

Ghana **my**  
Skills **future**  
Development **in**  
Initiative **my**  
GSDI **hands!**



LEARNING FACILITATING MATERIALS

NATIONAL PROFICIENCY LEVEL 1

TRADE AREA: **CASHEW SECTOR**

UNIT 1

**PREPARING FOR WORK IN THE CASHEW  
INDUSTRY**





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## UNIT INTRODUCTION

Welcome to Unit 1 of your learning journey on cashew. This guide prepares you for your work in the cashew industry.

Do you already know the major cashew producing and processing countries worldwide? Do you know the various actors along the cashew value chain? Can you list the health benefits of all the delicious products made from the cashew kernel and cashew apple?

Read through this guide and study the information carefully to get a better understanding of your own position in the cashew industry. This guide helps you to broaden your view on the activities and products along the cashew value chain. Knowing this information also helps you to appreciate the challenges and opportunities in the global cashew sector, beyond the borders of Ghana.



In this unit, you will learn about the global cashew industry and a broad spectrum of products made from the cashew kernel and cashew apple. The learning material covers three sub-units:

- 1) Cashew industry
- 2) Cashew value chain
- 3) Cashew products

Each sub-unit contains theoretical and practical exercises. Each module includes written materials, visuals as well as self-assessments to test your knowledge and skills.

The benefit of knowing this information is to understand your own position in the cashew industry in Ghana and worldwide. It will help you to tap into the potentials of this young industry by actively choosing the role that you want to play.

The better informed you are about the dynamics and bottlenecks of the cashew industry in Ghana, Africa and worldwide, the higher your chances of establishing, managing and contributing to a successful cashew business.

This learning material provides a good overview on the global cashew industry beyond National Proficiency Level 1, and is equally relevant to National Proficiency Level 2, as well as National Certificate Level 1 and 2. Beyond this guide, we encourage you to also look out for new information, innovations and technological advances during your practical work that expand your knowledge in cashew and influence your attitude in doing business in this sector.

Are you ready to start your cashew learning journey? Let's start!

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## ICONS



LEARNING  
OBJECTIVES



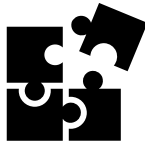
ATTENTION



PRACTICALS  
HANDS ON



CROPPING  
CALENDAR



SELF ASSESSMENT



WELL DONE!



TAKE A BREAK!

## ABBREVIATIONS

Here are some commonly used abbreviations.

°C	Degree Celsius
cm	Centimeter (1cm = 10mm)
CNSL	Cashew Nut Shell Liquid
g	Gram (1g = 1000mg)
GHS	Ghana Cedi
Kcal	Kilocalories
kg	Kilogram (1kg = 1000g)
m	Meter (1m = 100cm)
mm	Millimeter (10mm = 1cm)
m <sup>2</sup>	Square Meter
mg	Milligram (1000mg = 1g)
MT	Metric Tons (1MT = 1000kg)
RCN	Raw Cashew Nuts
ROI	Return on Investment
µg	Microgram (1µg = 0,001mg)

## 1. DEMONSTRATE KNOWLEDGE OF THE CASHEW INDUSTRY

### a) State the origin of cashew

The cashew tree originates from the North East of Brazil. In Brazil, the cashew tree was mainly planted to harvest cashew apples for processing into juice, cajuina, jam, alcohol and sweets.



Source: GIZ/ComCashew – Dwarf cashew trees in the North East of Brazil

The botanical name of the cashew tree is '*Anacardium Occidentale*'.

In the 16<sup>th</sup> century, Portuguese sailors brought the tree from Brazil to India and East Africa, specifically to Mozambique and Tanzania.

In the 17<sup>th</sup> century, cashew trees were first planted in West Africa to fight desertification and soil erosion. At that time, cashew was mainly planted to protect forest areas. Cashew was not planted for its economic value at that time.

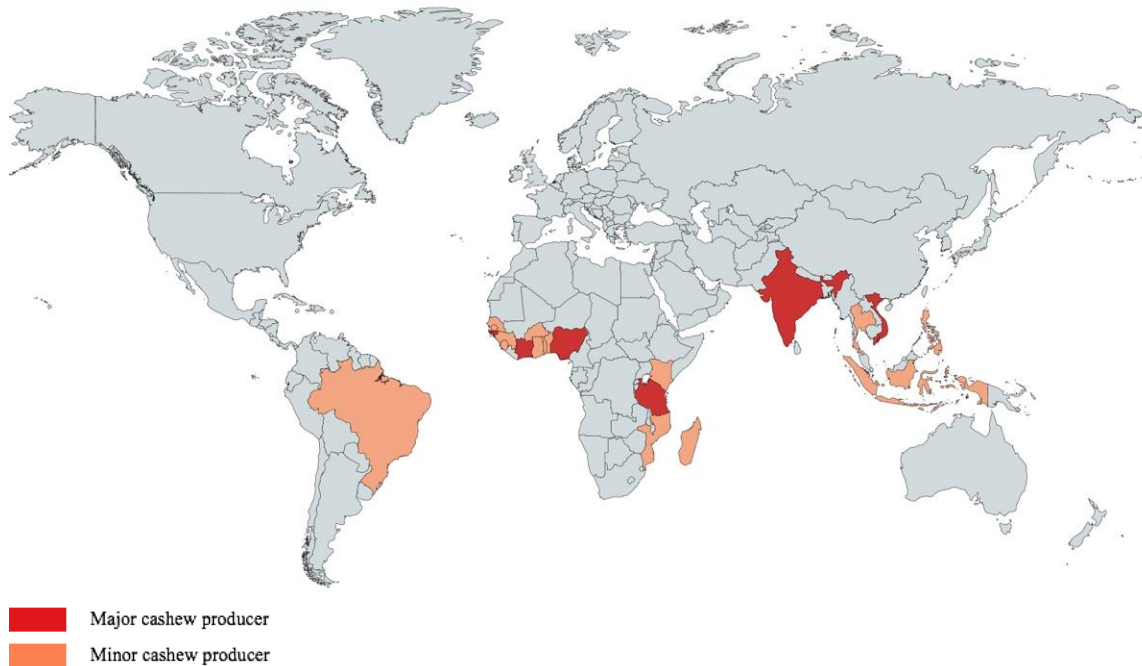
Business people and governments in West Africa only realized the commercial value of cashew nut production and processing in the 1990s. This was the start of cashew production and processing in Africa.

Unfortunately, cashew apples are not commercialized on the same scale as raw cashew nuts and kernels yet. Nevertheless, the business potential for manual or mechanical cashew apple processing is great.

## b) State cashew producing countries

The top four (4) cashew producing countries **worldwide** (2018/2019) are:

1. India: 800,000 Metric Tons (MT)
2. Côte d'Ivoire: 745,000 Metric Tons (MT)
3. Tanzania: 350,000 Metric Tons (MT)
4. Vietnam: 340,000 Metric Tons (MT)



Source: *Mapcart.net - Cashew producing countries*

The global cashew production is 3,585,000 MT in 2018/2019.

