

Competitiveness of the cashew nut industry in Mozambique

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nitidæ
landscapes & value chains





ACAMOZ

The ACAMOZ project is financed by the French Development Agency (AFD) and is implemented in partnership with the Instituto de Fomento do Caju (INCAJU) and the Ministry of Agriculture and Rural Development (MADER). It aims to contribute to the strengthening of the cashew value chain, in order to increase the incomes of small farmers, promote national processing and its integration in the international market, and improve the competitiveness and the economic, environmental and social sustainability of the cashew nuts production within a stronger and more transparent institutional framework led by INCAJU.

The project is divided into two components:

The first component aims to promote the availability of transparent market information, the strengthening of the institutional framework for decision making and guidance of the value chain to promote national processing and its integration in the international market. The reinforcement of the market information system (N'Kalô), facilitation of dialogue between cashew value chain stakeholders, technical advice on public policies such as the reference price, and the realization of a study on competitiveness of cashew nuts processing at national level are among the activities to be carried out.

This study is of key importance for the project advancement and the improvement of activities related to the processing of cashew nuts, it is interconnected with other activities and involve the participation of key stakeholders of the cashew nuts value chain.

The second component aim to develop an economically, environmentally and socially sustainable cashew nut value chain around the Gilé National Park, in the province of Zambezia, through the structuration and organization of producers, promotion of agroforestry systems and organic or fair trade cashew certification.

Nitidae

Nitidae is a French non-governmental organization, which aims to develop projects that combine the preservation of the environment and reinforces local economies. With a team of 100 employees, Nitidae develops projects in Madagascar, Burkina Faso, Mozambique and Ivory Coast.

It also provides technical expertise to agri-food companies and public institutions to improve the performance of agricultural value chains, decrease environmental impact and stimulate local economic development together with the organization of producers and local communities.

Nitidae has been in Mozambique since 2013, developing projects such as ACAMOZ, MOZBIO or the Legado Namuli project for the preservation of Mount Namuli in Gurue or payment for ecosystems services schemes (REDD+) or project such as LAUREL (Land Use Planning for Enhanced Resilience of Landscapes in Mozambique).



N'kalô

N'kalô is the first independent commercial consultancy service for the agri-food sector in Africa. From production to end user, n'Kalô provide strategic business consultancy and global market analysis. Its expertise is supported by a team of 20 analysts from 12 countries and a wide network of private stakeholders throughout the world. The n'kalô service is an innovative and efficient tool for analyzing agricultural markets for all professionals.

N'kalô produce newsletters on agricultural markets to inform professionals about price risk; provide customized services according to one's needs - and studies, technical assistance or support to project management: market research prospective, sectoral statistical studies, feasibility studies, crop forecasting models, engineering consulting (processes, standards and certification, supply strategy); provide strategic and committed advice on markets and prices, released by telephone (SMS, voice, hotline) to more than 60,000 farmers and producer organizations in 12 countries to improve their marketing, income, and limit their risks.

INCAJU

The Instituto de Fomento do Caju (INCAJU) is an institution governed by public law, created in December 1997 and reporting to the Ministry of Agriculture and Rural Development. More recently, through Decree No. 91/2018 of 31 December, its attributions, powers, autonomy, budgetary regime, organization and functioning have been redefined and have even been renamed INCAJU IP. Even so, its major institutional objectives were maintained, namely to promote the planting of cashew trees and the cashew industry.

The mission of the institution is "to promote, in a sustainable way, the increase in the production and quality of nuts, the organization of marketing and the structuring of the processing industry, in coordination with all interested entities, with a goal of transforming the comparative advantages of the Country in competitive advantages, increase the income of rural families, create jobs and contribute to the improvement of the balance of payments."

Its attributions include the definition of policies and strategies, the coordination of the stakeholder's cashew value chain, as well as those of others kernels under their tutelage. Its competencies include the support to the cashew production, the internal and external promotion of the cashew nut industry and other kernel. It is also responsible for elaborating and implementing, in coordination with specialized national and international institutions, the research, the transfer of technologies for the production, the cashew trade and the processing, the cashew apple included.



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Glossary

AICAJU: Associação de Industriais do caju (Association of Cashew Industrials)

CAPEX: Capital Expenses; investment costs

CNSL: Cashew Nut Shell Liquid

INCAJU: Instituto de Fomento do Caju (Cashew Promotion Institute)

kW: kilowatt, power unit

kWh: kilowatt-hour, unit of energy

LCC: Cashew Nut Liquid (abbreviation for Líquido de Castanha de Caju, translation of CNSL)

MW: megawatt, unit of power (1000 kilowatt equivalent)

Mt: Mozambican metical

OPEX: Operational Expenses; operational costs

RCN: Raw Cashew Nut

TM: metric ton, unit of weight

USD: United States Dollars

VA: Added value



1 Executive summary

The study first adopted a technical and empirical approach, based on the presentation of data and analysis, to allow a deep understanding of the specific situation of the cashew processing industry in Mozambique in 2019/2020. It did not express political opinions about Mozambique economic and social development strategy.

After the comments received during the presentation of the Draft report (March 2020), the authors had to develop a more theoretical and ideological discussion in order to feed the debate whether it would be advisable or not to continue supporting/protecting the cashew industry in Mozambique. That is why the authors includes positions that sometimes seem more political, even if the core of the report still remains very technical.

Nitidae is an NGO that supports producers above all, but also encourage policies in favour of an industrialization that would be connected with local production. Our analysis and proposals aim to defend the interests of Mozambique as a developing country not yet very industrialized. It also takes into account the probable scenario of growth of the extractive sector, as explained in the conclusion.

In 2019, Mozambique is the 9th cashew producing country, and the 4th cashew processing country in the world. By increasing the value of cashew exports, providing more than 15,000 jobs and participating in the industrialization of Mozambique, the cashew processing sector is strategic for the country. That is why this study intend to deeply analyze the sector's competitiveness today.

When compared to three other main cashew processing countries, Vietnam, India and Ivory Coast, cashew processing in Mozambique benefits from two main advantages:

- The procurement price for raw cashew nuts (RCN) paid by the factories. This price is lower than the price paid by the Vietnamese and Indian factories and equal to the price paid by the Ivory Coast factories. This is possible thanks to the factories' proximity to production areas (import and export costs are reduced compared to Vietnam and India, where factories import most of the raw material they process) and a tax on RCN exports, which aims to protect Mozambicans processing factories from the strong competition of Asian processors. This advantage is the main reason that makes the Mozambican cashew processing sector able to compete against Asian industry.
- The cost of unskilled labor: since the devaluation of the Mozambican Metical between the end of 2014 and 2016, minimum salaries in Mozambique have been lower than in Vietnam, Ivory Coast and most cashew processing states of India. The state of Tamil Nadu, in southeastern India is the only processing area where salaries applied to the cashew sector are lower than in Mozambique. This low wages would have been a major advantage 10 years ago, when most of cashew processing was still manual, but today with the increasing mechanization of cashew processing worldwide, its impact is rapidly diminishing.

On the contrary, the Mozambican industry faces numerous disadvantages when compared to its main competitors:

- Highest taxes are paid by Mozambican cashew processing companies when compared to Vietnam, India and Ivory Coast. In Vietnam, the state has set a very low tax level to attract investors and support industrialization in general, while in India and Ivory Coast, states are providing strong tax relief and tax credit to support the cashew sector in particular. In addition, one of the advantages normally offered to cashew processing companies when exporting cashew kernels, the refund of the Value Added Tax (VAT)



they pay for the inputs used in cashew processing, is not effective today in Mozambique, which increases the loss of competitiveness.

- The processing companies in India and the Ivory Coast benefit from subsidies: even if Vietnam does not directly subsidize its cashew sector, India and Ivory Coast establish strong incentives to export cashew kernels (disadvantage of 5.15% of FOB value in India, subsidy of 400 FCFA / kg of cashew kernels exported in Ivory Coast). Today, thanks to this support, cashew processing companies in both countries receive more subsidies than the taxes they pay.
- Higher cost of equipment, spare parts and inputs: as Mozambican processors need to import almost all processing machines, spare parts, most of their inputs and pay import taxes, their final cost is very disadvantageous compared to India and Vietnam, where most of them are available locally. Mozambican factories also need to create stocks of spare parts and inputs to avoid interruptions in supply, while Asian processors can easily and quickly find these supplies when they need them. This disadvantage is comparable or even higher in Ivory Coast.
- Higher financial cost: even if Mozambican factories pay a lower price for RCN (which slightly decreases the amount of loans), because their procurement is concentrated (the entire procurement occurs during 2 to 3 months) and the interest rate they have to pay is higher than in Asia or even Ivory Coast, the cost of the working capital loans is much higher than in competing countries. This is a disadvantage for most African countries compared to Asia, but the disadvantage is even greater in Mozambique than in West Africa, due to the shorter purchasing period and the higher interest rate.
- Higher technical / administrative labor cost: due to stronger demand and less offer of qualified and experienced people in Mozambique than in Asia, companies have to pay their technicians and managers higher wage than in Asia. This phenomenon has been increasing recently by the growth of the extractive sector in Mozambique (Mining and Gas), which accentuates the demand for skilled and experienced workers.
- Lower yields in terms of quantity and quality: cashew processing is highly dependent on processing yield, both in terms of quantity of tradable cashew kernels (called Kernel Output Ratio - KOR), and in terms of quality, i.e., quantity of whole cashew kernels, or Whole White (WW). Due to less experience in mechanization, less know-how from workers and less organizational flow in the factory, all factories in Mozambique are achieving lower yields than in India and Vietnam. However, yields are comparable or even slightly better than in Ivory Coast and West Africa, in general.
- Lower market prices: Indian processors obtain much higher prices for whole cashew kernels and even more for the broken cashew kernel, thanks to a huge domestic market (India is the first consumer of cashew in the world) strongly protected against imports of other processor countries. Vietnam's factories obtain, on average, slightly higher prices than Mozambicans ones, thanks to better visibility / marketing in the international market and thanks to more and more factories with high quality standards (BRC certification). Factories in Ivory Coast receive more or less the same prices as the Mozambicans ones.
- Little or no income from the sale of cashew by-products: few Mozambican factories are able to sell the by-products of cashew nut processing (shell, CNSL, oil-free cake, testa, damaged nut and powdered nut). Even when they value some of them, they obtain a lower price than Asian factories that benefit from well-structured markets and companies specializing in the trade and processing of these products. With the lack of market identification at the local level, for most Mozambican factories, these by-products are considered as waste and generate evacuation costs.



Finally, if we compare the processing cost of the Mozambican automatic factories¹ with the cost of Vietnamese factories (the most competitive industry over the last 5 years) as shown below, thanks to the RCN's export tax, the Mozambican industry remains relatively competitive.

But, as developed below, its exposure to higher risks threatens it even with such competitiveness.

Figure 1. Summary comparison of costs and incomes between 80% of the automatic cashew factories in Mozambique and Vietnam.

Figures Nitidae Feb 2020: based on investigation and feedbacks from the industry	For same quality RCN (outturn):	46	Lbs/bag					Advantage & disadvantage of Moz (based on averages - in USD/MT)
	KOR (after process)	19,0%	20,5%	19,8%	21,5%	22,5%	22,0%	
	In USD/MT of RCN processed	Mozambique			Vietnam			
		Min	Max	AVG	Min	Max	AVG	
Variable expenses								
Raw material								
RCN procurement	Price of RCN at factory gate in USD/MT	750	800	775	1200	1300	1250	▶ -475
Inputs								
Cost of all inputs	(Packaging, spares, power, etc.)	82	104	93	63	75	69	▶ 24
Money								
Cost of borrowing money		58	102	80	12	26	19	▶ 61
Variable wages (80% automatic factory)								
Cost of variable wages	(Handling, cutting, peeling, grading)	34	44	39	36	51	44	▶ -5
Others								
Other variable expenses	(Fobbing, waste, procurement, etc)	23	44	34	12	29	21	▶ 13
Fixed expenses								
Fixed expenses	(Fixe wages, equipement depreciation, etc.)	200	236	218	137	173	155	▶ 63
Total expenses without taxes on profit								
Total without RCN		397	530	464	260	354	307	▶ 156
Total including RCN		1147	1330	1239	1460	1654	1557	▶ -319
Incomes								
White Wholes		698	884	789	828	1046	934	▶ 145
Scorched Woles		154	180	167	148	168	158	▶ -9
Brokens		231	276	253	260	296	278	▶ 25
CNSL		0	21	11	35	42	39	▶ 28
De-oiled caked		0	5	3	26	51	38	▶ 36
Testa		0	0	0	2	3	2	▶ 2
Damaged cashew + cashew powders		0	30	18	31	41	38	▶ 20
Total incomes								
Total incomes	Per MT of RCN Processed	1084	1396	1240	1328	1647	1487	▶ 247
Profit (before taxes)								
Optimum factory	Min cost and max incomes	249			187			
Average factory	Average costs and incomes	1			-70			
Weak factory	Max costs and average incomes	-90			-167			
Starting factory	Max cost and minimum incomes	-246			-326			
Profits (before taxes) in a scenario without the tax on RCN exports								
Optimum factory without the "sobretaxa"		24			187			
Average factory without the "sobretaxa"		-224			-70			
Net profit (after paying tax on profit)								
Optimum factory	Min cost and max incomes	159			150			
Net profit for national shareholders (after paying tax on dividend)								
Optimum factory	Min cost and max incomes	143			142			

¹For the entire calculation, we use an 80% automatic factory with a processing capacity of 5,000 metric tons of raw cashew nuts/year. As explained in the methodology, there is a great diversity of size, technologies and work organization, thus we consider this model as an average model.



Even with the Tax on RCN exports which allow Mozambican factories to be relatively competitive with Vietnamese ones, a very important point to explain the difficulties faced by the Mozambican industry is the exposure to risk.

All processors are very sensitive to the volatility of cashew prices, but due to the short procurement period, Mozambican processors are even more exposed to this risk, with three major constraints:

- During the procurement period (December to February), if the difference between the RCN and the price of the cashew kernel is very small and they decide not to buy, they will have to remain closed for an entire year. They cannot, like Asian processors, work on "stop and go" scheme, depending on the market situation.
- If prices in the procurement period are particularly high, or if cashew kernel prices decrease after the procurement period, they can only decide to close the factory and export their remaining RCN stocks, but they will suffer heavy losses in any case.
- As there are few factories in the country, if they have difficulties with the trend to buy / sell prices, they will hardly be able to stop working on their own and start working as subcontractors to other factories that bought RCN at lower prices or to obtain sales contracts at higher prices.

That is why, in cases like 2017/2018 and 2018/2019, the difference between the RCN price during the procurement season and the cashew kernel prices in the following year did not allow them to make any profit and even led to large losses, as illustrated in the figures below.

Figure 2. Evolution of RCN and cashew kernel prices with procurement and selling period of Mozambican cashew factories.

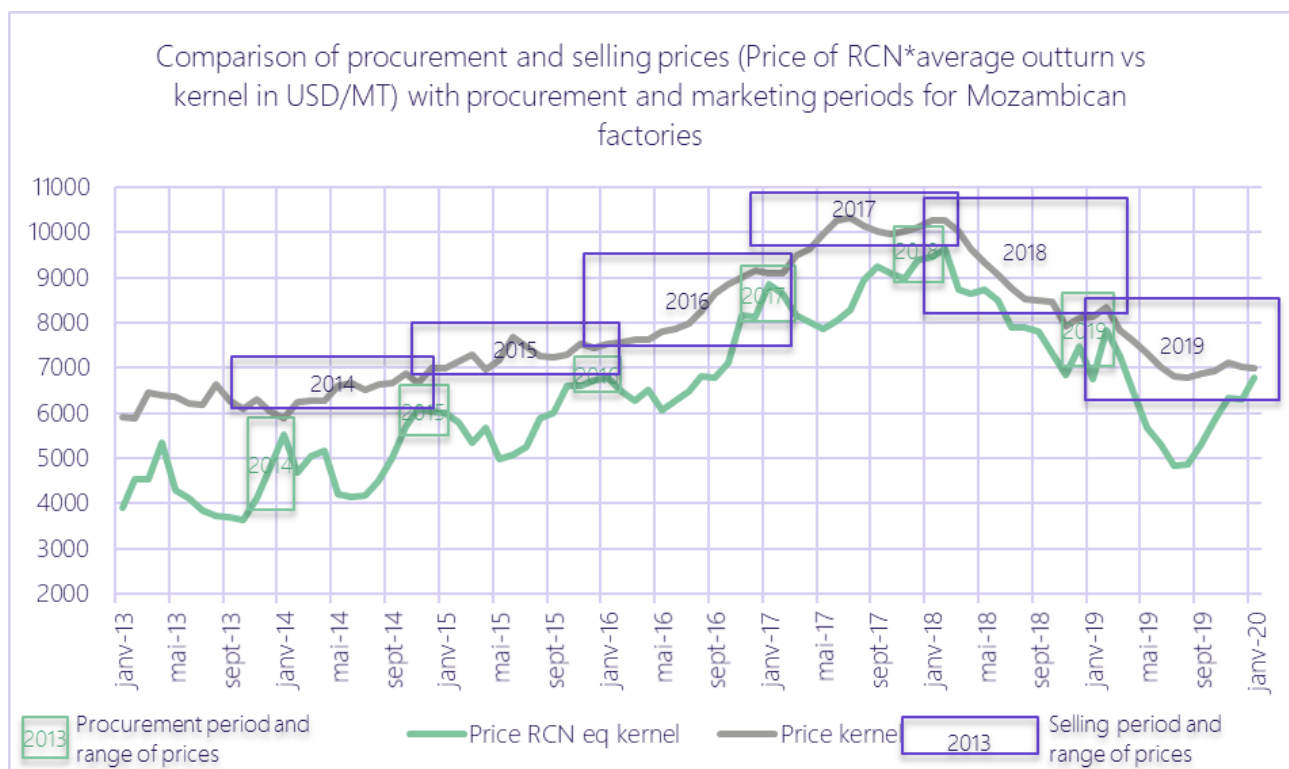
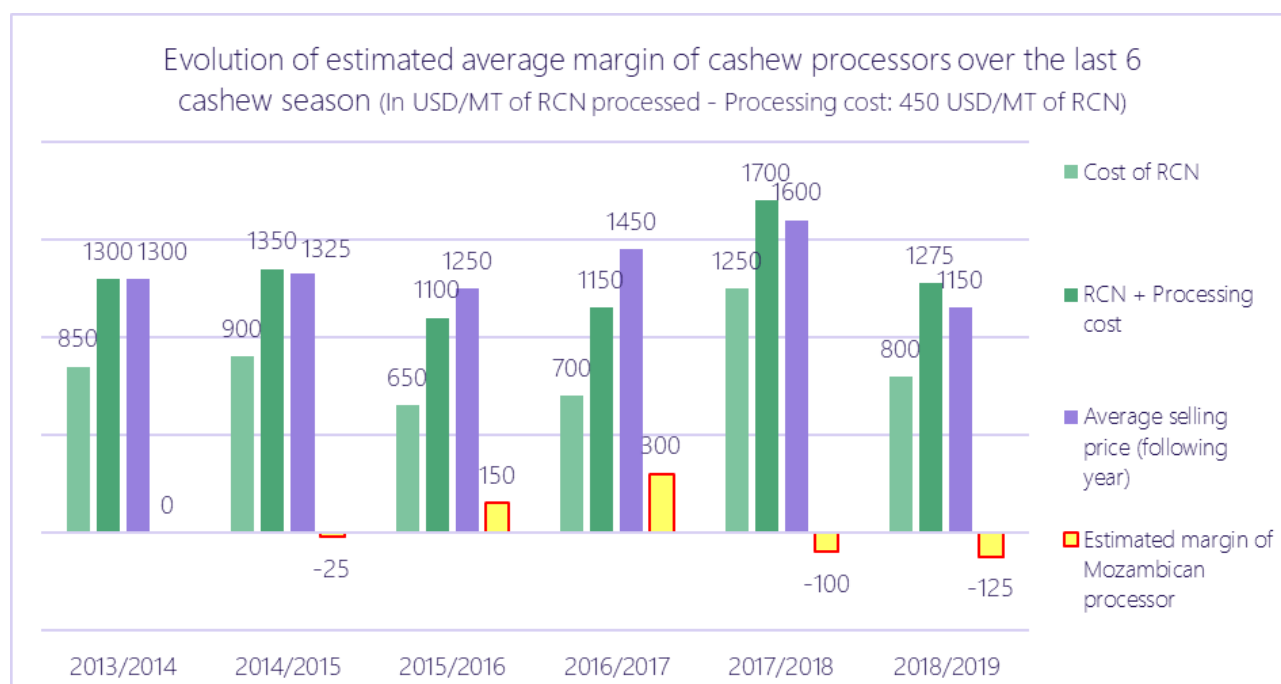




Figure 3. Estimated average profitability of a cashew factory in Mozambique during the last 6 cashew seasons (Source: Nitidae).



This strong exposure to price risk, is today probably the main threat to the cashew industry in Mozambique. The tax on RCN exports is not sufficient to guaranty the sustainability of the industry. If 2019/2020 cashew kernel prices do not rise, many factories are likely to close permanently as they will not be able to withstand 3 successive years of losses.

This major threat is not easy to mitigate, but we do the following proposal (developed in the last part of the report) to support, at the same time the processing sector and the cashew producers.

In general:

- Consider the cashew processing sector and the cashew value chain as an important sector for the diversification, redistribution and compensation of CO² in the context of the extractive sector growth in Mozambique.

Urgently:

- Maintain the tax on RCN exports (tax on the export of raw nuts, sobretaxa) and the purchase window for processors, since this measures could be considered as effective to allow the Mozambican industry growth.
- Establish a task force for the promotion of Mozambican cashew kernels and provide support for strategic markets such as South Africa and India.
- Hire a processing focal point for the INCAJU, with experience in the cashew nuts processing sector.
- Improve the governance and the use of the Tax on RCN exports to improve the income of the cashew producer and the processing sector.
- Provide a VAT exemption for inputs dedicated to the cashew processing sector.



In the middle term:

- Support AICAJU in return for a clearer and stronger action and development plan on several points, such as trade promotion, economic intelligence, technological surveillance, commercial regulation, valorization of by-products, training of Mozambican technicians and managers, partnership and support to farmers' associations, project design and development.
- Improve the governance of the Tax on RCN export with greater transparency and the construction and strengthening of interprofessional dialogue.
- Improve the use of the Tax on RCN exports through the diversification of support activities aiming at other objectives such as structuring producers, improving quality, implementing certifications, better valorization of waste by factories, encouraging the private sector to replace INCAJU's role regarding cashew tree spraying or cashew promotion services, improving living conditions for cashew workers or diversifying machambas (fields) to improve their resilience to climatic risks and the volatility of the cashew market .
- Seek convergence of regulatory policies for cashew in Tanzania and Mozambique, valuing the success and weakness of both policies.
- Implement a project to support added value, commercialization of by-products led by several processors.



2_Introduction:

2.1. Objective of the study:

This study aims to analyze the competitiveness of the cashew nut processing industry in Mozambique compared to the main processing countries in the world, more specifically Vietnam, Ivory Coast and India and, through the result of this analysis, give recommendations for policies, programs and projects to support the value chain, especially for the cashew processing industry.

2.2. Methodology

Definition of competitiveness

Industrial competitiveness and, more generally, economic competitiveness is a concept that is the subject of a wide theoretical debate and, at the same time, of empirical use by business leaders, investors, policy makers and journalists.

In general, we will refer to Professor MUCCHIELLI's concepts presented in the Encyclopedia Universalis²: "The term 'competitiveness' refers to the ability to face competitive situations and compete with others. Often used by economists, the concept was initially defined and understood at the company level, and then transposed to the macroeconomic level, to an activity sector or country levels".

As Rainer Feurer and Kazem Chaharbaghi³ rightly point out, the term can be considered from different points of view:

- Consumers: which industry is able to supply the product with the best quality/price ratio according to their needs? These needs change over time, but also according to social categories, identity and cultural factors (i.e., nationality, religion, consumption habits).
- Investors: what is the industrial investment that guarantees them the best risk/benefit ratio according to their investment plans? At this point, investment plans also vary from one operator to another, depending on the nature of the investment.
- Company: what is the best choice, the best organisation, the best investment that may help the company to continue to grow or, at least, to survive against my competitors?
- Policy makers (regulators, legislators): how to create a favourable environment for the business growth or, at least, for its survival in relation to its competitors?

Therefore, competitiveness can take on different scales: of a market, a wider economic sector, a productive unit or a territory.

If we consider the competitiveness of a specific economic unit (a company), we can also differentiate:

² <https://www.universalis.fr/encyclopedie/competitivite/>, Jean-Louis MUCCHIELLI : professeur à l'université de Paris-I-Panthéon-Sorbonne

³ <http://repository.binus.ac.id/content/f0542/f054214618.pdf>



- Endogenous structural competitiveness, which is linked to the choices made by the company in terms of work organization, technologies used, financial provisions, staff qualifications, quality of administrative and accounting management.
- Exogenous structural competitiveness induced by its location and the economic and regulatory context in which evolves inputs' cost, labor cost, credit cost, tax level, service delivery, level of standards, etc.
- Endogenous conjunctural competitiveness, which evolves according to the company's decisions: market and target customers, selected suppliers, type of contract and commitments to customers and suppliers, targeted procurement and sale prices, choice of financing, reform, incidents, layoffs of key personnel.
- Exogenous conjunctural competitiveness, which evolves according to the so-called "market", evolution of the procurement prices of raw materials and inputs, evolution of the resale prices of the finished product and of the by-products, supply and demand in terms of quantity and quality.

The aim of this study is to provide information on public policy options for a set of very different companies in terms of endogenous competitiveness (both structural and cyclical), the reason why we focused on an "exogenous" approach to competitiveness.

Contrary to other studies that intend to evaluate the endogenous competitiveness of the Mozambican industry, our wide knowledge of the cashew sector, in general, and the visits that we made to the factories led us to consider only exogenous factors for several reasons:

- There is no "model" for cashew processing, either in Mozambique or anywhere else in the world. Either from a technological point of view (type of machines, share of automation and manual work), from an organizational point of view (concentration in a single location or fragmentation of processing in several locations) or in terms of dimensioning (micro-unit or mega-plant), no processing model appears as "structurally more efficient" than the others. In addition, the organizational and technological choices of cashew nut factories around the world are in perpetual movement. A factory that is being automated in 2010 may well have already reverted to 100% manual processing.
- The Mozambican industry consists of factories of very different size and organization: among the 8 factories that we were able to visit during this study, none of them uses the same organization or technology in all the diversity of its processing phases. Some plants even changed their organization or technology between the beginning and the end of this study. This shows that the cashew processing sector in Mozambique is not rooted in a single outdated model, but in a diversity of companies that invest, evolve and constantly try to adapt to an extremely volatile market and constantly changing technologies.

The competitiveness of the Mozambican industry is therefore approached in this study from an exogenous point of view, taking into account the factors of economic and commercial policy, taxation, operating costs and market opportunities that affect the profitability of this industry in comparison with its main competitors, namely Vietnam and India, and in comparison with the African country that currently invests the most in local processing of cashew nuts, namely the Ivory Coast. An important part of this study is also dedicated to the recent situation on the international cashew market, which has particularly reduced the competitiveness of the Mozambican industry.



Scope of the study

The theme of this study is the competitiveness of the Mozambican industry and not the competitiveness of the entire cashew value chain in Mozambique.

The competitiveness of cashew nut production and, more generally, of the value chain as a whole is a broader issue that deserves to be addressed separately. Following the comments received during the presentation of the Draft report, we have integrated some synthetic data and analyses on the production of cashew nuts in Mozambique.

However, the vast topic of raw cashew nuts production and marketing will be the subject of another study under the Component 2 of the ACAMAZ Project, based on field surveys in the area where the project operates in the districts of Gilé and Pebane, province of Zambezia, which will very accurately address the critical points in the estimation of production costs and the different balance points for producers, as well as the typology of agricultural holdings, assessment of the dynamics of creating / renewing orchards, the effectiveness of the production support (supply of plant material, antifungal and spraying equipment, production and marketing advisory, and monitoring activities), the reliability of production and marketing statistics and the market share of the different Mozambican cashew production markets.

The issue of raw cashew nuts quality, which currently constitutes a disadvantage both for the competitiveness of cashew nuts processing and for the incomes/added value of the producer in the raw cashew nuts production, will also be developed in this second study. We would just like to point out that, contrary to some comments received, a total liberalization of the sector would in no way guarantee an improvement in the quality of the Mozambican cashew nut. Quality improvement is a problem that depends mainly on structuring marketing. For producers to invest in quality, the investment must be remunerated and, therefore, differences in quality must be paid at different prices. This can be done in the context of the development of local transformation (and we make proposals in this regard), as well as within a value chain structured, mainly, around the export of raw cashew nuts (case of Tanzania).

At this level, this report gives recommendations on how to organize marketing in relation to the local processing support policy. In the next study on the cashew production and the cashew value chain, more specific recommendations will be made on production and its implications for the value chain.

Study steps

This study was carried out in 9 phases:

- **Documentary research:** firstly, the Nitidæ team carried out a documentary review of the numerous studies carried out on the cashew nut sector, investment and export incentive policies and, more particularly, on the cashew nut processing sector in Mozambique. The main sources that were used during the study are cited in the bibliography at the end of this report.
- **Update of statistical data:** based on information already collected by the Economic Information Service n'kalô (www.nkalo.com, the main source of economic information on the cashew sector in Africa and in the world), in which several members of the Nitidæ team are also involved, and in close collaboration with INCAJU, the available data on the sector (marketed production, prices charged, exports of raw cashews and cashews) were compiled in order to take into account the latest and most complete possible figures.



