

## Cashew Processing Guides

# Number 2

# Opportunities and Challenges in Cashew Processing in Africa



**Published by:**

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ)

Dag-Hammarskjöld-Weg 1 - 5

65760 Eschborn, Germany

T +49 61 96 79-0

F + 49 61 96 79-11 15

I [www.giz.de](http://www.giz.de)

**Registered offices:**

Bonn and Eschborn

Germany

**Place and date of publication:**

Ghana, June 2019

**Responsible editor:**

Rita Weidinger (Executive Director)

GIZ/ Competitive Cashew initiative)

H/No. 313A, Cotonou Street

East Legon Residential Area - Accra, Ghana

T + 233 207 70 54 01

F + 233 302 77 13 63

**Contact:**

[cashew@giz.de](mailto:cashew@giz.de)

**Photo:**

© GIZ/ComCashew

# Opportunities and Challenges in Cashew Processing in Africa

## Contributors

Mary Adzanyo

Jim Fitzpatrick

Shakti Pal

Rowel Kutie Weyori

## A Competitive Cashew initiative publication in cooperation with



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra  
Swiss Confederation

Federal Department of Economic Affairs,  
Education and Research EAER  
State Secretariat for Economic Affairs SECO



## The Competitive Cashew initiative (GIZ/ComCashew)

313A Cotonou Street, East Legon

P. O. Box KIA 9698

East Legon, Accra, Ghana



## Cashew Processing Guides

# Number 2: Opportunities and Challenges in Cashew Processing in Africa

© Copyright: GIZ/ComCashew 2019

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise without permission in writing from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH or Competitive Cashew initiative (GIZ/ComCashew).

GIZ/ComCashew encourages fair use of this material. Proper citation is requested.

ISBN: 978-9988-2-9224-9

# Preface

The Competitive Cashew initiative (GIZ/ComCashew) - formerly African Cashew initiative (GIZ/ACi) - conducted a comprehensive study on raw cashew nut processing equipment (GIZ/ACi, 2011), through consultation with cashew industry investors worldwide. The study revealed areas of concern related to raw cashew nut processing. The main questions posed by cashew processors and potential investors who wanted to set up businesses in Africa evolved around raw cashew nut processing, equipment types and food safety.

In response, GIZ/ComCashew has published a series of five (5) cashew processing guides to provide useful information and practical materials to the industry, notably to new processors entering the raw cashew nut processing business in Africa and existing processors who plan to upgrade or expand their cashew processing factories.

The purpose of this Cashew Processing Guide Number 2: Opportunities and Challenges in Cashew Processing is to elaborate on the opportunities the cashew industry offers potential investors in Africa and the critical issues to be addressed in establishing a successful cashew processing business.

The guidebook also serves as a resource material and reference book for new investors in the raw cashew nut processing business. The information in this guidebook enables new processors to make informed decisions about investing in raw cashew nut processing.

# Acknowledgements

In developing this Guidebook, we received contributions and support from several partners and industry stakeholders to whom we are deeply grateful. We acknowledge, with thanks, the support of two groups of collaborators:

1. **Cashew Stakeholders:** This guidebook is built on our shared learning over the years

- African Cashew Alliance
- Association National des Transformateurs d'Anacarde du Burkina Faso
- Cashew Club
- Cashew Industry Association and Processors in Ghana
- Conseil du Coton et de l'Anacarde de la Côte d'Ivoire
- Conseil National des Transformateurs de Cajou du Benin
- FairMatch Support
- Groupement des Industriels du Cajou de la Côte d'Ivoire
- Ministère d'Agriculture de la Côte d'Ivoire
- Ministère d'Agriculture, Elevage et Pêche du Benin
- Ministère d'Agriculture, et des Aménagement Hydraulique and la Direction Générale pour la Promotion de l'Economie Rurale du Burkina Faso
- Ministère du Commerce, l'Industrie et de l'Artisanat du Burkina Faso
- Ministère de l'Industrie et des Mines de la Côte d'Ivoire
- Ministry of Food and Agriculture of Ghana
- Ministry of Trade and Industry of Ghana
- Technoserve

2. **Technical review committee, who participated in reviewing the manuscripts for publication:** Hussain Gilani (Cajou de Savane), Mark Van Sleeuwen (Afokantan), David Heubi (Gebana Afrique), Rita Weidinger (GIZ/ComCashew), Ernest Mintah (African Cashew Alliance) and Helene Widmer (GIZ/ComCashew).

The Technical Review Committee reviewed and approved the final draft of the manuscript for publication. We acknowledge and are grateful for contributions received from cashew processing experts who took time to work with us to review and provide critical feedback to enrich the contents of this guidebook.

We acknowledge the contributions of the following persons: Anthony Youdeowei (International Publishing Consultant), Ann-Christin Berger (GIZ/ComCashew), Nunana Addo (GIZ/ComCashew) and Sylvia Pobee (GIZ/ComCashew).



# Contents

<b>Preface</b> .....	<b>v</b>
<b>Acknowledgements</b> .....	<b>vi</b>
<b>1. Introduction</b> .....	<b>01</b>
<b>2. Opportunities</b> .....	<b>02</b>
<b>3. Challenges</b> .....	<b>06</b>
3.1 Investment and Working Capital Requirements.....	06
3.2 Access to Raw Cashew Nuts .....	07
3.3 Labour and Mechanisation .....	08
3.4 Process Organisation and Choice of Equipment .....	11
3.5 Factory and Technology Management.....	11
3.6 Food Safety and Traceability .....	12
3.7 Risk Management .....	13
3.8 By-Product Processing .....	14
3.9 Environmental and Social Impact .....	17
3.10 National Cashew Policies.....	19
<b>Recommended Reading</b> .....	<b>21</b>
<b>Glossary of Raw Cashew Nut Processing Terms</b> .....	<b>23</b>
<b>Acronyms and Abbreviations</b> .....	<b>25</b>



