

REVITALIZING VANILLA IN MADAGASCAR

Report on a Feasibility Study to Enhance Small Farmer Participation in the Vanilla Value Chain

Final Report

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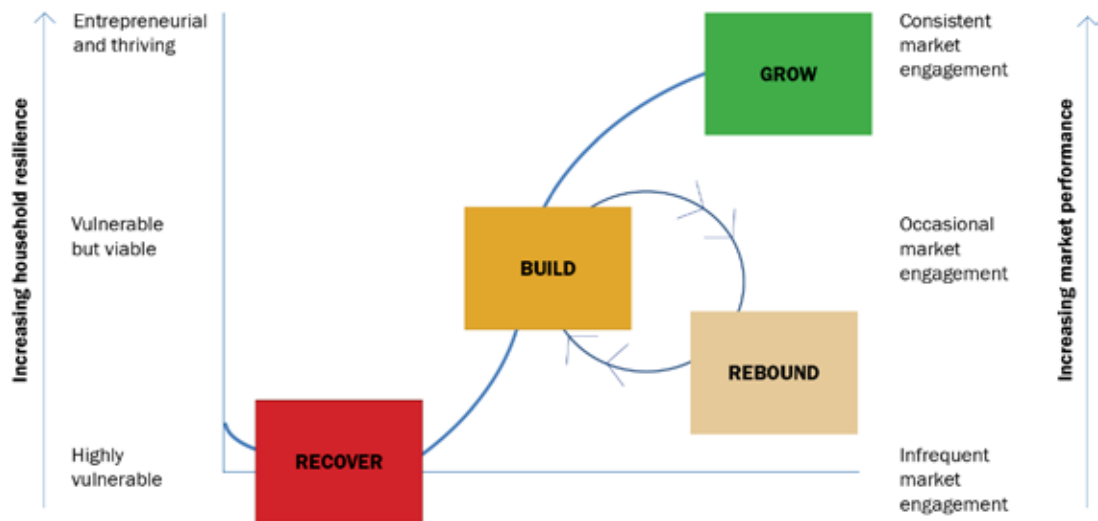
By: Jefferson Shriver

TABLE OF CONTENTS

Executive Summary	iii
I. Introduction	4
II. Madagascar Vanilla Supply Chain: Production, Postharvest Processing and Market Access	6
III. Opportunities, Challenges and Key Actors in Mananara and Mananjary ...	15
IV. Final Recommendations and Next Steps.	21

EXECUTIVE SUMMARY

Major donors in the international development community are raising their expectations for the programs they support to demonstrate that small-holder farmers in food security programming are moving along a trajectory from vulnerability to thriving entrepreneurship or from poverty to prosperity. Programs that support farmer trajectories to the point of food subsistence only while income and employment levels remain below the line of poverty are at a minimum less likely to be funded, and more importantly, are less likely to create lasting development impact.



CRS Agriculture theory of change. CRS Madagascar work would help move vanilla growers from Build to Grow, or from market limited to market engaged.

Over the past 10 years, CRS programs in different regions of the world have established a track record of working with small holders to bring them to market readiness and engagement, and to bolster their stature as vital participants in competitive value chains. As part of this journey, CRS has found high-value crops grown in agroforestry systems to provide an unusually powerful combination of social, economic and environmental benefits for small holders, their communities, and the landscapes they inhabit. CRS categorizes these multiple benefits using the triple bottom line language of people, profit, and planet.¹

¹ The triple bottom line (abbreviated as TBL or 3BL, and also known as people, planet, profit or the three pillars[1]) is defined as an expanded spectrum of values and criteria for measuring organizational (and societal) success: economic, ecological, and social. The phrase, "people, planet, profit," was coined by John Elkington in 1995 while at SustainAbility (<http://www.johnelkington.com/activities/ideas.asp>).

As CRS Madagascar expands its work in agriculture, it is looking to promote income security for small holder farmers through an agroenterprise, value chains approach. As part of its agriculture program over the past six years, CRS Madagascar has helped farmer families improve their food security in the regions of Mananjary and Mananara. Many of these farmer families also produce vanilla in agroforestry systems in small quantities, and both regions host supply chain actors and activities.

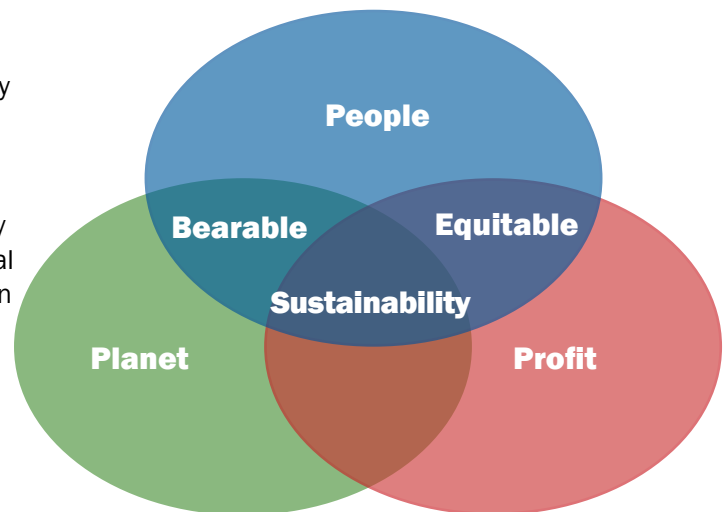
This study examines the viability of Malagasy small-holder participation in the vanilla supply chain. The country program sought to answer the question of whether vanilla is a value chain that offers significant opportunities for small holders, in which support from CRS will create social, environmental and economic benefits.

