



Alexander Schimmeck

Factsheet Resilience Solutions for the Cocoa Sector in Nicaragua

This Factsheet is a part of the Private Markets for Climate Resilience (PMCR) project to evaluate systematically the potential market for climate resilience solutions in the private sector. Focusing on agriculture and transportation, current practices and opportunities highlight products, services and finance in six emerging markets — Colombia, the Philippines, South Africa, Nicaragua, Kenya, and Vietnam.



Nordic Development Fund



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Cocoa sector in Nicaragua

Nicaragua is among the 16 countries in the world producing and exporting certified organic cocoa. Between 50-70% of total production is exported to international markets, with 100 percent of these exports graded as the highest quality –Quality A. Nicaragua’s main markets are Central America (70%) and Europe (25%). The balance of production is supplied to national industry for domestic consumption. Current annual production amounts to approximately 7,000 tonnes, although by 2026, this amount is estimated to have risen to 25,500 tonnes, of which 80% will be for export. Given Nicaragua’s potential in the global cocoa market, for more than a decade, private investors, international cooperation agencies and NGOs have invested time and resources in strengthening the cocoa value chain.

It is estimated that 95% of Nicaragua’s cocoa producers are small-scale farmers, who deliver their products to retailers through cooperatives and associations. Around 60% of farmers are organized in associations or cooperatives. Formal demographics on the small-scale growers is difficult to assess as many do not have land ownership. However, some larger companies are establishing commercial plantations, and medium-size companies are implementing innovative business models that cover the entire value chain.

One of the main challenges in the sector is the continued political instability, which has been leading cooperatives to downsize or close operations temporarily and, consequently, delaying exports. Other challenges include limited or reduced credit and financial support available for producers. All these negative impacts have been particularly critical for small farmers and organizations.

The cocoa value chain is evolving rapidly, with highly differentiated markets in terms of price, quality, production type, and management of social and environmental issues, among others. Consumers are increasingly prepared to pay a premium for high quality or ethically produced cocoa. These trends are creating pressure for value-chain stakeholders, including wholesalers, retailers and manufacturers, to adopt standard certification and ensure traceability in the value chain in order to guarantee product quality.

Cocoa becomes a lucrative investment at the post-harvest stage of the production process, after the products have left the farm. The quality and profitability of the sector relies directly on farm-level production. Therefore, in order to ensure the resilience of the entire value chain to climate variability and weather events, it is crucial to reduce the vulnerability of producers.

Sector facts (2018)

Total production: ~7,000 tonnes

Total area of production: ~13,000 hectares (ha)

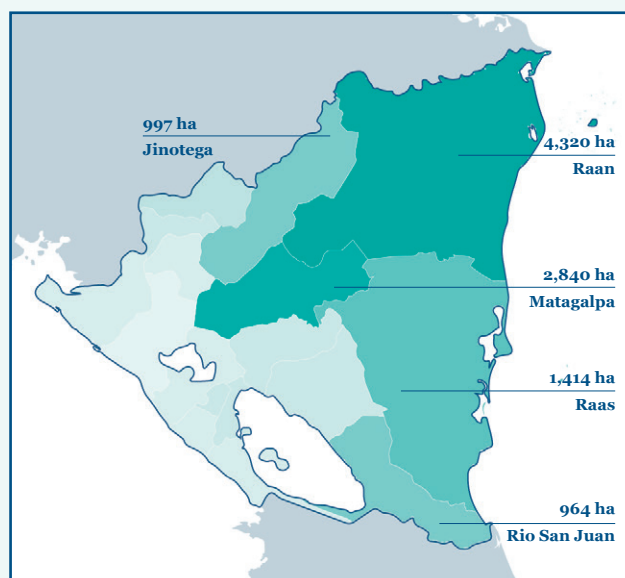
Main production regions: Matagalpa, Jinotega, Rivas, Nueva Guinea, RAAN and RAAS, at Rio San Juan is increasing. Waslala (RAAN) is known as the cocoa municipality, producing around 48% of the total cocoa in the country (ca. 1047 MT in 2014)

Number, size and types of producers: There are around 10,000 cocoa farmers, of which an estimated 95% are small producers, and the balance are medium and large producers. Small producers own farms between 0.7-3.5 ha.

