Knowledge Product

Challenges and opportunities in cashew (Anacardium occidentale) production in Puerto Carreño, Vichada

Cashew cultivation for commercialization in the Kanalitojo Reservation, Puerto Carreño, Vichada

1. Executive Summary

The collaboration between the Kanalitojo community, the Alpina Foundation, and Kardianuts has resulted in a joint project integrating agroecological practices, productive diversification, and community capacity building. The business model focuses on cashew cultivation as the primary axis, supplemented by other crops and small-scale animal husbandry to ensure food security and generate sustainable income. Notable achievements include the planting of 15 hectares of cashew trees, the creation of 18 productive *conucos* (small agricultural plots), and the installation of 20 laying hen sheds.

The project has improved food security, increased family incomes by 37%, and promoted gender equality through workshops and active community participation. Additionally, the agroecological model has supported soil regeneration and biodiversity conservation. Kardianuts has played a crucial role in commercializing processed cashews for international markets, ensuring sustainable economic growth.

Key challenges include delays in cashew crop development and the need to consolidate alternative incomes during the early stages. Proposed solutions involve strengthening infrastructure and capacities while diversifying income sources through complementary crops and poultry production.

Lessons learned highlight the importance of diversification strategies and continuous training. Looking forward, the project recommends strengthening communication with investors and scaling the business model incrementally, prioritizing economic sustainability, gender inclusion, and environmental impact. This initiative serves as a replicable model for other rural communities.

2. Context

Cashew (Anacardium occidentale) cultivation in the Vichada department, particularly within the Kanalitojo reservation in the municipality of Puerto Carreño, offers a viable solution to several critical challenges facing the region. These challenges

encompass food security, economic development, and reducing dependence on imports. The key aspects of these challenges are outlined below:

Food Insecurity

Vichada, like many other regions in Colombia, faces a severe food insecurity crisis. According to data from DANE, the rate of severe food insecurity in the department rose from 9.2% in 2022 to 16.8% in 2023. This increase underscores the growing difficulty in accessing adequate and nutritious food, which adversely affects the population's health, especially in rural communities. Vulnerable groups, including children, pregnant women, and the elderly, are disproportionately affected. Addressing this issue requires diversifying the basic food basket and strengthening local agricultural production, which are critical steps toward improving nutrition and food security in these rural areas.

Import Dependency

Despite Colombia's significant potential for cashew production, the country has yet to fully capitalize on this market. According to Trademapp.org, in 2020, Colombia imported 211 tons of processed cashews, with 126 tons sourced from Brazil and 85 tons from India. This reliance on imports highlights the immense opportunity for local cashew cultivation, particularly given that global demand for cashews is growing at an annual rate of approximately 7%, while Colombia's national production grows at only 6% annually. The cashew cultivation project in the Kanalitojo reservation thus holds the potential to reduce import dependency, promote local production, and leverage opportunities in the global market.

The department of Vichada faces numerous economic and social development challenges. It is among the most impoverished regions in Colombia, characterized by high poverty rates, inequality, and a reliance on subsistence agriculture. According to DANE, over 60% of Vichada's population lives below the multidimensional poverty line. This situation, compounded by low agricultural productivity and limited access to commercial markets, restricts indigenous communities' ability to generate sustainable incomes.

A significant issue in the region is the lack of diversity in commercial crops, which limits economic opportunities beyond traditional staples like rice, cassava, and corn. Cashew cultivation emerges as a promising solution to diversify agricultural production, bolster the local economy, and provide a stable income source for communities. This crop thrives in the region's climatic conditions and presents opportunities to integrate into both national and international value chains.

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At the global level, food security is a cornerstone of the United Nations' 2030 Agenda for Sustainable Development, which aims to end hunger, ensure food security, and enhance global nutrition. Nationally, Colombia's "World Power of Life 2022–2026" Development Plan supports policies that uphold the Human Right to Adequate Food (HRAF) and promote food security through policy reforms and food sovereignty initiatives. Regionally, the "Vichada Visible Departmental Development Plan 2024–2027" aligns with these strategies by fostering agricultural competitiveness and rural development through projects like cashew cultivation.