- **Design of a comparative Business Model:** based on the bibliography and on the work of designing the business plan for cashew nut factories already carried out by Nitidæ in West Africa and the data obtained from some Vietnamese and Indian processors and equipment suppliers, the Nitidæ team designed a theoretical and comparative Business Model for processing costs in Mozambique, Vietnam, India and Ivory Coast. A synthesis of this Business Model was then produced to be presented to the critics of the players of the Mozambican industry. This approach makes it possible to have more concise discussions with the private sector, focused on the critical points and specific charges supported by each party, avoiding too general discussions about the cashew sector, in general.
- **Collection of private sector information:** The Nitidæ team met with 18 agents involved in primary processing, secondary processing and the cashew trade in Mozambique and visited 9 processing plants. Such meetings had several objectives, (i) to submit the data of the theoretical business model to criticism by operators currently active in order to improve it, (ii) to observe the diversity of production models in Mozambique plants, (iii) understanding the cyclical problems of cashew processors in 2019/2020, (iv) to know the needs, concerns and proposals for public actions from the point of view of processors in 2019/2020.
- **Exchange of information with Incaju:** on institutional issues and the public sector's information needs on the processing of cashew nuts.
- **Preparation of draft report** completed in February 2020
- **Consultation of opinions, criticisms, comments and suggestions:** with a wide range of stakeholders and national and international experts on the report, in March 2020.
- **Preparation of the final report** in May 2020.
- **Presentation of the final report to the cashew sector stakeholders.**

Choice of technological model for comparisons

As explained earlier, the cashew industry in Mozambique, as in the rest of the world, is made up of a wide variety of models of companies in terms of size, technology and organization of production. However, to illustrate in a synthetic and clear way the competitiveness of the cashew industry in Mozambique compared to an equivalent industry in Vietnam, India and Ivory Coast, we had to choose a reference plant model to make comparisons.

The model chosen for these comparisons is a recent plant with a processing capacity of 5,000 tonnes of raw cashew nuts in a single switch (8 hours of daily activity), located in a peri-urban area, carrying out 80% of its processing in an automatic way (Vietnamese horizontal shelling technology) and 20% by hand (reprocessing of unprocessed products in the automatic circuit and manual processing of the largest nuts).

This model was chosen because it is the closest one to an "average plant" in the sector in 2019/2020, both in Mozambique and in the rest of the world. Even though there are economies of scale for large factories, their impact remains limited, especially in terms of operating costs (OPEX) and turnover, which allow these comparisons to remain meaningful.



List of actors encountered and consulted:

Stakeholders consulted in the first phase of data collection - October 2019:	
<ul style="list-style-type: none"> - Condor Nuts, Anchilo - Korosho, Nampula - Cashew Island, Lumbo - Olam , Monapo - Indoafrica , Meconta - Mocaju , Murrupula - CN Caju, Nacala - CondorAnacardium , Macia - SPEED + Agriculture and Energy, Maputo 	<ul style="list-style-type: none"> - UNIDO, Maputo - Pamoja , Nampula - Export Marketing Co. LTD., Nacala - SPAR Bakery, Nacala - MMI Kiboko - Corrugated iron factory, Nacala - MELT Group - Fábrica de Capulana, Nampula - Sunshine Nuts - Maputo - Mrs. Anabela, Macaju - Secondary Processor - Maputo - INCAJU

Stakeholders consulted in the second phase of data collection - March 2020 :	
<ul style="list-style-type: none"> - Acubar Batptiste - Economic Advisor to Minister, Maputo - Norbert Mahalambe - Consultant, Maputo - Carlos Costa - Consultant, Maputo - Daniel Massinga - Legal Office, Maputo - Cashew Yetu, Maputo - Caju e Nozes, Maputo - Condor, Maputo and Nampula - Mocaju, Nampula - ETG, Nampula - Korosho, Nampula - OLAM, Maputo and Nampula - Representatives from the Ministry of Industry and Commerce, Maputo - Sunshine Nuts, Maputo - SINTAICAF - AICAJU 	<ul style="list-style-type: none"> - Mrs. Anabela, Macaju - Secondary Processor - Maputo - DPASA - UCODIN - DPI - Commerce - ACIANA, Nampula - Julio Cuamba - Consultant, Maputo - Egídio Paulo - Consultant, Maputo - Sociedade de Indústria, Comércio e Serviços, Maputo - Beluluane Park , Maputo - Panfilo Tabora - Consultant - SPEED + - Sunil Dahiya - Consultant - Peter Massawe - Consultant - Shakti Pal - Consultant - INCAJU, Maputo



2.3. Context of the cashew sector in Mozambique

2.3.1. The cashew sector in Mozambique

2.3.1.1. Historical and political context

Colonial period

The cashew tree is a native tree from Brazil. It was introduced in Mozambique as in many other tropical countries by the Portuguese explorers during the 16th century. For several centuries it was a small agricultural commodity, mainly cultivated for its fruits and used in the forestry sector for its fast-growing properties, for reforestation and timber production.

According to Fernando Bessa Ribeiro (2008), at the end of the 19th century, some entrepreneurs from the state of Goa in India developed the first industrial cashew nut shelling process to valorize the cashew nut. Thanks to the historic trade between East Africa and India, Indian processors started importing Raw Cashew Nuts (Raw Cashew Nut, RCN) from Mozambique and Tanzania, from the beginning of the 20th century.

In the 50s, the political powers and their agents, Portuguese colonists, began to consider the export of raw cashew nuts as less interesting than internal processing and export of the cashew kernel on the international market. In the mid-1960s, industrial expansion began with the shelling of the Raw Cashew Nut. The mechanization of the process faced some difficulties, forcing the search for new options and solutions. The consolidation of the industry took place in 1975, at the same time as the country's independence.

Nationalization period:

After the independence and the departure of many Portuguese settlers who owned the factories, cashew processing started to be managed by public administrative commissions. In 1977, the processing plants were transferred to management by Directory boards appointed by the State. In 1979 a national company, "Caju Mozambique EE", was created to manage the entire industrial cashew sector. From a commercial point of view, despite the difficulties generated by the civil war, mainly access to raw materials, and the lack of qualified workers to supervise mechanical equipment, the company was able to take advantage of the struggle between capitalist and socialist countries to develop its exports and survive.

The North American market was the largest consumer of Mozambican cashew kernels and Mozambique was able to maintain marketing channels with higher prices for white and whole cashew kernels, at the same time establishing trade and cooperation agreements with European countries of the socialist bloc selling lower grade kernels (yellow and broken) with lower market value⁴. During that period, since 1975, the government reinforced protectionist measures to the national industry with the limitation of exports of raw cashew nuts and regulation of marketing prices.

Under the proposal of the Secretariat of State for Caju, an institution linked to the Ministry of Agriculture, the National Commission for Wages and Prices determined the prices to be applied in marketing at the beginning of each campaign. They established minimum prices to be paid to the producer and average

⁴ Fernando Bessa Ribeiro (2008). Entre Martelos e Lâminas: Dinâmicas Globais e Políticas de Produção na Indústria do Caju em Moçambique.



prices to be paid by traders to factories, as well as to which agents were allowed to sell, private, state or cooperative⁵.

With the increasing difficulties that led Mozambique to the capitalist restoration, which had repercussions on the cashew chain, and added to the aggravation of the disturbances caused by the civil war that dismantled the entire productive chain, the rural exodus resulted in little investment in replanting the trees and low plant productivity.

At this stage, the decline in production was so marked that there was a progressive decrease from 120,000 tons in 1976 to 22,000 in 1990⁶, as a result of the combined effect of deficient orchard management, aging of cashew trees, uncontrolled fires and the accelerated spread of pests (*Helopeltis* spp) and diseases (*Oidium anacardium*). The Mozambican industry faced financial problems and increasing inefficiencies with the nationalized companies, and there was a weakening of the industry as a source of foreign exchange for the country, with a 30% drop in the value of exports in 1978 to 12% in 1990⁷.

Liberalization period:

With the weakening of the cashew processing industry, there was an internal surplus of raw material that led to the interruption of the policy of banning the export of raw nuts, through Ministerial Order No. 6/72 of January 8, 1992. This decision was taken in the midst of an industry protectionist environment created through the reforms of the customs sector, Decree n° 17/91 of 19 June 1991, which instituted a tariff structure to protect the industry.

According to Ministerial Order No. 6/72, the government legislated a maximum export share of 10,000 tons (article 2) with a tax on the export of raw cashew nuts of 60% (article 6).

The worsening of the country's economic situation in the context of the cold war led to organize the first privatizations of the state's business sector. With the end of the Soviet Union and the need for investment in cashew processing facilities, privatizations appeared as the solution to the problems.

The privatization of *Caju de Moçambique* was organized with support of international institutions as FAO and World Bank. Their consultants presented as major constraints the deficiency of management (shortage of managers and intermediate managers), insufficient technical personnel and the coexistence of several technological systems that required technical maintenance and considerable import of spare parts increasing costs. These findings led to the political decision that *Caju de Moçambique* was not viable and had no future.

In 1994, the World Bank presented to the Mozambican government the introduction of liberalized measures for the export of raw cashew nuts, so far prohibited since 1975, based on the assumptions that the liberalization of trade and elimination of the RCN exports Tax, would lead to an increase in prices for the producers and this would result in greater investment in orchards and an increase in the supply of raw materials. Also, in the case of industries' bankruptcy, the lost jobs would be absorbed by the production of cashew nuts. As a counterpart to these policies, the World Bank would provide credits for the reconstruction of the country after 16-years of civil war.

Amid political decisions to protect the Mozambican industry and the complete liberalization of export trade, the conflicts between processors and exporters rekindled. Between 1993 and 1994, ACIANA and the national

⁵ Joana Leite (2000). A guerra do caju e as relações Moçambique-Índia na época pós-colonial.

⁶ Joana Leite (2000). A guerra do caju e as relações Moçambique-Índia na época pós-colonial.

⁷ Joana Leite (2000). A guerra do caju e as relações Moçambique-Índia na época pós-colonial.



industry tried to agree on the quantity of nuts to be made available for the supply of the national industry and the prices to be charged, but the discussions did not lead to consensus. During this campaign, the Ministry of Commerce seemed to have favored industrialists through a “Notice from the National Directorate of Foreign Trade” that allowed the export of surplus raw material from the industry and established rules for the export of 5,000 tons of nuts through an open tender procedure. Among the rules was the evaluation of the highest proposed FOB price and the obligation of providing proof that the bidders had supplied the industry with at least a third of the quantity of nuts to be exported.

Everything indicated to ACIANA that this mechanism was intended to hinder exports given the context of tension, forcing exporters to accumulate stocks of cashew nuts or reduce procurement from producers, or to supply shelling companies. ACIANA's reaction was to underline its losses and affirm that the inefficiency of the industry should not be borne by traders or producers receiving lower prices in view of the insistence of the prices proposed by the industry⁸.

In October 1994, ACIANA and AICAJU entered into an agreement that established rules and commitments, such as not exporting before the industry was completely supplied; or factories could only procure nuts from wholesalers accredited to ACIANA. However, in the midst of this tendency towards pacification, ideas of liberalization created unrest among industrialists and exporters.

The liberalization of raw cashew nuts meant the elimination of tax on export of raw cashew nuts, causing Mozambique to stop being the second largest exporter of cashew kernels because of a crisis in the sub-sector.

With the World Bank study claiming that it is not advantageous to invest in cashew processing but in exports, Mozambique has come to depend almost exclusively on India as the largest buyer of raw cashew nuts. Traders had a greater interest in selling to Indians than to domestic processors, due to their economic situation and their inability to compete with Indian prices that stood at USD 689 per ton in the 1992/1993 Campaign against the USD 271 offered by national processors⁹.

The liberalization of raw cashew nuts meant the end of export licenses, and all citizens could apply for export licenses and participate in the process. This caused an increase in the number of exporters and intermediate traders, both formal and informal. The cashew economy started to be based on the interests of intermediaries and storekeepers. Between producers and the international market, there are three more levels of intervention: small intermediaries, wholesalers and exporters (RCN) or processors (Kernel). As producers could not bear transport costs, they began to suffer pressure from formal and informal intermediaries who replaced rural canteens, who were put out of the scene by the prevailing situation in the country that, for decades, functioned as primary aggregators of RCN.

In conclusion with the liberalization policy adopted, producers received minimal gains, there was an increase in unemployment among industry workers and an increase in economic fragility; against the expectations and hypothesis that with the liberalization of raw cashew nut exports the producer would obtain premiums equivalent to at least USD 1 / kg, which, over time, proved to be inconsistent with reality¹⁰.

After assessing the negative effects of the policy of liberalizing the commercialization of Raw Cashew Nuts and the subsequent collapse of the processing industry, and with the objective of initiating a recovery

⁸ Joana Leite (2000). The cashew war and Mozambique-India relations in the post-colonial era.

⁹ Fernando Bessa Ribeiro (2008). Between Hammers and Blades: Global Dynamics and Production Policies in the Cashew Industry in Mozambique.

¹⁰ Fernando Bessa Ribeiro (2008). Entre Martelos e Lâminas: Dinâmicas Globais e Políticas de Produção na Indústria do Caju em Moçambique.



process of the Cashew Sub-sector that would integrate all its stakeholders and alleviate the high social costs due to the workforce that had been severely affected, the Law No. 13/99 of 1 November 1999 (the Cashew Law) was approved.

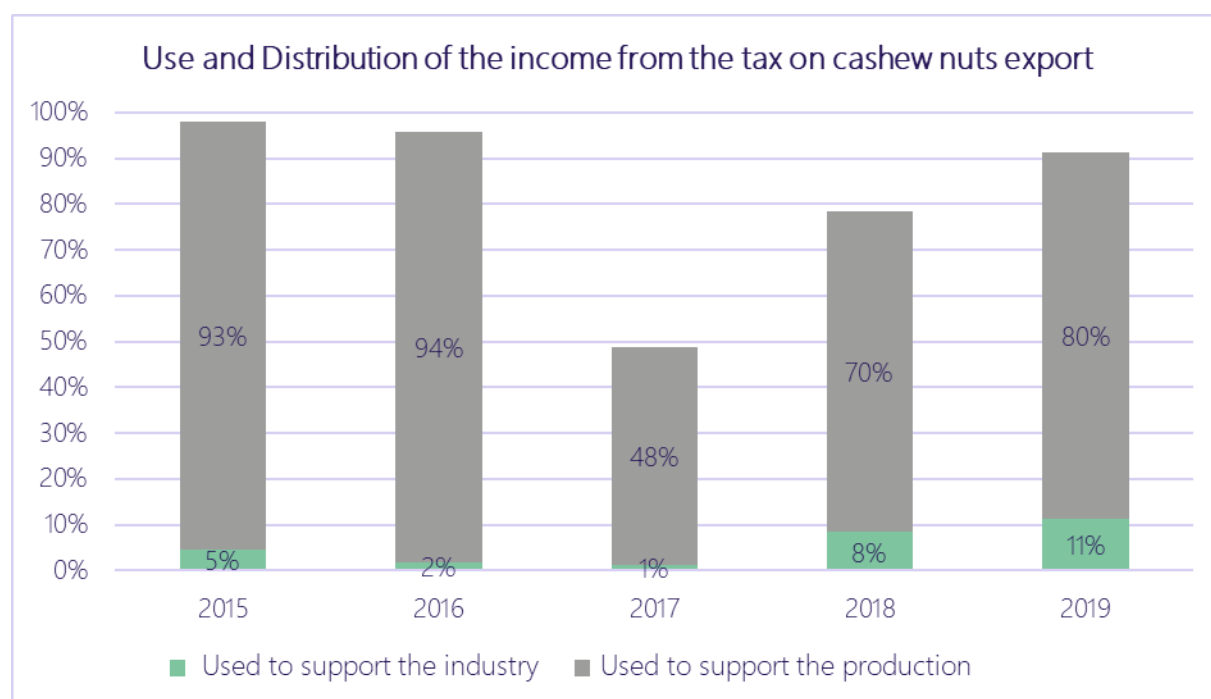
The Cashew Law foresaw a policy of promoting production and favoring industry with the re-establishment of the rate of Tax on RCN exports of cashew nuts with values between 18 and 22% for exporters; the implementation of a right of option for industries and the ban of export for processors. The consigned revenue from the Tax on RCN exports should be applied 80% to promote production and 20% to industry activities¹¹.

Policies since the 2000:

In recent years, the cashew processing industry has shown signs of recovery. From the 2000s onwards, new private investments in the country allowed the appearance and consolidation of small to medium-sized cashew processing plants, with semi-mechanized technology. This adopted technology allowed the use of intensive labor, generating more jobs, income and boosting the rural economy¹².

The income from the cashew nut Tax on RCN exports has been used by the Instituto de Fomento do Caju to support the development of the sub-sector, following the division determined by law. However, according to data provided by INCAJU, income is being divided according to the activities required each year, and this division may not be exactly as determined by law. In other words, the 20% that should be used to support the industry is not always realized directly, with the amount invested in promoting production in order to improve the quality of the raw material.

Figure 4. Use and Distribution of the income from the Tax on RCN exports. (Source: INCAJU, 2020)



¹¹ Lei do Caju. Lei n° 13/99 de 1 de Novembro de 1999.

¹² SICS – Sociedade de Indústria, Comércio e Serviços, SA (2019). Avaliação de meio-termo do Plano Director II do caju.



The main concern of INCAJU is to support the promotion of production by improving the productivity of cashew trees and quality of the nuts. Most of the incomes from the Tax on RCN exports go to integrated management, in the purchase of chemical inputs for the trees. Following the same direction, institutional training of INCAJU have demanded greater investments each year that come from the same income. The part of the income that is destined to the industry is concentrated in the activities of monitoring the commercialization and a guarantee fund for the processors.

The Guarantee Fund aims to provide guarantees to those who wish to conduct activities in the cashew sector at subsidized rates. The fund was created in 2001, as a result of an agreement between Banco Comercial de Investimento and INCAJU, and initially would have a duration of 5 years, being extended until the present period. One of the problems with this fund is that the maximum amount is only for small to medium-sized projects, so large cashew kernel processors and exporters do not benefit from this policy or Tax on RCN exports.

Current policies and reflections:

In 2018, an economic study¹³ was carried out by SPEED+ on cashew, which analyzes the current political regime and argues for the benefit of cashew producers by improving the quality of nuts and increasing production. The study considers the international economy of the cashew industry, Africa and the cashew value chain in Mozambique.

The study concludes that the current policy has impeded the competitiveness of cashew nuts in Mozambique and favored the inefficiency of the industry. It points out the low prices paid to producers as a cause of the low quality of the nuts, the low productivity of the trees, and the lack of investment in orchards (phytosanitary measures and renovation).

The study proposes a series of measures to improve the sector's competitiveness, among them: Gradually eliminate the RCN export tax, starting with an immediate reduction from 18% to 14%, and then decreasing constantly over five years to 0%; Allow RCN exports during the period from October to January, when global prices are highest; Improve the competitiveness of processors through investment in efficiency and reductions in business costs (transport, logistics, corruption, etc.); INCAJU's transition to play a regulatory and policy-oriented role, while the private sector meets the demand for input supply and extension services. These measures would have the effect of increasing competition for raw cashew nuts and increasing prices paid to producers by transferring the Tax on RCN exports value along the chain to the producer. As long-term effects they would improve productivity and quality of nuts, hence encouraging greater investment by producers in their orchards.

The gradual elimination of the export tax on RCN was integrated into the new proposal for the Cashew Law, presented in public consultation in August 2019. The opening of exports at the same time as the purchasing period for processors, and the reference price policy were integrated in the new regulation approved in January 2019.

These measures were the subject of discussions in public consultations and technical advice prior to the commercialization campaign. The new proposal for the Cashew Law was not approved and was strongly opposed by processors who argued that they were suffering from the crisis in cashew kernel prices and that they depend on the export tax, the right of option and the preferential purchase window, to maintain their activities and buy quality cashew nuts at affordable prices. They also claimed that they were not consulted,

¹³ The Economics of Cashew in Mozambique, 2018.



and that their positions were not considered during the process of preparing the SPEED + economic study, just as the study did not present a detailed analysis of costs and competitiveness in the case of processors in Mozambique, being a study on economic policies. Therefore, the revision of the Cashew Law, as well as the other policies are still under discussion and analysis due to the possible impacts on the cashew sub-sector in the current scenario of industry crisis.

Despite the fact that processors do not directly benefit from the income from the Tax on RCN exports, and the lack of transparency, this Tax on RCN exports remains one of the main advantages for processors, in addition to being one of the sources of income for the functioning of INCAJU. With the extinction of the Tax on RCN exports, the direct impacts on the sub-sector would reach both the public institute and the processors, putting the producers' activities at risk. Today INCAJU is responsible for supplying products for the chemical treatment of trees and there is still no plan for integrating the private sector in this activity. All financing for this activity comes from the Tax on RCN exports added to the fact that it is organized by INCAJU, which is also financed, in part, through that income. Therefore, this issue still needs to be further developed and discussed with all the players.

Clearly, greater transparency in the use of the Tax on RCN exports and new reflections and proposals on its use are necessary for this measure to be more efficient, and for processors to not be totally dependent on this policy for the proper functioning of their activities. This measure should be palliative for periods of crisis in the industry and flexible to needs, depending on the scenario that the sub-sector is experiencing. At this point, the interprofessional dialogue could allow a more comprehensive discussion and new proposals, having as opportunities for discussion the technical council meetings promoted by INCAJU, MADER and other stakeholders in the chain.

In the 2019/2020 commercialization campaign, the technical councils that preceded the opening of the campaign discussed the definition of the reference price in two working meetings, the impact of this price on the industry activity, and the need to maintain the preferential purchase window to protect the industry amid the crisis they are facing. The technical councils have representatives from processors, exporters and producers, even though they are not organized enough to have official representatives and can really defend the interests of producers. As a result of the discussions, the reference price was set at 34 MZN/Kg and the preferential window for processors was maintained, despite the new regulation approved at the beginning of the year allowing for simultaneous export and commercialization to processors. An exception was created due to the crisis, with exports only authorized in January.

Currently, the Cashew Law is still under discussion. A new proposal by a group of independent consultants from SPEED+ is under development, even with the strong opposition of processors, and INCAJU believes it is important to revise Law No. 13/99 to adjust it to the current scenario.

Today, the Nitidae ACAMAZ Project is the only one to develop a study on the competitiveness of the cashew nut industry in Mozambique to contribute to the new policies proposed by the Instituto de Fomento do Caju, since the SPEED + Project withdrew from this work and closed its activities on cashew.

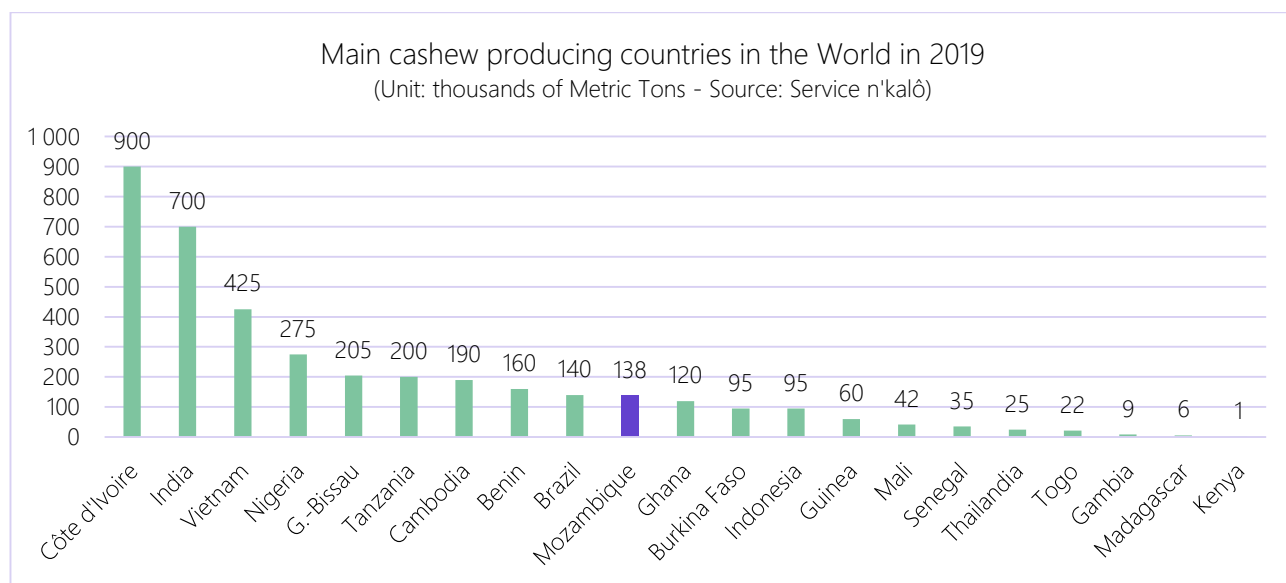


2.3.2 Situation of the sector in 2019:

In 2018/2019, Mozambique was the ninth producer of cashew in the world, with an estimated production by the Incaju of 143,400 MT, about 3.6% of the world production of cashew.

In terms of raw cashew nut exports, it holds the 14th position in the world ranking with 29,000 tons exported and in terms of cashew nut exports, it holds the 4th position in the world with 11,800 tons of exported cashew kernels.

Figure 5. The largest cashew producing countries in the world.



According to data from the 2015 National Agricultural Census, 1.33 million Mozambican agricultural families own cashew trees¹⁴. Production is carried out mainly by small producers with a wide variety of agricultural fields. While many small producers have only about ten old trees, several tens of thousands of them own one or several hundred cashew trees.

Historically, cashew nut production has been highly concentrated in the Nampula region, which accounted for more than 60% of production in the 1980s and 1990s and around 50% in 2020. For a long time, the provinces of Inhambane and Gaza were the second largest production area, but the productions of these two provinces now weigh less in the national balance due to a less dynamic planting of new cashew trees in the years 2000 and 2010. The provinces of Cabo Delgado, Zambézia, lhambane and Sofala have experienced the greatest growth in production in recent years due to a strong dynamic of planting.

In Zambézia, in the districts of Gilé and Pebane, where Nitidae carried out socio-economic surveys of 231 producers selected randomly under the ACAMAZ Project, 81% of farmers were cashew tree owners. In these two districts, on average, a cashew nut producer has 85 trees, of which 30 are over 15 years old and 55 are under 15 years old with an average yield of 3 kg/tree.

As can be seen from the figures compiled by Incaju (2003/2004 to 2019/2020) and the State Secretariat of cashew (1974/1975 to 2003/2004¹⁵), production of cashew nuts in Mozambique decreased significantly from

¹⁴ Carlos Costa and Christopher Delgado. 2019. "The Cashew Value Chain in Mozambique." World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO.

¹⁵ https://www.persee.fr/doc/luso_1257-0273_2000_num_7_1_1379



1982 (4 years after the ban on exports of raw cashew nuts in 1978) to 2004. Since 2004, growth has been irregular, but tends to accelerate since 2014, in particular due to a great impetus for the creation of new plantations.

This increase in production can be explained by a combination of several factors:

- The end of the civil war in 1992 and, at the same time, the end of the ban on the export of RCN;
- An increase in the prices of raw cashew nuts paid to producers under the combined effect of an increase in world prices and, as of 2004, greater competition between exporters of raw cashew nuts and local processors for access to nuts;
- Increased support for producers such as supply of plant seedlings, seeds and fungal treatments by INCAJU;
- Several major support programs for the sector and, in particular, for producers financed by international technical cooperation (Mozacaju, ACI, Mozbio, ACAMAZ).

In the end, for several hundred thousand smallholders, the vast majority of whom living below the poverty line defined by the World Bank (less than USD 1.9 / day/person¹⁶), cashew nuts are the main cash crop (main source of cash income).

Numerous studies carried out in recent years oppose the producers' interests: theoretically obtain the highest possible prices by reducing or eliminating the tax on exports of raw cashew nuts, and those of processors: maintain this tax to remain competitive with Asian processors (India and Vietnam).

However, this opposition of interest is not that simple.

When demand exceeds supply, competition between exporters may, in fact, be sufficient to ensure that producers have an advantageous negotiation position and obtain a significant share of the value of the raw cashew nuts on the international market, but it also rely on farmers proper organization, negotiation capacities and access to market information. However, in periods when supply exceeds demand, the differential between producer prices and international prices tends, on the contrary, to increase in a fully liberalized market, due to weak competition between exporters.

The presence of local processing protected by a tax on the export of raw cashew nuts tends, therefore, to reduce the volatility of prices offered to producers both from one year to the next and during the same season, as it maintains a regular local demand.

Producers earn less when there is a strong competition (seasons 2010/2011 and 2015 to 2018), but also loss less when competition is very weak because the local industry has no other choice than to keep its supply in the country. Otherwise, Asian industry may well not buy it or may take it only at extremely low prices.

The purpose of this study is not to assess the impact of the processing support policy on the incomes of Mozambican cashew nut producers. For this reason, we chose not to expand on this topic.

However, following the comments received on the Draft Report on the competitiveness of cashew processing in Mozambique, we made a point of stressing that the theoretical opposition between the interests of producers (or even of all players in the raw cashew nut export chain) and the interests of national processors is not as simple as it may sound.

In addition, the growth in the creation of new plantations and the production of cashew nuts in Mozambique in the last 5 years occurred in a context of local processing growth, which reached a record during the

¹⁶ <https://www.banquemondiale.org/fr/topic/poverty/overview>



2018/2019 season, with more than 11,800 MT of cashew kernel exported, that is, approximately 59,000 MT of raw cashew nuts processed, against 29,000 MT of raw cashew nuts exported. Hence, 67% of the total RCN produced in the country was locally processed.

