5] See https://www.reuters.com/article/tanzania-cashew-nuts/tanzania-seeks-buyers-for-surplus-cashew-nut-output-minister-idUSL8N1YX0AR.

[6] https://fr.reuters.com/article/ozabs-uk-tanzania-cashew-nuts-idAFKBN1W60DC-OZABS.

2018 (Nitidae, 2019). Furthermore, a side effect of an export ban across land borders, which in practice amounts to a regional export ban, is that it limits access to raw materials by processors in West Africa. Restricting trade across borders also runs counter to the spirit of the African Continental Free Trade Area.

However, it must be noted that in the presence of other market imperfections, a reduction of export restrictions on RCN does not automatically lead to significant gains for cashew farmers. For instance, McMillan et al. (2003) found that cashew market liberalization in Mozambique in the 1990s only led to modest gains for cashew farmers. In this context, a typical issue in cashew value chains in Africa is the presence of intermediaries that operate between farmers on the one hand and processors or exporters on the other hand. Such brokers buy cashew nuts from farmers or local collection centres and resell them with significant mark-ups. This absorbs some of the value created by farmers, who could benefit from higher prices if they were better connected to processing and exporting sites.

Incentives for processors

Several cashew-growing countries in Africa provide incentives to promote local processing. The bulk of these are fiscal incentives that take the form of reductions of or exemptions from taxes, tariffs and fees, but there are also examples of regulatory measures and direct subsidies. Côte d'Ivoire appears to have the most comprehensive support programme for cashew processing in Africa.

Cashew processors are exempt from import duties for machinery and spare parts in Benin, Côte d'Ivoire, Ghana, Nigeria and the United Republic of Tanzania. Temporary profit and sales tax exemptions and reductions apply to new cashew processors in Côte d'Ivoire, Ghana and Nigeria. In Côte d'Ivoire, policies to support local processing also include a subsidy of 400 CFAF/kg of cashew kernels exported, which is financed through the export tax on RCN; a government guarantee fund that supports processors to pre-finance the purchase of RCN; and a reduction of the fee for mandatory environmental and social impact assessments for new cashew processing plants. In several countries, including Ghana, Mozambique and the United Republic of Tanzania, cashew processors benefit from reduced or waived broad-based export taxes that otherwise apply to agricultural products. Togo plans to channel revenue from the export taxation of RCN to a new fund for the management of the cashew sector.[7]

Other policies that have been implemented in Africa include measures that give priority to local processors to purchase RCN. For instance, in Côte d'Ivoire in 2018, exporters were required to reserve 15 per cent of RCN for local processors. In addition, Mozambique has preferential purchase windows for local processors at the beginning of the harvest season.

4.3 SUMMARY

The examples of India and Viet Nam show that successful strategies for the promotion and development of cashew industries need to take a holistic view of the entire cashew value chain, including farming, processing and trade.

The cashew industry critically depends on a stable supply of high-quality raw materials. An agricultural policy framework should therefore promote and enable investments in the productivity of orchards and the quality of RCN. This includes ensuring that farmers have access to quality seedlings and training in effective farm management, including harvest and post-harvest practices. Public research can help to identify agricultural practices and technologies that work best in local environmental and economic conditions. In addition, a good system of agricultural extension services is needed to transfer research findings, technology and market information to cashew farmers.

Cashew-growing countries that do not have an established processing industry could also benefit from measures that support the creation of a strong knowledge and information base for potential market entrants. This includes access to technological and entrepreneurial know-how, market information and specialized training. For instance, there is a wide range of technical equipment for cashew processing, such as machinery for thermal treatment, shelling, grading and packaging (a recently published guidebook by ComCashew (2019b) lists 170 suppliers of equipment for various processing steps), and entrepreneurs therefore face the challenge of identifying the most suitable equipment mix as a function

[7] See https://togotribune.com/news/lexportation-de-noix-de-cajou-a-connu-une-nette-augmentation/.

of the size of the planned operation and a range of local circumstances, including the availability of skilled labour and financing costs.