The cashew cultivation project also emphasizes gender equity by recognizing and strengthening the essential role of women in the community. Traditionally responsible for production and resource management, women are integral to the project's success. The initiative provides tools and training to empower women, enabling their active participation in all stages of cashew production and marketing. By promoting equal opportunities for men and women, the project enhances women's economic autonomy and reduces regional gender inequalities.

Cashew cultivation holds notable potential for carbon capture due to the species’ deep root system and adaptability to various climatic conditions. This contributes to improved soil quality and reduced greenhouse gas emissions. Agroecological management practices associated with cashew farming help restore degraded ecosystems and conserve biodiversity. Additionally, the establishment of agroecological conucos for individual families maximizes carbon capture benefits, actively combating climate change and promoting sustainable agricultural practices.

Cashew cultivation in the Kanalitojo reservation seeks to address these issues by creating an alternative source of sustainable income for the community, improving food security , minimizing the effects of climate change through carbon capture, contributing to biodiversity conservation, recognizing the role of women, and promoting the active participation of the community in global markets. This initiative is aligned with national and international rural development policies, where agroecology and fair trade are presented as key solutions to combat poverty and promote social inclusion.

The project is spearheaded by the Alpina Foundation, which has 16 years of experience supporting vulnerable communities across Colombia. Having implemented over 78 projects in 12 departments, impacting more than 30,000 participants, the Foundation focuses on sustainable agroecological practices and responsible resource management. Their Rural Extension System for Sustainable and Healthy Food (SER RASSA) promotes agroecological systems that conserve biodiversity while minimizing environmental pressures.
Kardianuts, a local company operating a cashew processing plant in Puerto Carreño with a capacity of 450 tons annually, plays a pivotal role. The company manages a 1,200-hectare organic-certified model farm employing agroforestry systems and seeks to integrate small producers, including those from the Kanalitojo reservation, into the cashew value chain. Kardianuts aims to expand exports to markets such as the United States and Switzerland, necessitating increased local production.

Together, the Alpina Foundation and Kardianuts address food insecurity and facilitate cashew commercialization, empowering local communities and fostering sustainable economic development. Their shared commitment to food sovereignty, fair trade, and improved living conditions aligns with global, national, and regional policies. With their experience in agriculture and agroecological product commercialization, they provide a solid foundation for expanding and scaling this initiative.

3. **Goals**

The primary aim of this project is to develop the cultivation of cashew (Anacardium occidentale) in the Kanalitojo reservation, located in Puerto Carreño, Vichada. This crop has been identified as a strategic solution to address the region's food insecurity challenges and to establish long-term, sustainable sources of income for local communities. Cashew, recognized for its high commercial value in both national and international markets, represents a vital opportunity to diversify agricultural production in a region largely reliant on subsistence farming.

Cashew cultivation is innovative for several reasons. First, it is well-suited to the region’s tropical climate, characterized by distinct rainy and dry seasons. Its resilience to marginal soils and resistance to pests and diseases common in the area make it a viable and robust crop. Additionally, cashew can be integrated into agroforestry systems that enhance local biodiversity, contributing to ecosystem preservation while providing a stable income source.

By promoting crop diversification, cashew cultivation offers a long-term income stream and supports a comprehensive strategy for short- and medium-term food security. This is achieved by incorporating vegetable and tuber cultivation alongside cashew trees during their initial growth phase. Such a strategy ensures access to

food during the first year of cashew tree development, improving local nutrition until the trees begin to bear fruit.

Project Objectives

The overarching objective of the project is to improve the living conditions of rural communities in the Kanalitojo reservation, Puerto Carreño, through a comprehensive approach that combines short-term food security and long-term economic sustainability, primarily through cashew cultivation.