Average yield: ~860 kg per ha

Sector research institutions: Nicaraguan Institute of Agricultural Technology (INTA), National Agricultural University (UCA), Tropical Agricultural Research and Higher Education Centre (CATIE).

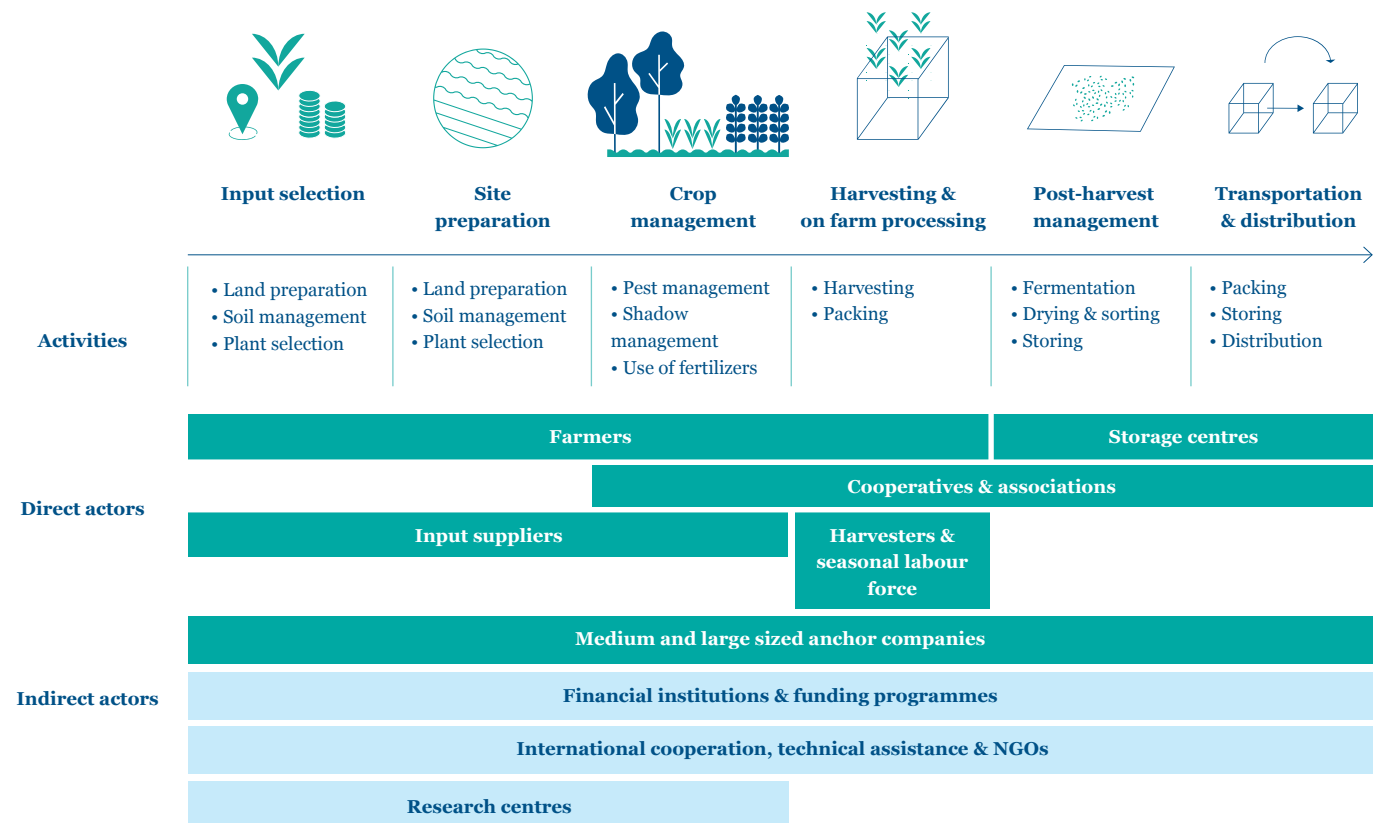
Cocoa Distribution Nicaragua (hectares)



For a list of references, see the References Section of the PMCR Report.

The cocoa value chain

The cocoa value chain builds on six main processes from production to retail. The summarized value chain below shows specific activities and direct and indirect actors engaged in these activities.