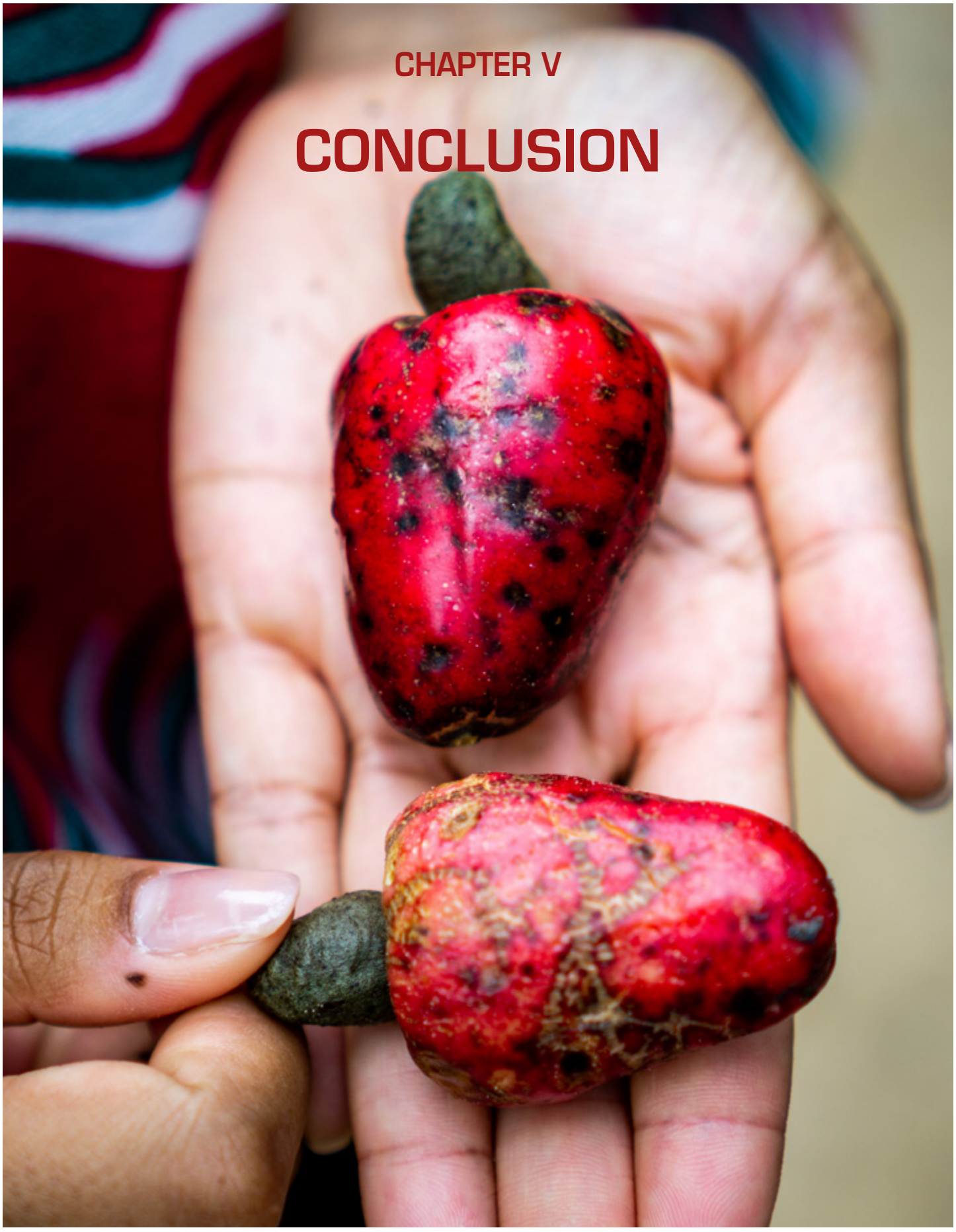
Investment and business costs are key parameters of the competitiveness of any industry, including the cashew-processing industry, that operates on a globalized market. Therefore, a supportive business environment and well-functioning physical and financial infrastructure are important enablers for the sustainable growth of cashew-processing industries.

Furthermore, it is important to facilitate access by cashew processing businesses to the main consumer markets for cashew kernels. A precondition for exports to such markets is the ability to meet international food safety standards and other market entry requirements. Therefore, support to build and strengthen capacity among cashew processors to manage quality and meet consumer market standards in terms of quality and food safety can be an important success factor.

Strengthening the link between farmers and processors can help to establish mutually beneficial, stable business relationships, reduce the need for intermediaries and improve market efficiency. This also includes the strengthening of rural infrastructure, including secondary roads, in order to better connect cashew-growing areas and processing sites.