Specific objectives:

1. ***Enhance food security through sustainable agricultural systems:*** In the initial years of the project, when cashew trees are not yet productive, complementary crops such as vegetables, tubers, and small-scale livestock farming will be implemented in conucos (family gardens). This approach ensures families have access to sufficient and nutritious food, directly addressing the region's high rates of food insecurity, particularly among its most vulnerable communities.
2. ***Expand and maintain sustainable cashew cultivation***: Expand cashew cultivation as a sustainable economic alternative for the Kanalitojo community. The maintenance of the initial 15 hectares of cashew will create jobs and build local capacities in cashew production, management, and marketing for both domestic and international markets.
3. ***Boost local economic development:*** trengthen the local economy by creating a cashew value chain that integrates small producers. This will enhance agricultural productivity and improve market access for cashew products. Furthermore, job creation within production and marketing will promote the economic inclusion of indigenous and rural communities.
4. ***Promote environmental sustainability:*** Implement agroecological practices to minimize environmental impact and respect the region’s natural resources. Key components include the use of organic fertilizers, the incorporation of agroforestry systems, and the promotion of local biodiversity, ensuring the project’s long-term ecological sustainability.
5. ***Strengthen training and technology transfer:*** Leverage partnerships with organizations such as the Alpina Foundation and Kardianuts to transfer knowledge about agroecological cashew production and complementary agricultural practices. This will enhance local capacities for managing cashew cultivation and other crops, ensuring the project’s success and sustainability over time.

The project’s innovation lies in its dual focus on cultivating a high-value commercial crop (cashew) while implementing a comprehensive food security strategy to

address the immediate needs of the community. By incorporating complementary crops and minor livestock farming during the cashew trees' initial growth phase, the project ensures food availability while promoting agricultural diversification and economic resilience.

Additionally, the use of agroecological practices minimizes the use of chemical inputs and respects natural cycles, making the model sustainable in the long term.

Innovation is also reflected in the development of a local business model that involves indigenous communities in every stage of the production process, from planting and tending to the trees to marketing the final product. This inclusive approach strengthens local self-management, reduces dependency on external actors, and fosters equitable economic development.

Currently, efforts are underway to secure funding to achieve the project's objectives and scale its results. Funding will be allocated to:

- Purchasing initial inputs for establishing new hectares of cashew crops and maintaining existing ones.
- Procuring materials and inputs for small-scale farming and livestock production.
- Acquiring agricultural tools and installing irrigation systems and other essential infrastructure.
- Providing training in agroecological farming techniques, sustainable land and water management, gender-inclusive approaches, cooperative models, and marketing strategies for agricultural products.

The project also seeks to establish partnerships with local buyers and exporters, improve logistics for cashew product distribution, and implement continuous monitoring and evaluation systems to assess the socioeconomic and environmental impacts. This ensures the project’s alignment with its goals throughout its execution.

This initiative addresses critical needs for food security and economic development in the region while offering a sustainable solution to its structural challenges. By integrating agroecology, cashew production, and capacity-building, the project provides an innovative approach to rural development.

Through adequate funding, the project aims to implement a replicable and scalable model that promotes economic, social, and environmental sustainability across the Vichada department.

4. **Methodology**

The project's approach to cashew cultivation in the Kanalitojo reservation is based on a comprehensive model that addresses both immediate food security and long-

term economic sustainability. This approach includes a combination of agroecological practices, an agroforestry system, and productive diversification. Through a participatory process with the community, the project seeks to generate sustainable income while promoting environmental conservation and strengthening the productive autonomy of indigenous families in the reservation.