Results from a three-week field investigation in Mananjary and Mananara conclude that vanilla is a viable value chain for Malagasy small holders and worthy of CRS support.

Opportunities for triple win impact include the following:

Profit

- Madagascar vanilla is considered the world's gold standard for quality. The country has a globally unmatched reputation and market demand for its high-quality Bourbon vanilla. The country consistently produces 65–85 percent of total world volume. Small holders can capitalize on this reputation.
- Madagascar's Bourbon vanilla is a high-value crop on as little as 0.5 hectare land size, with average annual net income potential of \$1,500–5,800 per hectare for green vanilla, and \$3,000–9,990 for cured vanilla over a six-year period. Cash income generated from vanilla will help Malagasy farmer families ensure food and income security during the five "lean months" from January to May when staple crops are not produced, hastening their livelihood shift from food staples to high-value crops.
- Small holders in Madagascar have affordable, high-quality, and accessible genetic material, know-how, and land availability for scaled-up vanilla production.



- As a perennial, vanilla provides a lasting economic asset of a minimum of 10 annual harvests per plant over a 13- to 15-year period. The plantations can be renovated during this time, allowing for vanilla plantations to thrive far beyond the 15-year vegetative cycle of this first planting.
- Postharvest processing requires only know-how and low-tech, affordable infrastructure. With CRS support, small holders can begin to produce and sell cured vanilla to capture more value from the supply chain.
- Developing secondary cash crops such as clove and pepper in the same agroforestry system would be an additional risk mitigation buffer to ensure a consistent income stream year-round.

Planet

- As an orchid originally found in tropical rainforests, vanilla is shade tolerant. Increased vegetative and tree canopy cover make vanilla a viable livelihood mechanism to protect water, forests, and soil, and it will help prevent slash-and-burn agriculture. Vanilla is a promising contrast to rice production on hillsides, where slash-and-burn methods are causing soil erosion and decreased moisture retention.
- A functioning certified-organic supply chain exists in Madagascar, with much room for growth. Organic certification holds the potential to reward farmers for the environmental services they provide through organic vanilla production in an agroforestry system.
- The vanilla plant requires a live support structure, or tutor, for survival, and thus it attaches itself to trees in a symbiotic relationship. To grow vanilla, farmers need to either keep existing trees on their farm or plant new trees. The result is an overall enhancement of the tree inventory in Madagascar.

People

- Vanilla's shallow root systems enable it to coexist well with other crops and trees as part of an intercropped agroforestry system. Farmer families on small plots can increase their income security while still growing annual staple and perennial food crops.
- Given manual pollination requirements and the multistep postharvest period stretching over two to six months, vanilla is a high provider of employment with benefits going beyond the family to the entire community. It is also a crop that can be easily produced and processed by women. Manual pollination, guiding and tying of the climbing orchid on trees, curing, drying, sorting, smoothing, and packaging processes all require intricate handiwork, but relatively light physical labor.
- Farmers and traders already possess fair trade certification for vanilla to ensure minimum price floors and greater profit equity on the chain.

There is much room to expand fair trade supply of Malagasy vanilla and global demand for fair trade vanilla.

- Supply chain actors with a social mission are working in the targeted geographic territories, strengthening prospects for new small-holder participation in the value chain.

However, for vanilla to be viable for small holders, there are a series of challenges to overcome and activities that need to be carried out to help farmers fully participate on the value chain. CRS Madagascar could do the following to address these challenges:

Production

- Using high-value and productive genetic material, increase plantation densities to at least 1,000 plants per half hectare (2,000 per hectare) to create more robust family income potential and create the higher volume necessary for competitive markets.
- Increase yields per plant from current production of 500 g to at least 1 kg of green vanilla using best practices in fertilization, shade, disease and pest management.
- Improve planning and design of vanilla agroforestry systems to ensure a proper balance of the short- and long-term needs related to food, income and fuel sources.

Postharvest Management

- Increase access to postharvest infrastructure for quality control and capture of added value through partially or fully subsidized infrastructure and material investments.
- Provide trainings to farmers and their enterprises in the primary and secondary postharvest processing.

Market Access

Cultivate relationships with national traders that have a social and environmental responsibility mind-set, such as From the Field (FTF) Trading Company (now called LAFAZA) and Premium Spice, to develop new, inclusive business relationship models.

Create more direct relationships with buyers of premium, certified vanilla using a one-agency approach. Build on CRS relationships in the Sustainable Food Lab² and the growing food-company relationship portfolio of the agency unit to tap global food-company sourcing and learning relationships in vanilla.