Overall, policies to support the cashew-processing industry are more likely to be successful if they directly target the constraints that are holding the industry back. For instance, if high costs in pre-financing inventory are limiting the growth of cashew-processing industries in Africa, measures to improve access to credit, reduce financing costs and lower risk could be effective remedies. The guarantee fund in Côte d'Ivoire is a good example in this context. With regard to the timing and implementation of policy interventions, a gradual approach based on clear, stable and credible objectives appears preferable over ad hoc or disruptive measures that may not lead to the desired results but instead increase market insecurity.

Finally, fostering regional cooperation and trade in cashew-growing regions can contribute to market stability, limit supply bottlenecks for processors in Africa and reduce incentives for cross-border smuggling.



CHAPTER V

CONCLUSION

5. CONCLUSION

The global cashew market is characterized by fragmentation and long supply chains. While more than 50 per cent of global cashew nut production takes place in Africa, more than 85 per cent of shelling industries are located in Asia and more than 60 per cent of cashew kernel exports are destined to the United States and the European Union.

Cashew-growing countries that mainly export RCN rather than processing them at scale forego significant potential for value creation and employment generation. The addition of value to cashew by-products such as shells and apples represents a significant underutilized potential in many cashew-growing countries. Since production typically takes place on smallholdings in rural areas, there is a direct link between value addition in the cashew sector and the achievement of poverty reduction and other Sustainable Development Goals. This untapped potential is greatest on the African continent, where, in 2018, less than 15 per cent of harvested RCN were processed and the bulk of cashew by-products was discarded as waste.

Current market trends and developments in the main cashew consumer markets offer opportunities for existing cashew processors and potential investors in the sector. The global demand for cashew kernels is on a sustained growth path, which creates opportunities for new market entrants. In addition, the traceability, transparency and sustainability of food supply chains is becoming increasingly important for consumers and suppliers, which could benefit processors in Africa that source RCN locally rather than through long supply chains and from multiple sources. For instance, the Sustainable Nut Initiative aims to increase the transparency and sustainability of nut supply chains. Furthermore, the growth of the organic food sector creates opportunities to develop certified organic cashew products that can be marketed at premium prices. For instance, in 2009–2018, retail sales of organic products in the European Union grew by 121 per cent (Willer et al., 2020).

For such opportunities to materialize, the entire cashew value chain needs to be strengthened in cashew-growing countries that aspire to develop and expand cashew-processing industries. Therefore, strategies and policy interventions in the cashew sector need to be based on clear objectives and take a holistic view that includes production, processing and trade. A stable supply of high-quality RCN is the backbone of every cashew industry. Therefore, the agricultural policy framework needs to be supportive of practices and investments that increase the productivity and output quality of cashew orchards. In addition to a reliable supply of RCN, cashew processors need a policy environment that enables them to operate with competitive transformation costs and facilitates access to the main export markets for cashew kernels. Promoting the development of cashew by-products such as CNSL, briquettes from de-oiled cashew shells and products based on the cashew apple can further strengthen value and job creation in the cashew sector. Finally, regional cooperation and trade facilitation, in particular in Africa, can contribute to market stability and help to reduce supply-side risks for processors.

REFERENCES

Abreu FP de, Dornier M, Dionisio AP, Carail M, Caris-Veyrat C and Dhuique-Mayer C. 2013. Cashew apple (Anacardium occidentale L) extract from by-product of juice processing: A focus on carotenoids. *Food Chemistry*. 138(1):25–31.

African Cashew Alliance. 2019. *2018 Annual Report*. Accra.

African Cashew Initiative. 2010. Analysis of the Benin cashew sector value chain.

African Cashew Initiative. 2012. Gender transformation in the African cashew value chain.

Aksoy MA and Yağcı F. 2012. Mozambique cashew reforms revisited. World Bank Policy Research Working Paper No. 5939, Washington, D.C.

Away4Africa. 2018. Environmental study of waste management in cashew processing in eight African countries.

Balgude D and Sabnis AS. 2014. CNSL: An environment-friendly alternative for the modern coating industry. *Journal of Coatings Technology and Research*. 11:169–183.

Centre for the Promotion of Imports from Developing Countries. 2018. Cashew nut processing West Africa: Value chain analysis – Benin and Côte d'Ivoire. Ministry of Foreign Affairs of the Netherlands.

Centre for the Promotion of Imports from Developing Countries. 2020. Entering the European market for cashew nuts. Ministry of Foreign Affairs of the Netherlands.