Methods and Tools Used

1. **Land selection and preparation** : A thorough evaluation of soil and climate conditions was carried out to determine the most suitable areas for cashew and productive conuco cultivation. Land preparation methods included manual weed clearing, incorporation of organic fertilizers, and the use of local compost, employing the minimum tillage method.
2. **Agroecological practices and establishment techniques** : Cashew cultivation has been implemented under agroecological practices, minimizing the use of agrochemicals and favoring organic fertilization. Comprehensive pest management is carried out through the use of biological control and organic methods, adapted to the needs of the ecosystem, weed control, and periodic pruning to improve the shape of the tree. It is worth highlighting that in the first semesters of the 15 hectares of cashew trees, they were established in an agroforestry system, integrating vegetable and tuber crops as a complement to the food security of families.
3. **Complementary Crops and Raising of Small Animals** : To ensure food security in the short and medium term, during the first 3 years, when the cashews will not yet be in production, complementary crops will be implemented to provide food security to families while the trees develop. Productive gardens of vegetables and tubers (such as yucca, yam, plantain, pumpkin, watermelon, beans, corn, dwarf topocho) will be established, offering a continuous source of food. For the gardens, an efficient irrigation system is proposed for the dry season. The raising of birds and pigs is also proposed, providing an additional source of protein and fresh food. These activities not only contribute to the family diet of the community but also allow the community to generate additional income through the sale of surplus agricultural products and the sale of eggs and meat produced.
4. **Training and Knowledge Transfer** : One of the key tools has been the ongoing training of community members in sustainable agricultural practices, cashew crop management, product marketing, gender focus, and productive associations. The Alpina Foundation and Kardianuts have been crucial in the implementation of a SER RASSA rural extension model that incorporates practical training, technical advice, and knowledge transfer on agroecological production and the management of high-value commercial crops such as cashew.
5. **Monitoring and Evaluation** : The project has implemented a constant monitoring system of the crops, evaluating the growth and development of the trees, soil health, biodiversity, and food security indicators through participatory monitoring practices, in order to adjust the project activities

according to the results obtained and ensure the fulfillment of the medium and long-term objectives.

The business model focuses on the marketing of processed cashews, starting in year 3 of the first 15 hectares that would enter their first phase of production with the aim of generating sustainable income both locally and internationally.

The main clients of processed cashews are national and international companies that demand this product in markets such as the United States, Europe (especially Switzerland) and Colombia. Kardianuts, as a local company with experience in cashew processing, plays a key role in marketing.

a) **Marketing Channels** : Cashews are marketed through Kardianuts and its national and international partners, through its processing plant, which facilitates wholesale sales through these channels. In addition, efforts are being made to establish alliances with Colombian exporters of agricultural products and fair trade platforms to facilitate the direct export of the product to international markets.
b) **Revenue Generation** : Revenue for the business comes primarily from the sale of processed cashews. In the first stage, revenue comes from the diversification of agricultural products derived from the project, such as vegetables, tubers, and animal proteins. From year 3 of the project, revenue comes from the sales of cashews transformed into baked almonds and packaged for distribution. As crops expand, revenue is expected to increase, not only through local but also international sales of cashews.
c) **Productivity Advances**: In the first 18 months of implementation, the project has managed to prepare and plant 15 hectares of cashew trees, with 1,500 plants in the development process. It is expected that in the coming years, especially between the third and fourth year, the trees will begin to produce their first harvest. During this time, the complementary productive units (vegetables and small animals) are generating additional income. Today, the community has 10 drilled surface wells, 18 patios of 1,200 m² and irrigation systems covering 600m², sheds for laying hens and broiler chickens, which has improved the economic situation of the families involved. At a productive level, it is expected that the total area sown in the coming years will increase considerably, reaching up to 200 hectares of cashew, 29 productive plots, 3 sheds for laying hens, 3 units for raising pigs, and 5 units for raising and fattening pigs.
d) **Socioeconomic Impact** : There has been an improvement in the living conditions of families on the reservation, especially in terms of food security, as complementary crops have provided nutritious food. In addition, training in agroecological practices has increased the technical

knowledge of participants and promoted productive autonomy, allowing them to manage their resources more efficiently.

e) **Results in gender approach:** In the technical support strategy of the project, a gender approach was integrated through workshops on the economy of care, decision-making, and care routes in cases of gender violence. However, due to cultural traditions and deep-rooted gender roles, where men are expected to be in charge of economic activities and women of domestic chores, there was initial resistance to addressing these issues. To overcome these barriers, individual visits were made to understand the perceptions of the community, and training in couples was implemented. This facilitated awareness about the importance of sharing household responsibilities and decision-making, promoting a gradual change towards greater gender equality in the community.

f) **Environmental Impact**: The agroecological approach implemented has allowed for proper management of natural resources, with an emphasis on the conservation of local biodiversity. The use of practices such as composting, organic pest management, and the integration and rotation of agroforestry crops has had a positive impact on soil regeneration and the conservation of surrounding ecosystems.