² Sustainable Food Lab is a network of global food companies, NGOs and research institutions dedicated to making food supply chains more environmentally, socially, and economically sustainable. CRS sits on the Advisory Board of the Sustainable Food Lab and has been a member for over four years. (<http://www.sustainablefoodlab.org>).

Enhance value capture among mature farmer enterprises to help them assume the role of vanilla exporter in the final years of the project initiative.

Strengthen Producer Organization and Value Chain Relationships

- Form or strengthen farmer–business enterprises to create the foundation for increasing production; improving access to postharvest processing infrastructure and services; and obtaining added value certification, input acquisition, and financial service access.
- Cultivate relationships with established vanilla producer organizations linking to formal markets such as KOMAM and Madagascar National Park.
- Facilitate links with lending institutions for sustained trade and working capital relationships.
- Influence local- and national-level public policy to create an enabling environment for the vanilla value chain.
- On a global level, CRS has forged relationships with several food companies currently buying vanilla that are interested in increasing their use of fair trade and organic certifications in product sourcing. CRS sustains ongoing dialogue and relationship with companies such as Ben & Jerry’s, Green Mountain Coffee Roasters, Starbucks, Aunties Organics, Hershey’s and Clif Bar through the Sustainable Food Lab and The Specialty Coffee Association of America. By engaging in vanilla value chain initiatives in Madagascar and elsewhere, CRS will strengthen its reputation and position as a facilitator of more direct supply chain relationships between farmers and buyers.

Monitoring, Evaluation and Learning

- Develop relationships with research institutions and universities specializing in vanilla such as the French Agricultural Research Centre for International Development (CIRAD), based in Reunion, to apply existing research and enhance learning and the documentation of evidence-based results.
- Incorporate a robust MEAL (monitoring, evaluation, accountability and learning) component into new vanilla initiatives in order to document best practices in activities up and down the chain to enhance learning about this little-known crop.

The final recommendation of the study is that CRS Madagascar should pursue the incorporation of a vanilla value chain component into its next Development Food Assistance Program (DFAP) or other major agriculture program.

I. INTRODUCTION

Varieties and Uses of Vanilla

Species	Growing Regions	Flavor Profile	Market
<i>Vanilla planifolia</i> (syn. <i>V. fragrans</i>)—common name Bourbon vanilla, Madagascar vanilla	Madagascar, Reunion and other tropical regions in proximity to Indian Ocean, Indonesia	Highest concentration of vanilla of all varieties. Soft, creamy end notes, full aftertaste of dried fruits and cinnamon extract. Bourbon vanilla is marked by moderate Bourbon/rummy notes, slight to moderate resin, and slight vanillin, woody, “pruney” notes.	Most common with most prominent market acceptance. Nearly all vanilla used in the United States is <i>V. planifolia</i> .
<i>Vanilla pompona</i>	West Indies, Central and South America		Production is rare, and market is limited to pharmaceuticals and perfumes.
<i>Vanilla tahitensis</i>	South Pacific—Tahiti, Moorea	A quick release of initial flavor and relatively sweet, high-resin content, weaker overall flavor than <i>planifolia</i> . Moderate fruity, floral notes with slight vanillin and Bourbon/rummy notes.	High demand in France and Italy for ice cream making.

Global Supply and the Importance of Vanilla to Madagascar

Global production of vanilla is estimated to be 2,000–2,300 metric tons (MT) per year. Annual exports of Madagascar vanilla range from 1,000 to 2,000 MT, accounting for 65–85 percent of total world production. Indonesia is a distant second to Madagascar in land under vanilla cultivation and total production, producing an average of 150 MT annually. Other major vanilla-producing countries include Mexico, China, Papua New Guinea and other islands of the West Indies. In Africa, Uganda and Tanzania have increased their production of vanilla in recent years to approximately 150 MT, as USAID has promoted the crop with small holders.

India produced 400 MT of vanilla in 2008. Today production is just 5–10 percent of the country's production five years ago. Primary production problems have been a fungal disease and improper processing units. In Mexico, vanilla production decreased by 90 percent in 2011. A freeze followed by heat and drought were the major culprits of the crop loss. Together, these two countries now produce no more than 100 MT per year, or 5 percent of total world production.

Approximately 80,000 farmers grow vanilla in Madagascar on 25,000 hectares of land.

Between 2009 and 2011, many producing countries began to stockpile and store their vanilla in hopes of better prices. That supply had almost been exhausted by the end of 2012. Falling global production, continued demand, and the depletion of stocks in producer countries are causing an upward trend on prices.

Agriculture in Madagascar accounts for 24 percent of its gross domestic product (GDP), while commerce and services accounts for 55 percent (according to 2009 statistics). Agriculture employs more than 70 percent of the labor force and provides livelihoods to the vast majority of about 20 million inhabitants, contributing more than 70 percent to export earnings, mostly through the export of seafood, vanilla, coffee, cacao, litchi, pepper, cotton, tobacco, groundnut, sisal, clove and ylang-ylang.

In 2012, Madagascar remained the dominant global supplier of vanilla and is considered the industry gold standard for quality. Approximately 80,000 farmers grow vanilla in Madagascar on 25,000 hectares of land. Due to its quality and origin, Madagascar's Bourbon vanilla has the highest market demand of any vanilla globally and has virtually no competition.