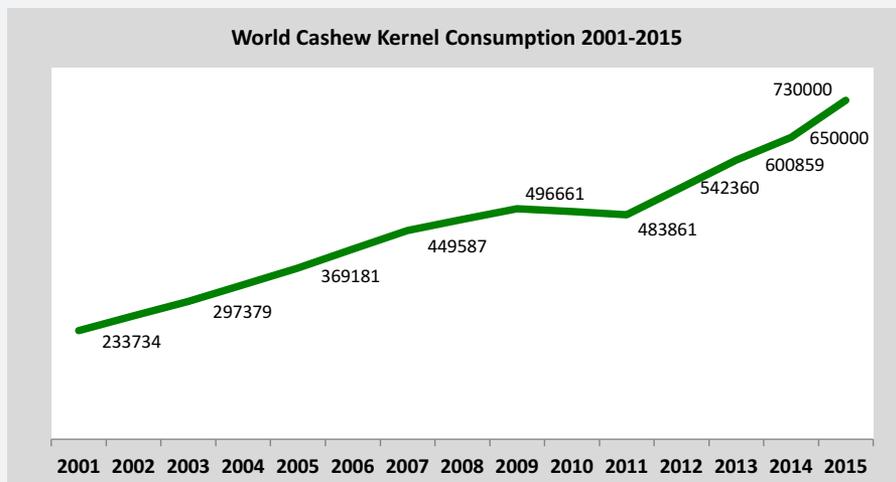
# 1. Introduction

In Africa, cashew processing has been widely shown to be a profitable venture, primarily because the global demand for high quality cashew kernels has been growing at 7-10% annually. However, cashew processors have experienced major challenges in the industry which have resulted in the relatively slow pace of growth and the closure of some processing factories in Africa.

This guidebook elaborates on the opportunities offered by the raw cashew nut processing industry and explains the challenges to be addressed by potential investors for successful establishment of a raw cashew nut processing business.

## 2. Opportunities

The global cashew market is growing at 7 - 10% annually, providing numerous opportunities for income generation along the cashew value chain. Growth in consumption has more than doubled in the past ten years (Figure 1), and this is mainly due to adoption of healthier lifestyles in consumer countries (ISS/UNComTrade 2015).

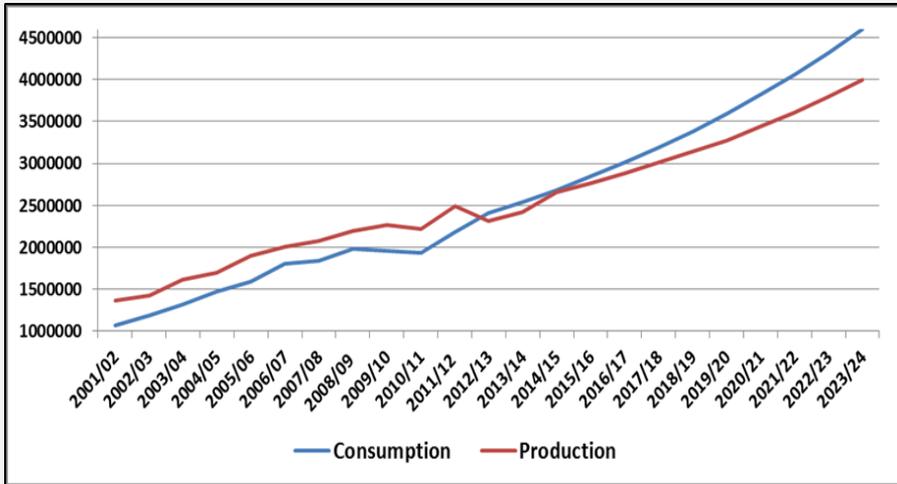


**Figure 1:** World Cashew kernel consumption in metric tons (MT)

Source: ISS/UNComTrade 2015

Nowadays, consumers perceive nuts as the healthy snack option<sup>1</sup>. Besides, cashews are well-placed in terms of price as compared to other tree nuts for a variety of reasons ranging from changing consumption patterns to economic growth in developed countries. The consumption of cashew kernels is projected to continue to grow at this pace, providing great opportunities for existing and new investors into the cashew processing sector.

<sup>1</sup> Main consumer countries in 2015 were India, USA, countries of the EU, China and Middle East; Australia, Brazil and Turkey are important smaller markets among a group showing growth in recent years. Source: ISS, UNComTrade



**Figure 2:** Demand and supply balance of cashew market projected until 2025

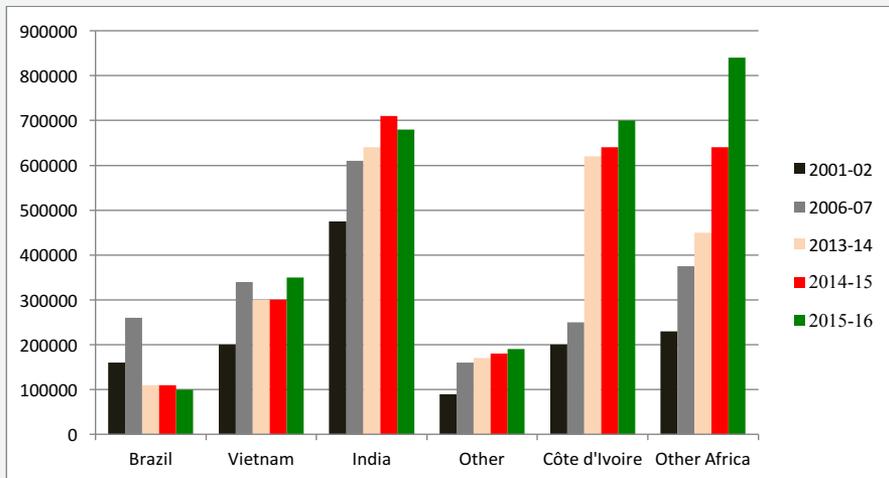
Source: ISS/UNComTrade 2015

Africa produces 55% of the world's cashew, with **Côte d'Ivoire** being the world's largest producer of raw cashew nuts in 2015. (ISS/GIZ/ComCashew 2015 and UNComTrade; ACA 2017). Projections indicate a continuous production growth in Africa driven by the use of improved planting material, better yields, higher rewards for farmers and better application of recommended Good Agricultural Practices. Furthermore, areas under cashew cultivation are still expanding in cashew-producing countries.

Simultaneously, cashew production is stagnant or falling in Asia and Latin America. This explains the tightening demand and supply balance explained in Figure 2 above.

The effect is increased competition for the raw cashew nuts on the African market. The high demand for raw material also provides opportunity for establishing new farms, expanding existing farms with high yielding varieties and replacing old non-productive trees with high yielding varieties. In order to sustain reasonable price for all actors along the cashew value chain, the demand and supply gap must be closed by an increased availability of raw material at a competitive rate.

Processing at source provides great opportunities for local processors to become more competitive. Figure 3 shows the growth trend of RCN globally.



**Figure 3:** RCN production trend 2001 to 2016

Sources: CBT, CCA, CEPCI, VINACAS, ISS calculations - 2016.