Africa grows approximately 2,000,000 MT. This is more than half (50 %) of the cashew crop worldwide.

The top four (4) cashew producing countries **in Africa** (2018/2019) are:

1. Côte d'Ivoire: 745,000 MT
2. Tanzania: 350,000 MT
3. Guinea-Bissau: 250,000 MT
4. Nigeria: 200,000 MT

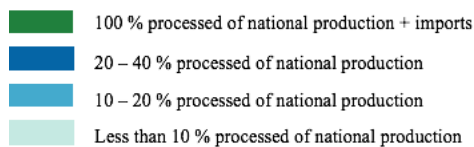
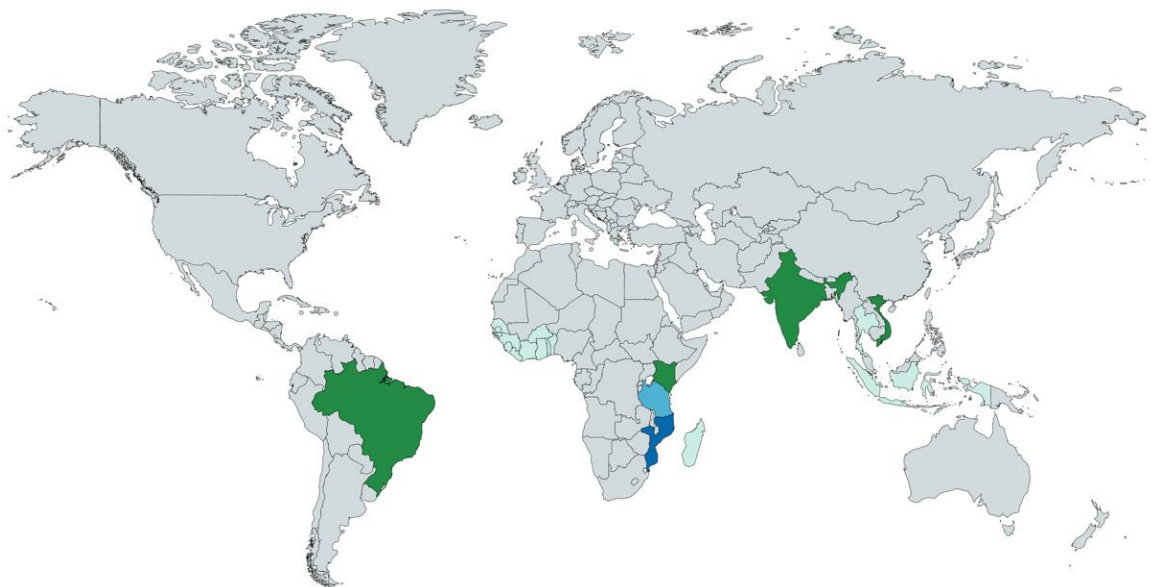
Source:

[https://nutfruitcongress.org/sevilla2018/files/pagina/1526997077\\_Cashew\\_Round\\_Table\\_Amit\\_Khirbat.pdf](https://nutfruitcongress.org/sevilla2018/files/pagina/1526997077_Cashew_Round_Table_Amit_Khirbat.pdf)

### c) State cashew processing countries

The top three (3) cashew processing countries **worldwide** (2018) are:

1. Vietnam: 1,490,000 MT
2. India: 1,671,849 MT
3. Brazil: 136,500 MT



Source: *Mapcart.net - Cashew processing countries*

Vietnam, India, Brazil and Kenya process 100 % of their national production and import raw cashew nuts from East and West Africa throughout the year.

Vietnam has a strong and highly mechanized processing industry. However, Vietnamese cashew production is decreasing, while raw cashew nut imports from Africa are increasing.

India is also importing raw cashew nuts from East and West Africa to satisfy their processing demand of raw cashew nuts. The processing industry is growing, but Indian production is stagnating.

Brazil's cashew production is falling, and the processing industry is declining.

East African countries process 15 – 30 % of their own cashew production. Only Kenya is processing 100 % of its cashew production, after banning raw cashew nut exports.



West African countries process less than 10 % of their cashew production. Côte d'Ivoire is the largest cashew producer in Africa, but processes less than 10 % of the local production, which makes Côte d'Ivoire the largest exporter of raw cashew nuts worldwide with only 70 000 MT (2018) of local processing.

Sources: Cashew digest, ACA Cashew Week, Cashewinfo, Cashew Club

Opportunities and challenges for successful raw cashew nut processing in Africa:

Opportunities	Challenges
<ul style="list-style-type: none"> <li>• The global cashew market is growing at 7 - 10 % annually</li> <li>• Consumption of cashew kernels increased 100 % in the past 10 years</li> <li>• Cashew kernels are cheaper compared to macadamia or almonds</li> <li>• Cashew kernels are healthier compared to groundnuts</li> <li>• Africa is producing approximately 55 % of the world's cashews</li> <li>• Cashew production in Africa is increasing due to:               <ul style="list-style-type: none"> <li>○ farm expansion</li> <li>○ planting of new plantations</li> <li>○ rejuvenation of old plantations</li> <li>○ use of improved planting materials</li> </ul> </li> <li>• Processing at source offers opportunities for close market linkages with farmers to access high quality raw materials</li> <li>• Traceability</li> <li>• By-product processing</li> </ul>	<ul style="list-style-type: none"> <li>• Access and costs of raw materials (raw cashew nuts)</li> <li>• High investment requirements for setting up a processing factory</li> <li>• High working capital requirements for purchasing raw materials</li> <li>• Access to loans and credits</li> <li>• Access to processing equipment and machines</li> <li>• Organisation of the processing process</li> <li>• Access to skilled labour</li> <li>• Cost of labour</li> <li>• Factory management</li> <li>• Food safety standards</li> <li>• Cost of unavailable infrastructure               <ul style="list-style-type: none"> <li>○ road networks</li> <li>○ access and cost of energy</li> <li>○ access to land to build factories</li> </ul> </li> <li>• Investment in climate and cashew-related policies</li> </ul>

Cashew processing is a profitable business, if it is well organised and managed. Gross margins range between 30 – 40 % with Return on Investment (ROI) achieved within 3 - 5 years.

Besides, processing of raw cashew nuts in Africa provides direct jobs for people living in the rural communities. It is estimated that processing the total African production of 2,000,000 MT locally, will create at least 550,000 direct jobs. These jobs would ensure a stable income and better food security for farming households. Farmers, factory workers and African economies share the benefits of local value addition.