Madagascar's 2012 harvest was estimated at 1,200 MT, which is considered a small harvest for the country. The 2013 harvest is expected to be even smaller at 900–1,000 MT.³

Global Market Trends in Vanilla

The global vanilla market has been characterized by much fluctuation over the past 12 years. In 2001–2002, the price reached an all-time high of \$300/kg for cured vanilla. By 2003–2004, those prices began a significant dip to \$75/kg, dropping to \$25/kg in 2005 and then crashing to an historic low of \$7.50/kg in 2007. Current prices of \$12/kg are still considered close to or below the cost of production, and many farmers are struggling to make a living from vanilla. Commercial prices during the last half of 2012 increased in Madagascar by 50 percent, marking an upward trend that market analysts

³ Vanilla Market Update 2013, The Gourmet Vanilla Company. <http://www.gourmetvanilla.co.uk/#/vanilla-market-2013/4574495445>

indicate will continue for the coming years.⁴ The United States is the largest global consumer of vanilla, followed by Europe (particularly France).

Because vanilla production is low and the product is expensive, 98 percent of all vanilla used as a flavor or fragrance is synthetic. This is leading to a misuse of “natural vanilla” terminology in product labeling, whereby companies may be using natural vanillin substitutes instead of vanilla beans. This type of labeling is deceptive to consumers, who may think they are buying products with genuine vanilla bean ingredients. The North American Vanilla Bean Importers Association (NAVBITA) was formed to create standards for vanilla labeling and to put pressure on the U.S. Department of Health and Human Services to correctly differentiate between synthetic vanilla and genuine vanilla beans.⁵

II. MADAGASCAR VANILLA SUPPLY CHAIN: PRODUCTION, POSTHARVEST PROCESSING AND MARKET ACCESS

Over a three-week period, CRS staff interviewed a series of vanilla supply chain actors and CRS partners in Antananarivo and the regions of Mananara and Mananjary. Meetings were held with organic certifier ECO-CERT, the local Catholic church, the local mayors, RAMANANDRAIBE Export, current Title II program agriculture project staff, Title II farmers with vanilla plantations, Madagascar National Park, exporter FTF Trading, private exporters, private collectors and primary processors, KOMAM producer association and farmers, processor and exporter Premium Spice, and others. Findings in this study come from the conclusions of those meetings combined with a literature review of available public documents on vanilla.

Growing conditions and Production Practices

Vanilla production thrives in specific locations and conditions 25° north or south of the equator, requiring a series of agroecological conditions that must be met to be commercially viable. These include the following:

Weather, Precipitation and Altitude: Vanilla cultivation requires a temperature of 21–32 °C (70–90 °F), an evenly distributed annual precipitation of 1,500 mm or more (no extended droughts), minimal winds, 80 percent relative humidity and altitudes of 0–600 m above sea level. Unpredictable dry periods and heat waves can have a negative effect on flowering, making vanilla sensitive to climate change.

⁴ North American Vanilla Bean Importers Association (NAVBITA), 2013 Market Report on Vanilla. <http://www.vanilla.com/2013-market-report-on-vanilla/>

⁵ <http://www.navbita.com/home.html>

Soil: Primary soil characteristics for vanilla include good drainage, abundant organic material and pH values of 6–7. Soil depth of roots should be approximately 40 cm in agroforestry systems.

Land orientation and shade management: In production sites where slopes predominate, it is better to select lands that are covered by sunlight in the morning, with an eastward orientation. This is to avoid moisture reduction in the soil and overdrying of the plant (leaf burn) and beans by the afternoon sun.

Preparation of forest-type land (trees taller than 10 m and wider than 50 cm in diameter predominate): Weeds must be controlled, as well as branches that extend to less than 4 m from the ground, along with damaged branches, regardless of their height; small trees and bushes located under the shade of taller trees should be eliminated to improve shade distribution and ventilation to 50 percent. Cut plant material is usually shredded and used as organic mulch.

The vanilla plant is propagated by cuttings that are planted at the base of supporting “mother” trees. The plants will not bear fruit or flowers until the third or fourth year, with maximum yields after seven or eight years. The vines are abandoned at 10 to 12 years old, when they are no longer commercially productive. Renovation of the plantation should take place continuously to avoid a waiting period without production.

Pruning: Vanilla plantations are pruned and trained downward not only to increase flowering, but also to keep the flowers and beans within easy reach of the workers for pollination and harvest. If left unpruned, the vines may grow as high as the forest canopy, but they will not flower.