In the long term, the project is expected to not only provide food security and income diversification but also stabilize the region's economy through the sale of processed cashews and other products. The results achieved so far show positive progress towards the consolidation of a self-sustaining production system, with a significant economic and social impact for the Kanalitojo reservation. This process contributes to strengthening the cashew chain, improving production, processing, and marketing, which drives local economic development and strengthens the integration of the community in a sustainable business model.

This business model sets a benchmark for other projects in the region, offering a viable path toward economic sustainability and social well-being through an agroecological and inclusive approach.

5. Results

The project has made significant progress in different areas, contributing to strengthening the community in a comprehensive manner. The quantitative and qualitative results achieved are summarized below.

Quantitative results:

- Ten shallow wells were drilled, ensuring access to water for irrigation and consumption.
- 18 productive conucos were established, each with an area of 1,200 m^2, distributed in 600 m^2 with self-compensating irrigation systems and 600 m^2 with manual irrigation.

- 20 sheds were delivered for raising laying hens, contributing to food security and economic autonomy.
- 15ha of crops were planted and maintained cashew.

Qualitative Results:

- ***Training and Capacity Building:*** Families have acquired greater knowledge and technical skills, particularly in agroecological techniques, such as the production of fertilizers and bio-preparations. This has enabled families to have the necessary infrastructure to implement sustainable production practices.

- ***Social and Community Strengthening:*** The project has fostered spaces for teamwork and community participation, strengthening mutual trust and promoting collective decision-making. Self-managed savings and credit groups have been key in this process, helping to consolidate a stronger social fabric with greater capacity for self-management.

- ***Cultural and Territorial Recognition:*** The project has facilitated the recognition of the community as an organization based on its cultural values and ancestral productive methods. The promotion of traditional products and the fostering of a sense of belonging to the territory have been fundamental in strengthening the community's roots.

- ***Cashew Cultivation:*** Fifteen hectares were planted with a total of 1,500 trees, which are expected to begin bearing fruit three years after transplantation and have an approximate life cycle of 30 years. By the third year, a production of between 300-700 grams of green nuts per tree is anticipated. Year after year, production is expected to increase until reaching a minimum of 12-14 kilograms of nuts per tree after 7 or 8 years. Cashew cultivation has been one of the project's pillars, fostering a deep bond with the land and strengthening the community. Although the process requires constant care, the crop has presented an excellent opportunity for community development, with high potential for marketing and generating future income. However, it is essential to continue strengthening crop maintenance and training families in their technical management to ensure long-term success.

- ***Production of Laying Hens:*** The laying hen sheds have allowed the community to generate additional income through the marketing of eggs, both within the community itself and in the local market. This model has bolstered the economic autonomy of families and contributed to the improvement of their food security.

- ***Gender Approach:*** Regarding the gender approach, it is crucial that interventions consider the community's cultural values. Although some women have begun to actively participate in productive units and self-managed savings and credit groups, it is important to recognize that women now have more opportunities to develop and make decisions thanks to the community spaces provided to them. These spaces not only encourage their participation but also allow them to gain visibility within the community.

- ***Rootedness and Strengthening of the Territory:*** One of the project's most significant achievements is the strengthening of the sense of belonging to the territory. Through joint work, families have established stronger bonds among themselves and with the community, which has fostered greater rootedness in a context of nomadic communities. The improvement of social, cultural, and livelihood capacities has had a positive impact, providing greater opportunities for future development.

- ***Income Generation:*** Producers' income increased by **37%** , from **$392,805** to **$452,333** , thanks to product diversification and marketing.

6. **Impact**

The project has had a significant impact on the Kanalitojo community, with notable improvements in local markets and food security. It has strengthened economic autonomy through productive diversification, the establishment of productive units, and the promotion of gender equality. Families now have new sources of income from crops grown in the conucos or productive patios and from the production of laying hens.
From an environmental perspective, the agroecological practices adopted have facilitated soil regeneration and the conservation of biodiversity, ensuring the long-term sustainability of the project. With the cultivation of cashews, it is expected that family incomes will increase and stabilize over time.