#### d) State cashew consuming countries

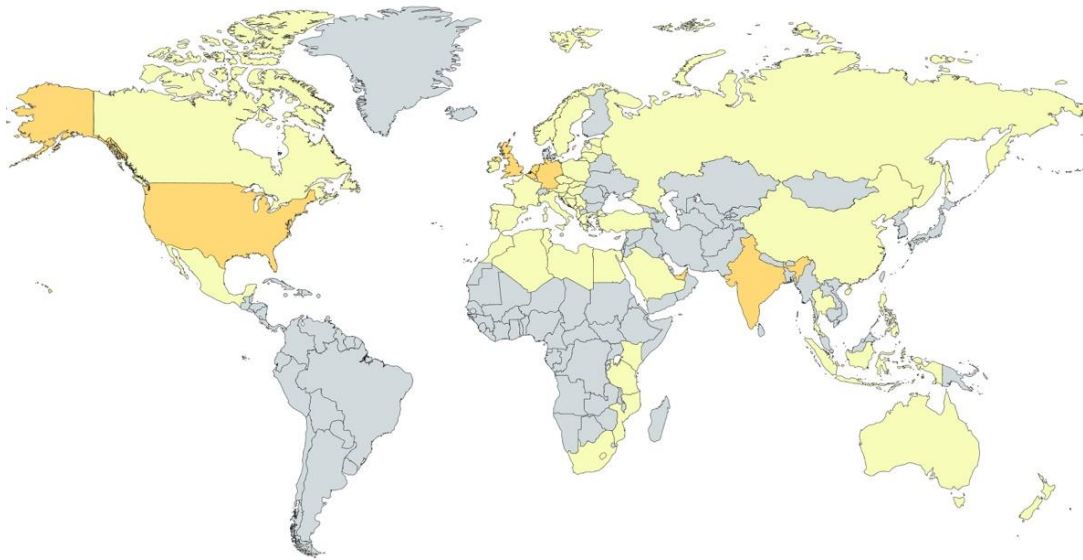
India consumes more than 300,000 MT of cashew kernels annually (as of 2018).

Apart from India, North America and Europe consume 40 % of the cashew kernels worldwide.

In Europe, the three (3) main cashew kernel consuming countries are:

1. Germany: 35,900 MT
2. Netherlands: 17,200 MT
3. United Kingdom: 16,700 MT

Source: <https://www.worldatlas.com/articles/top-cashew-consuming-countries.html>



- Major consuming country
- Minor consuming country

Source: [Mapcart.net](http://Mapcart.net) - Cashew consuming countries

#### Why is India consuming so many cashews kernels?

- In India, cashew kernels are part of the national cuisine. Cashew is an ingredient in many local dishes. Therefore, Indians demand much more raw cashew nuts and kernels than other countries. India is the largest and fastest growing market for cashew kernel and kernel by-product consumption worldwide.

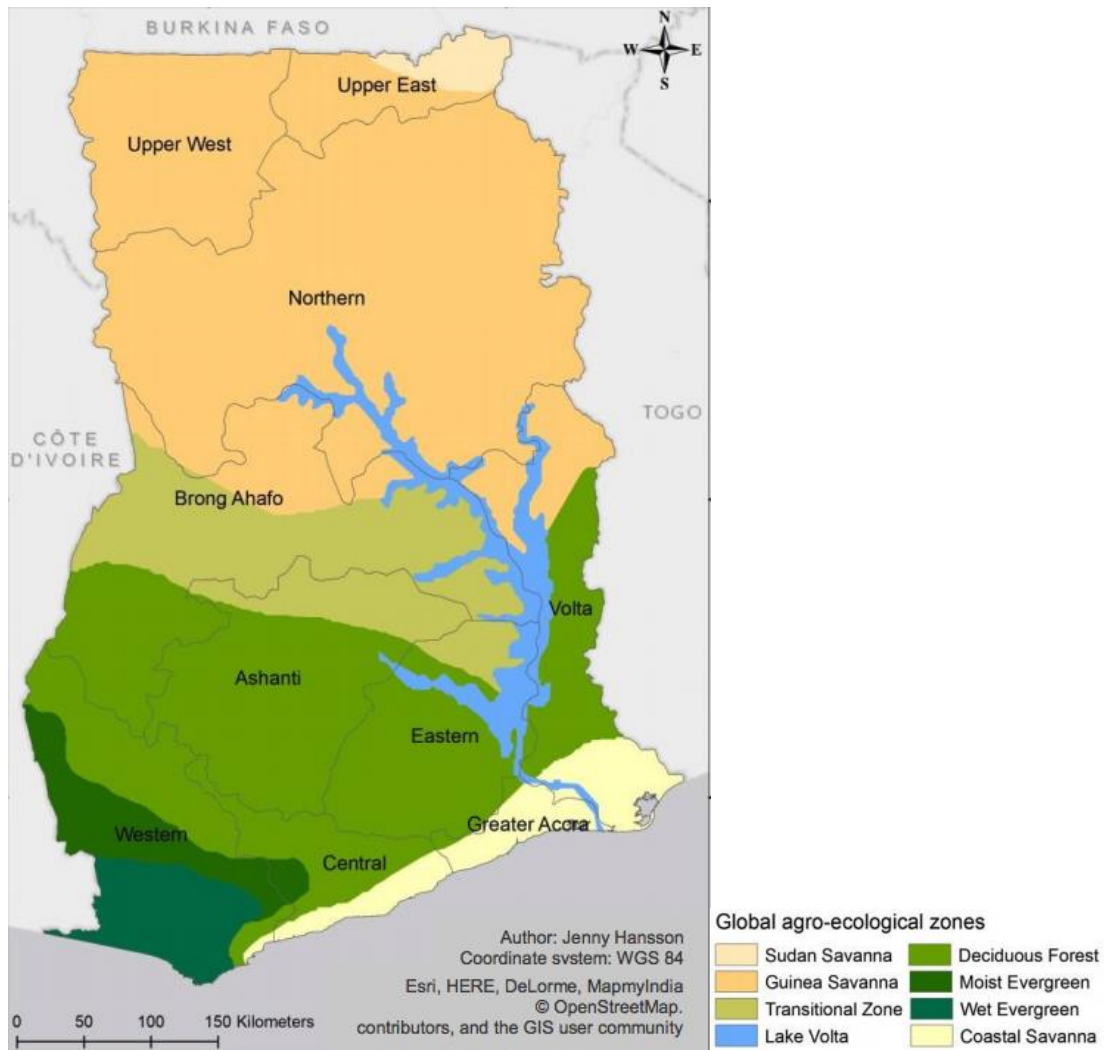
#### Why are cashew kernels mostly consumed in North America and Europe countries?

- Cashew kernels are more expensive than other nuts, for example groundnuts. The labour- or machine-intensive processing process results in high manufacturing costs.

e) Identify different agro-ecological zones in Ghana

Ghana has seven (7) agro-ecological zones:

1. Sudan savanna
2. Guinea savanna
3. Transitional zone
4. Deciduous forest
5. Moist evergreen
6. Wet evergreen
7. Coastal savanna



Source: <http://lup.lub.lu.se/luur/download?func=downloadFile&recordId=8918346&fileId=8918361>



Agro-ecological zones are defined on the basis of a combination of soil, landform and climatic characteristics. Each zone has similar opportunities and potentials for land use.