Today, 85 % of the raw cashew nuts produced worldwide are processed in India and Vietnam. The domination of Indian and Vietnamese processors in the kernel market poses potential risks of available kernel quality, volumes and pricing. International kernel buyers, therefore, are keen on diversifying their markets to mitigate those risks.

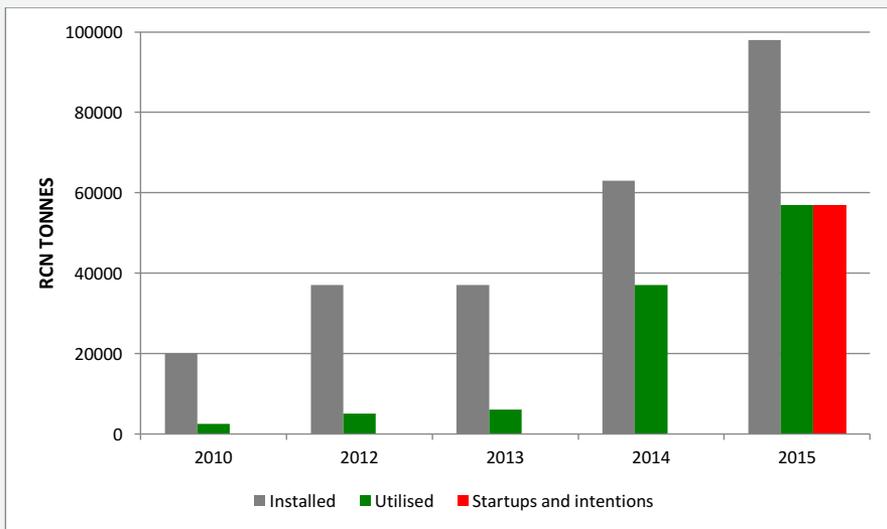
While kernel buyers search for new markets, investment prospects into cashew processing rise in Africa. Establishing a cashew processing business at source provides opportunity to market traceable cashew kernels. Moreover, processing in Africa encourages the development of a sustainable supply chain with direct business linkages to local farmers and cooperatives.

Cashew processing is a profitable business (Pal, S, 2010), if it is well organised and managed. Gross margins range between 30 – 40 % with return on investment achieved within 3 - 5 years (ISS, 2014). Besides, processing of cashew nuts in Africa provides direct jobs for people living in the rural communities. As at 2016, it was estimated that processing the total African production of 1.7 million tons locally, will create at least 450,000 direct jobs (ISS/GIZ/ComCashew 2016). 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.

The processing of cashew by-products offers another opportunity for value addition and diversification of revenue streams of processors. The raw cashew nut consists of 50 % shell, 20 - 25 % Cashew Nut Shell Liquid (CNSL) contained in the shell and 25 - 30 % kernel

including the testa (Sornprom, N (2007) and GIZ/iCA et Godjo (2012). Cashew processors in Asia are already utilising and marketing what is traditionally perceived as waste, namely the shell and the CNSL. They have reduced their overall costs by up to 20 %. Cashew shell is high in energy (Antwi et al, 2017) - 5000 kcal/kg (ISS, 2014) and 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 CNSL offers alternative means for income generation from cashew processing. Cashew processors in Africa should take advantage of marketing cashew by-product, instead of paying for the disposal of the cashew shell.

More and more investors are interested in investing in Africa to tap into the opportunities of the increasing demand for high quality kernels. The establishment of raw cashew nut processing factories in Africa is increasing rapidly, as shown in Figure 4 for Côte d'Ivoire.



**Figure 4:** Processing Trend in Côte d'Ivoire

Source: GIZ/ACi / ISS Calculations

## 3. Challenges

More processors and buyers are entering the promising cashew industry in Africa to establish their businesses. However, the setup of a cashew processing factory poses critical challenges and risks, which must be mitigated at the planning stage for the achievement of a profitable cashew processing business. Furthermore, the application of mitigation measures creates new opportunities for cashew processors.

### 3.1 Investment and Working Capital Requirements

Setting up raw cashew nut processing factories require an initial investment in factory buildings, warehouses for RCN and equipment. Additionally, working capital is required to purchase raw cashew nuts within three to four months of the cashew harvesting season to stock raw materials for processing throughout the year. Working capital is also needed to pay overheads for at least three months before proceeds from kernel sales are received.

In the case of a semi-mechanised raw cashew nut processing factory of 5,000 MT/year, it takes 12 - 18 months (Pal, S 2010; GlZ/ComCashew 2016) to set up the business, construct the premise, procure and install the equipment. Actual raw cashew nut processing starts in the second year. Despite the seemingly high investment costs, cashew processing is a profitable venture, if it is well-planned, organised and efficiently managed.

Estimates show that the returns on investment are achieved within 3 to 5 years depending on the installed and operated capacity of the factory. It is further estimated that a net margin of 10 - 20 % annually can be realised with good management practices. Financial institutions increasingly provide opportunities for processors to access funds as they recognise the potential of the cashew industry. Nevertheless, processors must understand the requirements, conditions and procedures for accessing funds from financial institutions to leverage capital.

In order to mitigate the challenge of investment and working capital requirements, investors and potential processors must ensure that sufficient funds are available for establishing and managing a cashew processing business. Good management of finances and proper record keeping is important for accessing loans with financial institutions.

#### Tips:

- Write a comprehensive business plan
- Explore various financing sources and understand their financing products to choose the most suitable for your business, for example medium to long-term loans
- Negotiate suitable and realistic terms for your credit facility
- Ensure firm agreements for investment financing and working capital before starting the business

### 3.2 Access to Raw Cashew Nuts

Raw cashew nut processing is a lucrative business; however, competition for access to raw material is very high. In 2016, Africa produced 1.55 million MT (ISS, 2016) of raw cashew nuts, of which over 90 % was exported. The residual 10 % cannot satisfy the RCN demands of local processors. Furthermore, African processors need to source their annual supply of RCN within the three to four-month harvesting seasons. Asian buyers mostly profit from different harvest seasons globally to secure their annual supplies. This poses challenges to Africa-based processors, who, though located at the source, compete with international raw cashew nut buyers. As a result, African cashew-producing countries increasingly protect their national markets to favour local processors.

Through regional collaboration among African cashew-producing countries, a higher proportion of the RCN produced in Africa could be retained for Africa-based processors. Regional cross-border trade of RCN should be encouraged to increase profitable processing businesses in Africa.