Dadzie A, Adu-Gyamfi P, Opoku S, Yeboah J, Akpertey A, Opoku-Ameyaw K, Assuah M, Gyedu-Akoto E and Danquah W. 2014. Evaluation of potential cashew clones for utilization in Ghana. *Advances in Biological Chemistry*. 4:232–239.

Das I and Arora A. 2018. Post-harvest processing technology for cashew apple: A review. *Journal of Food Engineering*. 194:87–98.

Das P, Sreelatha T and Ganesh A. 2004. Bio oil from pyrolysis of cashew nut shell characterization and related properties. *Biomass and Bioenergy*. 27(3):265–275.

Fang LH, Hong YG, Hong JS, Jeong JH, Han YG, Kwon IH and Kim YY. 2018. Effects of cashew nut testa levels as an alternative to wheat bran in gestating sow diets. *Asian-Australasian Journal of Animal Sciences*. 31(6):881–887.

FAO. 1988. Traditional food plants. Food and Nutrition Paper No. 42. Rome.

ComCashew. 2019a. Opportunities and challenges in cashew processing in Africa. Cashew Processing Guides No. 2.

ComCashew. 2019b. Guidebook to cashew nut processing equipment. Cashew Processing Guides No. 3.

Gomes TR, Freitas ER, Watanabe PH, Guerreiro ME, Sousa AD and Ferreira AC. 2018. Dehydrated cashew apple meal in the feeding of growing rabbits. *Semina-ciencias Agrarias*. 39:757–770.

Indian Council of Agricultural Research-National Research Centre for Cashew. 2008. Soil and water management in cashew plantations. Technical Bulletin No. 10.

International Nut and Dried Fruit Council Foundation. 2020. *Nuts and Dried Fruits Statistical Yearbook 2019/20*. Reus, Spain.

Kumar A, Moin A, Shruthi R, Ahmed A and Shivakumar HG. 2012. Cashew gum a versatile hydrophyllic polymer: A review. *Current Drug Therapy*. 7(2):2–12.

Kumar P, Senthil N, Kumar A, Sivakumar R and Kaushik C. 2009. Experimentation on solvent extraction of polyphenols from natural waste. *Journal of Materials Science*. 44:5894–5899.

Lubi MC and Tchachil ET. 2000. Cashew nut shell liquid: A versatile monomer for polymer synthesis. *Designed Monomers and Polymers*. 3(2):123–153.

Luciano RC, de Fátima Araújo L, Aguiar EM, Pinheiro LE and do Nascimento DS. 2011. Revisão sobre a potencialidade do pedúnculo do caju na alimentação animal. *Revista Tecnologia and Ciência Agropecuária*. 53–59.

Mangalassery S, Rejani R, Singh V, Adiga JD, Kalaivanan D, Rupa TR and Philip PS. 2019. Impact of different irrigation regimes under varied planting density on growth, yield and economic return of cashew (Anacardium occidentale L). *Irrigation Science*. 37:483–494.

McMillan, M, Welch KH, Rodrik D, Elbadawi I and O'Connell S. 2003. When economic reform goes wrong: Cashew in Mozambique (with comments and discussion). Brookings Trade Forum. 97–165.

Miao G and Fortanier F. 2017. Estimating transport and insurance costs of international trade. OECD Statistics Working Paper No. 4.

Nayak MG, Muralidhara B and Preethi P. 2018. Recent technologies for cashew production. *Indian Farming*. 68(10):52–55.

Nitidae. 2019. The West African cashew sector in 2018: General trends and country profiles.

Paull RE and Duarte O. 2011. *Tropical Fruits*. Volume 1. Centre for Agriculture and Bioscience International.

Porto BC and Cristianini M. 2014. Evaluation of cashew tree gum (Anacardium occidentale L) emulsifying properties. *LWT Food Science and Technology*. 59(2):1325–1331.

Prabhakaran Nair KP. 2010. *The Agronomy and Economy of Important Tree Crops of the Developing World*. Elsevier. Burlington, United States.

Ribeiro AJ, de Souza FRL, Bezerra JMNA, Oliveira C, Nadvorny D, de la Roca Soares MF, Nunes LCC, Silva-Filho EC, Veiga F and Soares Sobrinho JL. 2016. Gums-based delivery systems: Review on cashew gum and its derivatives. *Carbohydrate Polymers*. 147:188–200.

Root Capital. 2018. Issue brief: Applying a gender lens to agriculture.