The agro-ecological zones are defined by:

- Climate
- Soil profile
- Landform
- Landcover
- Specific restrictions for land

In Ghana, the average annual temperature is approximately 27.5 Degree Celsius (°C), with lowest temperature around 25 °C.

In the northern parts of Ghana, the maximum temperatures are above 30 °C, and the lowest maximum temperature around 26 °C.

It rains more often in the southern zones than in the northern zones of Ghana:

- The rainforest zones in the south have an annual rainfall of 2,200 mm/year
  - 2 rainy seasons annually - south of the transitional zone
- The sudan savannah zone in the north has an annual rainfall of 1,000 mm/year
  - 1 rainy season annually - north of the transitional zone



Crops have specific agro-ecological zones in which they grow best. Not all crops grow well in all agro-ecological zones.



Rain falls from May to September, with the highest amount of rainfall in June and September.

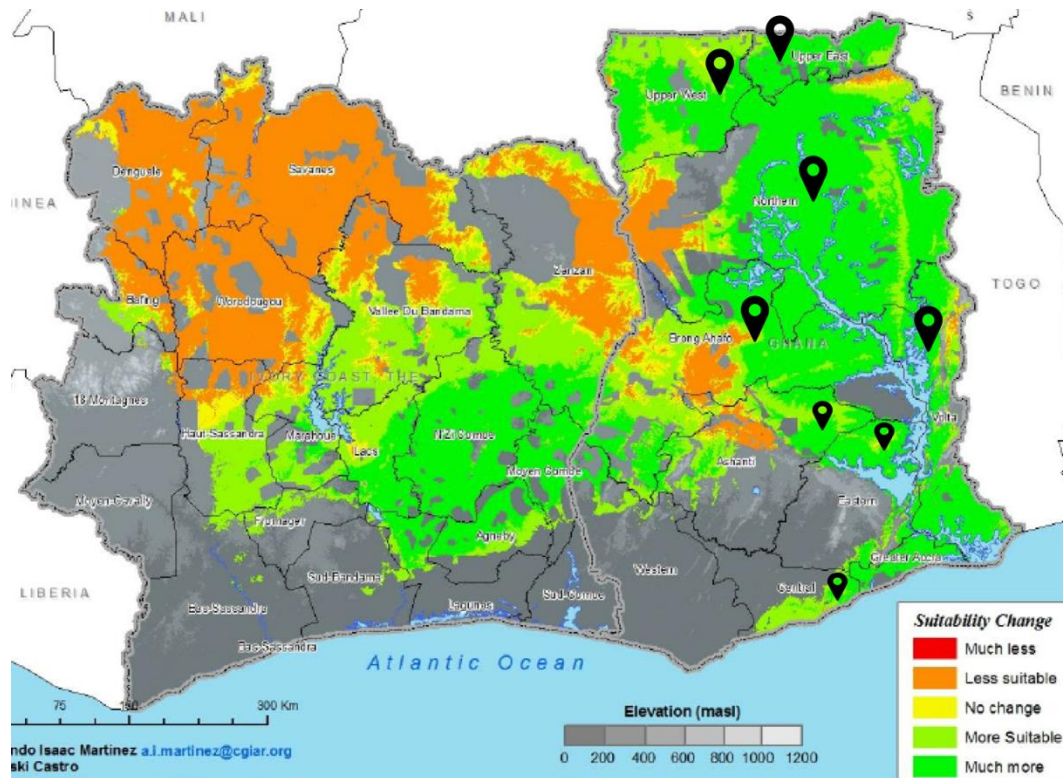
Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

**f) Identify cashew producing regions in Ghana**

The most suitable areas for cashew production:

- Sudan savanna
- Guinea savanna
- Transitional zone

Some parts of the deciduous forest zone, mainly in the east of the river Volta are also suitable for cashew production, as well as the coastal savanna zone.



Source: GIZ/ComCashew – Suitability for cashew growing in Ghana and Côte d’Ivoire

Cashew requires the following climatic conditions:

- Rain of 500 – 1.500 mm per year
- Temperatures of 30 – 35°C
- Altitude of 170 m – 1.200 m
- Flat grounds
- Soils pH rates ranging from 5.5 – 7

Cashew trees grow and produce well on these types of soil:

- Deep soil
- Fertile soil
- Well-drained soil
- Loamy soil
- Sandy soil
- Laterite soil

## SELF ASSESSMENT



1. State the top three (3) cashew producing countries.

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2. State the top three (3) cashew processing countries.

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3. State three (3) agro-ecological zones suitable for cashew production.

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*Well done! You have completed the first set of questions. This is very encouraging. Let's proceed on your cashew learning journey.*

## 2. DEMONSTRATE KNOWLEDGE OF THE CASHEW VALUE CHAIN

### a) State the various segments along the cashew value chain

The cashew value chain has eight (8) different value chain segments:

1. Input supply
2. Cashew production
3. Raw cashew nut (RCN) trade
4. Processing of raw cashew nuts (RCN)
5. Kernel roasting
6. Raw cashew nut (RCN) / kernel export
7. Domestic marketing
8. International marketing

A value chain is developed with the end market / end product in mind. First, we outline the sequence of processes involved in the production of cashew kernels.



Not all value chain segments are represented in all value chain maps. This is dependent on the developmental state of the cashew industry in a country.

*The cashew value chain **without** a local processing industry*



Source: GIZ/ComCashew

Characteristics of this value chain are:

- Focus on raw material (raw cashew nut) supply
- High number of middle men and raw cashew nut traders in the system
- Business linkages exist between farmers and local / international traders
- Export of unprocessed raw cashew nuts
- Processing of raw cashew nuts in Vietnam, India or Brazil
- Kernel export to Europe, US, Asia and Latin America for roasting
- Consumption in Europe, US, Asia and Latin America

*The cashew value chain **with a local processing industry***



Source: GIZ/ComCashew

Characteristics of this value chain are:

- Moderate number of middle men and raw cashew nut traders in the system
- Business linkages exist between farmers and processors
- Business linkages exist between local traders and processors
- Processing of raw cashew nuts takes place locally
- Kernel export to Europe, US, Asia and Latin America for roasting
- Consumption in Europe, US, Asia and Latin America

Benefits of domestic processing:

- Employment creation, especially for women in processing factories
- Income generation, especially for women in processing factories
- Local value addition
- Higher profit margins for farmers and processors through direct business linkages
- Development of business relationships between primary actors

*The ideal cashew value chain with a strong local processing industry and a domestic market for consumption of cashew kernels and apples.*



Source: GIZ/ComCashew

Characteristics of this value chain are:

- Direct business linkages between farmers and processors
- Contract farming
- Elimination of middle men and raw cashew nut traders
- Processing of raw cashew nuts locally
- Domestic roasting and kernel consumption
- Raw and roasted kernel export
- Marketing of roasted, packaged and branded kernels to supermarkets in Europe, US, Asia and Latin America



Benefits of domestic consumption:

- Processors can sell lower grade kernels to the domestic market
- Existing local industries can source healthy ingredients locally, e.g. chocolate and biscuit industries use cashew kernels for their products
- Local population adds healthy, delicious and nutritious cashew kernels to their diet

For cashew apple products, the value chain segments itself as well as the sequence of the value chain segments are highly dependent on the end product.