#### Tips:

- Develop RCN procurement strategy
- Establish strong farmer-processor linkage
- Develop loyalty packages / incentives for farmers to assure sustainable supply
- Advocate for regional collaboration and trade among African cashew-producing countries, prominently through national processors' associations and the African Cashew Alliance

### 3.3 Labour and Mechanisation

The availability and cost of labour are critical for a successful cashew processing business. The working conditions in cashew processing factories must be attractive and competitive for all types of workers to retain a trained and skilled labour force in the factory. The processor must understand the local labour environment in which the factory is established and develop an efficient labour management system for sustainable operations in the factory. In Africa, processors often experience challenges of comparatively high labour costs and lower productivity. The mitigation measures to these challenges are specific to the environmental conditions and culture of the factory location.

Mechanisation is the alternative to address labour challenges. The development of efficient cashew processing machinery is ongoing. It provides a variety of models and technology options. Improved technology makes market entry easier as it reduces broken kernels and thereby improves margins. Mechanisation is becoming more important as it ensures higher productivity. Nevertheless, mechanisation also presents challenges including high investment costs, high percentage of broken kernels and potential low shell out rates.

A good balance of labour and mechanisation is essential in cost management of factories. It is important to prepare for management of technology. Depending on the size of the factory planned, technology and labour should be planned so as to achieve a food-safe high quality kernels for the required market. Mechanisation allows for the establishment of higher capacity factories.

Considering the challenges associated with labour and mechanisation in cashew processing, it is essential for potential investors to recognise their employees as the most vital resource. Thus, cashew processors should carefully balance the risks and potentials of mechanisation and labour options for their particular business model and context. In order to mitigate the challenge of labour and mechanisation, investors and potential processors must carefully plan the site selection of their factory.

### Tips for labour:

- Skilled labour is an asset
- Consider the availability and cost of skilled labour
- Consider the proximity of labour and/or provide staff transport
- Understand labour culture of the factory location
- Develop human resources management strategy, including the development of bonus schemes, childcare facilities and a canteen

### Tips for mechanisation:

- Consider the availability, access and costs of amenities such as water and electricity
- Choose equipment based on your preferred cashew processing system, supplier reliability, efficiency and costs of equipment
- Ensure availability of skilled labour or service providers for the repair and maintenance of equipment
- Read Cashew Processing Guide Number 4: *Guidelines on the choice of cashew processing equipment for more details on equipment procurement*

A case study on the successful labour management by Mim Cashew in Ghana is presented in Box 1.

### Box 1: Case Study Mim Cashew, Ghana

Mim Cashew is a Danish investment and the second largest cashew-processing factory in Ghana, employing over 2,000 people from the surrounding towns and villages. More than half of Mim's employees are women, who otherwise do not have a stable source of income. Over the past years, the management of the factory observed a gradual, yet significant decline in productivity. When exploring the cause of the problem, lateness and absenteeism of workers were identified as the main reasons for the decline in productivity. The increasingly high rate of absenteeism is largely caused by cultural obligations and festivities which require women to spend more time with their families, particularly their children or attend weddings and funerals of extended family members. To address this problem, Mim Cashew set up satellite cashew processing stations (see glossary for definition) in the surrounding towns and villages. While most women still work in the factory, this new system allows some of them to stay closer to their family homes and continue their work for the factory by cracking the nuts in decentralised shelling stations. The company provided these workers with processing equipment and made sure that the hygienic conditions at the factory were simulated in these community work stations. They also assigned workers who were responsible for transporting the raw cashew nuts from the warehouse to the community satellite stations and the cracked nuts from the community satellite stations back to the factory. This system increased women's comfort, commitment and output at the workplace exponentially, while retaining skilled labour for the success of the processing factory. The management of Mim Cashew also found that the problem of lateness was due to the long distances and high commuting costs of their employees to the factory each morning. Mim Cashew, therefore, provided buses that picked the workers at designated bus stops every morning and dropped them off after their respective work shifts. Other incentives that were introduced to boost the morale of the workers are a bonus system in relation to productivity and the sponsoring of professional trainings, for example the Master Training Program jointly implemented by GIZ/ComCashew and ACA. The training is offered to factory personnel who distinguished themselves on the job. Mim Cashew also built a canteen on the factory site to provide at least one meal per day for their employees. This has drastically reduced the number of man hours which was previously lost when workers spent long hours on lunch breaks. Thus, by exploring and addressing the concerns of their workforce, Mim Cashew found innovative ways to increase productivity, retain already trained and skilled labour, and continue to provide more jobs for people in the surrounding communities.

### 3.4 Process Organisation and Choice of Equipment

When establishing a cashew nut processing factory, the investor must make an informed decision on the appropriate mix of raw cashew nut processing methods for their particular business model. The rapid technological developments challenge potential processors in selecting the appropriate machinery and factory setup for their business model. With over 100 manufacturers and suppliers<sup>2</sup> of raw cashew nut processing equipment in India, Vietnam, Brazil, Italy, Sri Lanka and China, procurement of the most suitable mix of machinery remains a challenge.

In the process of purchasing the appropriate technology<sup>3</sup>, processors should research on manufacturers and suppliers and exchange ideas with existing processors to benefit from their experiences. Potential investors should be aware of existing institutions and import procedures of cashew processing machinery. Buying the right equipment (e.g. upgradable) with the company's long term goal and vision in mind minimises cost during expansion.

Organising the factory in a linear flow from the beginning of the processing process to the final packaging assures easy monitoring and maintenance.

#### Tips:

- Buy the most recent equipment – avoid older models
- Research and talk to existing processors on their experiences with the equipment and suppliers
- Read GIZ/ ComCashew (2018) - Cashew Processing Guide Number 4: Guidelines for Choosing of Cashew Processing Equipment

### 3.5 Factory and Technology Management

The management of the cashew factory is important for competitiveness. During the planning stage of the factory, investors must decide on how the factory will be managed. Certain positions are inevitable for the success of an entire cashew processing factory such as operation/production managers, technology and equipment managers, human resource managers, food safety managers as well as finance and administration managers.

2 GIZ/ ComCashew (2018): Guidebook Number 3: Guide to Cashew Nut Processing Equipment

3 GIZ/ComCashew (2018): Guidebook Number 4: Guidelines for Choosing of Cashew Processing Equipment

A sustainable management approach is recommended, whereby operations in every section of the factory are regularly monitored. The data obtained shall be used to continually improve the efficiency of the factory. Regarding human resources in the factories, social and ethical standards must be considered.