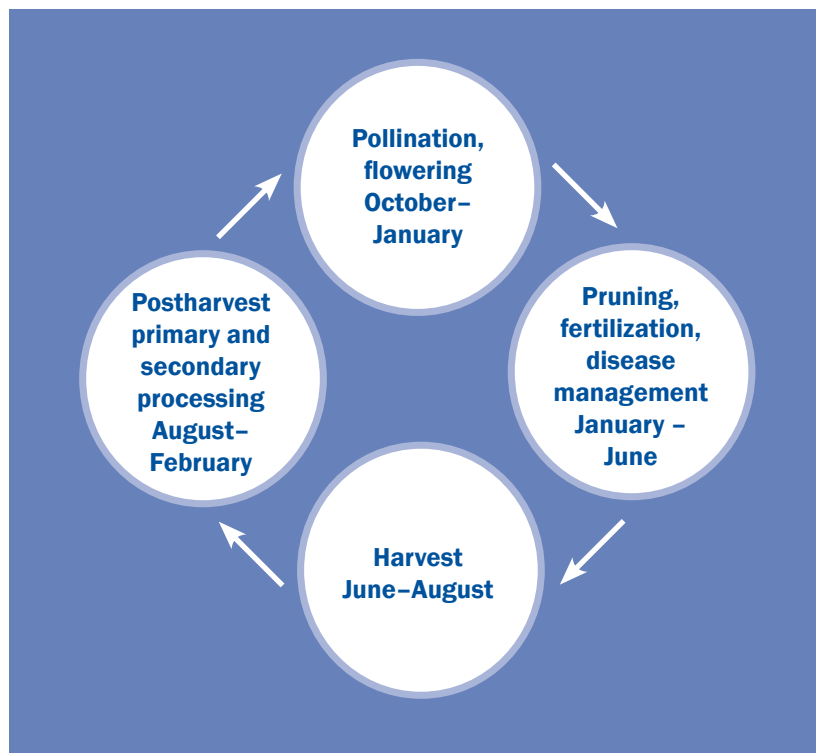
Pollination: It may take up to six weeks for a bud to turn into a flower. Although one vine may produce as many as 1,000 orchid blossoms, only 5–30 percent will be selected for hand-pollination. The orchids flower in the morning, wilt by early afternoon, and drop to the ground by early evening if not fertilized.

Harvest: The pods mature seven to nine months after pollination. A green vanilla bean resembles a large green bean filled with thousands of tiny seeds. Ideally the beans are picked before they fully ripen, when only the blossom-end tips are pale yellow. Then the beans undergo a long, complex curing and drying process that develops their distinctive flavor character.

Yields: Based on interviews with farmers, collectors and importers, the average yield per plant in Madagascar is 250–500 g per plant. However, to

obtain substantial income benefits production per plant should be, ideally, 1 kg of green vanilla per plant. The ratio of green vanilla to cured vanilla is 5 to 1 (due to shrinkage and weight loss during postharvest processing), yielding an average of 200 g of cured vanilla per plant.

Production, Harvest and Postharvest Cycle for Vanilla in Madagascar



Vanilla in Agroforestry Systems

Vanilla plantations in agroforestry systems come very close to imitating a natural forest and contain two to three shade strata. Additionally, annual staple crops found in vanilla agroforestry systems in Mananara and Mananjary include cassava, pineapple, corn and other crops.

The table on the following page⁶ describes the architecture and utility of such a system.

⁶ Aguilar, Luis Orozco, and Sampson, Arlene Lopez, "Evolucion, Aplicacion, y Futuro de la Agroforesteria en Nicaragua." *Agroforesteria en las Americas* 49 (2013): 99-110. <http://biblioteca.catie.ac.cr:5151/repositoriomap/bitstream/123456789/198/3/373.pdf>

Strata	% Tree Composition	Tree Size	Tree Species	Uses
Lower	33%	2-8 meters	Fast growing, often leguminous: <i>Inga</i> , <i>gliricidia sepium</i> , <i>cecropia peltata</i> , <i>tabebuia rosea (roble)</i> , <i>olive</i>	Provides tutor support structure for vanilla, as well as shade and firewood; adjusts nitrogen for soil health. Branches can be cut and planted for live fence posts and wind breaks.
Middle	50%	1-10 meters	Fruits: citrus, lychee, clove, <i>musacae</i> (banana), mango, avocado, black pepper, zac fruit, coconut, cinnamon	Provides food for family consumption and sale, gives shade, and can be a secondary cash crop.
Upper	17%	20 meters and higher	Naturally regenerated: <i>cordia alliodora</i> , <i>cedrela odorata</i> , <i>juglans ollanchana</i> , <i>terminalia oblonga</i> <i>bactris gasipaes</i>	Provides shade and is selectively harvested for timber.

Planting vanilla in diverse agroforestry systems can help restore degraded ecosystems and provide a host of environmental services, including:

- Reducing erosion and increases soil fertility
- Improving water quantity and quality
- Sequestering carbon and reduce greenhouse gas emissions
- Improving biodiversity in deforested and fragmented agricultural landscapes

Specifically, agroforestry vanilla plantations perform a number of restorative

ecological functions for the soil and water, as well as for farm resilience⁷:

Soil

- Leaf litter increases soil organic matter.
- Root systems pump soil nutrients from deeper layers of soil upwards to top soil.
- Fine root systems wrap around soil, preventing or reducing the speed of runoff and erosion.
- Leguminous tree species fix nitrogen from air into soil.
- Improved vertical distribution of roots and greater root density help to maintain soil nutrient reserves, thereby reducing the process of leaching.
- Leguminous, rapid-growth tree species can accelerate the restoration of reserves of nitrogen, phosphorous and potassium (N, P, K) in top soil and thereby make them available for use by the planted crop.