The balance between the interest of producers and the interest of national processors is difficult to find and is not the focus of this work. However, at the conclusion of this report we make several proposals and analyzes to try to consider the interest of the sector as a whole, in addition to neo-liberal economic biases that do not take into account the reality of the Mozambican sector and the international cashew nut market.

The cashew processing sector in Mozambique

In the processing sector, the country has 26 operating plants, but during the 2019/2020 campaign, only 11 of them were operating according to AICAJU.

Figure 6. Cashew processing factories in Mozambique.

	Factory name	Location	Capacity	Campaign status 2019/2020
1	Condor Nuts	Anchilo	12000	It works
2	Olam Moç.	Monapo	14000	It works
3	Koroshio	Nampula	10000	It works
4	Condor Caju	Nametil	8000	It works
5	CN CAJU	Nacala Porto	7000	It works
6	Koroshio	Chiure -Cable Delg .	6000	It works
7	Condor Anacardia	Macie - Gaza	6000	It works
8	SUNNY M. Intern .	REX	5000	It works
9	Indo Africa	Tell me	3000	It works
10	ADPP	ITOCULO	50	It works
11	Mocaju	Murupula	1000	It works
12	Hello Mozambique .	Angoche	3000	Does not work
13	CASHEW DML	Angoche	10000	Does not work
14	Caju Ilha	Lumbo -Ilha Moz .	8000	Does not work
15	Caju Ilha	Angoche	6000	Does not work
16	MOCAJU	Murupula	3500	Does not work
17	Olam Moç.	Mogincual	1000	Does not work
18	JAB MOZ	Morrumbene/Inhamb.	1000	Does not work
19	EMAJU	Monapo	50	Does not work
20	João F. Santos	GEBA	unknow	Does not work
21	Moma Caju	Moma	unknow	Does not work
22	Dingaloshe	Nangade -Cable Delg .	unknow	Does not work
23	Emil Agro Ltd .	Alto Molocue	unknow	Does not work
24	CAJU DE	MAJACAZE / GAZA	unknow	Does not work - for sale
25	Gowri Shankar, Lda	Liupo	unknow	Under construction
26	Agrico Marketing	Monapo	3000	Under construction

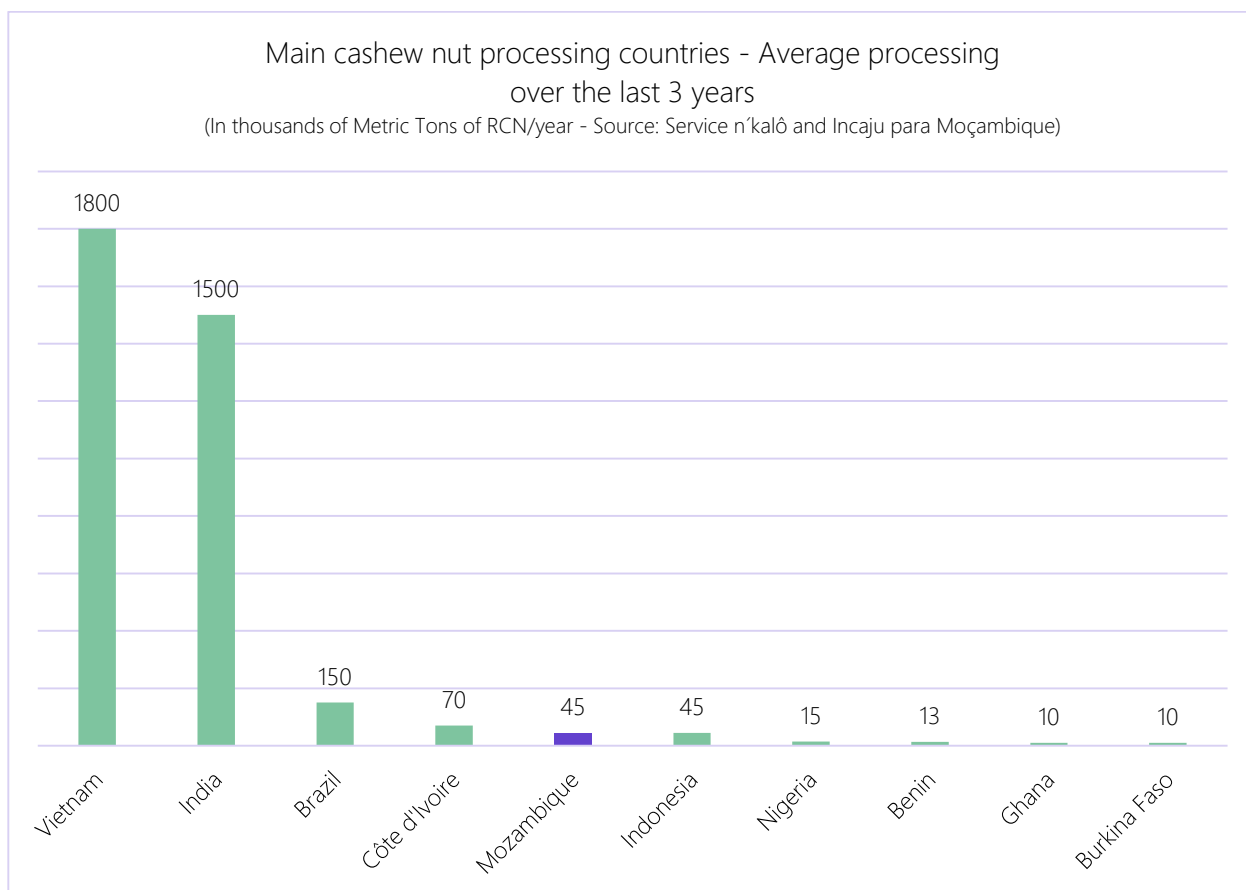
The total capacity of the estimated processing sector is over 100,000 Metric Tons (MT) of RCN. But during the 2018/2019 season, Mozambican factories bought just over 64,000 MT of RCN and exported about 11,800



MT of cashew kernel in 2019 (equivalent to about 59,000 MT of RCN with a ratio of 5 kg of RCN to 1 kg of cashew kernel).

This shows that Mozambique was the 4th or 5th world cashew processor in recent years, with processing comparable to Indonesia and about 1% of the world process. As visible below, the two main cashew processors are far ahead of the others.

Figure 7. Main cashew processing countries in the world - Average processing over the past 3 years.



More than 15,000 workers are involved in cashew processing in 2019; more than half of them are women.



3_General context of Mozambique's industrial competitiveness

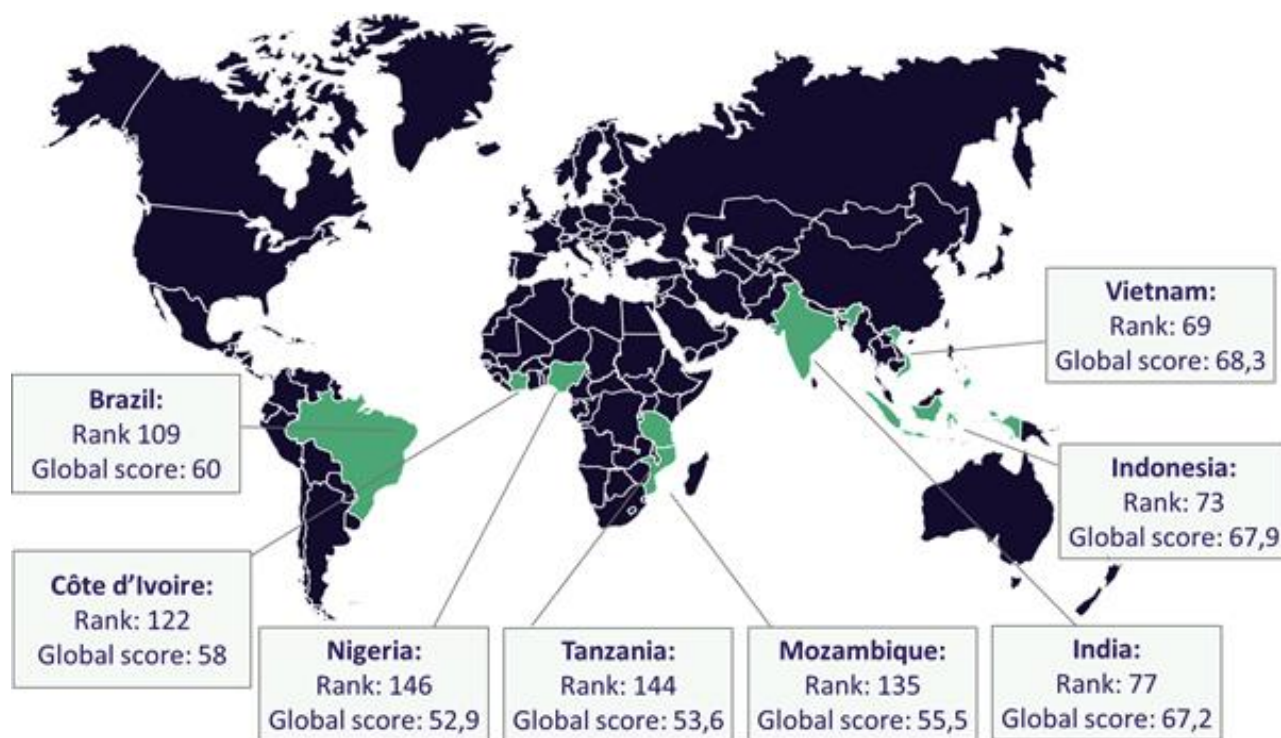
3.1 Doing Business classification

Mozambique is ranked at 135 out of 190 countries assessed by the World Bank's Doing Business 2019 report.

Even though this analysis is not sufficient to evaluate the competitiveness of the cashew industry in Mozambique, it provides some interesting comparison elements to consider some important advantages and disadvantages in the country.

When compared to other major cashew processing countries, Mozambique appears to be below Vietnam, Indonesia, India, Brazil and Ivory Coast, but in a better position than its neighbour Tanzania or the largest African economy, Nigeria.

Figure 8. Map of the Doing Business classifications of the largest cashew processing countries.



Among the many advantages and disadvantages studied in the Doing Business report, Mozambique appear to score well on 3 points:

- International trading: which assess the time and costs to import and export. Following the World Bank report, export and import timing from / in Mozambique is very good and almost half less than the average of sub-Saharan countries, but cost is very close to the average of sub-Saharan countries. Total export charges in Mozambique are higher than in India, Vietnam or Ivory Coast, but import costs are lower than in Vietnam and Ivory Coast. Nevertheless, this analyze should be considered carefully as the numbers are from Maputo port. According to exporters and processors,



the costs and times of export and import are much higher in the port of Nacala, where most of the raw cashew and the kernels are exported.

- Dealing with construction permits: which evaluate procedures, time and cost to complete all formalities to build a warehouse and the quality control and safety mechanisms in the construction permitting system. On this topics, Mozambique, even if far from the OECD cost, has a lowest average cost than most of the sub-Saharan countries and a shorter time to get a permit (118 days against an average of 145,7 days in sub-Saharan countries). But even so its score remains lower than that of Vietnam and India, the two main cashew processors worldwide.
- Access to electricity: thanks to important hydro-electricity production and public subsidies to the electricity price, Mozambique has one of the cheapest electricity among developing countries. The time and cost of connection to the electricity network is also an advantage but the interruption frequency (SAIDI index) is much higher than in India, Vietnam or even Ivory Coast which force most of the industry players to rely on an autonomous generator to compensate the supply interruptions which increase substantially the costs for processors (see paragraph 4.2.1).

On the contrary, on the following points, Mozambique has very low scores compared to its competitors in the cashew industry:

- Starting a business: the number of procedures and the time taken to start a business in Mozambique are quite similar to its competitors in the cashew industry, but the cost is much higher (120% of per capita income versus between 3 to 15% in competing countries).
- Enforcing contracts: to enforce contracts, even though the timing of judgment and enforcement of sentences is quite correct, the average cost of the process is much higher than in Vietnam, India or Ivory Coast.
- Obtaining credit: getting credit is also much more complicated in Mozambique, with very limited coverage of the country by private banks, higher interest rates and a less transparent and efficient banking system. According to World Bank¹⁷ macroeconomic data, average interest rates in Mozambique in 2017 were around 27.9% compared to 5.1% in Ivory Coast, 7.4% in Vietnam and 9.5% in India.

Overall, from the Doing business indicators, even if it is well positioned in Africa, Mozambique seems to have a much less favorable business environment than its main competitors in the cashew industry, as shown in the graph on the next page.

Vietnam and India are two Asian countries that have invested heavily in recent decades in improving their business environment to attract foreign investors and promote local entrepreneurship. They took advantage of the experience of other Asian countries such as South Korea, China or Taiwan, whose states created an attractive context for export industries similar to cashew processing.

¹⁷ <https://donnees.banquemondiale.org/indicateur/FR.INR.LEND>



Figure 9. Table of Doing business scores of largest cashew processing countries.

	Vietnam	Indonesia	India	Brazil	Ivory Coast	<u>Mozambique</u>	Tanzania	Nigeria
Ease of doing business rating	69	73	77	109	122	<u>135</u>	144	146
International trade	70.83	67.27	77.46	69.85	52.44	<u>73.84</u>	20.21	23.08
Obtaining construction permits	79.05	66.57	73.81	49.86	59.37	<u>72.57</u>	57.10	57.84
Access to electricity	87.94	86.38	89.15	84.37	56.23	<u>71.02</u>	74.61	42.63
Starting a business	84.82	81.22	80.96	80.23	93.70	<u>67.56</u>	72.65	82.97
Pay taxes	62.87	68.03	65.36	34.40	46.49	<u>64.04</u>	50.85	53.53
Scoring ease of doing business	68.36	67.96	67.23	60.01	58.00	<u>55.53</u>	53.63	52.89
Registering property	71.09	61.67	43.55	51.94	58.03	<u>52.94</u>	50.14	28.89
Insolvency resolution	34.93	67.89	40.84	48.48	48.00	<u>46.89</u>	39.04	30.42
Protection of minority investors	55.00	63.33	80.00	65.00	40.00	<u>41.67</u>	45.00	66.67
Execution of contracts	62.07	47.23	41.19	66.00	55.74	<u>39.78</u>	61.66	57.90
Getting Credit	75.00	70.00	80.00	50.00	70.00	<u>25.00</u>	65.00	85.00

3.2. Tax incentives in Mozambique compared to Vietnam, India and Ivory Coast

In addition to the favourable business environment, Vietnam, India and Ivory Coast created various tax incentives to attract and support domestic and foreign investment in the industrial sector, in general, and in the cashew sector, in particular.

Mozambique has created several tax incentives for investors, in particular:

- A 50% reduction of the tax on profit (IRPC: Corporate Income Tax) for new investments until 2025;
- A tax credit covering between 5 and 10% of the investment value during the first 5 years of the project);
- Specifically, for export industries: a reimbursement of import taxes and VAT (Value Added Tax) on inputs used in the production of the final exported product. Unfortunately, all the cashew processors interviewed complained that this reimbursement stopped several years ago.

However, as it is illustrated below, the incentives provided by the main competitors are even more advantageous.



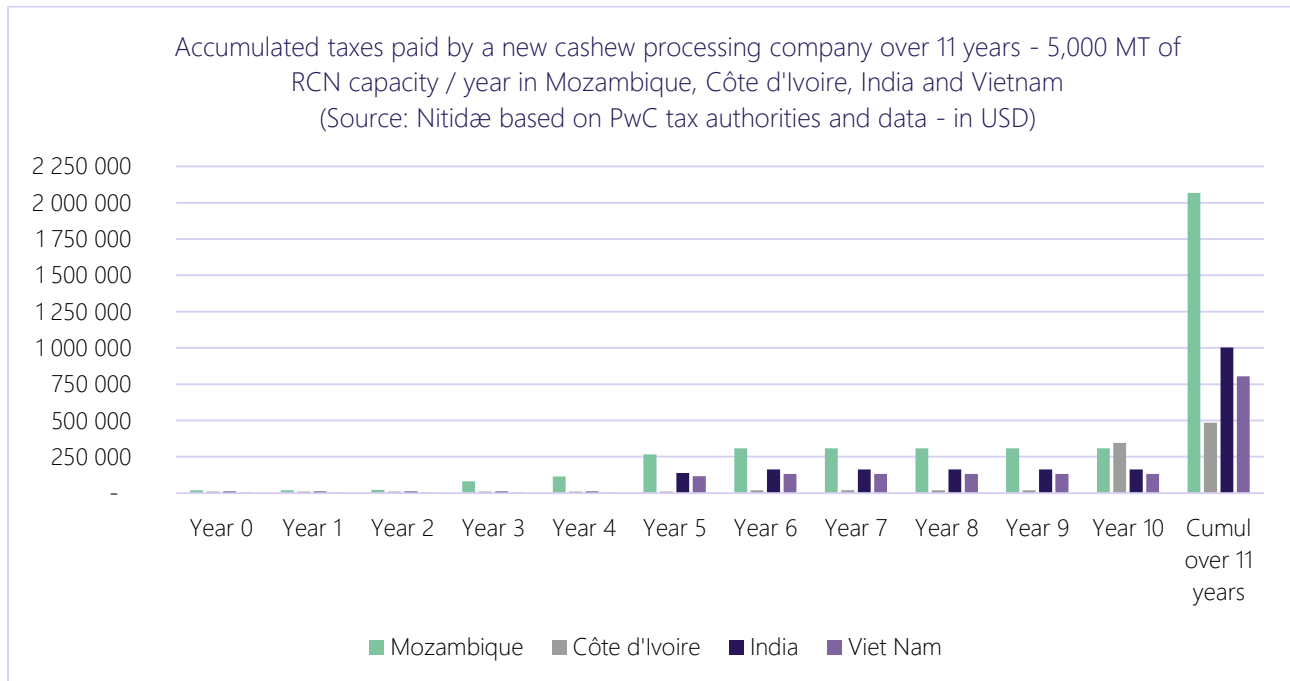
Figure 10. Table comparing tax incentive and subsidies in Mozambique, Ivory Coast, India and Vietnam

	Mozambique	Ivory Coast	India	Vietnam
Advantages for investors (in general)	1) <u>IRPC reduced by 50%</u> 2) <u>Tax credit of 5 to 10% of the amount invested</u> (depending on the investment area)	1) <u>No profit tax + no land tax, over 5 to 15 years</u> (depending on investment area) 2) <u>Customs fees for imported equipment reduced by 50%</u> during the first year of investment	1) For investment in fruit and vegetable processing: <u>No profit tax</u> (tax exemption) for 5 to 10 years. Note: All tax incentives in India are linked to sectors.	1) <u>Many tax reductions negotiated directly with the state</u> , depending on the size, sector and location of the project. (Possibility of no profit tax for up to 15 years). 2) <u>Priority investment areas</u> with additional tax advantages + land provided at low cost + networks provided at low cost.
Advantages for export activities in particular	1) <u>Without VAT on the export product</u> 2) <u>Refund of input taxes</u> (not actually applied)	1) <u>Without VAT</u> on the export product	1) <u>Without VAT</u> on the export product 2) <u>Refund of input taxes</u> 3) <u>No profit tax for the first 5 years</u> , 50% profit tax for the next 5 years. 4) <u>Duty Drawback</u> : tax credit equivalent to 0.15% of the FOB value of the exported product	1) <u>Without VAT</u> on the export product 2) <u>Refund of input taxes</u> 3) <u>No import tax on imported inputs</u> used to produce an export product
Advantages for the cashew sector in particular		1) <u>Direct subsidy</u> of 400 FCFA/kg (665 USD/metric ton) of exported white cashew kernels (200 FCFA/kg for shelled cashew kernels)	1). <u>Additional drawbacks of export rights for cashew nuts</u> : tax credit of 5% of the value of exported cashew nuts, CNSL and Cardanol. This tax credit is increased to 7% of the value of exported roasted/salted cashew kernels.	

For a new cashew processing company around Nampula (Mozambique), compared with equivalent companies based around Bouaké (Ivory Coast), Tuticorin (India) and Đồng Xoài (Vietnam), the cost of taxes in the first 11 years (1 year of plant establishment + 10 years of operation) would be around double, as shown below.

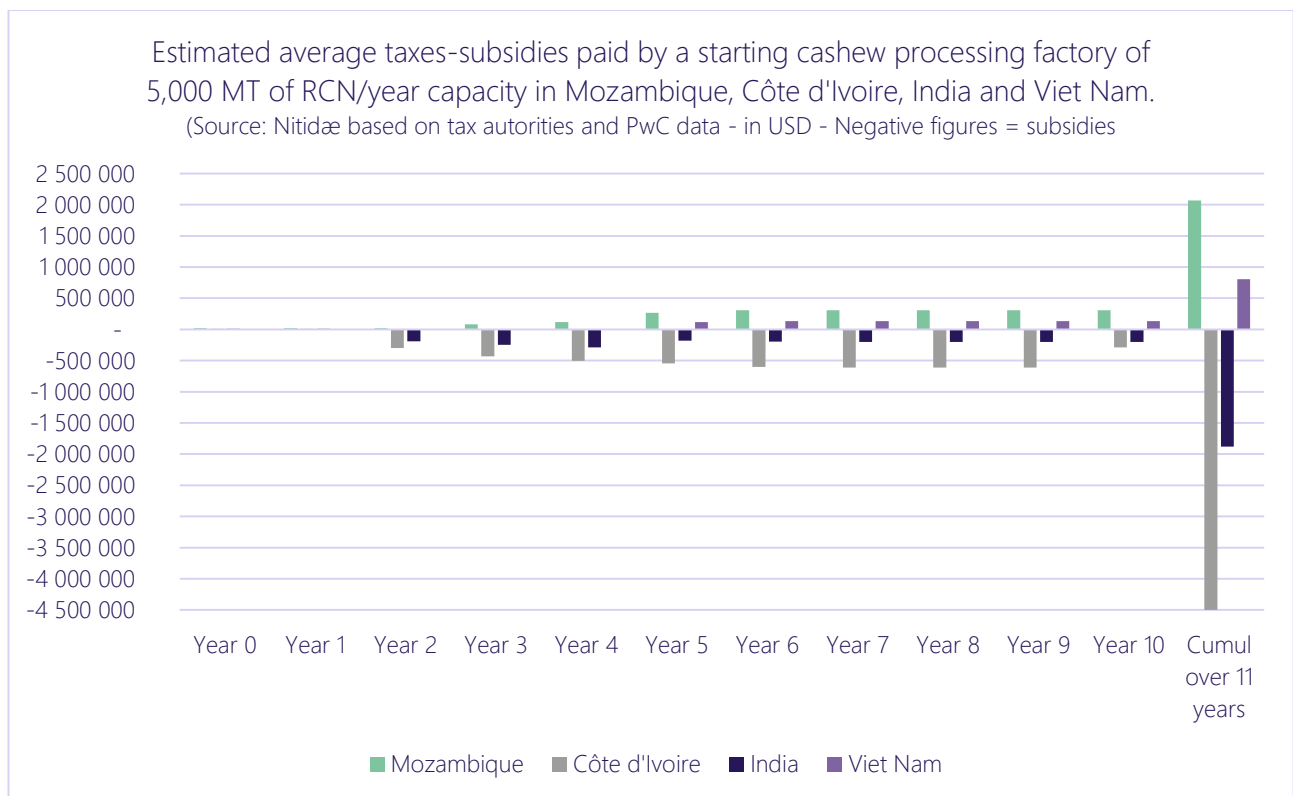


Figure 11. Chart with cumulated taxes paid by a new cashew processing company over 11 years.



When adding the actual subsidies (direct subsidy to cashew kernel exports in Ivory Coast and duty drawback of 5.15% in India), the incentive difference increases much more with a strong public support to the industry in both countries.

Figure 12. Estimated average of taxes and subsidies paid received by a starting cashew processing factory of 5,000 MT RCN/year in Mozambique, Ivory Coast, India and Vietnam





Estimated average tax paid and subsidies received by an initial cashew processing factory of 5,000 MT RCN / year in Mozambique, Côte d'Ivoire, India and Vietnam

Finally, after the incentive during the “investment phase”, the average “normal” tax level is also higher in Mozambique than in other competing countries, as shown below. Vietnam, in particular, has the lowest tax rate in the world.

Figure 13. Comparative table of taxes after the investment period in Mozambique, Ivory Coast, India and Vietnam (Source: PwC).

(Source: PWC)	Mozambique	Ivory Coast	India	Vietnam
Profit taxes after the investment phase	32%	25%	31 to 42%	20%
Dividend taxes paid to national shareholders after the investment phase	10%	10%	10%	5%
Dividend taxes paid to foreign shareholders after the investment phase	20%	15%	10%	5%
VAT on inputs for cashew processing (jute and plastic bags, equipment, etc.)	17%	18%	12 to 18%	10%

Hopefully, there is a specific point in terms of public taxes and levies for which Mozambique has the most competitive structure: the level of taxes on the payment of wages. These taxes are much lower in Mozambique than in competing countries.

Added to the minimum wage level, which is also much lower in Mozambique than in the other three countries (since the devaluation of the Metical in 2014/2015), the cost of taxes to employ unskilled labor in Mozambique is much lower than those from the Ivory Coast, India and Vietnam.

Figure 14. Comparison of taxes on wage payments (Source: PwC).

	Mozambique	Ivory Coast	India	Vietnam
Taxes on the payment of wages (%)	4%	15.45 to 18.45%	17%	22%
Minimum wage (USD/month)	75	100	75 to 140 (Depending on the state)	125
Payroll taxes (USD/month) for a worker with a minimum wage	3	15.45	13 to 24	27.5

This last point turn manual processing much more competitive in Mozambique than in other major cashew processing countries. This can largely explain why the actual processing in Mozambique is less mechanized than in other countries.

Guarantee Fund

Another incentive from the Mozambican government is the guarantee fund that was created in 2001, as a result of an agreement between Banco Comercial de Investimento (BCI) and the Instituto de Fomento do Caju, to provide bank guarantees for projects in the field of cashew and other crops defined by the Ministry of Agriculture and INCAJU. Financing is directed to small and medium-sized companies at favorable rates of 10 to 15%, with a coverage level of 80% of the total amount.



To be funded the projects should promote cashew farming, investment in the cashew industry development, processing or marketing, or cashew nuts and kernels production and quality increased; the deposit in the guarantee fund is 50,000,000 MZN.

Financing can be:

- Short Term financing, to support the treasury in the cashew industry;
- Medium and Long Term financing, for investment in the cashew industry and projects that promote the sustainable increase in production and the quality of cashew nuts and cashew kernels;
- Long-term financing, projects that promote cashew farming. Loan amounts vary from:

Companies	Minimum Amount (MZN)	Maximum Amount (MZN)
Small	600,000.00	1,000,000.00
Averages	3,500,000.00	7,000,000.00

The guarantee fund signed with BCI remains active, but with fewer activities and projects.

Currently, INCAJU has a new guarantee fund with the National Investment Bank (BNI), with a deposit of 60,000,000 MZN revenue also derived from the income from the Tax on RCN exports. The criteria are similar to the agreement with BCI, the same degree of coverage, targeting small and medium-sized companies, but with a financing limit of 5,000,000 MZN and subsidized interest rates ranging from 10 to 27%.

Therefore, the guarantee fund is aimed at small and medium entrepreneurs who would like to invest in the cashew industry or expand their business and facilities. The submitted projects to date presented a social component in that it generates employment in the area of processing, women inclusion as the main labor in the companies, construction and opening wells for water access for the local population, etc.

However, large industrial companies do not benefit from this guarantee fund, which is too small for the activities they carry out.

Industry Fund:

Another fund that is under development by the Ministry of Industry and Commerce in partnership with the National Investment Bank and Confederation of Economic Associations of Mozambique (CTA) is the Industry Fund, which aims to benefit micro and large companies in priority sectors, the agro-industry being one of them, therefore the cashew processing companies may be potential candidates for financing.

PROPARCO:

PROPARCO is a subsidiary of the French Development Agency that participates in the financing and support to companies in several countries, Mozambique being one of them. One of the sectors covered is the agro-industry and the agency has financing options through commercial banks that could benefit the cashew processing industry.

Currently, they have two bank guarantee options: ARIZ and EURIZ. These options aims to finance small or large companies in different sectors that have an important development impact, such as agriculture, or



projects and clients that belong to groups that have difficulty accessing financing, such as women and young people.

3.3. Labor cost in Mozambique

The cost of unskilled labor is certainly the best comparative advantage for cashew processing in Mozambique after the cost of the RCN.

According to various industry players, Mozambican workers in cashew factories have relatively good productivity. The number of kg/hour in shelling stages is slightly less than the Vietnamese workers, but very close to Indian workers and more productive than the others African countries.

This good productivity is closely linked to the long history of cashew processing in Mozambique. Many workers have several years of experience in peeling, unlike other African countries.

Figure 15. Comparison of cashew peeler productivity (Source: Industry).

Quantity of RCN shelled per worker per day (or 8-hour session), in kg				Quantity of kernel peeled per worker per day (or 8-hour session), in kg			
	Min	Max	Average		Min	Max	Average
Vietnam	40	50	45	Vietnam	9	12	10.5
India	35	45	40	India	8	12	10
Mozambique	35	45	40	Mozambique	7	12	9.5
Ivory Coast	30	40	35	Ivory Coast	7	10	8.5

Added to this good productivity, the particularly low level of wages in Mozambique, when compared to its competitors, makes the cost of labor to be one of the cheapest in the world.

Below are presented the wages of unskilled workers in the 4 countries. As in India, regulated wages vary widely from state to state, the main states are present in the table.

Figure 16. Comparison of minimum and maximum wages for unskilled workers in the main cashew processing areas.