As technology develops, processors have to continually learn how to operate and maintain processing machinery to achieve best results. Thus, factory managers need to understand the factors that influence performance of machinery. For example, it is important to replace parts of the machines, which are no longer functional, on the production line or undertake overall machinery replacement to guarantee production efficiency.

More efficient processing technologies result in improved performance of equipment. This leads to increased productivity, meaning a reduction on the percentage of broken kernels and higher profits.

#### **Tips:**

- Ensure thorough planning of management system before installation
- Employ skilled labour for senior positions of each section of the factory
- Regularly monitor factors for competitiveness of the factory
- Document operations
- Use data to improve efficiency and profitability of the factory

### **3.6 Food Safety and Traceability**

Increasing consumer demands for stricter enforcement of food safety standards and quality products continue to impact processors, as cashew buyers pay more attention to food safety requirements. Stringent food safety regulations in the USA and Europe, for example, the enactment of the Food Safety and Modernisation Act (FSMA), have compelled cashew kernel importers from the USA to verify the implementation of a food safety system in their supply chains. In the European Union (EU), compliance with HACCP is mandatory for all processed foods. In the USA, compliance to HACCP is highly recommended and requested by kernel buyers. This is to ensure that cashew kernels are free from hazard (biological, chemical and physical). Kernel buyers reported that the most significant hazard related to cashew is foreign matter. Therefore, processors must put in place the right processes to eliminate all hazards. Cashew processors should also ensure that certifying bodies they work with have third party verification system and are accredited or recognised by the Global Food Safety initiative (GFSI).

Consumers, especially in Europe, desire to know product origins and production systems. Therefore, product traceability - from farm to shelf - has become increasingly important for the competitiveness of the cashew value chain.

Compliance with food safety regulations and traceability increases operational costs and responsibilities of processors. However, compliance with quality standards<sup>4</sup> results in sustainable customer relationships, credibility, brand loyalty and profitability. As a result, most buyers are willing to support processors to meet cashew quality requirements.

#### Tips:

- Educate yourself about the legislative and buyer requirements for your specific market
- Plan and implement food safety guidelines in accordance with your market
- Read Cashew Processing Guide Number 5: Food Safety, Traceability and Sustainability in Raw Cashew Nut Processing

### 3.7 Risk Management

Risk<sup>5</sup> is defined as 'a probability or a threat of damage, injury, liability, loss or any other negative occurrence that is caused by external or internal vulnerabilities, which may be avoided through pre-emptive action or the probability that an actual return on investment will be lower than the expected return'.

In cashew processing, there are major risks that must be addressed to minimise their impact on factory productivity. Major risks in raw cashew nut processing include:

- Supply and cost of high quality RCN
- Reliability and traceability of the supply chain
- Fluctuating market prices and market trends
- Fluctuating exchange rates and unstable local currencies in African countries
- Non-existent or unstable government policies for the cashew industry
- Labour scarcity and wage increases

4 GIZ/ComCashew (2018). Guidebook Number 5: Guidelines on Food Safety, Traceability and Sustainability in Cashew Processing

5 Source: [www.businessdictionary.com/definition/risk.html](http://www.businessdictionary.com/definition/risk.html)

The risk associated with setting up a processing factory in Africa is minimised with a more stable supply of high quality RCN. In 2006, Africa produced 31 % of the global RCN. In 2017, Africa's production had already increased to 56%<sup>6</sup>. Cashew market projections show that this trend will continue to the advantage of Africa-based processors. Furthermore, the proximity to the source of RCN origin offers African processors an excellent opportunity to meet buyer requirements of traceable cashew kernels - from farm to fork.

#### Tips:

- Thorough planning of your business is essential and determines the chances of success
- Understand existing and potential risks for your business
- Develop and implement risk mitigation strategies for your business
- Continually monitor potential risks, define and implement mitigation strategies

### 3.8 By-Product Processing

Raw cashew nuts consist of 50 % shell, 20 – 25 % Cashew Nut Shell Liquid (CNSL) and 25 – 30 % kernels including testa {Sornprom, N (2007) and GIZ/iCA et Godjo (2012). Cashew shells contain a toxic acid - Cashew Nut Shell Liquid (CNSL) - which adds to the difficulty of cashew nut processing, but provides opportunities for adding value and income generation. There are marketing opportunities for RCN by-products such as cashew shells and CNSL. In India and Vietnam, cashew by-products offer additional revenue to RCN processors and thus improve business competitiveness. By-product sales can reduce overall processing cost by up to 20 %. Table 1 shows the price of cashew by-products in 2015.

**Table 1: Price of cashew shell products in India (2015)**

Product	Price/ Tonne
CNSL	\$ 565
Cardanol	\$ 1133
Cashew shells	\$ 151
De-oiled shell cake	\$ 69

Source : Fitzpatrick, James (2015)

6 Source: ISS/DCID/Vinacas/Sindicajou & ComTrade

CNSL is used as an additive in many industrial applications such as phenolic resin, brake lining powder, paint, varnish, insecticide and cement. With its high energy composition (5,000 kcal/kg), cashew shell cake is used as biofuel, charcoal and for other products.

RCN processors in Africa could also benefit from selling marketable products from the RCN waste. It is noteworthy that some processors in Africa have begun to extract products from RCN processing as shown in Table 2.

**Table 2: Examples of processing units processing cashew by-products in Africa**

<b>Name of factory</b>	<b>Country of location</b>	<b>By-products processed</b>
Kake 5 Industries	Benin	Shell to CNSL
Gebana Afrique Ltd	Burkina Faso	Shell to briquette Dried cashew apples
Anatrans	Burkina Faso	Shell to CNSL
Olam Ivoire Sarl	Côte d'Ivoire	Shell to CNSL
Mim Cashews	Ghana	Cashew apples for brandy
Usibras Ghana Ltd	Ghana	Shell to CNSL
Jungle Nuts	Kenya	Shell to briquette
Equatorial Nut Processing	Kenya	Shell to briquette

Technical details on processing of cashew by-products can be obtained from [www.comcashew.org](http://www.comcashew.org) and de Assis Paiva (2013), and the GIZ/ACi (2010); Cashew by-products study.

**Tips:**

- Consider by-product processing to increase your competitiveness
- Incorporate shell processing plan at planning stage of the factory
- Weigh the options for integration of shell processing at the start of the factory against introducing it at a later stage
- Ensure you have an environmentally-responsible and sustainable shell disposal plan

A case study on the successful introduction of cashew by-products at Gebana Afrique in Burkina Faso is presented in Box 2.