The ‘cajuina’ value chain includes seven (7) different value chain segments:

1. Input supply
2. Cashew production
3. Processing of cashew apples
4. Packaging / bottling
5. Domestic marketing
6. By-product export
7. International marketing



Source: GIZ/ComCashew

Cashew apple processing takes place in-country because the cashew apple is highly perishable.

Some cashew apple products are not pasteurized, for example fresh juices. The non-pasteurized products are meant for domestic consumption only and cannot be exported. For non-exportable products, the value chain ends after domestic marketing and consumption.

**b) Outline the role of the actors in each of the segments of the cashew value chain**

Each segment of the cashew value chain is made up of a specific group of actors. Each actor has a specific function in the value chain. The tables below present the actors per value chain segment and the various functions they perform.



Actors can have more than one function within a value chain segment

**1. Input Supply**

Actors	Functions in the Input Supply Segment
<ul style="list-style-type: none"> <li>• Agro-chemical dealers</li> <li>• Seed Dealers</li> <li>• Grafters</li> <li>• Nursery Operators</li> <li>• Equipment Dealers</li> <li>• Packaging Dealers</li> <li>• Research institutes</li> </ul>	<ul style="list-style-type: none"> <li>• Supply of agro-chemicals <i>(herbicides, weedicides, fertilizer)</i></li> <li>• Development of improved planting materials</li> <li>• Supply of improved planting materials <i>(polyclonal seeds, grafted seedlings)</i></li> <li>• Supply of machines, equipment, tools for production and processing <i>(tractors, hand shelling machines, juice press, etc.)</i></li> <li>• Supply of packaging materials <i>(vacuum sealing, polybags for rootstocks, bottles, etc.)</i></li> </ul>

**2. Cashew Production**

Actors	Functions in the Cashew Production Segment
<ul style="list-style-type: none"> <li>• Small, medium and large-scale farmers</li> <li>• Farm Supervisors</li> <li>• Foremen</li> <li>• Farmer associations and cooperatives</li> <li>• Out-growers</li> <li>• Seasonal labourer</li> <li>• Bee-keepers</li> </ul>	<ul style="list-style-type: none"> <li>• Planting</li> <li>• Intercropping</li> <li>• Weeding and spraying</li> <li>• Pruning and thinning</li> <li>• Canopy substitution</li> <li>• Harvesting cashew fruits <i>(collecting the fruits)</i></li> <li>• Post-harvest handlings of cashew fruits <i>(detaching, drying, bagging, storing)</i></li> <li>• Quality control <i>(kernel outturn ratio, nut count, moisture level)</i></li> <li>• Hiring of wage labourers</li> <li>• Selling of raw cashew nuts</li> </ul>

### 3. Raw Cashew Nut (RCN) Trade

Actors	Functions in the RCN Trade Segment
<ul style="list-style-type: none"> <li>• Small, medium and large-scale nut buyers</li> <li>• Field agents / middlemen</li> <li>• Procurement officer</li> <li>• Warehouse manager</li> <li>• Quality assurance manager</li> </ul>	<ul style="list-style-type: none"> <li>• Quality control</li> <li>• Purchasing raw cashew nuts from local traders and farmers</li> <li>• Transporting of raw cashew nuts</li> <li>• Drying and bagging of raw cashew nuts</li> <li>• Storage of raw cashew nuts</li> <li>• Managing warehouse operations</li> <li>• Sales of raw cashew nuts to processors, RCN buyers / exports</li> </ul>

### 4. Processing of Raw Cashew Nuts (RCN)

Actors	Functions in the Processing of RCN Segment
<ul style="list-style-type: none"> <li>• Small, medium, large-scale cashew nut processors</li> <li>• Small, medium, large-scale cashew apple processors</li> <li>• Section supervisors</li> <li>• Section clerks</li> <li>• Wage labourers</li> </ul>	<ul style="list-style-type: none"> <li>• Purchasing raw cashew nuts from local traders, buyers and farmers</li> <li>• Transporting of raw cashew nuts</li> <li>• Drying of raw cashew nuts</li> <li>• Calibrating of raw cashew nuts</li> <li>• Storage of raw cashew nuts</li> <li>• Shelling of raw cashew nuts</li> <li>• Peeling of kernels</li> <li>• Sorting of kernels</li> <li>• Grading of kernels</li> <li>• Packaging of kernels</li> <li>• Transporting of kernels</li> <li>• Cashew nut shell liquid (CNSL) extraction</li> <li>• Pressing of cashew shells into briquettes</li> <li>• Marketing graded kernels to different buyers</li> </ul>

### 5. Kernel Roasting

Actors	Functions in the Kernel Roasting Segment
<ul style="list-style-type: none"> <li>• Small, medium, large-scale kernel roasters</li> <li>• Section supervisors</li> <li>• Section clerks</li> <li>• Wage labourers</li> </ul>	<ul style="list-style-type: none"> <li>• Purchasing kernels from processors</li> <li>• Roasting cashew kernels</li> <li>• Flavouring cashew kernels</li> <li>• Packaging of kernels</li> <li>• Marketing of roasted kernels to different buyers</li> </ul>

## 6. Export

Actors	Functions in the Export Segment
<ul style="list-style-type: none"> <li>• Raw cashew nut traders</li> <li>• Wholesale kernel buyers</li> <li>• Exporters</li> </ul>	<ul style="list-style-type: none"> <li>• Road transportation</li> <li>• Logistics at the harbour</li> <li>• Shipments</li> <li>• Storage</li> <li>• Quality control</li> <li>• Sales transactions</li> </ul>

## 7. Domestic marketing

Actors	Functions in the Domestic Marketing Segment
<ul style="list-style-type: none"> <li>• Supermarket chains in Africa</li> <li>• Local supermarkets</li> <li>• Local food markets</li> <li>• Hotels</li> <li>• Restaurants</li> <li>• Roadside sellers / hawkers</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase of raw or roasted kernels</li> <li>• Packaging of raw or roasted kernels</li> <li>• Labelling and branding of raw or roasted kernels</li> <li>• Distribution of raw or roasted kernels</li> <li>• Sales of raw or roasted kernels</li> </ul>

## 8. International marketing

Actors	Functions in the International Marketing Segment
<ul style="list-style-type: none"> <li>• International supermarket chains</li> <li>• Food markets and bazaars</li> <li>• Hotels</li> <li>• Restaurants</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase of raw or roasted kernels</li> <li>• Packaging of raw or roasted kernels</li> <li>• Labelling and branding of raw or roasted kernels</li> <li>• Distribution of raw or roasted kernels</li> <li>• Sales of raw or roasted kernels</li> </ul>



The actors and functions in each value chain segment are not limited to the lists 1 to 8 above. If you engage with actors in the cashew value chain in Africa and around the world, you might meet someone who is specialized in a specific area of work that are not listed here.