Wages for unskilled workers								
	in local currency			Exchange rate	in USD			
	Min	Max	unity	1 USD =	Min	Max	Average	unity
Mozambique	4390	7000	MZN / month	63	69	109	89	USD / month
Tamil Nadu (India)	4163	5163	INR / month	70	59	73	66	USD / month
Maharashtra (India)	5096	5496	INR / month	70	72	77	75	USD / month
Odisha (India)	6012	7902	INR / month	70	85	111	98	USD / month
Kerala (India)	8280	9120	INR / month	70	117	128	123	USD / month
Karnataka (India)	9911	11876	INR / month	70	140	167	153	USD / month
Average India					94	111	103	USD / month
Ivory Coast	60000	70000	FCFA / month	596	99	116	107	USD / month
Vietnam	2920000	4180000	VND / month	23200	126	180	153	USD / month



With the lowest minimum wage after the state of Tamil Nadu in India, and a worker productivity very similar to the one in India, Mozambique probably has the lowest cost of unskilled labor in the world, just after Tamil Nadu.

Below is calculated the minimum, maximum and average cost of labor for manual peeling and manual shelling in the 4 countries.

Figure 17. Estimation of the cost of manual peeling and shelling in Vietnam, India, Mozambique and Ivory Coast (Source: Nitidae).

Manual shelling cost in USD / MT RCN				Manual peeling cost in USD / MT RCN			
	Min	Max	Average		Min	Max	Average
Vietnam	126	157	142	Vietnam	105	165	135
India	73	239	152	India	49	209	129
Mozambique	76	156	116	Mozambique	57	156	107
Ivory Coast	124	193	158	Ivory Coast	99	165	132

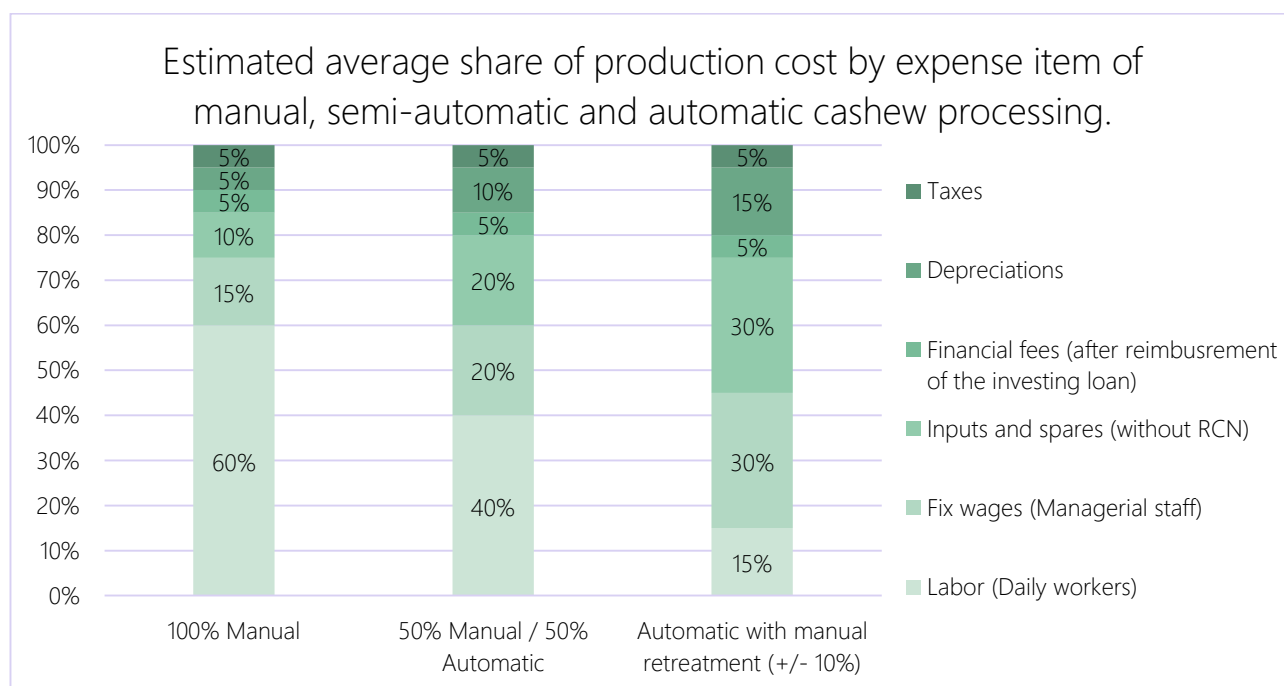
Assumption: The cost of shelling in USD / MT of processed RCN was estimated, as it is the most common unit used in the cashew processing sector. The conversion rate is 1 kg of cashew kernel = 5 kg of RCN

Other cashew processing operations using unskilled labor (handling, de-shelling, classification) also benefit from these lower costs.

The main issue regarding this advantage is that, with the growing automation of cashew processing, its positive impact on the total competitiveness of the industry is decreasing. Even if unskilled labor is always necessary to treat the unshelled nuts and unpeeled kernels, the share of labor in total processing cost have strongly decreased during last decade. As presented below, if labor (daily workers) amount for around 60% of the processing cost in a 100% manual factory, it amounts for only 15% in a 100% automatic factory, which is the process model that most of the new factories in the world are choosing.



Figure 18. Share of unskilled manpower among other production costs depending of the processing technology.



That is why this advantage in Mozambique will become less and less decisive in the future, and may even delay the mechanization of cashew processing in the country.

3.4. Women in processing

The cashew industry is responsible for employing around 15,600 employees, with more than half of women workers. It represents an alternative income for rural households relying on agriculture for food consumption and some cash crops such as cashew. To facilitate access to raw materials, industries have been built close to cashew nut producing areas and benefit also from access to local labor. Hence, the families living from agriculture and cashew production are the same ones that work in the industry for the processing of the cashew nut.

Cashew industry wage is defined by a specific sector agreement, therefore the minimum wage is different from the industrial or the agriculture sectors, since workers are dedicated to both activities. The wage was agreed by the National Union of Agricultural and Forestry Workers (SINTAF) and the cashew nut processing industry that signed an agreement for a minimum wage of 4,610 meticaís, established between the minimum wage in the agricultural (4,390 MZN) and the industrial (7,000 MZN) sector. However, in practice the companies pay an established minimum wage completed by an additional amount depending of each employee productivity. In other words, companies establish daily processing goals for each session and each employee will be paid according to the amount of nuts processed.

From this salary, is discounted 150 MZN/day of absence, so many employees may not even reach the minimum wage. Some companies reward the employees that reach their production goal, with a 100-120 MZN/week bonus, a strategy that aims to encourage attendance and increase the employee productivity.

The rural population rely on agriculture and get their income from the machamba (agricultural field), the industry still represents an alternative income. The opportunities offered by the industry do not yet provide



enough stability for workers to dedicate themselves only to this activity, and/or to turn it as its main income to ensure their own food security, an issue that affects in particular their attendance at workplace.

Processing companies face employee absenteeism due to their location in rural areas where the local labor are farmers working only temporarily in such companies out of the agricultural calendar. When it's the planting and harvesting periods, companies face the absence of employees for whom agriculture constitutes their priority. In some areas, employee turnover is not seen as a problem due to the large supply of labor, but in other areas it can be seen as a problem as unexperienced workers have a much lower productivity than others that have been in the industry for years.

Based on discussions with employees from different companies, the main reasons for absenteeism are health problems and death. Other reasons that have not been pointed out, as employees do not recognize such reasons as problems, or do not link them to absenteeism, are the excessive workload of women, little economic incentive, and few guaranteed labor rights.

As women won the right to go to work outside their homes, in companies, to help increase their families' income, many found themselves with the obligation to get jobs that could provide a higher salary than their previous job or the agricultural revenues their field could provide them. However, this achievement did not exclude or dilute their other responsibilities with their partners; they were accumulated creating a double workday. Women continue to be responsible for all activities related to their home and family, such as: taking care of children and elderly relatives, cleaning the house, working in fields to produce food for subsistence, going to the market, etc.

This extensive workload can cause physical and psychological exhaustion for women, who are usually ignored by the society. This is due to their responsibility to carry out these jobs without any recognition and in precarious conditions. The responsibility for raising children also stays with the woman, but she does not always have the conditions or support to take care of the children and go to work; so she relies on the daycare centers that the processing companies provide, find another relative or neighbor who can take care of her children or leave them at home under the supervision of her eldest child.

The processing companies have facilities to receive the children of their employees (day care centers), simple facilities and mostly without the supervision of a responsible adult. For mothers who are still breastfeeding their children, companies allow breaks for them to breastfeed their children and offer food (breakfast and lunch) for all children and employees.

According to conversations with SINTAF, most employees in the sub-sector do not have contracts signed with the cashew processing companies, and do not have access to their labor rights or even know them. In some cases, even having contracts with companies, they do not have a social security record that guarantees remuneration during periods of illness, maternity leave or after work accidents. Therefore, the lack of contract means that these workers are seasonal, do not have economic stability or any fixed connection with the companies, so they do not dedicate themselves exclusively to the industry and are always primarily relying on their agricultural activities.

The precarious facilities of the processing companies to welcome the children of employees do not contribute to break the vicious cycle of poverty, as older children continue to be deprived of attending schools to assume other domestic responsibilities, thus aggravating the problem of illiteracy in the country. Usually this situation tends to be more serious for young girls who culturally inherit this domestic responsibility and tend to drop out of school earlier for the same reasons. Women are also at a disadvantage because they are responsible for the care of sick and elderly relatives who force them to leave work and receive various salary discounts. They are not entitled to receive maternity leave, which makes them



dependent on relatives and husbands who have revenues, they have difficulty going back to work after the birth of their children due to the lack of support.

For this reasons, the regularization of the cashew industry workers to secure them with a stable paid work, good working conditions and specific qualifications can bring better returns to cashew nut processing companies.

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4 Competitiveness of cashew processing in Mozambique

4.1. Investment costs (CAPEX)

4.1.1. Land costs:

Land is relatively cheaper in Africa, in general, and in Mozambique in particular, than in Asian cashew processing countries, due to the lower population density and lower cost of life. We estimate the cost of land acquisition to build a cashew factory in industrial or rural area between 1 and 5 USD/m² for a 50-year concession in Mozambique. In comparison, the cost in India is estimated at between 5 and 15 USD/m² and between 10 and 20 USD/m² in Vietnam.

The cost of land provide a small advantage for Mozambique compared to Asian countries, as it can represent 2 to 6% of CAPEX in Mozambique against 12 to 24% of total CAPEX in Asia. The cost of land in other African cashew processing countries is almost the same, with the exception of Nigeria, where the cost of land is much higher.

4.1.2. Construction costs:

Earthwork, construction of buildings and connection to networks (water and energy) are relatively more expensive in Mozambique than in Asia. This is due to the import of part of the building materials and, compare to Asia, to the reduced presence of construction companies capable of and equipped to construct industrial buildings.

Construction costs in Mozambique are estimated to be 20% higher compared to Asia. For a cashew plant with a processing capacity of 5000 MT of RCN/year (+/- 50,000 m² of earthworks and +/- 5000 m² of buildings), the construction price is estimated between 1.2 and 1.6 million dollars in Asia, compared to between 1.4 and 2 million dollars in Mozambique depending on the choices of materials and optional buildings (extraction of cashew nut liquid - CNSL, daycare centers, restaurant, etc.).

4.1.3. Equipment costs:

Due to import costs and negotiation disadvantage with foreign suppliers, the cost of processing equipment imported in Mozambique is estimated to be between 5 and 10% higher than in Asia.

For a fully automatic cashew plant with a processing capacity of 5000 MT of RCN/year, the cost of the equipment, depending on the technology, organization and chosen suppliers, can vary between 650,000 and 1,050,000 USD/MT in Mozambique, while it costs between 550,000 and 950,000 USD/MT in Vietnam or India.

The other initial costs (vehicles, stock of consumables and project design) are also higher by +/- 10% compared to Asia, due to higher import costs and less local offer from suppliers and service providers.

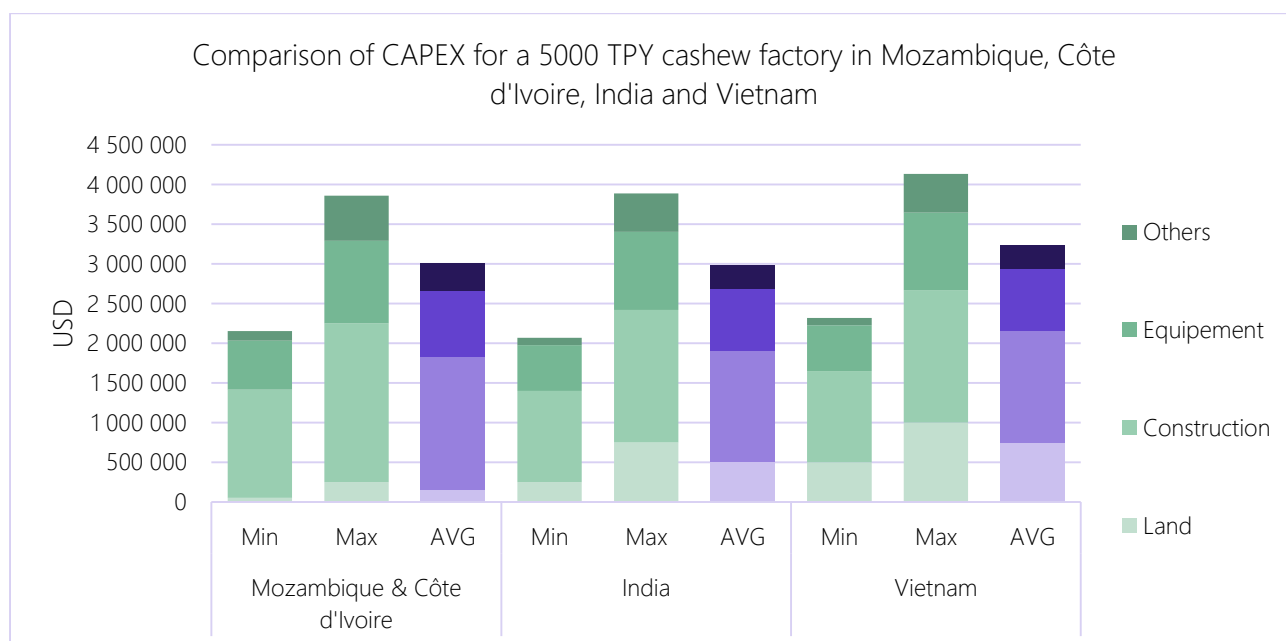


4.1.4. Total CAPEX costs

Finally, including cost of land, construction and equipment, the total CAPEX costs in Mozambique are quite similar to those of India and slightly lower than in Vietnam, where the higher cost of land overpassed the lower costs of construction and equipment.

But the CAPEX differences between Mozambique and its main competitors are relatively limited and does not exceed 10%. The total CAPEX for a fully automatic cashew plant with a capacity of 5,000 MT can vary between 2 and 4 million USD in all 4 compared countries, mainly depending of the location, technology and organization of the factory.

Figure 19. CAPEX comparison for cashew factories in Mozambique, Ivory Coast, India and Vietnam.



As described in the following paragraphs, the main differences are due to the OPEX and Risk assumed by the Mozambican industry.

4.2. Operational costs (OPEX)

4.2.1. Variable costs

Raw material (Raw Cashew nut - RCN)

At first glance, the price of raw cashew nuts (RCN) is the strongest advantage of the Mozambican industry. Thanks to the tax on RCN exports and the saving of the export costs, Mozambican processors theoretically benefit of a much lower price to buy raw material than Asian processors.

For instance, in February 2020, for RCN of Mozambique with an outturn of 46 lbs/bag delivered at his factory, an Asian processor would pay around 1300 USD/MT, while a Mozambican processor would pay around 750 USD/MT (45 MZN/kg) for the same product.

The costs that generate this difference are detailed below.



Figure 20. Comparison of RCN acquisition cost between Mozambican and Asian factory in 2019/2020.

Values in USD/Metric Ton	Mozambican Factory	Vietnamese or Indian factory
RCN price in the field	550	550
Harvest and transport costs	200	200
Fobbing costs		250
Mozambican export tax on RCN		230
Sea freight and transportation at destination		70
RCN price arrived at the factory	750	1300

But in reality, this difference is generally much smaller for two reasons:

- 1) The Mozambican industry makes its procurement during a low supply period in the international market. 80% of world production is concentrated in the northern hemisphere and available at the factories between March and September. The Mozambican cashew nut, generally available in Asian factories in January/February, pays on average a higher price than the same quality during the central season of the northern hemisphere. This peculiarity of the harvest schedule in Mozambique (but also in Tanzania and Madagascar) considerably reduces the price difference between an Asian factory that buys only 10 to 20% of its annual needs during this period and a Mozambican factory that has to buy 100% of its raw material during this period of low-supply.
- 2) Quality: the average quality of Mozambican raw cashew nuts is relatively low. The quality of the cashew nut is expressed mainly through outturn, which is an evaluation through the analysis of a representative sample of the cashew nut yield of a batch of raw cashew nuts. In Asia, processing plants, mostly manuals, are generally specialized in processing only batches of good quality cashew nuts: outturn of 48 pounds/bag and more. Other highly automated factories are only specialized in the processing of poor quality nuts at low prices. In Mozambique, as companies only have access to local production, they have to process all types of quality and cannot specialize in a particular outturn. When, as in recent years, the average quality is less than 48 lbs/bag, they obtain very low processing yields (both in terms of daily yield, quantitative and qualitative yields (see the paragraph on the different processing yields). In addition, when processing is mostly manual, workers who have part of their wages indexed to the total yield of the whole cashew nut kernel are discouraged because they earn less by shelling empty nuts or containing damaged cashew nut kernels. Under these conditions, absenteeism rates tend to increase. The only solution for processors who want to retain their staff is to increase the variable salary rate, which greatly increases their variable salary costs.
- 3) Price volatility: This topic will be developed in the paragraph "5.1. A limited production period"

Losses of money during purchases

Mozambican (and Ivorian) processors must rely on local traders or cooperatives to supply their factories. To purchase RCN efficiently, they must fund those suppliers before the start and during the season. Every year, some traders disappear with the money without bringing the nuts. Other suppliers deliver RCN with a much lower quality than what was initially contracted, but to continue getting the product, processors cannot ask them for quality compensation. We estimate that these losses during the acquisition cause a loss equivalent to between 1 and 1.5% of the money invested in RCN procurement.

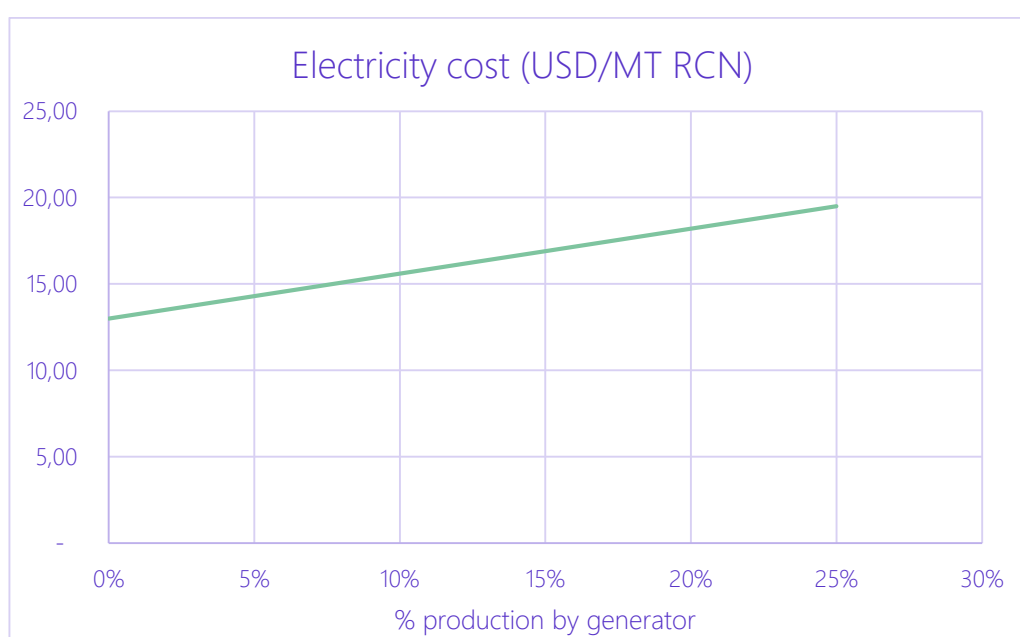


For Asian processors who import RCN from Africa, this risk is much less, because the Credit Letter used in international trade is a secure way of payment based on the exact quantity and quality control during the container filling. Even if some losses may occur on Asian processors, mainly in terms of contracted quality, they are much lower than those of African processors.

Energy

Factories tend to be located in peri-urban areas, some in industrial areas, others prefer to be close to the population to facilitate access to labor. In such cases, the electricity supply may not be properly constant, and factories must use generators to avoid production interruptions. This incurs additional operating expenses in the energy category. As you can see in the graph, electricity costs increase rapidly due to the use of a generator set.

Figure 21. Electricity cost, depending on the use of a generator.



Energy costs represent an average of 13.5 USD/MT of processed RCN, if 100% of the electricity comes from the EDM line. These costs can increase to > 20 USD/MT with the use of generator sets (e.g. in the graph, costs increase by 18 USD/MT with a 20% generator production share).

Proportionally, the basic cost of electricity represents 1.3% of the total production costs in factories (one percentage comparable to other countries analyzed), but may weigh more in factories that use generator sets (2% when the price of kWh reaches 23 USD/MT, extreme case), which creates a comparative disadvantage for Mozambican processors.

However, it would not be correct to conclude that energy costs are an important component in competitiveness. The energy problem stems from the quality of the electricity supply, rather than the cost. This is especially true in the case of factories around the city of Nampula. In fact, processors experience unpredictable production shutdowns due to power cuts; which alters the rhythms of production, and sometimes with consequences of malfunctions of the machines, sometimes as a result of breakdowns due to fluctuation of voltage. Some factories have decided to invest in voltage regulators to protect the most delicate equipment.



Therefore, the effects of power cuts cannot be measured only in the energy cost budget line. However, processors in the Meconta area have no complaints about the quality of the power supply after the installation of the electrical substation in Namialo.

Finally, an observation about the electrical installations of the factories: the cashew industry operates numerous rotating machines that are operating alternatively. Stopping/starting these machines produces minor distortions in the electrical network. The sum of these distortions affect the power factor ($\cos \varphi$), which can fall around 0.8. In a nutshell, with a power factor of 0.8, only 80% of the electricity received by the factory is actually used. However, the factory will be paying 100%.

An electrical installation that took into account the contribution of rotating machines includes capacitor batteries to dampen their effects on the network, resulting in a correction of the power factor (values around 0.9 - 0.95). The investments associated with this energy efficiency measure are not very important.

Inputs

Apart from water and energy, most of the inputs used in cashew processing are imported, while in India and Vietnam, most of them are produced and available locally throughout the year in large quantities.

These inputs are numerous, but the main ones are packaging (jute bags, boxes, plastic bags), spare parts and maintenance tools, packaging gas, clothing and tools for workers, and cleaning tools and products.

The cost of inputs can vary from factory to another, but it can lead to an additional cost between 5 and 10 USD/MT of RCN processed in Mozambique in comparison with Asian countries. In West Africa, some of these inputs are even more expensive, because the import cost is even higher, as they do not have the advantage of being able to buy them in South Africa.

Variable wages

As developed in paragraph 3.3, the cost of unskilled labor is relatively lower in Mozambique than the cost in Asia or Ivory Coast.

In an automatic factory, this difference of cost provides a slight advantage to Mozambique, with lower variable wage costs of +/- 5 USD/MT of RCN processed when compared to Vietnam, by 15 USD / MT when compared to India (less for the state of Tamil Nadu, which is even more competitive than Mozambique), and by 20 USD/MT when compared to Ivory Coast.

Fobbing and freight

The cost of fobbing (port transit) during exports at Mozambican ports is one of the most expensive in the world. It is an advantage for local processors when competing with RCN exporters to purchase RCN, but it is a disadvantage to export cashew kernels in containers.

Compared to Vietnam, the additional cost is about 25 USD/MT of exported cashew kernels (5 USD/MT of processed RCN). Compared with Ivory Coast and India, the additional cost is about 20 USD/MT of exported cashew kernels (5 USD/MT of processed RCN).



Waste Management

While in Asia, cashew shells are a by-product that providing additional income, in most Mozambican factories, cashew shells are waste that generate cost to be evacuated, and burnt close to the factory or in a nearby area.

This cost may vary between 1 and 5 USD/MT of processed RCN, depending if the factory can easily burn the shells within the plant area or have to transport them to another location, paying a service provider, or employing people and using their own trucks to move the shells.

Financing cost

Thanks to their ownership by multi-activity industrial group and to the support of Incaju and BCI bank, most of the current processing plants can access credit at rate quite lower than the average interest rate in Mozambique which reach 28%. Even so, many of those groups get interest rate higher than the rate available in Asia or Ivory Coast. In Côte d'Ivoire, a cashew processing factory can get an interest rate between 9 and 12%, in India, between 6 and 8%, in Vietnam, between 5 and 7% while in Mozambique few factories are able to get loans below 10% even when they can provide considerable assets as guarantee and with support of Incaju.

A second important point is that loans needed by cashew factories in Mozambique are much bigger than those needed by Asian or even West African processors as the procurement period is much shorter in Mozambique.

When a factory that processes 4500 Metric Tons of RCN per year in Vietnam needs a loan equivalent to a maximum of 1000 Metric Tons of RCN, a factory based in Mozambique will need a loan covering all 4500 Metric Tons of RCN to be able to purchase this quantity in less than 2 months.

For this reason, interest paid by Mozambican processors to supply their RCN represent between 10 and 20% of the total processing costs. While they are equivalent to between 5 and 10 % of the processing costs in Asia and between 10 and 15 % of the processing in West Africa where the procurement can be spread over 5 to 6 months.

Taxes

As presented in paragraph 3.2, taxes on profits are much higher in Mozambique than in Asia. After the investment phase, they can reach around 20% of the processing cost, while they remain at around 8% in Vietnam and around 10% in India.

4.2.2. Fixed costs

Permanent staff

Due to the strong demand for highly trained and experienced managers, in particular with the growth of the extractive sector (Mining and Gas), the cost of qualified labor in Mozambique is also higher than in Vietnam and India. This situation has led many factories to hire foreign managers and technicians to supervise the production.



Overall, the cost of qualified permanent staff is almost 50% higher in Mozambique than in Vietnam and 36% higher than in India.

This cost is estimated below for an automatic cashew plant with a capacity of 5,000 MT/year.

Figure 22. Comparison of the cost of qualified permanent staff in Mozambique, Ivory Coast, India and Vietnam.

	Mozambique	Ivory Coast	India	Vietnam
Cost estimation <i>In USD / year</i>	680,000	630,000	500,000	460,000
% of processing costs	41%	39%	31%	28%

Competition between industries and extractive companies for qualified managers and technicians also leads to higher turnover than in Asia, which can decrease the productivity of many factories.

Maintenance and depreciation

With the need to import most equipment and spare parts, the cost of maintenance and depreciation is also higher.

Most factories are forced to build up stocks of spares and even import additional machines that they will keep to replace the broken ones to avoid workflow interruption. While in Vietnam and India cashew processing areas many stores with spare parts and new machines are available and allow for a quick replacement of any broken equipment.

With this situation, the cost of maintenance is estimated to be 40% higher than in Asia and comparable to Ivory Coast, even though in this country, some stores of cashew equipment have recently opened to take advantage of the growing industry.

4.2.3 Incomes

Yield/Outturn of cashew kernels (quantity and quality)

Due to better knowledge, longer experience in the sector and continuous innovation in cashew processing equipment, Vietnamese and Indian processors are able to considerably decrease losses during the processing of RCN.



The yield of the cashew nut processing is expressed through 4 important indices:

<p>Daily factory yield: Quantity of cashew nuts processed by the factory in one day of operation</p>	<p>Daily income from work: Amount of cashew nuts processed by a worker in an 8-hour workday.</p>
<p>Quantitative yield: Amount of marketable cashew kernel obtained at the end of each processing step and at the end of the entire processing chain.</p> <p>This yield varies according to the quality of the raw cashew nut stock at the supply point (outturn and moisture content) and the ability of the entire processing chain to limit losses (degradation during storage, small pieces broken during processing, cashew kernels that remain hidden inside the shells, product contaminated by the blades of the peeling machines).</p>	<p>Qualitative performance: Proportion of whole white cashew kernels at the end of the process. Each time a cashew kernel is broken, split or burned, it loses a significant part of its value. To be profitable the factory must try to obtain a maximum of whole white cashew kernels.</p> <p>This yield also depends both on the quality of the raw cashew nuts purchased and on the factory's ability to preserve as much as possible the whiteness and integrity of the cashew kernels.</p>

Much of the profitability of a cashew processing plant depends on the optimization of these 4 yields. It must be possible to process as much as possible, with as few personnel as possible, losing as little weight as possible and obtaining as many whole white cashew kernels as possible at the end of the process.

Thanks to a more efficient workforce, as it is more specialized and more experienced, but also due to its technological advancement, Vietnamese and, to a lesser extent, Indian processors are, on average, better in all 4 yields, even if there are important differences within the Vietnamese and Indian industries.

In consequence:

- First, they get a larger quantity of cashew kernels for the same processed RCN stock.
- Second, in a batch of cashew kernels, they get a higher rate of white whole grains (WW), which is the most profitable product in the cashew industry.