## Box 2: Case Study - Gebana Afrique, Burkina Faso

Cashew by-product development and processing is a profitable business for cashew nut processors and offers opportunities to diversify revenue streams. Gebana Afrique is a Swiss investment in nut and fruit processing of cashew and mango in Burkina Faso.

Apart from cashew nut processing, Gebana Afrique also dries and processes cashew apples and mangos into delicious dried fruits for sale on the domestic and international market. The mango and cashew crop also bring many benefits to the farmer cooperatives. When volumes go up, the fresh fruit farmers could benefit from sales and the women doing the processing gain stable incomes from paid employment.

The production of dried cashew apples as compared to mangos is still very low, because the cashew apple taste is more exotic and its processing is new. The cashew apple is high in Vitamin C (Lower S and Agyentu-Badu C. K. (2009) and an excellent ingredient for dried fruit mix. The dried fruits are marketed through an online shop – [www.gebana.com](http://www.gebana.com) or <http://gebanashop.ch/>

Gebana Afrique is Organic and Fairtrade certified, meaning that their products adhere to the highest consumer standards in Europe and the US. Traceability of the product from the farmer level is key to ensure compliance with organic and Fairtrade standards. Fairtrade certification pays a social premium to farmers and village-level processors, which benefits the whole community. Currently, Gebana Afrique is offering certified cashew kernels on the international market.

Gebana Afrique has installed an innovative system to manage factory waste, such as cashew shell and water that is produced in the processing process. The cashew shells are used to generate heat to steam the raw cashew nuts or to dry the cashew apples and mangos. Thus, the use of cashew shells reduces energy-related costs at factory level. As part of their recycling strategy, Gebana Afrique is also pressing the cashew shells into briquettes. These are offered to employees as an extra to their monthly salary. The waste water is purified and used for their factory garden.

### 3.9 Environmental and Social Impact

Cashew processing generates considerable amounts of waste, such as cashew nut shells, smoke emissions and waste water. These waste products are often poorly managed, leading to environmental pollution and health risks for factory workers and the surrounding communities. There are still weaknesses in the enforcement of environmental regulations on national level, nevertheless local communities, customers and buyers will demand enforcement of such regulations. Processors must efficiently manage the disposal of waste as non-compliance with environmental regulations can reduce competitiveness, lead to payment of heavy penalties or even factory closure. See box 3 on Examples of Waste Management Regulation for Côte d'Ivoire and Benin.

#### **Box 3: Example of Waste Management Regulation from Côte d'Ivoire and Benin**

The Ministry of Environment, Health and Sustainable Development is the institution in charge of environmental management issues in Côte d'Ivoire. To implement its activities, it has created the CIAPOL (Centre Ivoirien Anti-Pollution) for the management of industrial waste, ANASUR for the management of household waste and the ANDE (National Environment Agency), Environmental and social impact.

All the regulations concerning the management of industrial waste are in the code of the environment. Potential investors are advised to read through this document.

Article 26: Environmental impact assessment of the investment code (2011) explains the importance of conducting an environmental impact assessment for a new factory:

In compliance with the environmental legislation, all investors must carry out a study to assess environmental impacts of the potential investment. Investors must comply with best practices in terms of environmental impact assessment criteria and assessment processes applicable to their business lines (investment code 2011)

Article 75 of the environment code (1996) prohibits the discharge of all solid, liquid and gaseous substances into watercourses and water bodies and their surroundings; any activity likely to affect the quality of the air and water, both surface and underground.

It is recommended that a waste facility be constructed within the perimeter of the plant where all waste is stored according to its type for disposal or further processing (CIAPOL).

The law: Environmental Framework in the Republic of Benin, Law no.98-030 of February 1999 stipulates the requirements for environmental protection and management of industrial waste in Benin. Articles 65-85 specifically prescribe the waste disposal mechanism for industrial waste. Articles 45-48 and 38-39 explain how water and gaseous/smoke emissions respectively should be handled. The processor and potential investor are encouraged to go through these documents for their chosen country of factory installation.

*Source : Loi - Cadre sur l'Environnement en République du Benin (1999). Loi no. 98-030 de 12 février 1999 portant loi-cadre sur l'environnement en République du Benin ; République de Côte d'Ivoire (1996) ; Loi n° 96-766 du 3 octobre 1996 Portant Code de l'Environnement*

Although cashew nut shells are considered a waste product, they can be processed into valuable products such as Cashew Nut Shell Liquid (CNSL), briquettes and biofuel to generate extra revenue. The smoke and waste water from the factory can be purified and water can be reused for other purposes in the community such as gardening and peri-urban agricultural production.

Cashew processing is a critical source of employment and income generation, especially for women and youth in rural communities. The cashew industry is estimated to provide employment for up to 450,000 people in Africa (ISS/GIZ/ComCashew, 2014) should all of Africa's production be processed. Employment in cashew processing is recorded as improving the lives of farmers and farming families (GIZ/ACI, 2014). The social impact of the cashew processing industry will increase dramatically with the establishment of more processing factories in Africa. The multiplier effect of employment in cashew processing in rural areas is the improvement of sustainable livelihoods through an increase in income generation and higher purchasing power.

#### Tips:

- Incorporate waste disposal and management plan in your factory set-up
- Implement national and international regulations on industrial waste management
- Understand potential risks associated with non-compliance with national environmental policies and develop strategies to mitigate them
- Consider a Corporate Social Responsibility Program for your core business

### 3.10 National Cashew Policies

Governments, in collaboration with industry stakeholders, have developed specific incentives to support the growth of the cashew sector in many African countries. Intensive stakeholder advocacy led governments to formulate tax incentives for the establishment of cashew processing factories. In Ghana, for example, newly established processing businesses are exempted from export tax on kernels and corporate tax for five years. In Côte d'Ivoire, the government has provided industrial zones for new investors with the objective of increasing its local processing. A subsidy of 400FCFA/Kg of kernel processed is provided to processors annually.

#### Tips:

- Understand national and regional cashew policies for your selected factory site
- Join or create a processor association as well as the industry association - African Cashew Alliance (ACA) - for political negotiations
- Engage in policy advocacy for an improved business environment

Furthermore, cashew businesses do not pay import duties for cashew products, equipment and materials when registered through the responsible institutions and official channels. This helps processors to reduce initial investment costs and to maintain profits.