Keep your eyes and ears open!

**c) Outline the economic value of cashew in Ghana**

1 kg of raw cashew nuts can be sold for around GHS 5. The price for 1 kg of raw cashew nuts is dependent on the quality of your product and on the international kernel prices. As of 2019, the price for raw cashew nut in Ghana is not determined by the government and can change within one cashew harvesting season and from one year to another.

Farmers mainly invest the money they gain from raw cashew nut sales into:

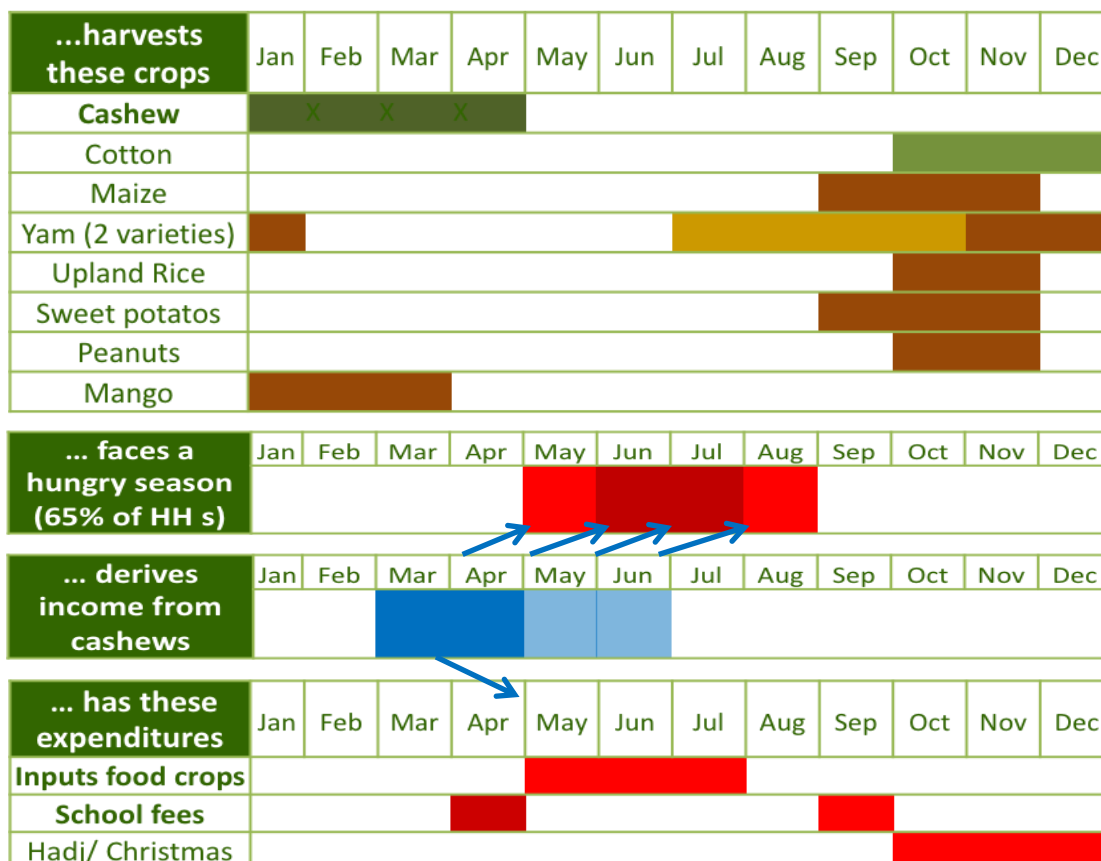
- Food
- School fees
- Inputs for food crops / intercropping
- Investments into the maintenance and/or expansion of cashew plantations

Cashew is harvested and sold in the 'lean season' from January to May / June when no other income is generated from the sale of other crops such as maize, yam, sweet potatoes and peanuts (groundnuts). In the lean season, farming communities and households often slip deeper into poverty because they have:

- no product to sell
- no fieldwork available

Farmers, who **do not** cultivate cashew face several issues in the lean season:

- lack of food
- no source of income to pay for school fees or investments in farm operations



Source: GIZ/ComCashew – Income generating period from cashew cultivation in Ghana

The main cashew harvest season creates employment for day labourers, when no other fieldwork is available. In cashew producing communities, crime rates decrease because community members earn well from either selling raw cashew nuts or doing farm labour. Income from cashew-related activities such as harvesting, drying, trading, loading and transporting often feed an entire community in the lean season, when no other income is generated from the sale of other crops.

The local cashew processing industry also creates employment and income, especially for women in rural areas. Unfortunately, women often do not have any opportunity for formal employment and therefore, little access to income-generating activities, because they lack the required educational background and skills.

The expansion of local processing, thus value addition, contributes to building a local industry. On a national level, this entails moving away from being a mere supplier of raw cashew nuts to becoming a raw cashew nut processing country resulting in:

- Selling processed products at a better (value added) price
- Higher margins for primary value chain actors (farmers and processors) due to better market linkages
- Local employment creation in the production and processing segments
- Local income generation in the production and processing segments



Source: GIZ/ComCashew – Cashew fruits grown in Ghana

d) Sketch a basic chart of the cashew value chain



Practical exercise: Draw the ideal cashew value chain and describe the characteristics of this value chain.



**SELF ASSESSMENT**

1. Mention the eight (8) value chain segments in the cashew value chain.

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2. Mention the seven (7) value chain segments in the 'cajuina' value chain.

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3. List six (6) functions of actors in the processing of raw cashew nuts segment.

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4. State three (3) facts that underline the economic value of cashew in Ghana?

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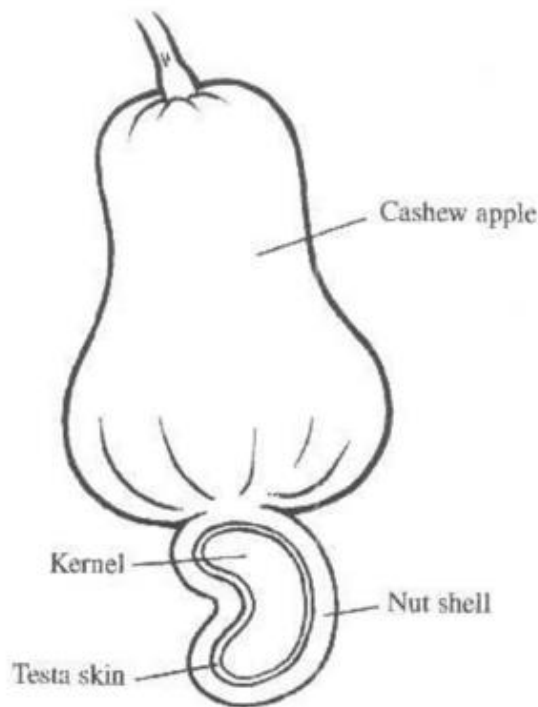
*You are making great progress! You have completed the second set of questions. Let's move on to the last chapter.*