In terms of the market, substantial progress has been made in developing a sustainable business model that can be scaled, with Kardianuts included as a key marketing channel. This partnership ensures access to both local and international markets for the products, thereby strengthening the cashew value chain.

At the commercial level for agricultural products from the conucos, the project has established community and local marketing channels, enhancing the technical and commercial management capabilities of the families in Kanalitojo.

7. **Challenges**

- ***Cashew Crop Maturity:*** As a long-cycle crop, cashews require between 3 and 4 years to reach productive maturity, representing a critical period without significant income from this crop. This makes it challenging to attract investors seeking quicker returns and highlights the need for a clear strategy to ensure economic sustainability in the early stages of the project.
- ***High Initial Investments:*** Scaling up the model requires substantial investment in infrastructure, including irrigation systems, water wells, sheds, and equipment for cashew production and processing. Additionally, expanding the cultivated hectares and consolidating production units demand technical and financial resources that are not always readily available or easily accessible for community-based projects.
- ***Ongoing Training:*** Expanding the model necessitates continuous enhancement of the technical and commercial capabilities of participating families. This involves financial and logistical resources to maintain the quality and sustainability of the project over time.
- ***Attracting Investors:*** The project's characteristics, such as its agroecological approach and long production cycles, may not align with traditional investors' expectations of quick returns. This requires a well-defined communication and presentation strategy to attract funding from investors focused on long-term impact.

8. **Solutions**

Consolidation of Kanalitojo, Strengthening of Existing Cashew Cultivation, and Establishment of New Hectares

The solution to these challenges has been to consolidate the productive base of Kanalitojo by strengthening the existing crops for the commercialization of agricultural surpluses from the conucos or productive patios, egg production, and the establishment of new hectares of cashews. The support from the foundation and Kardia has been critical in accelerating the maturation process of the project by facilitating access to technical and financial resources. Investments in infrastructure, such as water wells, irrigation systems, and animal sheds, have helped improve the sustainability of complementary crops and ensure food self-sufficiency in the initial phases.

Moreover, ongoing training through the Alpina Foundation and Kardianuts has been essential for enhancing productivity and agroecological management. These actions have not only stabilized family incomes but have also fostered trust among community members, thereby strengthening the foundation for sustainable growth and positioning the community for external investment opportunities.

9. **Lessons Learned**

One of the key lessons learned has been the importance of having an income diversification strategy while the cashew crops reach maturity. The implementation of agroforestry systems and the breeding of small animals for egg production have

provided a reliable source of income and food security in the short term. Additionally, continuous training in agroecological practices and the strengthening of the social fabric through self-managed savings and credit groups have proven essential to the project's resilience.

Regarding investment readiness, it has become clear that projects involving long-cycle crops must develop robust financial sustainability plans. This underscores the need for alternative and diversified income sources in the initial phases. Therefore, the project continues to seek strategic partners interested in proactively investing in responsible agricultural models in Colombia.

10. Recommendations

To improve and further scale this type of project, it is recommended to establish a more solid communication plan with potential investors, emphasizing the long-term benefits and income stability once the cashews begin to produce. Additionally, it is crucial to continue the gradual expansion of cultivated hectares, diversify crops, and improve both local and international marketing channels. The gender approach should also be reinforced throughout all stages of the project, ensuring that women have equal access to resources and opportunities in economic activities. This will contribute to the social sustainability of the project.

11. Conclusions

The community has successfully consolidated a sustainable agroecological model and strengthened the economic autonomy of families in Kanalitojo. The comprehensive approach, which includes productive diversification and infrastructure strengthening, has been crucial in overcoming initial challenges and ensuring the project's stability. As the cashew crops mature and the community continues to develop its productive capacity, both in the conucos and with minor species, the project can serve as a replicable model for other communities, promoting economic sustainability and environmental protection. In the future, the development of new markets and external investment will be pivotal to consolidating the growth and scalability of the model.

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