Additional information on incentives for cashew processing in selected African countries is listed in Box 4.

#### **Box 4: Incentives for establishing cashew processing businesses in selected African countries**

##### **Côte d'Ivoire:**

- a) 100% exemption from profit and sales taxes – in the first year of operation. Companies are granted 50% and 25% exemption in the second and third years of operation, respectively.
- b) Cost of environmental and social impact assessment for processing factories reduced from 13.5 million FCFA to 5.5 million FCFA (until 31st December 2020)
- c) Reduction of customs duties and exemptions from Value Added Taxes (VAT) on equipment spare parts (2014 – 2020)
- d) Processors benefit from government subsidy of 400FCFA/kg kernel processed (2016-2020)

##### **Ghana:**

- a) 10 years of tax exemption for cashew processors in industrial free zones
- b) Customs duty exemption on imports of equipment and spare parts

##### **Mozambique:**

- a) Differential tariff for export: 18% for exports of RCN and none for cashew kernel exports.
- b) 45 days' priority raw cashew nut purchasing window for local processors at the beginning of each cashew harvest season.

##### **Nigeria:**

- a) Reimbursement of 30% of the Free On Board (FOB) value of cashew kernels exported
- b) Customs duty exemption on import of equipment and spare parts

##### **Tanzania:**

- a) Differential tariff for exports: \$160 per ton for export of RCN and none for cashew kernel exports.
- b) Customs duty exemption on imports of equipment and spare parts

*Source: GIZ/ComCashew, based on MOFA (2015); Worldbank (2015),*

## Recommended Reading

These references provide further information for sustainable and competitive raw cashew nut processing.

African Cashew Alliance –ACA-, (2017). Industry Databank Report, 2017

Antwi, E., Lekchiri S., Engler N., Latrache M., Nelles M., and Schch A., (2017). Agro Waste Management in Low Income Countries –Future Perspectives to use Waste as a Resource. Presented at the Sardinia 2017 / Sixteenth International Waste Management and Landfill Symposium / 2 - 6 October 2017

Conseil Coton et Anacarde (2016). SIETTA 2016, [www.sietta2016.com](http://www.sietta2016.com)

ISS (2015); État des lieux et Opportunités de la transformation de l’anacarde, presented at SIETTA 2016

de Assis Paiva, F.F. (2013a). Cajuina – Improving Cashew Nut Post Harvest Technologies in Tanzania Technical Manual; by EMBRAPA - Brazilian Agricultural Research Corporation. Retrieved from <http://comcashew.org>

de Assis Pavia, F.F. (2013b). Cashew Apple Candy – Improving Cashew Nut Post Harvest Technologies in Tanzania Technical Manual prepared by the Brazilian Agricultural Research Corporation. Retrieved from <http://comcashew.org>

de Assis Pavia, F.F. (2013c). Cashew Preserve – Improving Cashew Nut Post Harvest Technologies in Tanzania Technical Manual prepared by the Brazilian Agricultural Research Corporation. Retrieved from <http://comcashew.org>

de Assis Pavia, F. F. (2013d). Cashew Pulp – Improving Cashew Nut Post Harvest Technologies in Tanzania Technical Manual prepared by the Brazilian Agricultural Research Corporation. Retrieved from <http://comcashew.org>

Foretell Business Solutions PVT Ltd. (2008). Cashew Hand Book 2008 – A global perspective.

GIZ/ICA et Godjo, T (2012). Etude des possibilités de valorisation des coques d’anacarde issues des unités de transformation au Benin ; page 16-17

GIZ/ ACI; Fitzpatrick J. (2010). Competitiveness of African Cashew Sector; [www.comcashew.org](http://www.comcashew.org)

GIZ/ ACI; Fitzpatrick J. (2011). Summary Equipment Study Report; [www.comcashew.org](http://www.comcashew.org) ISS, 2016; The World Cashew Market and the Opportunity in Processing, presented at SIETTA 2016

Lower, S and Agyentu-Badu C. K. (2009). Mineral and Proximate Composition of Cashew Apple ( *Anacardium occidentale* L.) Juice from Northern Savannah, Forest and Coastal Savannah Regions in Ghana. *American Journal of Food Technology* 4 (4) 154-161. 2009; [https://www.researchgate.net/publication/38103880\\_Mineral\\_and\\_Proximate\\_Composition\\_of\\_Cashew\\_Apple\\_Anacardium\\_occidentale\\_L\\_Juice\\_from\\_Northern\\_Savannah\\_Forest\\_and\\_Coastal\\_Savannah\\_Regions\\_in\\_Ghana](https://www.researchgate.net/publication/38103880_Mineral_and_Proximate_Composition_of_Cashew_Apple_Anacardium_occidentale_L_Juice_from_Northern_Savannah_Forest_and_Coastal_Savannah_Regions_in_Ghana)

Ministry of Food and Agriculture Ghana (2016). Draft Ghana Master Plan 2015 (unpublished)

Pal, S (2010). Assessing the Potential to Develop Cote d'Ivoire's Cashew Sector (unpublished)

République du Benin (1999). Loi no. 98-030 de 12 février 1999 Portant loi-Cadre sur l'Environnement en République du Benin

République de Côte d'Ivoire (1996) ; Loi n° 96-766 du 3 octobre 1996 Portant Code de l'Environnement.

Sornprom, N., Extraction and purification of anacardic acid from cashew nut shell. 2007, Master of Engineering (Chemical Engineering), Graduate School, Kasetsart University. p. 69p.

Webber, C. M., Labaste, P. (2010). Building competitiveness in Africa's agriculture – A guide to value chain concepts applications

World health organization - food safety unit (fos). (2004). AFRO Food Safety Newsletter. (No 1)

Worldbank (2015). Projet d'appui au Secteur Agricole en Côte d'Ivoire (PSAC); Investment Opportunities in the Côte d'Ivoire cashew processing industry. November 2015.

Zuraw, L. (2015, 4th December). Food Safety News: WHO Releases First Global Estimates of Foodborne Disease. Retrieved from <https://www.cspinet.org/new/pdf/global.pdf>

## Glossary of Raw Cashew Nut Processing Terms

**Calibration of raw cashew nuts:** Grouping the raw cashew nuts into various sizes (based on the diameter of the nuts) to facilitate shelling and reduce breakage during processing.