### 3. DEMONSTRATE KNOWLEDGE OF CASHEW PRODUCTS

#### a) State the products that can be made from cashew

Cashew products can be made from the three (3) main parts of the cashew fruit:

1. Cashew Apple
2. Cashew Nut shell
3. Cashew Kernel with Testa skin



Source:

[http://www.tzdp.org.tz/fileadmin/\\_migrated/content\\_uploads/Cashew\\_Value\\_Chain\\_Diagnostics.pdf](http://www.tzdp.org.tz/fileadmin/_migrated/content_uploads/Cashew_Value_Chain_Diagnostics.pdf)

#### 1. Cashew Apple Products

- Fresh cut cashew apples
- Cashew juice:
  - Concentrated juice
  - Fresh juice
  - Ingredient for mixed juice
  - Sweetened juice
  - Unsweetened juice
  - Cajuina
  - Nectar
- Bakery products:
  - Cake
  - Bread



- Biscuit
- Alcohol:
  - Wine
  - Beer
  - Brandy
  - Ethanol
  - Cachaça
- Syrup / jam
- Honey
- Cashew plums
- Cashew pulp / fibre
- Flour
- Sorbet
- Dried cashew apples

Products derived from the cashew apple and kernel are mostly edible products or food ingredients. The weight ratio of cashew apple to the raw cashew nut is 9:1.

Consequently, from 3,585,000 MT of raw cashew nuts produced in 2018/2019, 32,265,000 MT are cashew apples.



In total 32,265,000 MT of cashew apples are available for processing into delicious cashew apple products. *Here comes your business opportunity!*



The processing of cashew by-products offers another opportunity for value addition and diversification of income streams for processors and farmers.



Source: GIZ/ComCashew - Fresh cashew fruits

## 2. Cashew Nut Shell Products

Products derived from the cashew nut shell are for industrial use and application.

- Cashew Nut Shell Liquid (CNSL) is used for:
  - Phenolic resin (used as fillers for industrial products, glue, and coaters of for example laboratory countertops)
  - Brake lining powder
  - Paint and varnish
  - Insecticide
  - Medication for leprosy, psoriasis, and ringworm
- Shell cake is used as:
  - coal substitute, if compressed and hence reduce deforestation
  - industrial fuel, if produced in large quantities



Source: GIZ/ComCashew – Cashew shells

The raw cashew nut consists of:

- 50 % Shell
- 20 - 25 % Cashew nut shell liquid (CNSL) contained in the shell
- 25 - 30 % Kernel including the Testa skin

Out of the 3,585,000 MT of raw cashew nuts produced in 2018/2019, 2,509,500 MT (70 %) is the cashew nut shell and liquid, while 30 % is the cashew kernel with the Testa skin.

→ 3,585,000 MT of raw cashew nuts = 2,509,500 MT of cashew nut shell and liquid

→ 3,585,000 MT of raw cashew nuts = 1,075,500 MT of cashew kernel with Testa skin



In total 2,509,500 MT of cashew nut shell and liquid are available for processing into products for industrial use and application.

*This is your business opportunity, right here!*

Cashew processors in Asia already utilise and market what is traditionally perceived as waste, namely the shell and the cashew nut shell liquid (CNSL). Cashew shell can be used for boiling and heating. When processed into briquettes, cashew shells provide a good additional source of income. The extraction and sale of cashew nut shell liquid (CNSL) offers alternative means for income generation from cashew processing. Cashew processors in Africa should take advantage of marketing cashew by-products, instead of paying for the disposal of the cashew shells.

### 3. Cashew Kernel Products

- Roasted and flavoured cashew kernels:
  - Raw
  - Sweet
  - Salted
  - Powdered
  - Coated
- Cashew nut paste
- Ingredient in many dishes:
  - Cashew curry
  - Cashew nut soup
  - Cashew cake and cookies
  - Cashew ice cream
- Cashew and dried fruit and nut mixes
- Cosmetics:
  - Oils
  - Hand and face creams



Source: GIZ/ComCashew – Cashew kernels

## b) Identify cashew by-products

Here are some of the main by-products made from cashew apples, kernels and shells.

### 1. Freshly Cut Cashew Apples



Source: GIZ/ComCashew – Cashew apples freshly cut and served

### 2. Cajuina



Source: GIZ/ComCashew – Cajuina on supermarket shelf in Brazil

### 3. Fresh Cashew Apple Juice



Source: GIZ/ComCashew – Fresh cashew apple juice in glass

### 4. Cashew Nectar



Source: GIZ/ComCashew – Cashew nectar packaged in drink box from Brazil

## 5. Cashew Sweets



Source: GIZ/ComCashew – Sugar coated cashew fibre sweets with cashew kernels from Brazil

## 6. Cashew Apple Jam



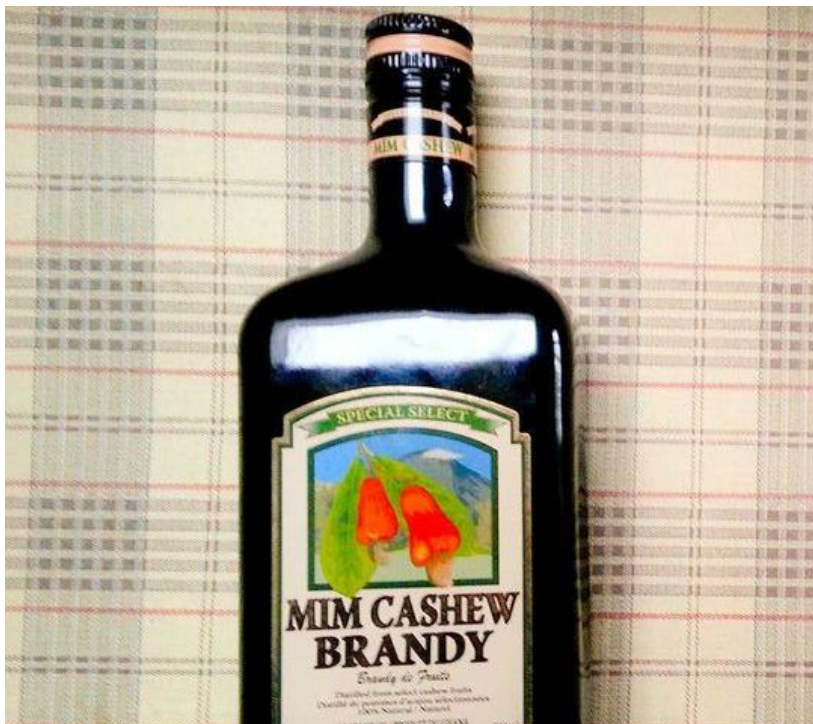
Source: GIZ/ComCashew – Cashew jam from Ghana