Thanks to this process optimization to reduce losses in quantity and quality, they will get more value for the same processed RCN stock than any other processing countries.

In percent, the difference may seem small: 1 or 2% more of the final amount and 3-4% more cashew kernels, White Whole (Full White), but these small optimizations substantially improve their income. With the same selling price, 1% more cashew kernels equals about 15 USD/MT additional processed RCN, and 1% more white whole cashew kernels equals about 7 USD/MT more processed RCN.

It is these two accumulated advantages with better selling prices (see below) that provide the biggest advantage for the Asian industry.

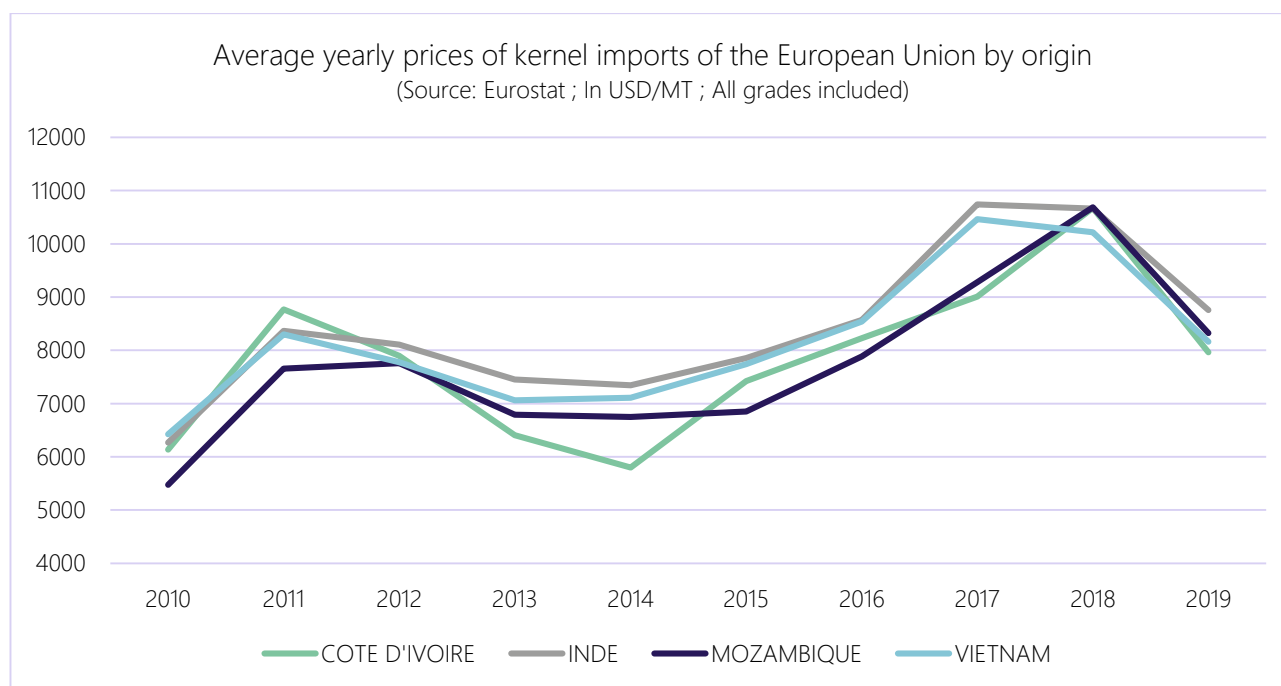


Sales of cashew kernels

The prices of cashew kernels depend mainly on the certification obtained by the factory (most Mozambican factories already have the HACCP certification, but none have the BRC certification that allows to obtain a good premium prices) and of the marketing strategy/position of the company.

Sales prices of African cashew kernels are generally similar or very slightly lower than those in Vietnam. However, as illustrated in the chart below, Vietnamese factories still get slightly better prices than Mozambican or Ivorian ones because of their a better/long term relationship with their clients.

Figure 23. Average annual cashew kernel price (all grades included) CIF EU by origin (Source; Eurostat).



Generally, Indian factories get higher prices for cashew kernels, for several reasons:

- Local market: the main reason is that they have access to the largest cashew market, their domestic market, protected from the import of cashew kernels from other countries by a very high minimum import price system. This local market has much higher prices for broken cashew kernels than the international market and slightly higher prices for whole cashew kernels. So when their international buyers' offers low prices, they prefer to simply sell on the local market.
- Better reputation: Indian suppliers are considered more reliable and respectful of their commitments their commitments, and better suppliers, because they do not try to renegotiate prices after signing a contract, and their exports are rarely delayed.
- Long-term relationship with their clients: as India was the main cashew processor throughout the 20th century, several importers in the world have become used to work with them and prefer to continue buying from them at a higher price than starting to buy with new, unknown suppliers whose cashew quality and flavor may be different from what they get from Indian suppliers.

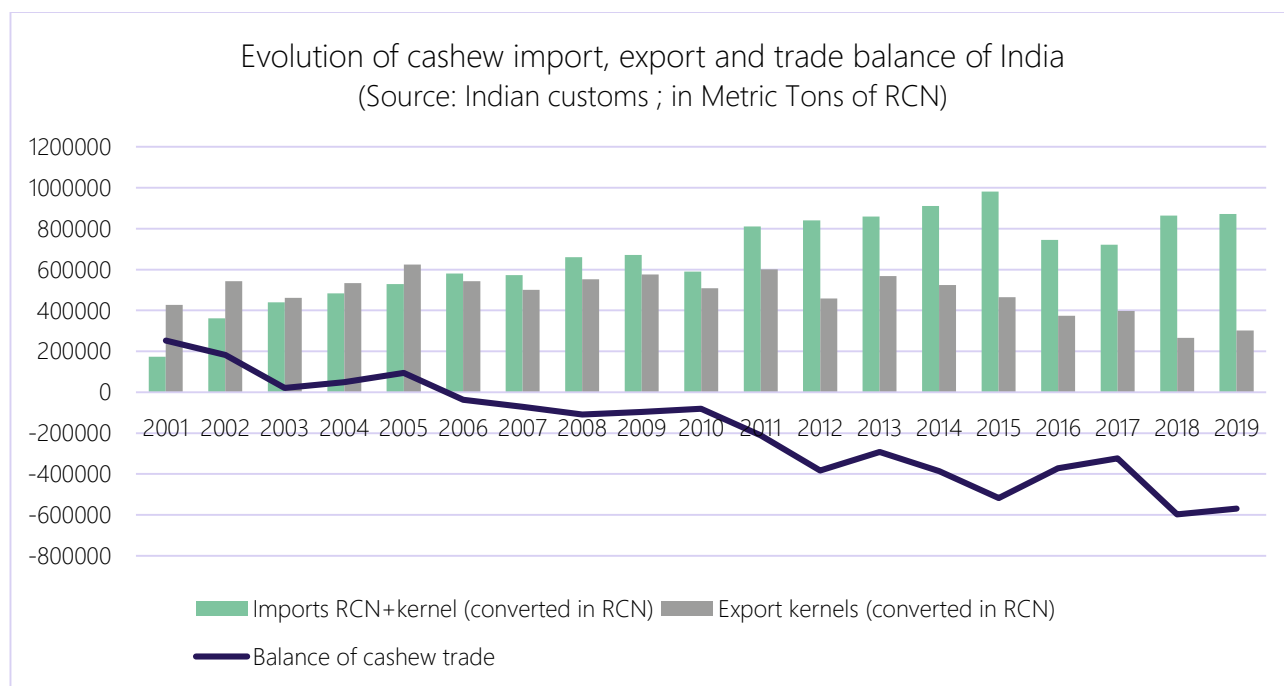
Meanwhile, with the higher prices they offer to the international market and with their processing which less and less competitive with Vietnam, Indian kernel exporters are losing market shares in the international



market since several years and should probably continue in the following year as they get more and more protectionist with their local market, disconnecting it from the international market.

As visible in the chart below, the trade balance of cashew import and export in India is negative since 2006 and its deficit is growing rapidly. This means that India is already a net importer of cashew nuts and will probably cease to be the second largest exporter on the international market after Vietnam in the next decade.

Figure 24. Evolution of India's cashew trade balance from 2001 to 2019 (Source: Indian Customs).



Overall, one can consider that Mozambican (and Ivorian) processors obtain an average selling price 5 to 10% lower than Indian processors and, of 0 to 4 % lower than Vietnamese processors.

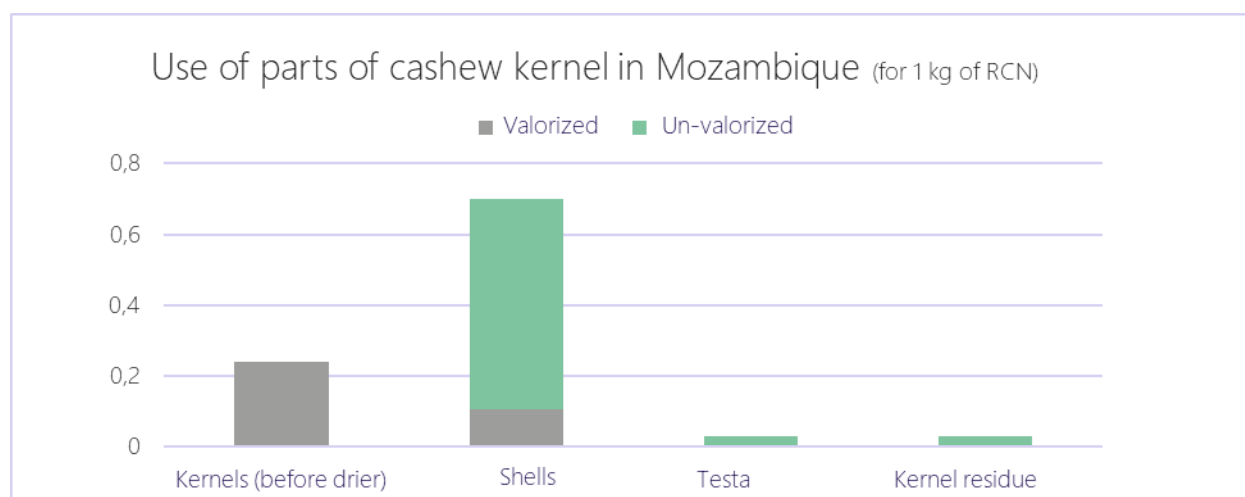
Sales of by-products

The cashew industry has the potential to be a “zero waste” chain, to put it another way, that all materials can be valued in different processes.

It can be compared to the sugar industry, where all the residual materials in the process chain (bagasse, molasses) can be used, either in the same process, or to feed other processes and industries. However, in the Mozambican cashew processing chain, little added value is currently given to materials other than cashew kernels. Only the cashew kernels valid for commercialization and a small part of the shells are valued. The value of cashew nuts is 30.5% of the weight on average.



Figure 25. Use of kernel parts in Mozambique.



In India and Vietnam, almost all cashew shells are sold or used. The largest factories extract CNSL (liquid from the shell) and sell CNSL to the chemical industry and the liquid-free shell (cake) to the industries that use it as fuel. Smaller factories and also those located in clusters, common industrial zones, sell the shell to companies specialized in CNSL extraction. Studies by the African Cashew Alliance indicate that competitors in India and Vietnam obtain a benefit from the sale of the shell and its derivatives, from between 30 to 60 USD per ton of processed RCN¹⁸.

Even cashew pelicule (testa) is sold to industries that use it to make products as diverse as food or textile dyes, food antioxidants or animal bedding. Too much damaged cashew kernels (moldy, rotten or contaminated by insects) are generally used as food for animals (chicken, pig, cow...). These cashew by-product markets are providing small, but additional, revenues to factories in Asia.

In Mozambique, few factories (Condor, Indo Africa, CN Caju) already value cashew shell and, for those that export CNSL, the price they obtain is very low, due to transportation costs, compared to the price than Asian factories get. This represent a major loss of income for the Mozambican industry. Some processing partners even sell some quantities of shell for CNSL extraction, at 2 Mt/kg (or 33 USD/MT of shell, and 24 USD/MT of RCN). Generally, neither the damaged testa nor the cashew kernels are valued in any way. Oilcake is minimally valued in the case of Condor, who sells part of the produce to a company that sells improved stoves adapted to this fuel.

¹⁸ Away4Africa & Fúnteni Installations et conseil, "Environmental Study of Waste Management in Cashew processing in eight African countries," African Cashew Alliance, 2018.



Figure 26. Current status of most cashew processing factories in Mozambique.



The sale of shell by-products represents an opportunity for processors, which is only now beginning to be explored. Other by-products can also find a national market and create additional revenue. If these by-products were processed directly by the cashew processors, the benefit would be maximum for them; however, this is generally not the case – nor is it for Asian competitors that can for example sell their the testa and cashew residues to other actors for processing.

Figure 27. Optimized chain of cashew nut by-products valorization in Mozambique.



The commercialization value of these products as described above has been estimated (minimum, maximum and average amounts) in the Mozambican case. The Figure 28 present the average sales of the different cashew nuts products, including the marketable cashew kernels (the equivalent of 1,600 USD/MT RCN corresponding to an average price of 8,000 USD/MT of cashew kernel). The by-products of the shell after extraction (CNSL and oilcake) represent on average 5% of the value of the cashew kernel. They can add a revenue, of 36 to 113 USD per MT of RCN equivalent. If the shell is not extracted by the factory itself, the revenues would be +/- 24 USD/MT RCN, which is a lower profit, but does not require any shell processing costs.

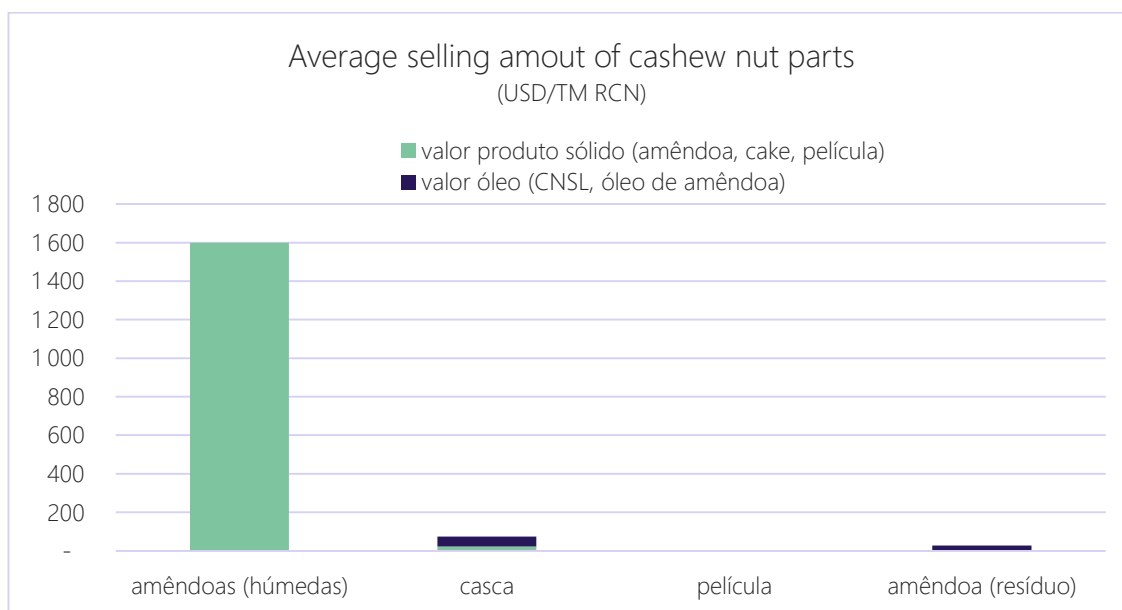


The potential market for cashew nut by-products in Mozambique is discussed in the Market Opportunities for Cashew nut by-products.

Figure 28. Potential commercialization value of cashew nut by-products in Mozambique.

	1 kg RCN, in which									
	0,24	kg cashew kernels (moist)								
					Selling prices (USD/MT)		Marketing value (USD/MT)			Share of the value
					min	max	min	max	Average	Average
	0,7	kg of shell	0,548	Torta	12,08	72,49	6,61	39,69	23,15	19%
			0,146	CNSL	200	500	29,20	73,00	51,10	51%
	0,03	kg testa	0,027	testa	0	92	-	2,48	1,24	1%
	0,03	kg of rejects cashew kernels	0,008	Cashew kernel cake	100	200	0,80	1,60	1,20	1%
			0,021	Cashew kernel oil	900	1620	18,90	34,02	26,46	0,3%
Total	1,00		0,750				55,51	150,79	103,15	100%

Figure 29 : Average selling amount of cashew nut parts (USD/MT RCN)





Box 1: The cashew apple (or accessory fruit):

The Cashew apple is not a by-product of the cashew industry. In fact, in order to ensure a good conservation during the transport and storage of the cashew nut, it must be separated from the nut as early as possible. So no cashew apple arrives in the cashew factory.









Brazil and Go state in India, are the only two cashew growing areas where the accessory cashew apple market is well developed. In Brazil, cashew apple is sold as fresh fruit to consumers and also used as an ingredient for the production of juice, puree and ice cream. In the state of Goa, the cashew apple is used to produce a famous local alcohol called “Feni”, which is based on a mixture of coconut water and fermented cashew apple juice. Such valorization was possible thanks to the long-standing tradition of consuming cashew apple by the local rural population, which generated a demand for new urban consumers after rural exodus.

To be able to supply such cashew fruits and juices in cities, juice producers and manufacturers have selected cashew varieties with bigger, more resistant and less astringent fruits. The fresh cashew apple value chain is completely different from the kernel value chain. Farmers harvest the fruit from the tree (before it falls), pack it in special packaging to protect it, and traders transport it immediately the same day from the harvesting area to the consumption centers. To supply other states in Brazil than the Northeast (cashew producing region), the fruit must be transported by plane, but few quantities are exported to central and southern Brazil. When the fruit is eaten fresh, the cashew nut is considered as a waste.

For juice production, the value chain is the same until the factory. After separating the nut from the fruit, the fruit is immediately pressed and the cashew nut is sold to processors at a low price, because they are wet and some of them are not mature, so their outturn is generally very low.

An important point, even in Brazil, which is the only country with a strong demand for cashew apple in urban markets, the fruit is not appreciated by all consumers, the price of cashew apple juice is one of the lowest in the market (see below) and remains a small sector. Most cashew production is used to produce cashew nuts.

Figure 30. Screenshot of the price of cashew juice compared to mango, guava and grape juice on a supermarket website in Brazil. Source : Carrefour Brasil website.

			
Suco de Caju Concentrado Bela Ischia 1L	Suco de Manga Concentrado Bela Ischia 1L	Suco de Goiaba Concentrado Bela Ischia 1L	Suco de Uva Concentrado Bela Ischia 1L
Por: RS 7,19 em 1x no Cartão ou Boletô	Por: RS 7,24 em 1x no Cartão ou Boletô	Por: RS 7,24 em 1x no Cartão ou Boletô	Por: RS 11,49 em 1x no Cartão ou Boletô
- 1 +	- 1 +	- 1 +	- 1 +
COMPRAR 	COMPRAR 	COMPRAR 	COMPRAR 

It is also important to note than despite strong investment by large juice companies (Pepsi Co among others) in the production of cashew apple juice in India and Nigeria, this value chain did not meet a strong success in those countries. More generally, many development project aimed to support processing in almost all African countries and, so far, most experiences led to only few small companies, without strong growth or economic success.



4.3. Synthesis of advantages and disadvantages of Mozambican cashew processing

As Vietnam is currently the most competitive cashew processor in the world, we compare the advantages and disadvantages of cashew processing in Mozambique with Vietnam for 1 metric ton of processed RCN.

All figures considered are based on cost and prices during the 2019/2020 campaign. The green flag on the right indicate the advantages obtained by Mozambican processors (lower cost or higher income), red flags indicate the disadvantages (higher costs and lower income).

Figure 31. Detailed cost and incomes comparison between 80% automatic cashew factories in Mozambique and Vietnam.

Figures Nitidae Feb 2020: based on investigation and feedbacks from the industry	For same quality RCN (outturn):	46 Lbs/bag						Advantage & disadvantage of Moz (based on averages - in USD/MT)
	KOR (after process)	19,0%	20,5%	19,8%	21,5%	22,5%	22,0%	
		Mozambique			Vietnam			
		Min	Max	AVG	Min	Max	AVG	
Variable expenses								
Raw material								
RCN procurement	Price of RCN at factory gate in USD/MT	750	800	775	1200	1300	1250	▶ -475
Inputs								
Jute bags		16	18	17	10	12	11,0	▶ 6,0
Cartoon+plastic bags		22	24	23	18	20	19,0	▶ 4,0
Spares		25	28	26,5	15	16	15,5	▶ 11
Water		1	2	1,5	1	2	1,5	▶ 0,0
Power		13	14	13,5	16	17	16,5	▶ -3,0
Gaz de packaging		2	3	2,5	1	2	1,5	▶ 1,0
Diesel for generator		0	4	2	0	2	1,0	▶ 1,0
Wood		0	5	2,5	0	0	0,0	▶ 2,5
Worker clothes		1	3	2	1	2	1,5	▶ 0,5
Other supplies (office, cleaning, etc.)		2	3	2,5	1	2	1,5	▶ 1,0
Money								
Bank interest: Moz: 9 to 12% for 11month - Vietnam 5 to 7% for 2 month		55	88	71,5	10	15	13	▶ 59
Other bank fees	Letter of Credit, fees	3	4	3,5	2	3	2,5	▶ 1,0
Collateral management		0	10	5	0	8	4	▶ 1,0
Variable wages								
Handlers		1	2	1,5	1	3	2	▶ -0,5
Cutting		15	20	17,5	16	22	19	▶ -1,5
Peeling		15	18	16,5	15	21	18	▶ -1,5
Grading		3	4	3,5	4	5	4,5	▶ -1,0
Others								
Fobbing		18	19	18,5	12	13	12,5	▶ 6,0
Risk funding traders	Issues with funded suppliers	5	10	7,5	0	5	2,5	▶ 5,0
Waste management	Transport and burning of shells	0	5	2,5	0	1	0,5	▶ 2,0
Employe premiums or profit sharing		0	10	5	0	10	5	▶ 0,0
Fixed expenses								
Depreciation (remplacement of equipments)		55	60	57,5	45	50	47,5	▶ 10
Fix wages	Management and technicians	125	150	137,5	75	100	87,5	▶ 50
Fix taxes		3	4	3,5	2	3	2,5	▶ 1,0
Other fixed expenses		17	22	19,5	15	20	17,5	▶ 2,0
Total expenses without taxes on profit								
Total without RCN		397	530	464	260	354	307	▶ 156
Total including RCN		1147	1330	1239	1460	1654	1557	▶ -319



Quantity produced in kg for 1 MT of RCN processed									
		Mozambique			Vietnam				
		Min	Max	AVG	Min	Max	AVG		
White Wholes	55% in Moz ; 58% in Vietnam	100	118	109	118	135	127		
Scorched Woles	13% in Moz ; 11% in Vietnam	25	27	26	24	25	24		
Brokens	32% in Moz ; 31% in Vietnam	61	66	63	67	70	68		
CNSL	14%	140	140	140	140	140	140		
De-oiled caked	51%	510	510	510	510	510	510		
Testa	3%	30	30	30	30	30	30		
Damaged cashew + cashew	Recuperable losses	85	60	72	61	41	51		
Selling price in USD/kg									
White Wholes		7,00	7,50	7,25	7,00	7,75	7,38		
Scorched Woles		6,25	6,75	6,50	6,25	6,8	6,53		
Brokens		3,8	4,2	4,00	3,9	4,25	4,08		
CNSL		0	0,15	0,08	0,25	0,3	0,28		
De-oiled caked		0	0,01	0,01	0,05	0,1	0,08		
Testa		0	0,01	0,01	0,05	0,1	0,08		
Damaged cashew + cashew powders		0	0,5	0,25	0,5	1	0,75		
Incomes									
White Wholes		698	884	789	828	1046	934	▶	145
Scorched Woles		154	180	167	148	168	158	▶	-9
Brokens		231	276	253	260	296	278	▶	25
CNSL		0	21	11	35	42	39	▶	28
De-oiled caked		0	5	3	26	51	38	▶	36
Testa		0	0	0	2	3	2	▶	2
Damaged cashew + cashew powders		0	30	18	31	41	38	▶	20
Total incomes									
Total incomes	Per MT of RCN Processed	1084	1396	1240	1328	1647	1487	▶	247
Profit (before taxes)									
Optimum factory	Min cost and max incomes	249			187				
Average factory	Average costs and incomes	1			-70				
Weak factory	Max costs and average incomes	-90			-167				
Starting factory	Max cost and minimum incomes	-246			-326				
Profits (before taxes) in a scenario without the tax on RCN exports									
Optimum factory without the "sobretaxa"		24			187				
Average factory without the "sobretaxa"		-224			-70				
Net profit (after paying tax on profit)									
Optimum factory	Min cost and max incomes	159			150				
Net profit for national shareholders (after paying tax on dividend)									
Optimum factory	Min cost and max incomes	143			142				

As presented in this table, if we do not take into account price volatility and with the current tax on RCN, cashew processing is in average, more competitive in Mozambique than in Vietnam. The cost of processing is in average about 155 USD/MT of RCN higher in Mozambique than in Vietnam.

Better yields in kernels quantity and quality (more white whole) and access to a slightly better market in terms of prices and easiness to find clients provide additional incomes to Vietnam processors around 170 USD/MT of RCN processed.



To that additional incomes, the extraction and commercialization of by-products provide another revenue of about 85 USD/MT of processed RCN. Thus, Vietnamese processors accumulate on average a bonus of 255 USD/MT of processed RCN.

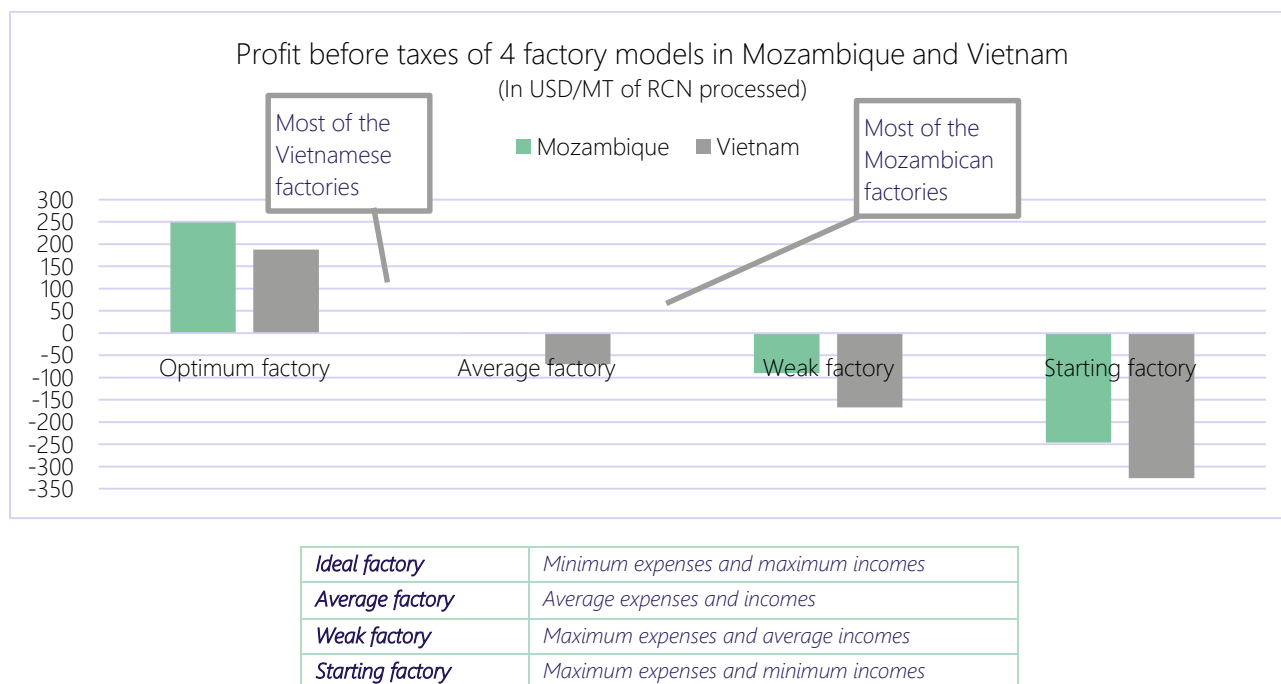
Without the tax on RCN exports, Mozambican factories would have a disadvantage of about -155 USD/MT of processed RCN.

Thanks to the tax on RCN, Mozambican processors obtain an advantage that compensate and even slightly overcome their disadvantages in terms of costs and incomes. If we include the tax on profit and dividend which are higher in Mozambique (36% and 10%) than in Vietnam (20% and 5%), the ideal factories in both countries would have almost the same net profit and the same profitability for shareholders.

This is why we can consider that the tax on RCN exports is very well designed and adapted to its objective of protecting the cashew sector in Mozambique.

The main issue, illustrated in the graph below, is that during a difficult period for cashew processing, as the 2019/2020 season, only average to ideal factories are able to continue working without major losses. In such situation, in Vietnam, many “average factories” close their doors or work as subcontractors in “tail processing” for the most competitive ones. While in Mozambique, most factories cannot simply stop working if they do not want to close for the whole year.

Figure 32. Comparison of Net profit of cashew processing plants in Mozambique and Vietnam depending of their costs and incomes performance (Source: Nitidae)



Also, several factories in Mozambique are in the condition of “weak factories” or even “starting factories” with less than 5 years of existence. In that case, it will be very difficult for them to survive to the 2019/2020 season. In conclusion, we can say that theoretically the Mozambican industry should be competitive in the international cashew market thanks to the tax on RCN exports, and if the processors are able to optimize their costs and the marketing of their production, which is not an easy task as they face additional risks compared to other countries as presented in the next paragraphs.