**Cashew Nut Shell Liquid (CNSL):** Caustic liquid found in the cashew shell.

**Cashew processing lines:** A complete set of equipment required for RCN processing.

**Conventional:** Cashew kernels produced and processed without organic or fair-trade certification.

**Drum roast:** Method of heat treatment of raw cashew nuts by use of direct heating of raw cashew nuts in a drum.

**An environmental impact assessment:** An assessment report of the likely impact of a proposed activity on the environment.

**Food safety:** Handling, preparation and storage of food in ways that prevent foodborne illness. It includes a number of routines that should be followed to avoid potentially severe health hazards.

**Grading:** Classification of the kernels based on colour, shape (whole/broken) and size. Grading is done manually or with machines.

**HACCP:** Hazard Analysis and Critical Control Points – Factory safety system.

**Hand cracking:** Shelling (separation of kernel from shell) raw cashew nut manually using small hand shelling machine.

**Heat treatment:** Application of direct heat, hot oil or steam to the cashew nuts in preparation for breaking of the shells. Heat treatment makes it easier to remove the shells.

**Kernel:** Consumer product obtained after processing of raw cashew nut is the kernel. The kernel is the edible part of the raw cashew nut.

**Kernels Outturn:** The weight of kernels obtained during processing of a given quantity of RCN, usually expressed as a percentage.

**Oil bath:** Method of heat treatment using hot CNSL bath to extract CNSL of raw cashew nuts to make them brittle.

**Outturn (in RCN trade):** Weight of kernels in pounds per 80kg bag of in-shell nuts. Outturn (in RCN trade) is not the same as kernel outturn as the cutting test does not establish breakage, grades and processing losses.

**Oven drying & humidification of kernels:** Application of heat to kernels, followed by subjecting the kernels to humid conditions. While drying reduces the moisture levels of the kernels and brings about contraction of the testa, humidification increases the moisture levels and leads to expansion of the testa. This process facilitates the removal of the testa without breaking the kernels. The process is also described *“thermal shock”*.

**Peeling:** Removal of the testa from the kernels. The objective is to obtain the kernels whole and intact. Peeling is done either by peeling machines or by hand, using small knives.

**Quality standards:** A set of criteria on the requirements, specifications, guidelines or characteristics to ensure that materials, products, processes and services are fit for their purpose.

**RCN:** Raw Cashew Nuts – also known as in-shell nuts. These are dried raw cashew nuts with the shell still intact.

**Satellite processing unit:** Small-scale localised cashew processing unit linked up with a bigger unit for the final product. This may be for the purpose of shelling, peeling and/ or grading out nuts and is usually located in outlying villages producing RCN.

**Shell:** Outer coat of the raw cashew nut before shelling.

**Shelling:** Removal of the cashew kernel from its shell or separation of the kernel from its shell. This is achieved through cracking or cutting to expose the kernel with testa for separation.

**Testa:** Inner skin surrounding the cashew kernel after the shell has been removed. The testa lies between the shell and the white kernel. During processing, the testa is removed after having been rendered brittle or soft by heat treatment.

**Vacuum packing:** Method required by buyers for packaging cashew kernels. The process involves a vacuum and back flushing with a combination of carbon dioxide and nitrogen to prolong the shelf life of the kernels.

**Warehousing:** Storing the raw cashew nuts procured for processing. It ensures the continuous supply of raw nuts throughout the year.

**Yield in processing:** Mass of kernels in grammes per kilogramme of in-shell nuts (%)

**Yield per hectare or tree:** Gross weight of cashew nuts per tree or per hectare

# Acronyms and Abbreviations

<b>ACA</b>	African Cashew Alliance
<b>ACi</b>	African Cashew initiative, led by GIZ, (since 5/2016 ComCashew)
<b>AFI</b>	Association of Food Industries, USA
<b>BRC</b>	British Retailers Consortium
<b>CNSL</b>	Cashew Nut Shell Liquid
<b>GIZ/ComCashew</b>	Competitive Cashew initiative, led by GIZ, formerly African Cashew initiative (GIZ/ACi)
<b>FAO</b>	Food and Agriculture Organisation of the United Nations
<b>FAOSTAT</b>	Food and Agriculture Organisation Statistics
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (German International Cooperation)
<b>HACCP</b>	Hazard Analysis & Critical Control Point
<b>ISS</b>	Ingredients Sourcing Solutions
<b>RCN</b>	Raw Cashew Nut
<b>TNS</b>	TechnoServe
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>USDA</b>	United States Department for Agriculture
<b>WHO</b>	World Health Organisation
<b>w/w</b>	Weight by weight







## **The Competitive Cashew initiative (ComCashew)**

The Competitive Cashew initiative, formerly African Cashew initiative (GIZ/ACi) presents a new and innovative model of broad-based multi-stakeholder partnership in development cooperation. GIZ/ComCashew is a private-public partnership programme under the implementation of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, with funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) as well as Cooperation Partners from the private and public sector.

GIZ/ComCashew's main objective is to increase the competitiveness of African cashew smallholders, processors and other actors along the value chain to achieve a lasting reduction of poverty in the project countries - Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mozambique and Sierra Leone. GIZ/ComCashew aims at ensuring that by 2020, each of the 580,000 cashew farmers trained will earn an average additional annual family income of at least \$600.

Beyond increasing farmers' direct income, the initiative aims at improving cashew-processing capacity in Africa, developing sustainable supply chain linkages and supporting a better organisation and coordination of the cashew sector. GIZ/ComCashew also strengthens initiatives in the cashew sector and responds to questions regarding investment and processing.

It is time to accumulate and share the valuable experience and knowledge gained in the production and processing of raw cashew nuts and its by-products with industry as well as potential investors in the raw cashew nut processing sector.

This *Guidebook on Opportunities and Challenges in Cashew Processing* is a practical guide for new investors and existing processors in the raw cashew nut processing business.

It provides valuable information on the following:

- Opportunities offered by the cashew industry and the international market to potential investors in Africa
- Challenges to be addressed by potential investors for successful establishment of a cashew processing business.
- Opportunities and options offered by the challenges with raw cashew nut processing
- Critical issues to be addressed by processors and investors to make an informed decision about investing in the business of raw cashew nut processing.

### Other Titles in this Series:

- **Cashew Processing Guide Number 1:** Guidebook on the Cashew Processing Process
- **Cashew Processing Guide Number 3:** Guide to Raw Cashew Nut Processing Equipment
- **Cashew Processing Guide Number 4:** Guidelines for Choosing Raw Cashew Nut Processing Equipment
- **Cashew Processing Guide Number 5:** Food Safety, Traceability and Sustainability in Raw Cashew Nut Processing