Water

Vanilla plantations:

- Improve water infiltration: corn and soy plots by comparison infiltrate five times less water than their vanilla agroforestry counterparts.
- Protect water springs.

Farm Resilience and Biodiversity

Vanilla plantations:

- Create a temperature stabilizing micro-climate to guard against extreme weather.
- Form natural wind and rain breaks.
- Provide habitat and resources for a variety of plant and animal species.
- Maintain landscape connectivity and facilitate the movement of animals, seeds and pollen.

Postharvest Processing

During production and harvest, the vanilla orchid and the ripe vanilla bean lack aroma. During the postharvest curing process, glucovanillin, a vanillin precursor formed during the ripening of the vanilla fruit, is enzymatically converted to glucose and vanillin. The longer a bean vine-ripens, the more concentrated the vanillin and other flavor compounds are after curing. Higher

⁷ Beer, J., C. Harvey, M. Ibrahim, et al. "Servicios Ambientales de los Sistemas Agroforestales." *Agroforesteria en las Americas*, 10, No. 37–38 (2003): 80-87.

vanillin indicates higher bean quality, which impacts the beans' market value. Beans left on the vine can split and decrease in quality.

Mexico developed the original, labor-intensive process for curing green vanilla beans that can take five to six months. The "Bourbon" process is a result of slight modifications made by the French. This method is currently practiced in Madagascar, Comoros, and Reunion. Indonesia employs a different process, picking beans while they are still immature to avoid theft. Although their curing process takes from several weeks to two months, the Indonesians have begun to adopt Bourbon growing and curing practices to increase bean quality. Laura Brandt, in her article, "The Creation and Use of Vanilla," describes the curing process in the following way:

The curing process varies among growing regions and many bean curers use a combination of techniques, yet all curing methods involve four phases that directly affect the amount of vanillin and other flavor components in the beans:

- *Wilting or killing of the beans stops their respiration. Heat is applied to the pods either by letting them sun-dry, as in the traditional Mexican method, or by submersing them in hot water for several minutes, as in the Madagascar Bourbon process.*
- *Sweating the wilted beans involves rapid dehydration and slow fermentation to develop key flavor components. The beans are alternately sun-dried during the day and wrapped in boxes at night for several weeks until the beans acquire a deep chocolate-brown color.*
- *Drying the beans [must be done] very slowly at low temperatures.... Over-drying or rapid drying reduces flavor quality. In the past, Indonesians used wood fires to accelerate the drying process, which causes the beans to develop a smoky aroma and flavor of inferior quality.*
- *Conditioning is an aging process necessary for flavor development that involves placing the dried beans into closed boxes for several months.*

[Conventional industrialized methods are also conducted by large spice companies.] McCormick [for instance] ... uses a



A boiling pot is used to blanch green beans for 90 seconds. Then the beans are put in blankets and set for 24 hours. Jefferson Shriver/CRS.



Elevated drying patios are used for dehydration and slow fermentation. Jefferson Shriver/CRS.



Wooden boxes and blankets help retain moisture during curing and drying process. Jefferson Shriver/CRS.



The beans are sorted by length and humidity. Jefferson Shriver/CRS.

one- to two-week curing process in which the beans are chopped and placed into a curing tank for about 72 hours until they are no longer green. Then they are dried in a rotary or fluidized dryer, and spread out in a perforated conditioner until the desired moisture level is achieved.

After curing, the vanilla beans are graded and bundled. Top-grade beans are oily, smooth, aromatic and very dark brown.⁸

In Madagascar, currently only 5 percent of farmers are substantially involved and capturing value in postharvest activities. Most sell their green vanilla as a raw material at the farm gate to collectors, receiving the lowest price point. However, primary and secondary postharvest processing of vanilla is an attainable skill and accessible investment opportunity for small holders. Infrastructure and equipment needs include wooden boxes for storage, bamboo drying beds, boiling pots and blankets. Interviews in Madagascar revealed that quality in primary postharvest is based on the following skills and tasks:

- Receive high-quality green beans harvested at correct time.
- Begin postharvest processing of beans within one day of harvest.
- Ensure proper washing, and boil green beans for 60–90 seconds to initiate the curing process.
- Respect the timing of drying: 1–2 hours per day from 8 a.m. to 12 p.m.
- Keep equipment clean.
- Properly store the vanilla in boxes wrapped in blankets after each day of drying.

Secondary processing, usually handled by the exporter on the supply chain, involves the following steps:

- Manual smoothing of each bean, carried out by hand.
- Sorting first-, second-, and third-quality vanilla by length and humidity. Humidity grades are 34–36 percent for first grade; second grade is 32–24 percent; and third grade is 27–29 percent.
- Proper storage in blankets and wax paper at origin for up to six months until weight decreases.
- Shipment from exporter to importer usually handled in cardboard boxes, with vanilla wrapped in wax paper.