## 7. Cashew Cachaça (Alcohol)



Source: GIZ/ComCashew – Cachaça made from cashew apples in the local market in Brazil

## 8. Cashew Brandy (Alcohol)



Source: <https://www.gepaghana.org/import/ghana-exporter/mim-cashew-agricultural-products-ltd/> - Cashew Brandy produced in Ghana

## 9. Cashew Wine (Alcohol)



Source: GIZ/ComCashew – Cashew wine produced in Ghana

## 10. Cashew Cake, Coated Cashew Kernels, Roasted and Salted Cashew Kernels



Source: GIZ/ComCashew – Cashew apple and nut cake, coated and roasted kernels



## 11. Banana – Cashew Nut Bread



Source: GIZ/ComCashew – Banana and cashew nut bread

## 12. Flavoured Cashew Kernels with Chilli Powder



Source: GIZ/ComCashew – Chilli powdered cashew kernels

### 13. Cashew Paste



Source: GIZ/ComCashew – Cashew kernel paste

### 14. Cashew Ice Cream



Source: <https://urbanvegan.net/ice-cream-brands/> – Cashew milk ice cream

## 15. Cashew Milk



Source: GIZ/ComCashew – Cashew nut milk in supermarket shelf in Brazil

## 16. Cashew Nut Mixes



Source: GIZ/ComCashew – Cashew nut mixes in supermarket shelf in Brazil

## 17. Cashew Cosmetics (Oil, hand and face creams)



Source: GIZ/ComCashew – Cosmetics made from cashew in supermarket shelf in Brazil

## 18. Cashew Nut Shell Liquide (CNSL)



Source: [www.tradeindia.com](http://www.tradeindia.com) – Cashew Nut Shell Liquid (CNSL)

## 19. Briquettes



Source: African Cashew Alliance – Cashew Nut Shell Briquette

## 20. Shells



Source: GIZ/ComCashew – Cashew shells in Brazil

## c) List health benefits of the cashew fruit

### 1. Health benefits from consuming cashew kernels

Cashew kernels are among the healthiest nuts in the world and provide very important nutrients for our bodies.



Cashew kernels are high in calories. Consume cashews in small portions. 100 g of cashew kernels = 553 calories (kcal).

Although cashew kernels are high in calories, they also contain healthy fats. The fat content in cashew kernels is also much lower than in other nuts such as almonds, walnuts, peanuts and pecans.



Consuming healthy fats, as they are found in cashew kernels, olive oil and fish, reduces risk for heart disease and cleans the blood from other unhealthy fats.

Cashew kernels are cholesterol free, high in magnesium and antioxidant contents.

The high level of magnesium fulfils the daily recommended value to protect you from:

- High blood pressure
- Muscle spasms
- Migraine headaches
- Tension
- Soreness
- Fatigue
- Asthma

People diagnosed with high blood pressure benefit greatly from unsalted cashew kernels (easily available as snack option).

Consuming cashew kernels regularly and in moderate portions can prevent type-2 diabetes by:

- Stabilizing blood sugar levels in diabetics
- Reducing high cholesterol
- Preventing insulin resistance

## Nutritional value per 100g of cashew kernels

Nutrient	Nutrient Value	Percentage of Recommended Daily Allowance (RDA)
Energy	553Kcal	28
Carbohydrates	30.19g	23
Proteins	18.22g	32.5
Total fat	43.85g	146
Cholesterol	0	0
Dietary fibre	3.3g	8.5
<b>Vitamins</b>		
Folates	25ug	6
Niacin	1.06mg	6.5
Pantothenic acid	0.864mg	17
Pyridoxine	0.417mg	32
Riboflavin	0.058mg	4.5
Thiamin	0.423mg	35
Vitamin A	0	0
Vitamin C	0.5mg	1
Vitamin E	5.31mg	35
Vitamin K	9.1ug	3
<b>Electrolytes</b>		
Sodium	12mg	1
Potassium	660mg	14
<b>Minerals</b>		
Calcium	37mg	4
Copper	2.195mg	244
Iron	6.68mg	83.5
Magnesium	292mg	73
Manganese	1.655mg	72
Phosphorus	593mg	85
Selenium	19.9mg	36
Zinc	5.78mg	52.5

Source: GIZ/ComCashew Source – Nutritional value of cashew kernels

Cashew kernels are a great source of iron. Iron is important for pregnant women for blood production to nourish the foetus. Eating cashew kernels also helps to fight fatigue caused by the lack of iron during pregnancy.

Ladies, spending a lot of money on hair care products is expensive and ineffective! Eating cashew kernels can encourage hair growth and solve the problem of hair loss. Eating cashew kernels can also promote hair growth, as it is rich in iron and thus helps circulate oxygen to the scalp.

## 2. Health benefits from consuming cashew apples

Cashew apples also offer an excellent source of nutrition.

Cashew apples have the following nutritional benefits:

- 5x the vitamin C content of oranges
- 12x the vitamin C content of pineapple
- Carry important antioxidants, iron and calcium
- Rich in mineral salts
- Good source of vitamin A & B

Cashew apples have fibrous flesh and are full of juice. Cashew apples have a particular flavour but are often forgotten once the raw cashew nuts have been harvested. The majority of cashew apples are discarded after the raw cashew nuts are detached from the apples. Yet, the cashew apple is very nutritious and has a high potential of becoming a healthy part of the African diet, especially for children.

### Nutritional value per 100g of cashew apples

Nutrient	Nutrient Value
Moisture	84.4 - 88.7 g
Protein	0.101 - 0.162 g
Fat	0.05 - 0.50 g
Carbohydrates	9.08 - 9.75 g
Fibre	0.4 - 1.0 g
Iron	0.19 - 0.71 mg
Calcium	0.9 - 5.4 mg
Carotene	0.03 - 0.742 mg
Ascorbic Acid	146.6 - 372.0 mg

Source: GIZ/ComCashew – Nutritional value of cashew apples

Due to its high nutritional value, the consumption of cashew kernels and apples is good for your health. Combining cashews with other nuts and fruits such as fresh or dried cashew apples makes a healthy snack.



Cashews can also be consumed as part of various dishes. Have you ever tried cashew nut soup, instead of groundnut soup?

The foods that you eat determine your health. To stay healthy, you need to eat foods that are high in nutrition. Healthy foods and regular physical exercise enable you to carry out your various daily tasks. Consuming nutritional foods also increases the ability of our bodies to prevent and fight diseases.





## SELF ASSESSMENT

1. Name five (5) products made from cashew apples.

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2. Name five (5) products made from cashew kernels.

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3. Name three (3) products made from cashew shells.

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4. Name three (3) health benefits of consuming cashew kernels.

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5. Name three (3) health benefits of consuming cashew apples.

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*Congratulations! You have completed the full unit.*

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Other information is retrieved from cashew news bulletins that require membership and subscriptions fees:

- Cashew Digest
- ACA Cashew Week
- Cashewinfo
- Cashew Club