Normal environmental conditions for production

- The ideal *temperature* for the cocoa plant is between 18-32°C, with an average of 25°C, and ideal annual rainfall of 1,000-3,000 mm.
- For optimal production, and in order to avoid physiological stress, the cocoa tree requires protection from direct *sunlight* and excessive *winds*.
- Microbial fermentation and drying of the cocoa beans are critical steps in the post-harvest process. This is to guarantee the development of aroma and flavour, the main quality factors for the chocolate industry. *Humidity* and *temperature* conditions also need to be monitored to ensure product quality.
- Dried beans must be packed in clean bags made of food-grade sacking material and kept off the ground and away from walls in dry, well-ventilated and smoke-free storage. Cocoa should be transported in clean, well-ventilated conditions away from odorous material.

Changes in the weather that could affect production

- The growth stage of the cocoa plant is particularly vulnerable to climate variability.
- Changes in the duration of the rainy or dry seasons affect the physiological settings for flowering and bean production.
- *Lack of rainfall* and prolonged *droughts* can cause losses in flowers and diminish sugar development in the fruits, affecting the post-harvest phase and overall product quality.
- Strong *winds* and other *extreme weather events*, such as hurricanes, windstorms and floods, may cause losses in flowers, pods or even cause the falling of plants.



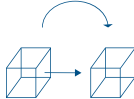
- Increases in *temperature* and excessive *humidity* can damage the beans during drying, inducing conditions for mould formation. Plus, excess rains and floods lead to higher vulnerability to diseases and plagues, affecting bean quality and delaying harvesting.
- *High temperatures* affect working conditions at the farm-level.

Main climate-related impacts affecting the value chain and the entire sector

- Post-harvest processes are significantly dependent on environmental conditions. *Excess rains, floods and droughts* impact negatively the bean fermentation and drying processes.
- The quality of products is vulnerable to excessive *humidity* during storage or transportation to collection centres.
- *Floods, landslides and disruptions* in rural roads can affect the transportation of products to markets, leading to increased transportation costs.
- As the road network in the main cocoa regions is frequently affected by floods and landslides during the rainy season, product transportation to storages centres or the market are disturbed. In some regions the main transportation is by boat through the river, which during low water levels as consequence of prolonged droughts, is a barrier for transportation of products to markets through the river. This way of transportation can also enhance the risk for increased humidity.
- *Droughts, excess rains, floods, high temperatures and strong winds* impact directly the availability of quality of cocoa for local and international markets and create uncertainties in the entire value chain.

B*Resilient Process Model

Each process of the value chain was assessed using the B*Resilient Process Model (BRPM), in order to identify the climate risks associated with each phase and the resilience options and tools available to address these risks, as well as to achieve specific resilience outcomes. The summarized BRPM analysis of the **site preparation**, **crop management** and **storage and transport** processes in the cocoa value chain is presented below.

Resilience outcome				Increased productivity across the cocoa value chain		
Process						
				Site preparation	Crop management	Storage & transport
Risks				Extended droughts	Extended droughts Excessive rainfall High temperatures	Excess of water & humidity Excess or lack of water in the rivers for transporting products to markets Landslides and floods in roads Extreme variability in river flow levels (for boat transportation)
Main Actors				Farmers Input suppliers Cooperatives Government agencies Technical assistance & financial institutions	Farmers Medium and large sized anchor companies Government agencies Technical assistance	Storage centers Cooperatives & associations Government agencies Financial institutions
Options & tools				Water harvesting, irrigation & efficient water use Resilient plant varieties In-farm infrastructure Credit for irrigation	Agroforestry systems Shadow cultivation Planned pruning Capacity building Technical assistance	Equipment Decentralized storage Contingency plans Improved infrastructure Strengthening institutions capacity & governance



Cocoa drying process. Claudia Munera

“Current climate patterns are challenging farmers’ traditional knowledge. Due to an excess of rain, some farmers are opting for transporting the harvest to postharvest centres in drier areas.”

Farmers Association ADDAC

Resilience solutions

Identified resilience solutions in the cocoa sector in Nicaragua vary from *certified schemes* to *knowledge services*, including *expertise*, *training*, *technical assistance* and *specialized consultancies*.