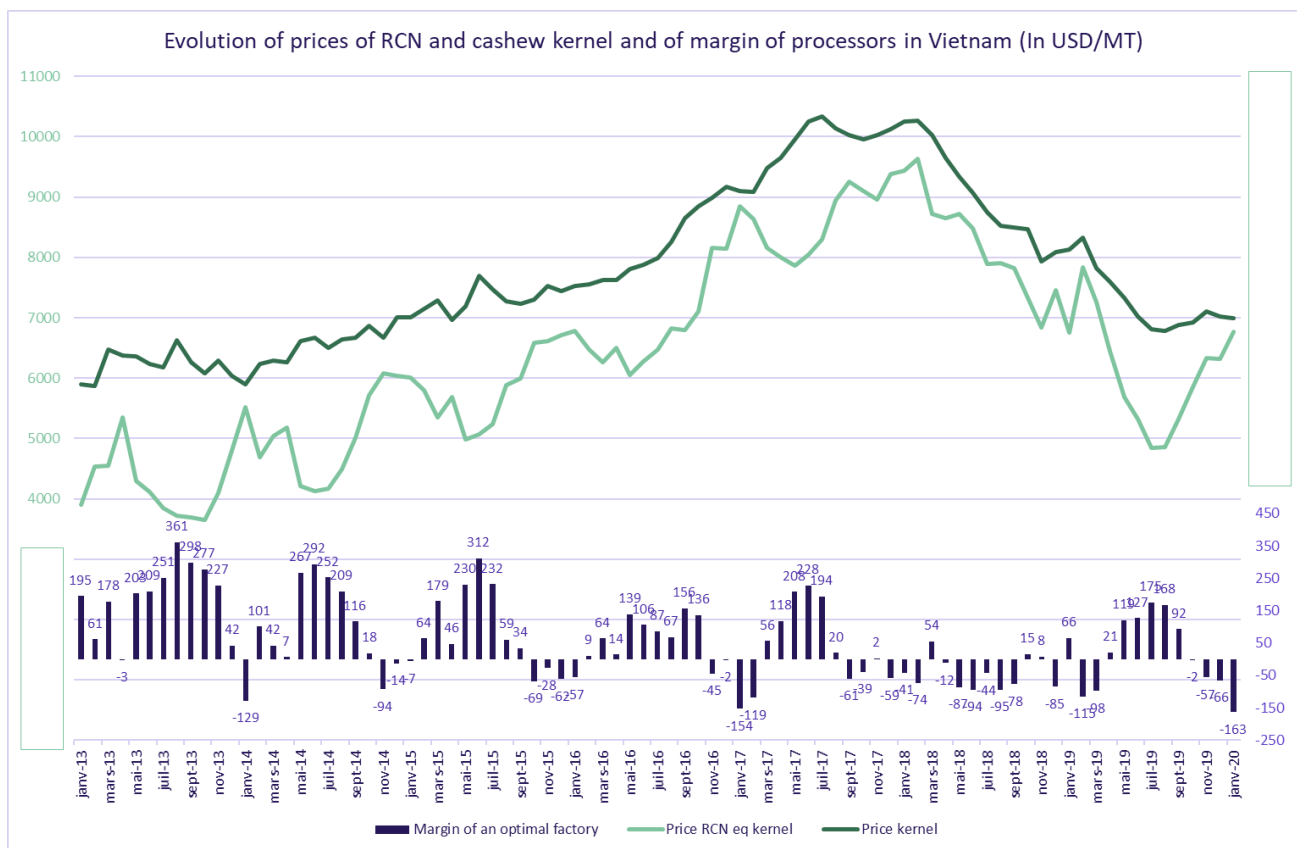
5 Particular risk faced by the Mozambican cashew industry

5.1. A limited procurement period: the main challenge and risk for the Mozambican industry

Price volatility in the cashew market is a major threat to all cashew factories. A slight increase of the price of RCN during the procurement or a slight decrease of cashew kernel prices after procurement can generate huge losses for any factory in the world.

As illustrated in the chart below, even the best Vietnamese factories can make losses in some periods, almost every year as prices of RCN and kernel do not move at the same pace and are both highly unpredictable.

Figure 33. Evolution of average monthly prices for cashew kernels and RCN (in cashew kernel equivalent) in Vietnam (Source: Vietnam Customs) and the estimated margin for an ideal factory with a processing cost of 250 USD / TM RCN.



Vietnamese and Indian industries are able to mitigate this risk by spreading their supply and sales throughout the year.

On the last chart, a Vietnamese “ideal factory”, spreading its purchases and sales evenly throughout the year (1/12 every month), would have the following average margin per year.



Figure 34. Average annual profit per MT of RCN processed at a Vietnamese factory.

Campaign	Average annual profit per MT of RCN processed
2019	36
2018	-44
2017	33
2016	56
2015	83
2014	89
2013	191

By anticipating price evolution on the short term and buying more when their margin is high and less when the margin becomes smaller, the Asian processor can even often avoid losses. Except in 2018, when many Vietnamese processors suffered losses even optimizing their risk management, most of them have been able to survive with the low margins of the last 3 years.

The biggest issue and risk for African processors in general, and Mozambican in particular, is the short procurement period they have access.

Figure 35. Procurement period for the cashew processing factories, depending on their location.

Average procurement of cashew factories by origin of RCN												
	Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez
India / Vietnam	5%	5%	10%	15%	15%	15%	10%	5%	5%	5%	5%	5%
Brazil	25%	10%					10%			5%	25%	25%
West Africa		5%	20%	30%	30%	10%	5%					
East Africa	40%	10%	5%								10%	35%

Local production		Imports from West Africa					Imports from East Africa and Indonesia					
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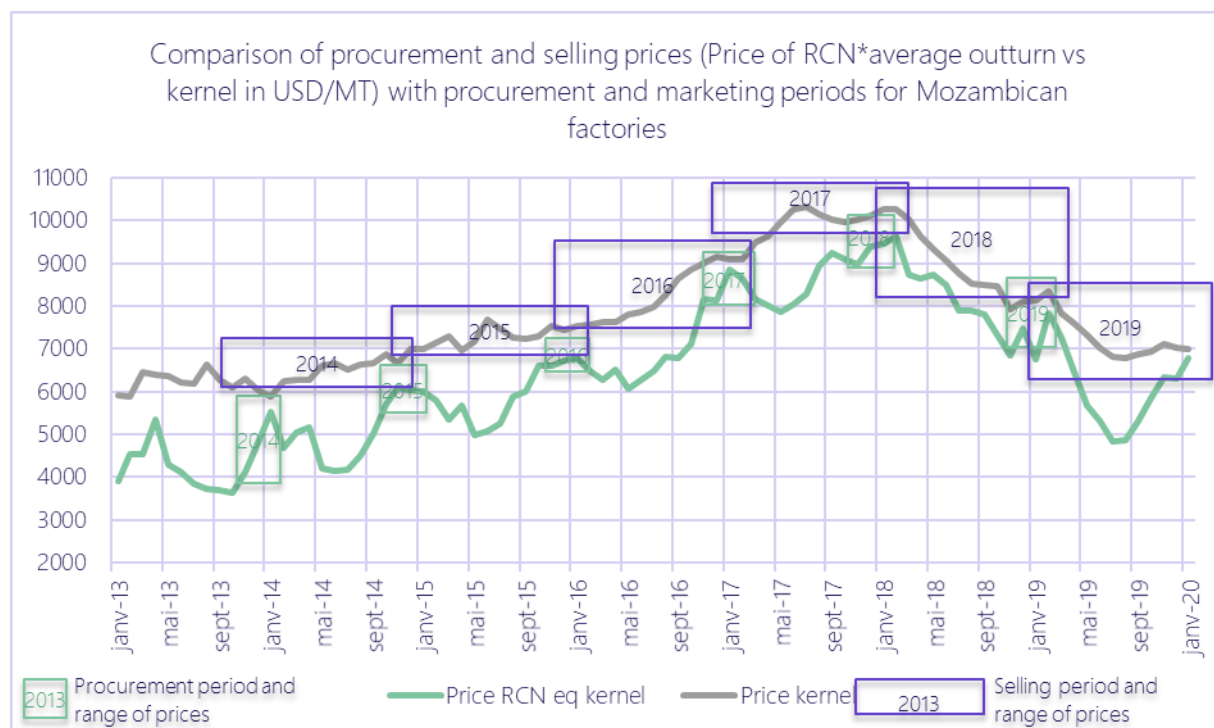
In Mozambique in particular, most factories must concentrate around 75% of their procurement in December and January, which lead to a strong exposure to price risk. If RCN's price is high on the international market during this period (which it usually does), they will be forced to pay a higher price for RCN than Asian factories.

With the same price chart in Vietnam, if we compare the purchasing and the trading period of the Vietnamese factories, we see:

- 1) That the procurement period of Mozambican factories is almost always during a peak of prices, mainly because this is the period with the lowest supply of RCN in the international market.
- 2) That in period of price increase along the year following the procurement season, the margin for Mozambican factories may be very high (for example, from 2013 to 2016), but that in the period of decreasing prices, it may be negative and the losses may be huge.



Figure 36. Comparison of procurement and sale prices (RCN price x Average of outturn vs. cashew kernel in USD/MT) with the periods of procurement and sale for Mozambican factories.



Finally, if we analyze the profitability of processing during the last 6 cashew seasons, the 2015/2016 season was profitable and the 2016/2017 season was very profitable, but all the others were negative and the last two were period of great losses due to falling prices.

Box 2: The cashew sector context from 2018 to 2020

From 2013 to 2017, the world cashew market went through a unique phase of growth in its history, both in terms of volumes traded and prices. This trend has been driven by several factors:

- strong growth in cashew nut production in West Africa (between + 5% and + 10%/year over the period) and, to a lesser extent, in East Africa and Asia.
- very significant investments in cashew nuts processing, especially in Vietnam, with the creation of hundreds of new processing companies of different dimensions and, at the same time, technological innovations that reduced costs and improved the efficiency of the processing' automation.
- strong growth in demand for cashew nuts and, more generally, for nuts, both in emerging countries (India, China, Southeast Asia, Middle East) and in industrialized countries (Europe, USA, Australia). This growth in consumption has been fueled by an increase in the purchasing power of the middle classes in these countries, as well as by a growing interest, on the part of some consumers, in nut-based diets (vegetarian consumers, diets, balanced diet).

At the end of 2017, the cashew market reached a breaking point:

- very high prices, especially compared to other nuts, whose prices had risen less rapidly. This situation has considerably slowed the growth of consumption, orienting consumers towards other



types of nuts, such as almonds, which are cheaper and benefit from a major marketing effort by the main Californian cooperative (Blue Diamond) supported by the US Government.

- a processing capacity well above the world production of raw cashew nuts (industrial overcapacity), which leads to excessive competition between processors and a reduction in profit margins for all industries.
- a postponement of important stocks from 2017 to 2018, as some traders and processors have accumulated excessive stocks to take advantage of the continuous rise in prices of raw cashew nuts and cashew kernels, increasing the sense of scarcity in the industry, when in the 2017 season it had been excellent in terms of production.

Noting that prices were no longer rising, wholesalers began to resell their stocks in early 2018 and Asian processors for lack of liquidity (because they had reduced their profit margins) started to spread their supplies as much as possible. The 2018 commercialization campaign of raw cashew nut in the northern hemisphere were marked by a first spectacular fall of readjust to low prices. Some West African producers had to wait more than 8 months before selling all of their stocks.

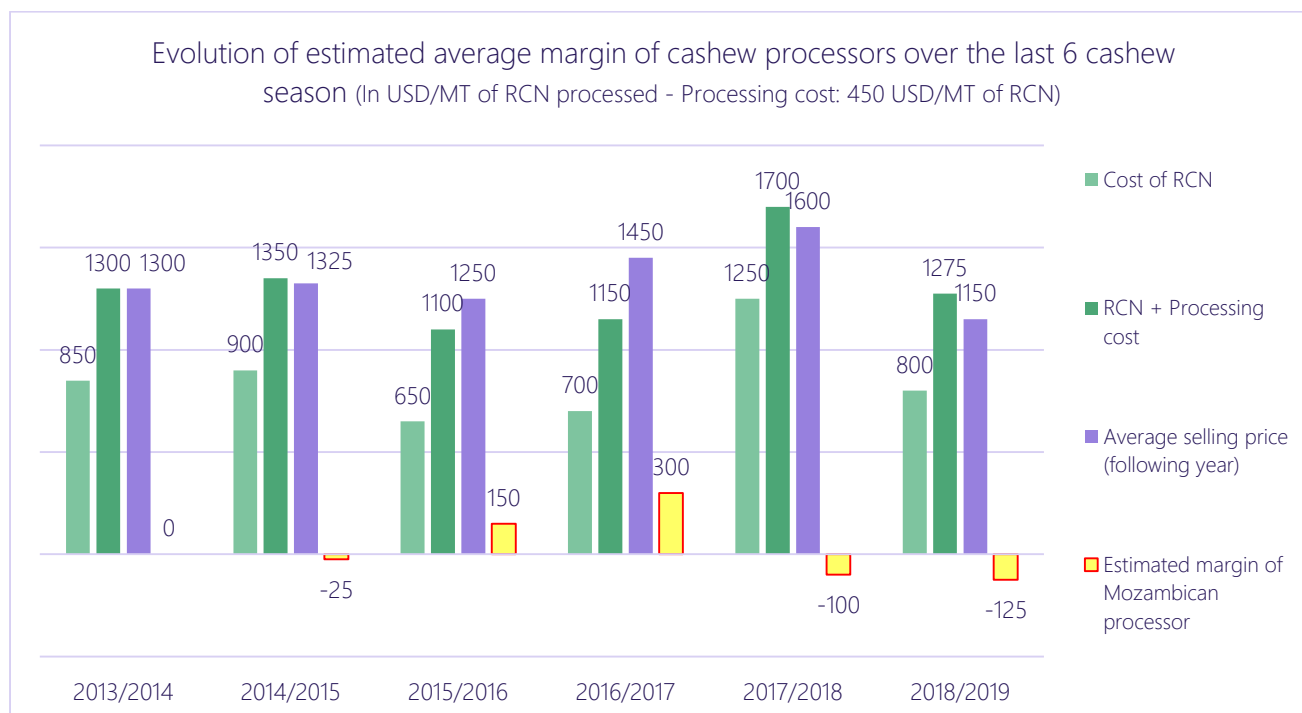
At the end of 2018, to try to stop the prices fall and support its producers, the government of Tanzania, aware that its production occurs at a time of weak supply in the international market, announced that it will buy all the production and would cancel all export licenses for raw cashew nuts. This decision did really result in a cashew nuts worldwide price rise during the end of November and December 2018, just when Mozambican processors carry out their supply. Finally, it benefited mainly West Africa, which, thanks to this withdrawal of 200,000 tonnes of cashew nuts from the international market, was able to evacuate its unsold stocks (about 200,000 tonnes precisely).

In January 2019, the international cashew market realized that Asian processors would have enough raw cashew nuts to process despite the absence of Tanzanian cashew nuts and prices fell again, pressured by the 200,000 MT stock, hanging like a Damocles' sword, that no one did know when or to whom it would be sold.

During the 2019 campaign, the drop in prices started to have an impact on cashew nuts world consumption that started to rise again quickly. In the second half of 2019, the balance between supply and demand was restored and prices stabilized. Many factories in Asia and Africa closed; the ones that remained were the ones that had taken the most care to preserve their margins. At the end of 2019, stocks appeared to have decreased significantly and everything indicated that prices would rise slightly in 2020. For Mozambican processors, it would be a good opportunity. Unfortunately, the coronavirus epidemic is disrupting all markets and the global economy, and prices have dropped again since the end of February 2020.



Figure 37. Estimated average profitability of a cashew factory in Mozambique during the last 6 campaigns (In USD/MT RCN processed - Processing cost: 450 USD/MT RCN) (Source: Nitidae).



Even the most efficient Mozambican factories, with a processing cost of only 400 USD/MT, would have suffer big losses during these two cashew seasons.

During the good seasons in which industries did get profit from cashew nuts processing, they invested some of their profits in the expansion or improvement of the facilities. Some factories have changed their organization, others have invested in new plant and others in technological improvements. According to data provided by AICAJU, investments made by the sector in the last 5 years are around 51,689,041 USD.

5.2. Difficulty to access bank loans

With the short procurement season, the time of negotiation and the availability of bank loan is a big risk.

Asian processors can negotiate short-term financing for the RCN they use and reimburse all over the year, depending on their cash flow needs. While Mozambican processors must borrow huge amount, often higher than the value of their factory to buy at once 100% of the needed stock. Appart the fact that this situation greatly increases its financial cost, it also generate a big risk.

A short delay during the negotiation or the disbursement of their loan can prevent them from buying much of the needed stock. If a processor does not receive a loan before the RCN export window open, he may even lose the whole season.

This is a big risk which make the success of processors very difficult or impossible for those that are not part of a large industrial group and are not able to borrow money easily and quickly with the guarantee of the whole group assets and activities.



5.3. The availability / interest of labor to work in cashew processing

With the low wages of workers in cashew processing, many workers find more interest working in the agricultural sector (generally in their fields), during the harvesting and planting period of annual crops, than in factories.

This is the counter part of the Mozambican labor competitiveness, agriculture can easily be more profitable than being a cashew industry worker. For most Mozambican factories located in rural or suburban areas, the presence and the turnover of workers is a major issue, for some plants located in rural areas only 20% of temporary workers are present all year round, and 80% of them alternate with agriculture during the peak of agricultural work, they are only present in the plants when there is few work in their fields.

In Asia, most factories are located in urban areas. This ensures a better presence of workers and a lower impact of agriculture and other rural activities on the presence of workers.



6 Conclusions and opportunities for the cashew sector in Mozambique

6.1. How to change fossil fuel revenue paradigms:

The Mozambican government expects to earn US \$ 95 billion in revenue from the exploitation of natural gas deposits over 25 years, more than seven times its gross domestic product¹⁹.

In a statement, on the 27th March 2019, the President of the Republic of Mozambique, H.E Filipe Nyusi, announced government plans to establish a sovereign wealth fund to manage future gas production revenues and allocate a fixed portion of the revenue to the state budget to finance infrastructure development, poverty reduction and economic diversification.

The President also warned that the economy should serve as a buffer when gas prices are low and that funds should be managed to avoid effects such as Dutch Disease²⁰, referring to the phenomenon in which a commodity boom, such as gas exploration, makes the country's currency more expensive and its other products less competitive.

Oil and gas prices fall in 2020 due to the global crisis of CoVid-19, is an unprecedented example, but this fall also results from the commercial conflicts of the main oil and gas producers²¹. The volatility of the oil and gas market is known to regularly put at risk countries economically dependent on this sector.

There are few examples of countries with a wealth of natural resources that have successfully managed their resource revenue to share it with the population and ensure the development of other economic sectors. The cases of Norway, Botswana and Chile offer interesting experiences²². It is clear that this success depends on many factors, macroeconomic policy choices, but also on governance and transparency. However, all three countries chose to invest in research and training, in addition to infrastructure.

In Chile, for example, a world champion in copper mining, a foundation created by the government to manage part of the copper revenues played a key role in creating the national wine sector, mainly through the development of know-how exchange programs with the private wine sector in France.

Since then, this foundation has worked on other topics and led a strategic vision for agricultural diversification in the country, such as aquaculture development or water management, a key issue for agriculture adaptation to climate change.

With 64% of the Mozambican population being rural in 2018²³, the objectives of poverty reduction and diversification of the economy with gas revenues should include a strong national strategy for the development of the agricultural sector, including the agro-processing industries.

The cashew sector, due to its economic importance for the country and with an already established processing industry, represents a unique opportunity to change the fossil fuel revenue paradigm, investing

¹⁹ <https://www.bloomberg.com/news/articles/2019-05-16/mozambique-expects-95-billion-of-gas-revenue-over-25-years>

²⁰ <https://www.bloomberg.com/news/articles/2019-03-27/mozambique-plans-sovereign-wealth-fund-to-pool-future-gas-income>

²¹ <https://oilprice.com/Latest-Energy-News/World-News/Oil-Falls-As-Saudi-Arabia-Launches-New-Price-War-With-Record-Discounts.html>

²² <https://www.oecd-ilibrary.org/docserver/238030862800.pdf?expires=1587118571&id=id&accname=guest&checksum=496EBBD0CD77DFB63D77F15D3F0A901F>

²³ <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=MZ>



part of the national income in a low-carbon agricultural value chain, based on agroforestry production systems, resilient to climate change and economically benefiting 1.33 million rural families.

In addition to its legal obligations, the oil and gas companies usually choose, within their Corporate Social Responsibilities, to invest in natural resources, usually forest management or conservation projects, with carbon related (sequestration, reduction of emissions) and reputational associated benefits. However, finding long-term impacts on the ground and economic sustainability for this type of project is always challenging and its implementation may be associated with some reputational risks (green washing, local conflicts over land use). There too, the direct support of oil and gas companies operating in Mozambique to cashew sector within their Corporate Social Responsibilities would be a very innovative scheme that would achieve economic results for the national economy and the rural households, as well as positive impacts in terms of climate change adaptation and small farmers' resilience, through the promotion of a productive agroforestry system.

The level of support can be numerous, as pointed out in this study; access to finance is a key challenge for processors. And the profitability of investing in gas for the banking sector in Mozambique may worsen this situation. On the other hand, it could be an opportunity if planned properly. In addition, the technical knowledge of gas companies, associated service providers and supplier companies could offer an opportunity for the cashew sector, including potential strategic partnerships for the development of renewable energy production systems using cashew shells. Finally, the needs at producers' level are also numerous: structuring of associations and cooperatives, technical support, or support to a strong policy to secure cashew price to encourage farmers' investment in cashew production.

6.2. General Recommendations

To the Government of Mozambique:

- Integrate agriculture and rural development as a pillar of Government intervention and the future intervention of the National Sovereign Petroleum and Gas Fund.
- Choose the cashew value chain as a priority commodity and the first pilot case of the Agriculture and Rural Development program of the National Petroleum and Sovereign Gas Fund.
- Integrate green infrastructure in land use to improve water and watershed management, a key issue for Mozambique and SADC's exposure to the impacts of climate change and more frequent extreme events (drought, cyclones).
- Invest in Research and Development, education and training in high value-added commodities, mainly through the establishment of partnerships with foreign universities and exchange programs with the private sector in India, Vietnam or Brazil for cashew, or for example with South Africa and Australia for macadamia.

To the Ministry of Energy and EDM:

- Integrate CNSL into the national energy mix as a co-combustion fuel for energy production, which would guarantee additional revenue for the cashew processing sector, thus increasing its competitiveness. CNSL can be used as a substitute for heating oil and heavy fuel oil. The consumption of CNSL could be guaranteed by applying a quota of CNSL biofuel in power plants.
- Promote shells or oilcake co-combustion in the new coal-fired power plant (Nacala).



- Support small IPP²⁴ projects based on biomass, namely cashew shell and its derivatives.

To oil and gas companies:

- Prioritize an integrated support to the entire cashew value chain in its Corporate and Social Responsibility programs, through access to finance, sharing of knowledge and Research, development in renewable energy systems based on cashew shell, and support to small producers.

To donor agencies:

Design an investment strategy, with multiple funders, in the cashew sector to:

- Support access to finance for processors and farmers' organizations.
- Support partnerships between farmers and processors associations to improve the quality and organization of farmers.
- Advocate widely for competitive processing of cashew nut by-products and for maximizing their value in the domestic market.

6.3. Sector recommendations in order of priority over time:

A. Emergencies: before the next campaign

1. Maintain the current policy:

The cashew processing industry in Mozambique is competitive with the current public policy, but its situation remains very precarious.

Like the rest of the world cashew sector, the Mozambican industry has faced a very tough situation for 3 years with continuously decreasing prices and strong competition between processors, as the sector is marked by an excess of processing capacity (it has more processors than RCN available), which is likely to continue in the coming years with the growth of Vietnamese industry, on one hand, and African industry, on the other.

In comparison with Asian or even with other African processing countries, the Mozambican industry is more exposed to price risk and may collapse even with the current public support.

Greater protection for the Mozambican cashew industry with an increase in the RCN tax (Tax on RCN exports) or an export ban for the RCN does not seem to be a good strategy, because producers also suffer from current falling prices and examples like Kenya, shows that protectionism can lead to production collapse, as the producer will not receive a price incentive to continue planting and harvesting cashew.

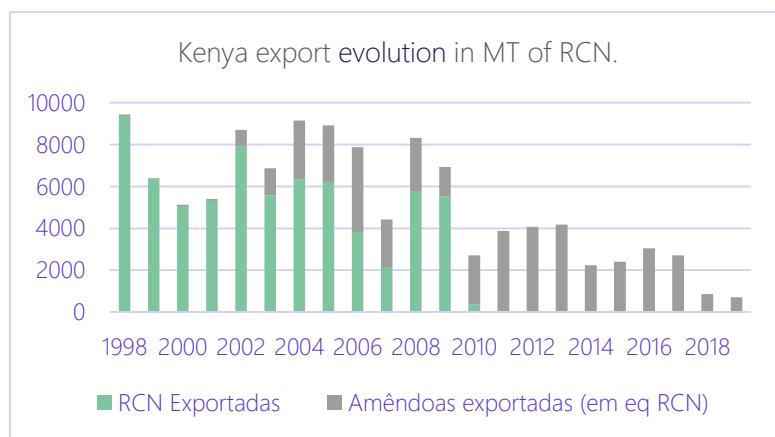
²⁴ Independent Power Producer



Box 3: Cashew sector in Kenya:

From 2010, to support its cashew processing industry, which is facing strong competition from Indian processors, Kenya decided to ban the export of RCN. Following this decision, cashew prices fell sharply and have remained fixed since then by the Cashew Processor Association after discussion with the government and producer associations.

After the decision to ban RCN exports, cashew processing increase from around 2500 to around 4000 RCN/year. But cashew production quickly began to decline. During the last campaign, most Kenyan industries closed their doors as they did not find enough RCN to process, and RCN import from Tanzania was too expensive for them.



For the sustainability and growth of the cashew industry in the coming years, we consider important to continue but also at the same time to improve public support.

- *Keep the Tax on RCN exports at its current level*

As shown in paragraph 4.3., **Mozambique has an average deficit of competitiveness compared to Vietnam of around 155 USD/MT**, if we add to this deficit the difference in tax on profits and dividends, without the “Tax on RCN export”, the profitability of processing cashew would be much smaller than in Vietnam.

India, which has a less competitive deficit than Mozambique when compared to Vietnam, is having two complementary strategies to preserve its industry:

- strong protection of its domestic market, and
- export subsidy called “Law Drawback” equal to 5.15% of the FOB value of cashew kernels.

Ivory Coast, which has a higher deficit of competitiveness than Mozambique when compared to Vietnam have:

- an RCN export tax of around 180 USD/MT, slightly lower than the Mozambican tax in 2019/2020, and
- a huge subsidy on cashew kernel exports: 665 USD/MT of exported cashew kernels (equivalent to more than 135 USD/MT of processed RCN).

The current Tax on RCN exports is actually well designed to allow the Mozambican cashew industry to be competitive with the Vietnamese industry and we recommend to maintain the same 18% of the FOB price level.

But it is also:

- insufficient to protect the Mozambican industry from its stongest exposure to price volatility compared to Asian countries.



- a limitation on the profit of small producers of cashew in years of high demand in the international market (cf: part on production).

Remarks on the tax on Raw Cashew Nut export principle and usage:

In our view, the transfer of money from small poor producers to a fragile industry such as established in the cashew sector with the Tax on RCN exports remains perfectly legitimate as:

- part of this transfer support the interests of these same producers, through the provision of services (seedlings, phytosanitary treatment, advice on operations) or, as proposed below, support to producers' structuration and quality improvement, therefore adding value to production.
- it plays a regulatory role in the local market: the presence of processors guarantees demand and competition for national production, which avoids price drops and low sales during years of global oversupply; and price increases in years when supply is insufficient to prevent producers from investing too much in cashew production to the detriment of diversified agricultural systems that guarantee the resilience of the agricultural fields.
- the industry remains exposed to international competition, thanks to competition from many exporters, which avoids the formation of an oligopoly and guarantees prices evolution representative of the global market supply and demand, even with attenuated fluctuations.
- Private players in this sector invest in the continuous improvement of their production facilities and in partnerships with producers.
- For its economic and social development, Mozambique needs to develop a diversified industry. Industrial development is such a strategic sector for Countries that all the other countries involved in the cashew nut sector also develop protectionist or dumping policies to maintain or develop their cashew processing.

It is true that the use of tax incomes²⁵ can and should be continuously improved, and we share propositions in that sense, but its disappearance, even progressive, does not make sense at a time when the Mozambican cashew industry is subject to high competition and difficult economic conditions .

One day, African and, more particularly, Mozambican factories may be competitive with Asian industries and the greatest competition is likely to be between African countries; one day, Vietnam and India will specialize in exporting agri-food processing equipment to Africa and no more in the agro-food processing of African products; one day, the Mozambican cashew industry will benefit from the conditions of access to inputs, equipment, services and qualified labor, so advantageous that a gradual adjustment of the support to this industry will be needed according to political agendas; until then, perhaps the extractive sector (gas) can pay the "cost of industrialization" that is now borne by producers; but as long as most African cashew nuts are processed in Asia, a policy of supporting industrialization through a tax on the export of raw materials is not an economic aberration, but an essential tool for an economy that still has few advantages to fight with the great industrial powers of Asia.