Sanjeeva SK, Pinto MP, Narayanan MM, Kini GM, Nair CB, Subba Rao PV, Pullela PK, Ramamoorthy S and Barrow CJ. 2014. Distilled technical cashew nut shell liquid as an effective biofuel and additive to stabilize triglyceride biofuels in diesel. *Renewable Energy*. 71:81–88.

Sawadogo M, Tanoh ST, Sidibé S, Kpai N and Tankoano I. 2018. Cleaner production in Burkina Faso: Case study of fuel briquettes made from cashew industry waste. *Journal of Cleaner Production*. 195:1047–1056.

Srinivas A and Anilkumar P. 2017. Emergence of sustainable approaches for functional materials: Cashew nut shell liquid and other relevant crop-based renewable resources. In: Anilkumar P. *Cashew Nut Shell Liquid: A Goldfield for Functional Materials*. Springer:1–18.

Strom S. 2014. Cashew juice, the apple of Pepsi's eye. *The New York Times*. 9 August.

Technoserv. 2020. *Cashew Shells: from Waste to Energy and Profit*. Arlington, United States.

Telascrêa M, Leão AL, Ferreira MZ, Pupo HFF, Cherian BM and Narine S. 2014. Use of a cashew nut shell liquid resin as a potential replacement for phenolic resins in the preparation of panels: A review. *Molecular Crystals and Liquid Crystals*. 604(1):222–232.

Tyman JHP, Johnson RA, Muir M and Rokhgar R. 1989. The extraction of natural cashew nut shell liquid from Anacardium occidentale L. *American Oil Chemists' Society*. 66(4):553–557.

United Nations Economic Commission for Europe. 2013. Standard DDP-17 concerning the marketing and commercial quality control of cashew kernels. United Nations. Geneva and New York.

United Republic of Tanzania. 2020. Regional profiles of cashew nut production and processing investment opportunities, Lindi, Mtwara, Tunduru and Pwani regions. United Republic of Tanzania Investment Centre.

United States Department of Agriculture, Foreign Agricultural Service. 2018. Food for progress LIFFT cashew SeGaBi[Senegal, the Gambia and Guinea-Bissau] cashew value chain study.

VV Giri National Labour Institute. 2014. Employment and social protection of cashew workers in India with special reference to Kerala. Ministry of Labour and Employment, Government of India.

Vani JM, Monreal MTFD, Auharek SA, Cunha-Laura AL, de Arruda EJ, Lima AR, da Silva CM, Antoniolli-Silva ACMB, de Lima DP, Beatriz A and Oliveira RJ. 2018. The mixture of cashew nut shell liquid and castor oil results in an efficient larvicide against Aedes aegypti that does not alter embryo-foetal development, reproductive performance or DNA integrity. *PLOS One*. 13(3).

Willer H, Schlatter B, Trávníček J, Kemper L and Lernoud J. 2020. The world of organic agriculture: Statistics and emerging trends 2020. Research Institute of Organic Agriculture, Frick and International Federation of Organic Agriculture Movements-Organics International. Bonn.

World Bank. 2020. *Doing Business 2020*. Washington, D.C.

Zignago G and Gaulier S. 2010. BACI[Base pour l'analyse du commerce international]: International trade database at the product level, the 1994–2007 version. Working Paper No. 23. Centre d'Etudes Prospectives et d'Informations Internationales.

COMMODITIES AT A GLANCE SERIES

– No. 1: Historical evolution of primary commodity prices and price indices

– No. 2: Special issue on cotton in Africa

– No. 3: Special issue on energy

– No. 4: Special issue on food security

– No. 5: Special issue on rare earths

– No. 6: Special issue on gold

– No. 7: Édition spéciale sur l'or (in French)

– No. 8: Special issue on gum arabic

– No. 9: Special issue on shale gas

– No. 10: Special issue on coffee in East Africa

– No. 11: Édition spéciale sur le café en Afrique de l'Ouest et du Centre (in French)

– No. 12: Édition spéciale sur la gomme arabique en Afrique centrale et occidentale (in French)

– No. 13: Special issue on strategic battery raw materials

– No. 14: Special issue on cashew nuts

All reports are available on the UNCTAD website at https://unctad.org/topic/commodities.

Layout and Printing at United Nations, Geneva – 2100266 **(E)** – January 2021 – 995 – **UNCTAD/DITC/COM/2020/1**