Leading resilience solutions: *certification and traceability schemes*

Certification and traceability schemes encourage the production of stipulated product quality by applying good production practices, improving entrepreneurial and productive processes, reducing environmental impacts and supporting financial sustainability. Ultimately, the certification of products can lead to greater knowledge, capacity, higher prices and profits for cocoa farmers.



At the farm level, certification schemes stipulate guidelines and production practices in terms of crop and farm management, including shade management, agroforestry, biodiversity, conservation and management of soil and water, and watershed management, to name a few. The implementation of production practices aligned with certification schemes requires training and capacity building for farmers, producers and cooperatives to guarantee that the quality level and standards of a given certification or traceability scheme are met.

Resilience contribution: Good practices promoted by certification and traceability schemes can optimally lead to reduced losses due to climate change and guarantee sustainable and climate-resilient production in the cocoa sector. As best practices supported by certification schemes in the cocoa sector are closely linked to farm-level biodiversity, these schemes are expected to contribute directly to the climate resilience of the sector. In practice, biodiverse cocoa agroforestry systems may perform better during extreme climatic events than mono-crops. In addition, certification can help farmers face price variability and achieve financial sustainability, as certification of products ensures higher prices and a larger share of the final price for the farmer, than traditional cocoa markets.

Market opportunities: With adequate training around certification processes and protocols, the different actors involved in the production and commercialization of cocoa in Nicaragua may also support and facilitate certification processes. With around 1.8 million hectares in the country available with the right climatic conditions for growing cocoa, there is big potential to increase its production. Private companies play a crucial role in achieving a higher uptake of certification and traceability schemes in the cocoa sector. Demand for certified cocoa beans is continuously increasing in Nicaragua, with companies like Ritter Sport paying premium prices for cocoa beans that meet the quality standards for the international fine cocoa market. Ingemann is an example of a company that traces cocoa beans from the early stage, to ensure that the right practices are being implemented to meet quality requirements.

“Climate change is rapidly challenging our assumptions of the world and our expectations for the future. It is forcing us to find new solutions or rediscovering old ones. It is turning to be a transversal thematic to facilitate cross-sectoral dialogue and boost collaboration and learning in innovative ways.” **Claudia Munera, Biologist and Climate Adaptation Expert**



Marcela Torrente

Advantages of the resilience solution

- As the quality of the cocoa bean greatly influences final prices, certification schemes are key in ensuring adequate quality of cocoa production and higher prices.
- Certification schemes support farmer capacity strengthening through training on plant physiology, crop and product management, and ultimately the financial management of their farms, including budgeting and accessing credit.
- The main certification companies, including international quality control and traceability schemes and independent certification schemes (e.g. Ingemann), are represented in Nicaragua and have proven to be successful.
- This growing predominance of certification schemes is being supported by the increasing global demand and willingness to pay premiums for high quality and sustainable cocoa.

Main challenges related to the resilience solution

- Certification schemes are expensive and the implementation of required changes in production processes and farm-level practices can create a significant cost impact. Most small farmers do not have the financial resources to proceed with the necessary investments to qualify.
- International certification standards respond mostly to European or North American requirements, which can change unexpectedly and repeatedly within short time periods. Constant changes in requirements and regulations can make implementation even more expensive and less appealing to farmers and producers.
- The requirements and benefits associated with the certification programs are not always clear for producers and, consequently, selecting a certification processes can be confusing. Also, in some instances, particularly for producers not exporting, investments required by certification schemes are ultimately not reflected in their revenues.

Climate resilient business

Ingemann is an international group of Danish origin, established in Nicaragua since 2007. The company is a dynamic organization with a high level of knowledge in the agricultural sector, producing and exporting organic cocoa and honey. In 2016, Ingemann together with the Inter-American Development Bank and the Nordic Fund, developed the Adapta Project. This project combines research and the analysis of climate information, to create climate resilient cocoa and honey producers. The more than 1,450 producers working with Ingemann, have guaranteed access to the international market and receive tools to improve their production practices. <https://ingemann.com.ni/>



Ingemann Adapta

“Adapta Cacao has been a positive project to help strengthen farmers’ climate awareness, having a real impact in the Cocoa sector in Nicaragua.”
Lars Saquero Møller, Ingemann & Proyecto Adapta Cacao