That is why we advise Incaju and the Mozambican government to conserve the tax on RCN exports and just "rethink" the uses of their income.

²⁵ Our research also showed that one of the criticisms on "promoting undeclared exports" of raw cashew nuts is overestimated. By comparing data from Mozambican customs, Incaju and the customs of destination countries, we could see that these "unregistered" exports from Mozambican customs and/or Incaju never exceeded a few hundred tons. To finish this work, we also evaluated the hypothesis that raw cashew nuts are registered on arrival under a different customs code than cashew nut HS080131 (which was unlikely because Indian, Vietnamese or Chinese customs have no reason to adopt this type of practice for a product with a low added value as raw cashew nuts), and no significant volume of similar product in terms of FOB value was found.



- *Keep the current preferred procurement window*

The industry's preferred purchase window does not allow raw cashew nuts to be exported until the industry reaches its minimum supply targets, it is a very imperfect but also very effective mechanism.

In theory, this could mean that during most of the campaign, October/November/December, Mozambicans processors could find an oligopoly and impose particularly low prices to producers.

In practice, this mechanism does not prevent exporters from starting to buy stocks of raw cashew nut from the beginning of the campaign. It just prohibits them from exporting those stocks until manufacturers confirm that they have achieved part of their goals. This imperfect functioning means that the competition between exporters and processors starts from the beginning and last throughout the commercialization campaign. Exporters' supply chains are often the first to return to activities in October. At the same time, given the high volatility of Mozambican production, in particular depending on highly variable meteorological factors in the production areas and recurring cyclonic events, this mechanism ensures that if the production of a campaign is clearly insufficient compared to the industry's needs and purchasing capacities, the industry maintain the possibility of repurchasing from exporters (who will not fail to apply their costs and margins).

This seemingly imperfect mechanism, therefore, acts as a safety valve, allowing for strong competition between buyers during the campaign and a possibility of adjustment in the event of a strong disconnect between industry capacity and Mozambican production.

2. Establish a task force for business development:

This task force can be coordinated by INCAJU (for example, the "focal point for processing", see proposal below), including representatives from APIEX, the Ministry of Foreign Affairs, the Ministry of Industry and Trade and AICAJU. Initially, it would target the neighboring countries of the Southern African Development Community (SADC): South Africa, Botswana, Zimbabwe, Zambia, Swaziland, Lesotho and Malawi.

In these markets, it would sponsor market studies aiming at identify agri-food processors (including snacks, pastry, confectionery, icecream, catering companies), distributors, localities, target populations, events and means for the promotion of Mozambican cashew kernels and, in particular, broken cashew kernels as it is difficult to sell them on the international market.

Food security players: WFP, FAO, a food producer to fight Nutriset²⁶ malnutrition may also be targeted, and particularly for the promotion of the Baby Bits (BB) cashew kernel grade, due to its high content of cashew kernel sprouts, it has a higher level of vegetable protein than other types.

This task force should provide AICAJU with contact lists by country/sector at regular intervals and can also organize promotional events and facilitate/subsidize visits to Mozambican factories for large buyers in the interested sub-region.

In parallel with this commercial development mission for the local market, this task force could also work to improve the Mozambican industry position in the South African and Indian markets.

²⁶ <https://www.nutriset.fr/products/fr/plumpy-nut>

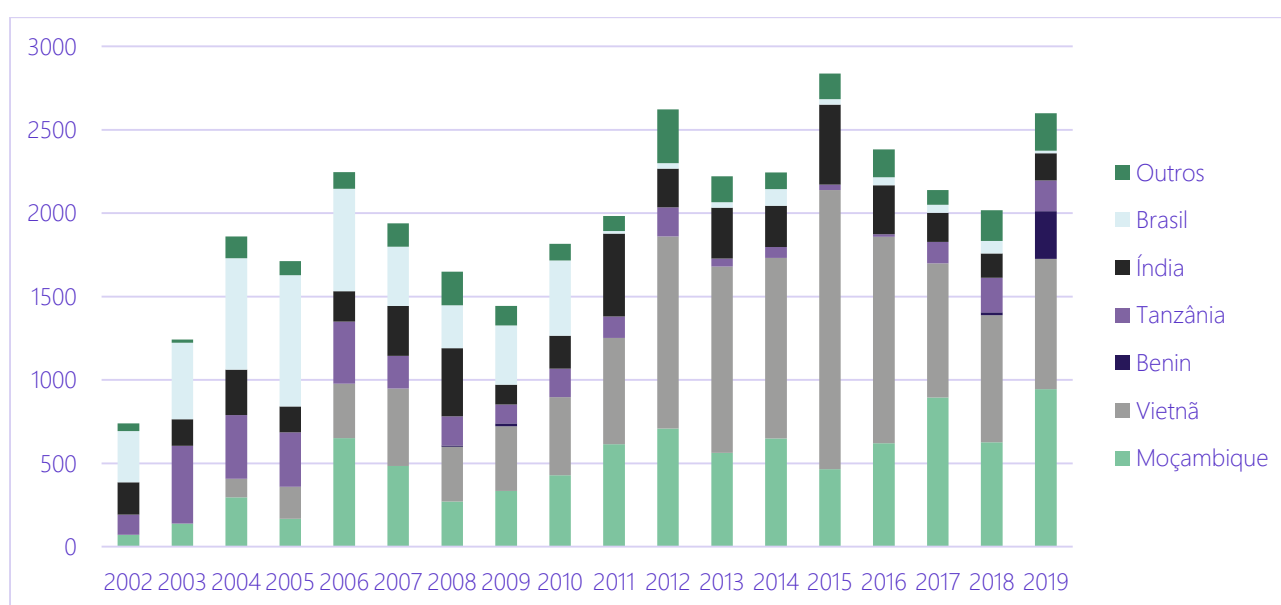


- *In the South African market:*

South Africa is a growing cashew market in the world. Even though it remains small compared to large markets like India, the United States of America or the European Union, it is a market in which Mozambique has a comparative advantage due to the short distance.

In 2019, South Africa imported 2600 MT of cashew kernels, but despite SADC's short distance and free trade agreements, Mozambique's market share in those imports was only 36% as illustrated below. This is mainly because South Africa does not impose any duty on kernel imports from Vietnam or India, even without any free trade agreement with them.

Figure 38. Imports of cashew nuts from South Africa by origin from 2002 to 2019 (Source: South African Customs, in metric tons of cashew kernels).



The Mozambique State could easily negotiate a 10 to 15% duty on cashew kernels from outside SADC with the South African state, arguing that the development of Mozambique's cashew industry is beneficial to South Africa's economy as part of the input used in processing (plastic bags, some spare parts) are imported from South Africa, and since the development of Mozambique's industry is very strategic for neighboring countries.

By undertaking the writing of some articles and documentaries in the South African media about the cashew industry in Mozambique, AICAJU and INCAJU could easily start spreading the idea that South Africa should benefit their neighboring country, in addition to promoting Mozambican cashew to Southern African agribusiness and consumers.

This low-cost activity must be started quickly. A first step may be to ask the Embassy of Mozambique in South Africa and the representative of Mozambique in SADC and the representative of Mozambique in the WTO to send a letter of request for clarification to the Ministry of Commerce of these countries, emphasizing mutual interests in establishing protection for this product. If the response from the South African Ministry of Commerce is not favourable or if he does not respond, a lobbying campaign in the South African media (publications in the South African and sub-regional media, reports on the Mozambican sector and interviews with representatives of AICAJU to show that South Africa is not in solidarity with its neighbors) can also be



envisaged to put pressure on the South African Ministry of Commerce to take rapid action for this protection.

▪ *Indian Market:*

India's protectionism over cashew kernels was possible only because no African country protest against it. However, this excessive protectionism which is closing the world's largest cashew market to other processing countries is contrary to Indian commitments both in the World Trade Organization (WTO) and during India-Africa international meetings and diplomatic visits.

India is importing RCN from all over Africa and, even if one recognize the right to protect its historic cashew industry, which provides income for hundreds of thousands of workers, the almost complete closure of its market to cashew kernel imports, decided in the summer 2019, is completely unfair and objectionable.

In the World Trade Organization (WTO), India and most African countries are often allied in agricultural trade negotiations, as they defend the right to protect and promote their small farmers and call for decrease of subsidies in developed countries. On many topics India needs support from African countries to negotiate beneficial deals.

By putting pressure on India, African countries could easily negotiate, if not a re-opening of the cashew kernel market, at least importation quotas for the African cashew industry.

Maybe this is not something that Mozambique can do alone, but as the oldest cashew processing country, Mozambique could lead a negotiation with other African countries, in particular, Ivory Coast, Nigeria, Benin, Tanzania and Burkina Faso, all with strong economic relations with India.

African countries may even ask for support from the USA, the European Union or China to put pressure on India, as these countries will be very sensitive to support industrial development in Africa and to fight India's unfair protectionism.

Mozambique can also count on the International Cashew Council (CIC), recently created on the initiative of the Ivory Coast to federate the public institutions responsible for supporting the cashew sector in the various African producing countries to carry out this negotiation. This issue of access to the Indian market can be a subject of consensus, facilitating a common positioning for all member states of this CIC.

3. Focal point for cashew processing in INCAJU

It would be important for Incaju to have a specialized focal point for monitoring, communication and assistance to cashew processors.

Ideally, this person should be from the processing sector (ideally several years of experience in different factories) and speak English fluently to facilitate communication with all existing processors (primary and secondary), potential investors in the sector and be able to participate in actions to internationally promote the cashew kernel from Mozambique.

This person, based at the INCAJU economic department, could have as main missions:

- Monitor supply status, sales status and financial risks in general for the profitability of Mozambican processors (economic intelligence).
- Facilitate discussions and information sharing between AICAJU and INCAJU for all negotiations (reference prices, opening of the campaign and exports, sectoral reforms, etc.).



- Administrative assistance in the case of a processor or a new investor having difficulties with a freight forwarder in the import of equipment or inputs for cashew nut processing.
- Promote the cashew processing sector to new national and international investors and assist in project creation
- Significant participation and support to the business development task force for the export of cashew kernels and products processed from cashew kernels.
- Assistance to processors to identify funders, support / guarantee mechanisms and investors, both for working capital financing and for new investments.
- Assistance to processors to identify markets and create partnerships for the recovery of by-products (peels, CNSL, testa, oils and contaminated cashew kernels).

To carry out his missions, he will also be able to count on many specialists of the sector who work in Mozambique and in West Africa, in particular all those who contributed to this study.

4. Non-payment of VAT in the absence of refund

The Mozambican State has had budgetary difficulties and proven inefficient in recent years to refund VAT on equipment and inputs to Mozambican processors who export their cashew kernels. We propose that an operator-driven and product-limited exemption policy which the state can be sure that will not be used for any other purpose other than the export of cashew nuts (packaging gas, cardboard boxes and plastic bags with specific dimension of the cashew nuts export product, specific machines for cashew nuts processing) is proposed to processors. As established for imports from international organizations and tax-exempt sectors, such as development projects, cashew processors may receive an exemption certificate from the Ministry of Industry and Commerce after validation by Incaju, for a period of several years and for specific products.

B. Evolution to be prepared within a year:

5. Ascent of AICAJU:

The Association of the Cashew Industry of Mozambique (AICAJU) must be clearly strengthened to play a much stronger role, in terms of coordination between processors but also to ensure coordination/communication with the public sector.

Its current functioning is criticized by some of its members and by public authorities. In view of the many challenges faced by the sector and developed in this study, a strong professional association is crucial for the sector's sustainability and efficiency.

The example of professional associations such as the Indian Cashew Promotion Council²⁷ or the Vietnam Cashew Association²⁸ should inspire AICAJU.

²⁷ CEPCI - www.cashewindia.org

²⁸ VINACAS - www.vinacas.com.vn



In particular, AICAJU must have a complete and regularly updated roadmap following the model published by CEPCI, which sets out objectives for negotiations with public authorities, internal coordination and international promotion.

Many activities can be coordinated by AICAJU. Bellow, we list some of the main objectives that the association could establish for itself:

- a) Courteous, transparent and ambitious negotiations with public authorities: reference prices for producers and exports, opening of the campaign, opening of exports, sectoral reforms.
- b) Commercial development: market studies, identification of new clients for cashew kernels and processing by-products, promotions of Mozambican products to new customers, mechanisms for distributing orders/customers identified among members of the association.
- c) Organization and participation in promotional events: Conferences and Food Fairs, such as Golden Cashew *Rendez-Vous de VINACAS*, *SIETTA* in Ivory Coast or Kaju India in India.
- d) Economic Intelligence: monitoring the international market, state of the market supply, export statistics of cashew kernels and raw cashew nuts, anticipation of risks, production of notes about market conjuncture, upstream and during commercialization campaigns (the N'kalô Service can support AICAJU to carry out this activity).
- e) Technological surveillance: exchange of experiences and appreciation of processing equipment, input suppliers, service providers.
- f) Commercial regulation: proposal for standard contracts for the procurement of raw cashew nuts with suppliers and producers' associations, establishment of an arbitration structure and listing of suppliers with unresolved disputes to avoid recurrences.
- g) Coordination for waste recovery: Establishment of a platform or commercial contract between factories for the recovery of by-products in the local market (see proposals below on this specific topic). At this point, Mozambican processors must understand that waste recovery is an economic issue (small additional revenue), but also regulatory and commercial. It is likely that, in the coming years, the environmental impact of factories will be increasingly subject to controls by the Mozambican authorities, but also by cashew kernel importers or even public authorities in consuming countries (carbon taxes on imports). Therefore, it is important for the Mozambican industry to anticipate the standards that are likely to be implemented in the next decade.
- h) Technician training program: qualified worker, team leader, section manager with experience and mandate of factory director or commercial officer with universities and technical training centers. In this sense, AICAJU could take advantage of the experience of the company Olam, which has already implemented partnerships with Mozambican training centers. An internship program in several factories could facilitate the training of versatile technicians, capable of optimizing production models, drawing on the experiences of various locations. For example, Ivory Coast created a training center specialized in cashew processing in Yamoussoukro to train its technicians. We do not believe that such investments are necessary, but that a factory training program is more appropriate and cheaper. Scholarships for selected students could be co-financed by AICAJU and INCAJU. A graduation and scholarship ceremony can be an excellent communication tool for the industry. In the medium term, a program with international



exchanges in English-speaking countries (India, Tanzania, Nigeria, Ghana, South Africa) can also be beneficial for future processing executives.

- i) Testing and developing partnership mechanisms with producer associations: as developed below, strengthening the structure of producers and partnerships between processors and producer associations is the best way to combine both interests; reduce logistics costs of factories' supply and encourage producers to invest both in increasing the planted area and in raw cashew nuts quality preservation. These partnerships are also an excellent communication tool on the impacts of the industry, both for national authorities' level or with customers abroad.
- j) Fundraising from technical and financial partners: AICAJU can also play a role designing a project for the implementation of technical assistance programs, co-financing of investments, facilitation of financing, establishment of certification (Organic Agriculture, Trade Fair, Zero Deforestation) or subsidies for partnerships between producers and processors financed by Public Aid for Development. For example, the Matching Funds implemented by the African Cashew Initiative and later by GIZ's Comcashew financed many social and environmental projects for cashew processors in Africa. Other donors (DANIDA, USAID, AFD, EUROPAID, etc.) could be interested if AICAJU positions itself with concrete and ambitious proposals on issues that improve the social and environmental impact and competitiveness of the value chain as a whole.

AICAJU's rise, of course, must go through an increase in its budget and human resources. To make this possible, INCAJU could allocate a small operational grant to AICAJU in exchange of a clear roadmap and then, in the following years, based on the achievement of objectives.

6. Improve the use of the RCN export Tax:

Some of the objectives established by the government for INCAJU for the use of Tax on RCN exports revenue have been or are clearly being achieved.

Mozambique's national production is experiencing growth, which is certainly irregular (due to the meteorological and phytosanitary risk) and from the opinion of many private stakeholders, lower than the official figures, but this growth is undeniable since 2004. A strong dynamic of planting of new cashew trees can be observed in all main production areas and the antifungal treatment of cashew trees has been widely distributed.

This success of the RCN exports Tax policy by INCAJU should not prevent us from considering that its use must be continuously improved and that its objectives must evolve over time according to the economic and political environment.

As explained in the introduction, a second study should be carried out within the scope of the ACAMAZ project with, among other objectives, the characterization of cashew tree planting dynamics and use of fungicides to establish perspectives / proposals in order to improve the production forecast and monitoring, to support to producers from an agronomic point of view, or in terms of producers' structuration and quality improvement.

However, within the framework of this study, it is possible to foresee several ways to improve the use of the RCN exports Tax revenues.

- a) Governance: First of all, in terms of sector governance, unfortunately, until now, no structure that associate the private sector allows to present, discuss and periodically validate the results of the use of the RCN



exports Tax and discuss, propose, adjust possible developments of actions to be taken. We believe that the strengthening of interprofessional dialogue, through the current Technical Council, which takes place annually and has representatives from some stakeholders' value chain, could support the dialogue about several important issues related to the use of the RCN exports Tax. Public-private planning workshops should be organized every 3 years in order to evaluate and plan with the greatest possible transparency the policies implemented with this resource in the sector, taking into account the evolution of economic and political conditions.

- b) Respect the shares allocated to production and processing support: The Cashew Law of 1999 specify that 80% of the RCN exports tax incomes must support production and 20% for processing. So far, these proportions have not been respected and actions to support processing have been limited to a maximum of 11% of the total budget in 2019, with an average of 6% in the last 5 years²⁹.
- c) Diversification of actions: so far, most interventions have strongly focused on actions to support the increase in production in quantitative terms (Seedling production, Integrated Cashew Management, Cashew Promotion), which represent around 47% budget over the past 5 years. Support for processing focused on the creation of a Guarantee Fund which, according to information provided by INCAJU, mainly supported the financing of secondary processing projects and large-scale plantation of cashew trees. Without questioning the relevance of these actions, which, as indicated above, seem to have largely borne fruit, we believe that it could be strategic for the cashew industry to diversify support aiming at other objectives such as producers structuration, quality improvement, certifications schemes implementation (Organic Farming, Fair Trade, Zero Deforestation), improve waste valorization by factories, encourage private sector participation to replace INCAJU's role in spraying or cashew promotion services, improve the cashew workers conditions or support to agricultural diversification to improve their resilience to climate risks and the volatility of the cashew market. Without being considered directly as priority actions, these reflexions could be tested as "pilot" which results would lead to extension, adaptation or abandonment in a second phase.

Regarding the last point about the diversification of actions, we present in the two boxes below different proposals that we consider particularly relevant in the current economic context:

Box 4: Subsidy for processors and producers partnerships with the objectives of improving cashew kernels quality and traceability, reduce the marketing costs, and increase producers' structuration and prices.

There are few ways to improve the incomes of small cashew producers and the competitiveness of processors: improving the value chain between farmers and processors, in particular with two types of actions:

- i. improve the organization of farmers and reduce the marketing logistical costs of RCN from the field to the factory;
- ii. Improve the quality of cashew with the most efficient tool: quality premium.

Currently, most of the RCN exports Tax revenues are used to support production, subsidize seedlings and chemicals to treat cashew trees. This strategy has had some success, but it is also criticized because it benefits mainly to the largest producers and has an enormous logistical cost.

It also has a low impact on cashew quality, which remains substantially low in Mozambique and affects processing incomes. In addition, a large part of the best nut from Mozambique, Cabo Delgado

²⁹ Source: INCAJU.



production, is smuggled into Tanzania, where the commercial system value quality better by paying a higher premium.

Supporting partnerships between processors and farmers' organizations can lead to several advantages:

- A better organized farmers' association could manage the promotion of cashew production, distribution of seedlings and planting material, in addition to chemicals, decreasing the need for Incaju intervention and allowing seedlings and chemical suppliers to organize logistics more efficiently on their own;
- Better farmers' associations could improve cashew nut storage and packaging in production areas;
- A better organization could improve the traceability of cashew nuts from the production zone to the factory, something that western cashew kernel importers are increasingly asking processors for;
- This would also allow farmers to obtain collective and individual quality awards and take better care of quality;
- It would make it easier for cashew processors to install new certifications such as Fairtrade and Organic, which would add value to Mozambican cashew nuts;
- Finally, it would reduce the logistical costs of collection and transportation from the farm to the factory, involving the farmer into the collection process and reducing the number of intermediaries.

To be the most efficient, this policy must be based on the strategies developed by processors, and by farmers' associations. Processors and farmers' association would have to sign an agreement on how to collaborate. Part of the cashew quality premium must be paid by the processor to the farmers' association and INCAJU can complete the prize. Below, we propose an example of the budget for this activity.

Quality reference		Subsidy fee 50%				Exchange rate: 1 USD = 60 MZN			
45	lbs/bag	Quality Award				Paid by the Processor		Paid by the State	
46	lbs / bag	2	MZN / kg	33	USD/MT	17	USD/MT	17	USD /MT
47	lbs / bag	4	MZN / kg	67	USD/MT	33	USD/MT	33	USD /MT
48	lbs / bag	6	MZN / kg	100	USD/MT	50	USD/MT	50	USD /MT
49	lbs / bag	8	MZN / kg	133	USD/MT	67	USD/MT	67	USD /MT
50	lbs / bag	10	MZN / kg	167	USD/MT	83	USD/MT	83	USD /MT
51	lbs / bag	12	MZN / kg	200	USD/MT	100	USD/MT	100	USD /MT
52	lbs / bag	14	MZN / kg	233	USD/MT	117	USD/MT	117	USD /MT
53	lbs / bag	16	MZN / kg	267	USD/MT	133	USD/MT	133	USD /MT

Subsidized quantity (TM)		Average award	Costs for processors (USD / TM)	Cost to the State (USD/TM)	Subsidy cost (USD)	INCAJU monitoring and support USD/MT (USD)	Total cost of policy measure (USD)
Year 1	5,000	50	25.0	25.0	125,000	15,000	140,000
Year 2	7 500	60	30.0	30.0	225,000	22 500	247 500
Year 3	10,000	70	35.0	35.0	350,000	30,000	380,000



Year 4	12 500	80	40.0	40.0	500,000	37 500	537 500
Year 5	15,000	90	45.0	45.0	675,000	45,000	720,000
Year 6	17 500	100	50.0	50.0	875,000	52 500	927 500
Year 7	20,000	110	55.0	55.0	1,100,000	60,000	1,160,000
Year 8	25,000	120	60.0	60.0	1,500,000	75,000	1,575,000
Year 9	30,000	130	65.0	65.0	1,950,000	90,000	2,040,000
Year 10	40,000	140	70.0	70.0	2 800 000	120,000	2 920 000

The biggest advantage of this policy would be that any subsidy and co-financing by processors would directly improve farmers' income, while at the same time improving quality, and purchasing would directly support local processing. In other words, it is a way to redistribute part of the RCN export tax to farmers, while supporting local processing at the same time.

We can imagine that the subsidy could decrease inversely with the total volume to be purchased in order to avoid a too much important increase of this policy's budget over time.

It should also be considered to pay this premium during the dry season, to help the farmers when they most need money. The example of farmers' organizations that benefit from this award would also encourage other farmers to organize themselves.

Better structuration of professional associations could also at medium term, facilitate the representation of producers within the cashew sector discussions with the Government and, more particularly, INCAJU and facilitate a joint implementation of the cashew sector' regulation and governance that associate both the public and the private sectors, on the long-term the sector regulation by the private sector could be done under the form of an interprofessional organization.

The implementation of this action can be done in a very simple way. INCAJU would open contests to all national processors with a list of clear and mainly social criterias (number of producers, volumes involved, increased producer incomes, additional services and possible certification obtained by processors) and duration of implementation of 3 years' renewable for two new periods of 3 years if the objectives are achieved (in total, the action can therefore be carried out over 9 years with an increasing number of producers). The subsidy is then paid in tranches, for example, a first tranche of 50% upon signing of the subsidy contract and a second 50% tranche subject to an assessment of the number of producers actually affected and that the payment by the processor of the 50% premium to the producers has been effective.

This innovative policy, based on public-private and public partnerships, and promoting the strengthening of the entire cashew value chain, can even be supported by technical and financial partners such as AFD, the World Bank or the European Union.



Box 5: Co-financing of factories' modernization or waste processing investments in exchange for better workers conditions

Investments to improve cashew factories, such as import of new machines, building of new facilities or certification costs (HACCP & BRC), could also be subsidized in return for improving wages and/or contractual conditions for workers in factories.

Investments that would help the Mozambican industry to be more competitive could be negotiated in return for improving workers' wages and contracts. An annual budget can be drawn up and its use negotiated with processors who wish to submit a proposal and/or with AICAJU.

As previously mentioned, in this context, investments in the recovery of by-products/waste from the cashew processing industry can be considered as priorities. Below we detail several technical solutions adapted to the different types of plants found in Mozambique.

7. Convergence of Tanzania-Mozambique trade policies

Public policies supporting the cashew sector in Tanzania and Mozambique are relatively different, but have tended to converge in recent years.

Close collaboration and an objective of bringing together or even homogenizing the policies of the two states could be extremely valuable and effective.

- On one hand, Tanzania was able to establish a commercialization system structured around wholesale stores in the main areas of production, the Warehouse Receipt System³⁰, which has several important advantages/successes, namely:
 - i. a strong structure of producers who deliver practically all of their production to official stores through cooperatives;
 - ii. a strong improvement in quality thanks to a differentiated payment according to the quality that encouraged cooperatives and individual producers to really invest in maintaining the quality of their cashew nuts;
 - iii. a growing supply of services provided by cooperatives.

In fact, as part of the scheme, producers are encouraged to use the bank to be able to receive an advance on delivery (based on a storage receipt) over the years so that they can save, borrow and place orders in bulk for inputs (fungicides, seeds/seedlings, fertilizers, etc.), simplifying the logistics of inputs distribution from private suppliers. This device proved to be extremely effective for the raw cashew export sector to Asia, which is probably the most profitable for producers in the world, especially in times of high demand in the international market. However, it was built at the expense of local cashew processing that sank in recent years and allowed populist political interventions (2011, 2012 and 2018) on fixing the purchase price to producers that leads to economic disasters for the sector and the State budget. In 2020, the State of Tanzania seeks to rebuild its local cashew processing sector and can draw on the Mozambican experience of the past 15 years to increase investments and find a better balance between the interests of producers and processors.

- On the other hand, Mozambique managed to relaunch a large-scale local industrial transformation after two major crises, at the same time that it relaunched the planting of new cashew trees and encouraged

³⁰ This "simplified physical bag" mechanism is based on a chain of official stores with independent weight and quality control and on a weekly auction of stocks available at the various stores.



producers to continue investing in the production of cashews, thanks to a good balance between protection and free competition, as demonstrated in this study. However, its sector still suffers from a very weak structuring of producers, a weak incentive to preserve and improve quality and a supply of services to producers entirely dependent on the State and not accessible in the most isolated areas of the territory. The State of Mozambique and INCAJU are currently working on a project to structure commercialization in the form of a physical market exchange comparable to that of Tanzania.

By exchanging the advantages, disadvantages and learning of their respective policies, Mozambique and Tanzania would have everything to gain and could develop a roadmap for the convergence of policies of the two countries, which would make it possible to remunerate producers and promote policy development to establish an industry capable of withstanding intense competition from Asian industries in the long run. Following the example of the cooperation between Ivory Coast and Ghana in their regulatory and support policies for the cocoa sector, a roadmap for the convergence of the public policies of the two States (which could include in a second phase, Kenya and Zambia that are currently trying to develop cashew production), could greatly strengthen the sustainability and effectiveness of these policies.

One can even imagine that one day, if the two policies are sufficiently aligned, the processors of each country will be able to be part of their supply in the other country, according to the production and the situation with a free trade and free competition at subregional scale.

The sharing of practices and the expansion of an input market for the entire production area of the two countries can also provide significant gains across the sector in both countries.

We are aware that this work cannot be carried out in the short term, but meetings to discuss the proposal, share experiences and develop the general guidelines of what could be the common policy of the two countries and the roadmap on “how to get there”, could be organized with the support of the ACAMAZ Project after the publication of this report.

8. Promote the national added value of the cashew nut through the valorization of by-products

As previously stated, the different parts of the cashew nut can be fully valued. Especially, if the shell is used for energy purpose, the factories have the theoretical opportunity to be completely autonomous energetically, and even be in surplus, as the shells contain more energy than the one needed for processing. The valorization of the cashew apple seems less advantageous and less directly applicable at large scale.

In practice, not all factories have the opportunity to make the most of their shells for reasons of scale, technological and financial limitations, therefore the actual benefit is much less than the full potential. However, the potential additional revenue for the factories is 24 USD/MT of equivalent RCN, in the case of selling the shell without processing it; and a total revenue from by-products that makes around 50 to 150 USD/MT of RCN equivalent (of which the shell and its derivatives concentrate 80% of the value – see Figure 28). This additional benefit becomes an added margin for the factory, when it comes to negotiating a competitive price for cashew nuts or cashew kernels.

In any case, cashew nuts processing represents an opportunity from a global energy point of view, because the shell can be considered as a renewable resource and transformed into a variety of energetic products (solids, liquids, gas). Also, as these energy resources are going to replace other non-renewable imported resources, the energy use of the shells translates into a smaller environmental impact, by saving natural resources. The environmental argument can become a factor of differentiation from other competitors on



the continent, a factor of relations improvement with communities and authorities and finally send a very positive image to the increasingly demanding buyers and certifiers.

In the table below is presented a list of several by-products valorization projects' opportunities to be carried out in Mozambique. Most are directly linked to energy recovery. This sector can be especially attractive to Oil & Gas companies, as it develops the biofuels business.