⁸ Brandt, Laura. "The Creation and Use of Vanilla." Food Product Design <http://www.foodproductdesign.com/articles/1996/03/the-creation-and-use-of-vanilla.aspx>

Market Access

Despite Madagascar’s unmatched reputation for high-quality vanilla, the vanilla market is plagued by volatility. Throughout the field visit, farmers identified low and volatile market prices as the number one obstacle to earning a stable livelihood from vanilla production. The behavior pattern among most farmer groups interviewed was to follow crops with the best price and abandon crops during price dips. This occurred even with perennials such as robusta coffee and vanilla. The primary motivator for farmers to keep producing vanilla is finding long-term, stable market relationships. In the meantime, overall vanilla production has decreased over the past years in response to dropping prices.

As can be interpreted from profit margins in the table below, vanilla continues to be a high-value crop. However, prices received by the farmer are as little as 15 percent of the value paid to the exporter, and 7 percent of product value paid to the importer. Should farmers assume additional roles on the supply chain to that of collector, preparator, and even exporter, they stand a greater chance of sustaining their livelihoods through vanilla on the conventional market.

*Supply Chain Actor Breakdown and Estimate of Profit Margins
(Conventional Market)*

Farmer	Collector	Preparator	Exporter	Importer
<ul style="list-style-type: none"> Supplies collector with green vanilla Produces green beans according to standard needed Price received: \$1.42-\$2.38 (\$7.14-11.90 cured equ.) 	<ul style="list-style-type: none"> Works with preparator to buy green beans from farmers at farm gate 	<ul style="list-style-type: none"> Supplies exporter with cured vanilla Primary postharvest process Price Received: \$14.00-\$26.00 	<ul style="list-style-type: none"> Supplies importer with cured vanilla Contracts with importer Ensures secondary postharvest processing Price Received: \$38.00-\$47.00 	<ul style="list-style-type: none"> Supplies to wholesaler or retailer Does packaging and domestic shipping Price Received: \$70.00-\$100.00

Third-Party Certifications Improving Profit Margin Equity on Supply Chain

One of the major findings of the field study is that key actors—growers and exporters—have fair trade and organic certification. This certification and market offers up to three times the price of the conventional market and represents a powerful



opportunity. CRS can help to expand this value chain opportunity at both the supply and demand level through work with farmers and buyers.

As indicated by the table below, minimum prices guaranteed by certification can double or triple the price paid to farmers. Premiums paid by certifications are as follows:

Certification Type	Green Vanilla	Cured vanilla
Double Certification Organic and Fair Trade	Market price plus \$5.60/kg, plus a 50-cent premium paid to the cooperative for community related social investments (compared to conventional price of \$1.42–2.38)	\$45 (compared to conventional price of \$19.05)
Fair Trade Certification	Market price plus \$5.10/kg, plus a 50-cent premium paid to the cooperative for community related social investments.	\$40

The market for certified vanilla is relatively small at this time due to limited market demand. For the 2012 harvest, the exporter Premium Spice negotiated contracts for 6 MT of cured vanilla to fair trade markets out of a total of 100 MT of cured vanilla produced in Mananara. However, large companies such as Ben & Jerry’s and Whole Foods Market have pledged to increase their purchase of fair trade vanilla in the coming years. Linking these values led companies with the Malagasy vanilla supply chain could expand market opportunities in fair trade vanilla in the near future.

Documentation is often considered a hurdle for farmer associations to access certifications. Currently, Premium Spice handles certifications for both the company and the farmer cooperative. The costs of certification are also a potential hurdle. At the moment, Premium Spice and the growers are sharing the costs of certification. More information is needed on costs of certifications for farmers and how farmer groups will be able to make this payment on an annual basis.

As vanilla farmers seek more equitable and stable market access in the future, both conventional and certified markets should be pursued. To ensure price equity in conventional markets, farmers will need to develop inclusive business model approaches with exporters and buyers interested in more equitable and sustainable relationships. Farmer associations and CRS would also do well to help expand certified market opportunities by both helping farmers access certifications and working with buyers to increase demand for certified vanilla.

III. OPPORTUNITIES, CHALLENGES AND KEY ACTORS IN MANANARA AND MANANJARY

CRS Madagascar selected Mananara and Mananjary as two potential geographic priority zones for vanilla value chain work as part of future Title II agriculture programming. CRS staff visited the two regions as part of this study to converse with supply chain actors and learn more about the potential viability of farmer and supply chain profitability through ongoing CRS program support. The makeup of both regions proved to be quite different, making one set of recommendations impossible. Rather, an analysis of both regions was needed to determine suitability and potential program strategies.

Mananara

Mananara is considered to be one of the best origins for vanilla in Madagascar, if not the world. Total volume is second only to the neighboring region of Sava. Vanilla in Mananara is produced in highly diverse agroforestry systems in buffer zones of forest reserves, or in the reserve itself as a sustainable forest crop. These production systems are a significant contrast to vanilla grown in Sava, where production is carried out in greenhouses or monoculture fashion.

Mananara Nord is the first declared biosphere of Madagascar and a national park established in 1999 by UNESCO. Formal cooperation to manage the biosphere ended in 2002, and now forest management is under the responsibility of the national government. The European Union has provided funding for biosphere reserve management from 2003 to 2009 with both environmental protection and poverty reduction mandates. High-value tree and tutor crops grown in agroforestry systems, such as cloves and vanilla, have been promoted for sustainable livelihoods of families living in or around the reserve. Currently 80 percent of all farmers in the vicinity grow these two crops.