Under the 35,000 tonnes of RCN currently processed, 25,500 MT of shells are being produced each year, with a maximum potential of 4,900 MT of CNSL and 16,800 MT of oilcake. However, the maximum potential can only be reached if the shell volumes are not centralized in large installations, since for some factories far from the processing areas, it would not be profitable to send the shells so far. However, centralization adds to the profitability of this processing due to economies of scale. That is why of projects 1 and 2, the first number is the most efficient (lowest investment per unit of processed shell) and allows to process all the shells generated by the industries of the Nampula-Nacala hub. These alternatives are discussed in detail in the section "In the medium term: promote the creation of a centralized management platform for shell and other cashew products."

An interesting solution for small and medium size factories are the pyrolysis furnaces (projects number 3 and 4), which are a low technological alternative adapted to them. The by-product is coal and heat for the boiler. The advantages of the pyrolysis oven are detailed in the "Short to medium term: support for the training of factories in the adoption of pyrolysis furnaces and other technologies for the enhancement of in-shell fuel.

Finally, only plants that have a high and steady processing rate above 6,000 TM RCN per year would be eligible for a type 5 project - electricity generation.



Opportunity	Eligible factory type	Examples of Mozambican processors	Country potential ³¹	Technology, current limitations	Budget	Nitidæ Experience
1. Centralized by-products platform - CNSL extraction and others	All factories from the Nampula-Nacala hub	Condor, Caju Ilha, Olam, ETG, Indo África, CN Caju	<u>3,700 TM CNSL:</u> - Replacement of 3,400 MT of fuel oil (for industry or power generation) - Up to 1 MW electric produced with CNSL - 750,000 to 1,900,000 USD/year of business figure per sale of CNSL <u>13,000 TM cake:</u> - Cake coal for 3,500 families - 300,000 USD/year of business figure for coal sales	Average Needs prior study and market research (1-2 years)	200,000 - 375,000 USD / site	Cardoil, industrial and experimental study for LCC fuel use in Ivory Coast Cajouvalor , 2012-2014 ElectriCI , 2016-2020 Beninut 2018
2. CNSL extraction at each factory	Capacity > 5000 MT RCN/year	Condor, Caju Ilha, Olam, ETG, Indo África, CN caju	<u>4,300 TM CNSL:</u> - Replacement of 3,900 MT of fuel oil (for industry or power generation) - Up to 1.1 electric MW produced with CNSL - 860,000 up to 2,200,000 USD/year of business figure per CNSL sale <u>15,000 TM cake:</u> - Cake charcoal for 4,000 families - 350,000 to 540,000 USD / year of business figure per coal sale	Low Need market research. Low individual profitability if low volumes. (1-2 years).	150,000 - 250,000 USD / site	Technical advice and dimensioning of CNSL extraction plants in West Africa

³¹ Base 35,000 TM RCN processed in the territory, and the geographic and size distribution of existing plants.



Opportunity	Eligible factory type	Examples of Mozambican processors	Country potential ³²	Technology, current limitations	Budget	Nitidæ Experience
3. Installation of H2CP pyrolysis furnaces	Capacity <5,000 MT RCN/year and vertical boiler	Mocaju, Caju Ilha, other small and medium sized factories	<u>3,000 MT valued shells</u> - 300 MT bark charcoal - 36,000 USD / year business figure for coal' sale	Low Need to create local manufacturing and operating capacity	5. 000 USD/unit Training and technology transfer program. 350,000 USD	Cajouvalor H2BE , 2014-2015 Agrovalor RCI , 2017-2021 21 installations carried out since 2013
4. Pyrolysis furnaces optimized for coal	Every factory not close to housing	Mocaju Condor anacardium other small factories	<u>Up to 17,000 MT of valued cake</u> - 3,300 TM cake charcoal for 4,500 families - 400,000 to 600,000 USD/year business figure	Average Need technology development (1-2 years) and previous feasibility study	1.00 0 - 10 000 USD/unit (depends on capacity)	Process under developing
5. Gasifiers for electricity and coal	Capacity > 6000 MT RCN/year	Condor, Olam, ETG	<u>13,000 MT valued shell</u> - 3x250 kW electric ³³ -100% supply of factories, possibility of injection into neighboring networks - 1,300 MT coal for 1,750 families -130,000 to 237,000 USD/year business figure in the sale of coal	High Require prior study, long-term project development (> 2 years).	> 2 000 000 USD/unit	ElectriCl Beninut 2018 Agrogazélec 2020-2023

³² Considering 35,000 TM RCN processed in the territory, and the geographic and size distribution of existing factories.

³³ Three installed 250 kW power sites



➤ **In the short term: promote and support the use of CNSL as fuel for other industries.**

Today, CNSL extraction is not very profitable in Mozambique because:

- The cost of packaging, transport and export captures most of the added value of CNSL;
- The quantity available and the chemical market in Mozambique are not large enough to justify facilities that add value, starting with the distillation of cardanol from CNSL (which is the main product used by the chemical industry, for example in the paints production).

CNSL is a very calorific fuel. It could be used as the equivalent of fuel oil (industrial fuel, also known as heating oil) in the national market. An example that this perspective is perfectly adapted to the Mozambican context is that a processor in Mozambique has already started selling it to a metallurgy factory. In fact, the shell liquid has been used, in the case of not having a market in the chemical industry, as a heating fuel in Asian and Brazilian industry for decades. It is not surprising that the Mozambican industry adapts equally to the new fuel.

Promoting the use of CNSL as fuel for other industries that now import oil or fuel oil at high cost would generate additional income for the cashew industry and, at the same time, lower the fuel cost for other industries. Precisely, in the province of Nampula there are at least two metallurgical factories that need this fuel, in addition to other large industries such as cooking oil refineries, beverage factories, etc. just a few kilometers from the cashew factories. Even if the country starts producing oil, there is no guarantee that consumer prices will drop to be competitive like CNSL, which can be sold up to 250 USD/MT - heating oil is currently being sold at 660 USD/MT in Mozambique. The immediate use of CNSL in these industries is possible without the need for technological development; it is only needed a product promotion and progressive learning of product handling by technical players (fuel suppliers, adapted burners suppliers, etc.). INCAJU and AICAJU could be key players in the development of this market.

The shell oilcake that is not used by the factories could also be sold to industries that today use wood as fuel, with a competitive price, requiring a minimum exchange of combustion equipment and without environmental consequences or product quality. The application of the oilcake could be of interest, for example, for bakeries and plants that need drying (grinding plants).

The promotion of full use of the national cashew peel can be carried out by its integration in large combustion applications, such as electric plants. New diesel/gas and coal thermoelectric plants are planned to join Mozambique's electricity generation mix in the coming years³⁴, some of them in cashew processing areas, where energy-rich by-products are available in large quantities. The inclusion in the co-firing of these materials in the standard fuel supply would add a factor of sustainability to these ventures, and it is also an opportunity to start dealing with these renewable biofuels (liquid and solid) from a promising national culture, capitalizing on thus knowledge and preparation of the energy transition.

For example, when developing a mixture of fuel oil with a very low proportion of CNSL, all potential production of CNSL from processed nuts would find an internal market: just replace 0.8% CNSL with diesel / heavy oil fed at the Pemba, Nampula, Nacala and Quelimane thermoelectric stations, which currently total 135 MW of installed power, all CNSL production in the North would be absorbed. Other possibilities on a smaller scale are also possible, including the use of the solid part of the shell (see Annex 1).

³⁴ Away4Africa & Fúnteni Installations et conseil, "Environmental Sturdy of Waste Management in Cashew processing in eight African countries," African Cashew Alliance, 2018.



- **In the medium term: promote the creation of a centralized management platform for shell and other cashew products.**

In general, cashew processors lack the skills or vision to process their by-products themselves in a competitive way. There is a perception that it is not an easy task to capture a market for all matters other than cashew kernels. Furthermore, due to the economic context of the sector, processors do not wish to take additional costs and risks to open a new line of business.

On the other hand, in the main processing countries (India, Vietnam, Brazil), the scheme is exactly similar: the cashew processing factories specialize in food processing (cashew kernel and cashew kernel by-products for human consumption), while the other by-products (shell, peel, cashew kernels not marketable for human consumption) are sold to private operators who collect these materials, coming from several nut processing factories, for further processing in their facilities. Other advantages of exporting the by-product processing are that the price risk of the final product rely with a third person, out of the factory. Also, the process in a centralized unit with a diversity of suppliers is more efficient and stable.

In exchange for sending their shells, the cashew factories will be able to supply themselves in oilcake to feed their boilers, thus putting an end to the smoke problems around the factory and the risks of treating this dirty matter, the shell. In the Mozambican case, this industrial symbiosis is possible due to the fact that the factories are relatively close. Most of them are on the Nacala-Nampula hub, and there is a trend towards concentration near these two cities. It is about proposing one or more centers for by-products processing, this type of platforms would allow easier access to the commercialization of products such as:

- Solid fuel (oilcake in powder form, or in briquettes for bakeries and houses);
- Cashew oil (liquid fuel for industry, power plants, or raw material for paints);
- Cashew kernel oilcake (for mixing in chicken feed);
- Cashew kernel oil (human and cosmetic food (soap);
- Peel (food and textile dye, food antioxidant, chicken litter)

Annex 1 presents more details on the market for these products.

These platforms could be promoted by INCAJU and partly financed by the guarantee fund for processors. The organizational structure can be public-private or 100% private, and even seek the processors' contributions for this business. Several processors contacted find interesting to expand the existing CNSL extraction facilities to accept larger volumes of shell from their industrial partners. Currently, there are already cases of centralization of shells, for example Indo Africa that buys shells from some neighboring factories. However, in order to achieve full use of the by-products, it is necessary to work on prospection and creation of value chains for by-products, as little is known about them in the Mozambican market.

INCAJU's role in this initiative could be:

- Provide information to processors and AICAJU on the economic opportunities to transform by-products and to participate in the identification of a common solution;
- Conduct a preliminary study to determine the technical solutions and the multi-stakeholder organizational scheme of this initiative;
- Market study of by-products; when necessary, market development and promotion of by-products at national level;
- Active fundraising for the development of competitive products derived from cashew by-products for the Mozambican market.



Considering that this initiative strategically favors almost all processing factories in the country, AICAJU could, as a representative of the interests of processors, take the lead, to coordinate this initiative, propose the implantation sites and research financial partners. AICAJU could play a decisive role to define these centers and become an interested party through actions in these companies.

- **Short to medium term: support factories capacity building in the adoption of pyrolysis furnaces and other technologies for the enhancement of in-shell fuel.**

The pyrolysis furnace is an equipment adapted to small and medium scale processing companies. It was first conceived in 2013 in the context of a Nitidæ project in Burkina Faso. Since the first model, more than 20 pyrolysis furnaces have been installed in West Africa, of which 14 in cashew factories and the remaining in factories that previously needed firewood to produce heat (fruit drying, refining food oil, etc.). In fact, these ovens work with vertical boilers and other equipment that needs heat, and that can be built locally or imported at a low price.

Figure 39. The pyrolysis oven can feed vertical boilers (on the left, Caju Ilha) and dryers (on the right, Mocaju).



The Figure 40 shows two images of newly installed ovens in Ivory Coast. On the left, the oven supplies a clean smoke flame to the boiler to cook 8 tonnes of cashew nuts in 8 hours. On the right, another pyrolysis oven with the boiler connected to the dryer system. At the bottom you can see the horizontal boiler now working at half load. The two plants reduced their smoke production and increased the shell appreciation ratio: 20 to 25% compared to 10 to 15% initially.



Figure 40. Two pyrolysis furnaces in West African factories, with the boilers above.



Several projects have supported the introduction of this technology and the promotion of the technical knowledge necessary for its manufacture and operation: Cajouvalor in Burkina Faso, Agrovalor in Ivory Coast. The success of these actions is visible in the sector itself that found a first solution adapted to its context, and that is now interested in the thermal valorization of the shells, including coal. These initiatives are perfectly replicable in Mozambique if technical, sectoral or environmental support funds are mobilized.

The use of the device is highly recommended in small and medium scale plants (up to 5,000 RCN tons/year), including those that are starting. The oven accepts the raw shell, but it can also be fed with oilcake. The charcoal produced by the pyrolysis furnace is a first experience for the population to become accustomed to using a derivative of shells as fuel. Factory personnel can receive this product as “extra” as well as an incentive, even if it can also be sold.

With regard to the scaling up of the system, a large-scale technology (gasification) will be tested for the first time in a cashew factory in Benin. This solution can take more or less 3 to 4 years and it is adapted for larger factories. Gasification aims to convert most of the shell into gas. The gas is treated and feeds an electric generator (250 to 750 kW). Solid waste (coal) will be generated abundantly, given that 60% of the shells generated by the factory can be recovered through this equipment and up to 100% in the case of supplying electricity to neighboring communities. Nitidæ has a key role in this project, in the creation of a value chain for bark coal.

INCAJU, in its role of supporting processors, could facilitate or promote the transfer of these technologies to Mozambique in the short term, increase their visibility, facilitate connections and exchange of experience with other institutions, participate in fundraising activities for major projects. etc. to finally create the conditions that would lead to the launch of larger scale projects, including the electricity generation with the shell and large scale carbonization.



9. Improve the business environment in Mozambique

Improving the competitiveness of the cashew industry and, more generally, of the agri-food industries in Mozambique also depends, a lot, on improving the business climate in the country.

As noted at the beginning of this report, there are many areas for improvement in this business environment, from administrative simplification, general tax and administrative incentives to investments and exports, reducing import and export charges through ports or improving professional training and creation of industrial “clusters” in various areas of the country. It is not in the scope of this report to list all of these possible improvements, resulting from various studies and technical assistance from Technical and Financial Partners. We will only draw some interesting conclusions from the SPEED + Program, which seem particularly relevant for the cashew industry in Mozambique.

The SPEED + Project produced a series of reports related to the commercialization, import and export of products and their value chains in Mozambique, especially on cashew nuts. Among the reports we can highlight the importance of the Port of Nacala for the value chains in the corridor, which impacts the cashew subsector.

The Port of Nacala, being the third largest port in Mozambique and which drains most of the cashew nuts and cashew kernel, has obstacles to the development, such as poor infrastructure and storage posts in the port itself or close to the main production points, this was pointed out as a factor limiting the competitiveness of the Nacala corridor. This lack of storage posts increases the number of intermediaries in the chain and post-harvest losses.

Regarding the import and export processes, we can highlight the documents that analyze the new Trade Facilitation Treaty of the World Trade Organization (WTO) in 2017 and the report on the economic impacts of the Corporate Income Tax (IRPC) in the agricultural development in Mozambique. These documents present international standards to be applied to dispatch and clear goods at borders with greater transparency in trade-related fees and charges. It also suggests that the fees to be charged should vary according to the value of the merchandise, the fees that generate tax revenue should be reviewed, eliminated or restructured, revision of the fees applied every 10 years in order to reduce the charges. Regarding the IRPC, the report suggests that tax incentives for agriculture should be linked to capital expenditures, through provisions such as expenditures on agricultural works, special investment subsidies or investment tax credits; the government can promote investment more efficiently and equitably, reducing the standard IRPC rate for all companies; and the Ministry of Finance should develop procedures for reporting “tax expenditures” to improve transparency and consider adopting a budget allocation to limit tax expenditures that can be approved each fiscal year.

C. Other proposals considered irrelevant or non-priority:

To finalize this report, we also wanted to mention the proposals made during the exchanges held in February and March 2020, but which we do not consider relevant or priority.

a) The establishment of a minimum price for the purchase of raw cashew nuts

Many West African countries and Tanzania, in some campaigns, bet on minimum prices in an attempt to influence the price paid to cashew producers during the campaign. Overall, these experiences have had mixed results, in some years they have had disastrous results for the producers themselves and for all the cashew industry actors’.



It must be emphasized that all of these minimum price setting policies are not accompanied by a stabilization mechanism [variable taxes, stabilization fund, advance sale in future markets or indexing a minimum variable price to a reliable reference price (value stock market)]. The prices are fixed, at best, purely based on declarations or a principle of punishment (fines, withdrawal of licenses, confiscation of shares) of economic operators who have not complied with the minimum price.

Under the conditions of the marketing chains spread over vast rural areas, involving a very large number of actors and oriented towards a particularly volatile international market, these incomplete public interventions favored above all: arbitrary decisions in relation to certain economic operators, increased corruption in the sectors (whether on the initiative of private or public players), in certain contexts a disorientation of producers or even an influence on their sales strategies that was strongly unfavorable to them in terms of income. In cases like Tanzania or Ivory Coast, they could also have seriously harmed local processors, forced to pay a higher price than players in the export sector, due to increased exposure to arbitrary controls and the complaint.

This inefficiency and even the counter productivity of minimum price policies can be explained by several reasons:

- Governments tend to (especially during the pre-election period) set minimum prices higher than those that could be paid to producers in a situation of pure and perfect competition based on international prices in force at the time of fixing them. These decisions are explained by the legitimate desire to defend the interests of the largest number and the poorest players in the sector (producers). But its impact is, at best, very low: international prices are increasing, most producers would have received this price or a higher price anyway during the campaign; at worst: if prices on the international market remain stable or fall, producers are encouraged to stockpile while waiting for the minimum price to be respected; the quality of their stocks gradually decreases and they generally find themselves in need to sell to a price lower than what could have been obtained at the beginning or in the middle of the campaign due to less negotiation capacity, due to the urgent need for financial resources and the lower quality of the product.
- In vast areas of production, not all producers have the same “market connection”, the same quality or the same capacity to gather large quantities during a sale. The exclusion of minimum prices is generally defined at the national level, without taking into account isolation, quality parameters or the volume sold per transaction. This price homogeneity is never effective in production areas, where prices vary according to many parameters. Many producers do not understand why the price is the same as those who do not care for quality, do not make a group sale or do not mind transporting their product to a place of sale, market.
- No African government has publicly undertaken in the past decade to lower the minimum price set during the campaign due to falling prices on the international market. The political weight of such a decision is considered too heavy and, therefore, governments tend to remain silent or publicly accuse national and international traders of bad faith when prices fall and their minimum price is not respected. We can emphasize that this type of discourse tends to accentuate the distrust between producers and actors of the sector accused of all evils and do not encourage them to build lasting commercial relationships (respect for the word given, contractualization, certification, mechanisms for price risk distributing) with these operators.



- These policies comfort producers with misinformation about the functioning of markets and the idea that price developments depend mainly on government decisions. If prices rise above the minimum price, producers who have benefited from this high price will praise the government for its policy, even if the increase is only the result of the international market situation. Producers who sold too early for the minimum price and did not take advantage of the price increase will conclude themselves that next year they will wait longer to sell and therefore take more risks. But if prices do not reach the minimum price or fall below that price at some point in the season, producers will criticize government policy, even if they are not responsible for the decline in prices on the international market.

We emphasize again that the objective here is not to denounce stabilization policies based on real stabilization tools, either by clearing/charging (floating taxes, stabilization fund, reserve shares) or by transfer under approval (anticipated contract sales via future contracts). Such policies work relatively effectively in certain sectors (cotton, cocoa, rubber, palm oil, cereals) in many countries around the world. Even if they are criticized for their exogenous impacts on international markets and generally classified as distorted by world markets (with the exception of transfer to approval policies) by the World Trade Organization (WTO) agreements, such policies are authorized by international agreements, provided that do not exceed a certain amount of public support for national production³⁵ .

We question the relevance of setting these prices without supporting them with an effective stabilization mechanism.

The choice of Mozambique to announce a “reference price” for the procurement of cashew nuts from the producer, which is neither a minimum nor mandatory price, seems to us much more relevant, given the difficulty of stabilizing the prices of cashew nuts in the local market.

However, there are still two areas for significant improvements possible for this advertising policy:

- i. A clarification on the definition of this reference price: many state agents and some producers consider this reference price to be a minimum price. Certain state agents and those responsible for the localities sometimes even carry out punitive (perfectly illegal) actions against private operators, who buy below this reference price, regardless of location, quality and quantity sold. It therefore appears urgent to clarify the definition of that price, to explain its methods of calculation and the factors that may favor lower or higher prices compared to this reference price.
- ii. Regular updating of this reference price: if certain campaigns exist, the volatility of international prices is low enough to guarantee the relative stability of prices “around” the reference price; in other years, changes in the international price can cause a strong increase or a strong reduction compared to the reference price fixed before the campaign. It therefore seems be important to promote good information for producers and improve their negotiation skills in a context of rising and falling prices, that a mechanism to update the reference price is provided in advance (depending on a threshold of price variation in the market. international) and activated as soon as the international market changes significantly. Under the ACAMAZ project is currently implemented a Markets Information Service³⁶ to inform on a weekly basis the producers and all the value chain stakeholders about the diversity of prices, their evolution, the market conditions, in addition to give advice on sales strategies to allow producers to continually adapt their sales strategy and

³⁵ The threshold for public support to the agricultural sector must not be exceeded is calculated on an indicator called the Aggregate Support Measure (AMS). The levels of AMS practiced on the African continent are very low and clearly below what the WTO agreements allow, due to the low budgetary capacity of States to support their agricultural sector.

³⁶ Information and Advice Service in the N'kalô Markets (www.nkalo.com)



negotiation capacity in line with the evolution of the local, national and international market. Finally, this system could complement or even replace a reference price definition, as it takes more into account the volatility of the international market and the diversity of local situations.

b) The import of raw cashew nuts to meet the needs of processors:

This idea sparked considerable debate during the restitution workshops of the study preliminary version.

After checking the International Trade Center (ITC) database of trade policies³⁷, Mozambique does not prohibit the import of raw cashew nuts. It is subject to a 20% customs duty only, except for products from SADC members for which it is exempt from customs duties.

Completely facilitating or clearing the import of raw cashew nuts from other producing countries does not seem particularly strategic. On the one hand, because a really exceptional economic situation would be necessary (a very sharp drop in price between the season in Mozambique and those of the producing countries in the northern hemisphere), so that imported cashews can be cheaper than raw cashews at the Mozambican factories level. On the other hand, given the support that already exists to promote the development of local processing in Mozambique, it seems to us illegitimate to place Mozambican producers in competition with producers from another country. The development of the cashew value chain in Mozambique is taking place and should continue to be done in a fair balance between the interests of producers and the interests of national processors.

c) Prioritize support for secondary processing over support for primary processing of cashew nuts

If, from our point of view, secondary processing should benefit from the same advantages and support as primary cashew processing, it is still absurd to oppose or prioritize them for several reasons today.

On one hand, in all countries that process and/or consume cashew nuts worldwide, secondary processing is largely done locally. This situation is mainly explained by the need to adapt the brand, marketing and [recipes/ingredients](#) to the eating habits of a territory, distributor and specific category of the population.

If there is some effective example of secondary processing as the example of Sunshine Nuts in Mozambique or Tolaro Group in Benin, their success is fundamentally linked to a long term business relationship with these companies that have created specific distributors and markets and agreed to order a finished or semi-finished product. Their model can be adopted by other companies that have similar connections to distributors linked with specific markets, but it would remain a minority for a long time.

India is a good example to show the limits of that sector. India has heavily invested for more than 10 years in the support to export of finished products and offers an additional export subsidy, nevertheless they still represent less than 10% of exports.

In the sub-regional market, there are certainly opportunities for finished products from Mozambique, but if we consider that finished products should be part of the strategy for promoting Mozambican cashew in the sub-region, we think that this strategy should deal on an equal foot with primary processing and secondary processing products.

It must be emphasized that the competitiveness of secondary processing is mainly linked to the competitiveness of primary processing. If the latter cannot survive, much of the secondary transformation will disappear with it.

³⁷ www.macmap.org



Finally, it should be noted that in many markets the primary processing of cashew nuts corresponds to final processing. An increasing number of distributors offer plain white cashew kernels “in bulk” to consumers who buy them and consume them as they are or use them as ingredients for cooking without any other form of packaging or processing. This method of consumption is indeed expanding on the European market.

d) Subsidize the export of cashew kernels

If some of the Nitidae consultants involved in this study participated in the development of the Ivory Coast processing support policy, which includes a subsidy for the export of cashew kernels, this policy does not seem to be adapted to the context of Mozambique so far.

The main reason is the proportion of exports of raw cashew nut and cashew kernels. In the last campaigns, exports of cashew kernels exceeded exports of raw cashews. Given the significant investments made by Mozambican processors in the past 5 years and if the number of factories that will definitely close their doors in 2020 is not very large, it is likely that exports of processed products will remain above those of the gross product in the coming years. It seems difficult to sustainably finance a subsidy to a majority flow, using a minority flow. However, this policy is only relevant if it can be implemented over the long term and can be integrated by manufacturers in their turnover and return projections on investment over several years.

However, if the gas sector shows growth and generates the expected tax revenue, in a few years it could replace the tax on the export of raw cashew nuts with a subsidy on the export of cashew kernels that would be beneficial for the entire industry.



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Annex 1. Market opportunities for cashew nut by-products

Local sale of by-products is possible in the following sectors:

- Animal feed. The **rejected cashew kernel** that is used to feed animal feed is also named *Cashew nut meal*. The sale of chicken feed is especially developed in Mozambique (*New horizons* in Nampula sell 600 tons of ration per week, with high soy content). The rejected cashew kernels can be sent to poultry feed. Cashew kernel cake (without oil) is used as a substitute for soy. Various experiences indicate that the introduction of rejected cashew kernels up to 20% in the ration composition has no influence on the growth of chickens (INRA, CIRAD, AFZ and FAO, 2020). Cereal soybeans are imported into Mozambique at up to 400 USD/MT. The rejected cashew kernel is always more economical than soy.
Many experiences collected in West Africa (Nigeria, Ivory Coast) indicate good results in the inclusion of *Cashew nut meal* for pigs (between 10 and 30%). In Brazil, the material has been used for dairy cows, chicken and sheep. In India, the material is used to feed chickens and pigs.
- Human or cosmetic food. The **cashew kernel oil** refined has a place in the food market as oil for cooking, and in cosmetic compositions (soothing properties).
- Hand protection during peeling. The **cashew kernel oil** can replace castor oil which is currently used for the protection of the hands of manual peel operators and therefore will participate in the economy of this material .
- Raw material for the painting industry. The country has companies for the industrial production of paints and varnishes with a phenolic base (Neuce factory in Nacala). The CNSL is a cheap raw phenol replacement; it might be interesting for manufacturers of this type. You can also find sales of small volumes of raw CNSL indicated for wood treatment.

Figure 41. Sale of cashew oil from the Condor industry, in Nampula.





In addition to these products, the peel can be used differently, for energetic purposes:

- CNSL fuel. The **Cashew Nut Shell Liquid** (also LCC) can be burned in industrial applications: in India and Vietnam, the heavy fraction (which is more viscous than the liquid sold in the fine chemicals industry, and having impurities) has been used as furnace oil and working in industrial boilers as heavy fuel oil. In Mozambique, CNSL starts to be used as fuel: the steel factory of the Indo Africa group, in Nacala, already uses CNSL in its burner. Other industries could also benefit from this cheapest oil than the fuel oil use in commercial sales (for example, large bakeries, beverage factories, oil refineries...).
- The shell extraction residue (or cake) is also a good fuel, having a calorific value similar to firewood. The company Pamoja cleantech in Nampula has developed an initiative to use the cake in improved cookstove (Figure 42). Up to 750 cookstove have been sold so far in Nampula neighbourhood. Other market that could use cake in large quantities are bakeries, the manufacturing industry and collective kitchens. In an area where forest capital has experienced a progressive decrease due to anthropic pressure, it appears as a paradox that the shell is not used systematically in place of firewood.

Figure 42. Improved cookstove with cake, sold by Pamoja cleantech in Nampula.



- Charcoal. Various experiences in West Africa confirm the interest of using carbonized **cashew nut shells** in households. In Burkina Faso and Ivory Coast, the shell is carbonized in small and medium-scale factories through pyrolysis furnaces (Figure 43). These furnaces are used to feed the factory's boilers, with the advantage for the industry to create less smoke and improve the working environment for the personnel operating the boilers. The second advantage is the production of charcoal at the end of the day. Charcoal can be recovered by workers for domestic use. Other factories process the charcoal to make briquettes for commercial sale (Figure 44). The cashew shell charcoal market is under development in cashew production areas in Ivory Coast, the design of larger reactors is underway.



Figure 43. Unloading of charcoal from the oven. Agrovalor RCI Project (Nitidæ, 2017-2021).



Figure 44. Charcoal briquette from cashew shell.



However, the cake can also be turned into charcoal with pyrolysis ovens or specific technology. In fact, charcoal is a product with greater added value and with a higher demand in urban areas, it can create a synergy between the charcoal workers and the factories, near the villages.

The cake appears to be preferred to shell for the conversion into charcoal. Using carbonized cake would be more profitable in this case, since the extracted CNSL contribute to the global benefits. Charcoal production close to Maputo seems very profitable (margin for cashew processor up to 3,000 MZN/tonne of shell, ie 2, 200 MZN/tonne RCN), but much less in Nampula as charcoal is more affordable.

- Electricity. In the case of large factories, shell based electricity generation is an opportunity to improve the factories viability and the access to electricity in rural areas. Factories from 6,000 tonnes RCN can install small gasification reactors. This process is very similar to pyrolysis. Gasification products are electricity generation combined with heat to power the plant, and charcoal. The use of all shells for electricity generation would allow the supply of part of the energy to neighboring populations. Two initiatives are in process in Ivory Coast and Benin with factories capacity from 10,000 to of 15, 000 MT RCN. The investment to develop these projects is very important (2 to 4 million dollars), added to an important administrative process, which require part of the investment to be carried out. The advantages for the processor are mainly economics and operational due to electricity costs savings and a greater energetic autonomy.



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