Mananara has a functional vanilla farming and supply chain culture. Farmers in Mananara have established plantations with reasonable density. These farmers have considerable knowledge of pollination techniques and postharvest practices, and they report few disease or pest problems. Vanilla supply chain actors have ongoing presence and activities in Mananara, including a producer organization linked to formal markets.

KOMAM: Organized Farmers Linked to Fair Trade and Organic Vanilla Markets

The cooperative KOMAM is a good example of organized farmers participating in the vanilla value chain and capturing more value, providing a point of reference from which CRS can learn. In 2004, the Madagascar

National Park, an NGO, identified the lack of direct market mechanisms and farmers not adding value to vanilla as a principal problem for vanilla growers. As a result, it formed KOMAM, a community association of vanilla growers, that same year. Starting with 141 members in 10 communities, KOMAM now has expanded to 854 members in 37 communities. KOMAM's members' average plantation size is 1 hectare, and the average number of plants per farmer is 1,500. To be a member of the cooperative, a farmer must grow a minimum of 200 plants, and the farmer must produce at least 50 kg of vanilla to sell in certified markets.

KOMAM has received support from Swiss Intercooperation and has commercial contacts with Slow Food Italy. In 2006, KOMAM earned both fair trade and organic certification for its vanilla. It exports vanilla through the company Premium Spice, with whom it also shares the costs of certification. KOMAM members have sold up to 7 MT of vanilla in a given year through fair trade channels, citing insufficient market demand for this certification as the principal hurdle to selling all of their production through fair trade channels.

KOMAM provides different business development services to its members, such as training in production training and postharvest process—soil preparation, tutor management, pollination and harvest techniques. In all, 80 percent of member farmers sell their vanilla in green form to Premium Spice. KOMAM also provide its members with tools, blankets for postharvest, and paper for packaging.

KOMAM's relationship with Premium Spice has provided substantial benefits. A higher-value market access and sharing the costs of certification are two of the most important benefits. However, the relationship is marked by distrust. Farmers desire more transparency in the commercial relationship with Premium Spice. Increased disclosure regarding buyer relationships and profit margins were cited as some of the major areas for improvement.

Premium Spice: Inclusive Business Exporter

Premium Spice is the only direct vanilla exporter based in Mananara, and the only exporter with fair trade and organic certification. It has 10 percent of the total market share for vanilla in Mananara, exporting 10 MT of cured vanilla annually. Premium Spice has a full primary and secondary harvest facility in Mananara. Premium Spice has a clear social profile and is engaged in an inclusive business relationship with KOMAM. Its openness to working in partnership with small holder organizations and its export track record to certified markets make it a compelling potential private sector partner.

FTF Trading

Founded by former Peace Corps workers, FTF Trading is a vanilla and clove exporting company with a social and environmental profile. Its office is in Tamatave, and it sources product from farmers in both Mananara and Sava regions. FTF trains farmer cooperatives in different aspects of vanilla production and processing. FTF buys mostly green vanilla beans from farmers and does its own collecting and postharvest processing of beans using curing teams. LAFAZA is its importer partner in Oakland, where vanilla is wholesaled to a diversity of buyers around the country. FTF is not using social or environmental certifications to date, citing the lack of market response. FTF expressed openness to working with CRS to help farmers become more involved in postharvest processing, and could provide an important training function and market channel for farmers in Mananara.



Manual pollination, guiding and tying of the climbing orchid on trees, curing, drying, sorting, smoothing, and packaging processes all require intricate handiwork, but relatively light physical labor. Jefferson Shriver/CRS.

In summary, Mananara is a compelling choice for vanilla value chain support for the following reasons:

- Established plantations, vanilla knowledge and experience
- Diverse agroforestry systems with two strong cash crops: vanilla and cloves
- Attractive income potential on both conventional and Fair trade market, especially for cured vanilla
- Few disease and pest problems in our rapid diagnostic
- Simple and relatively low-cost postharvest equipment and technologies
- Strong potential supply chain partners

The following challenges remain:

- Only 5 percent of farmers are processing their vanilla. For those who are, exporters complain that quality often does not meet export standards.
- Yields are low at an average 250–500 g per plant. No fertilizer is used on any farm visited, with little attention paid to soil conservation to

prevent erosion. Yields can potentially increase to 1 kg green per plant through more regular fertilizer applications.

- Vanilla continues to experience price volatility from one year to another on the conventional market.
- Cyclones are a threat to both vanilla and cloves.
- Clove is booming and so may distract farmers from vanilla pollination, which happens at the same time.
- Little transparency exists with exporters.
- Cost of certifications is high.
- No national-level seed bank or technological propagation methods are used to obtain high-quality genetic material.
- There are a high number of intermediaries on the chain. Farmers must capture more value.

Mananjary

The prospects for vanilla in Mananjary appear to be different from Mananara. In this region, it was difficult to find established vanilla plantations. In the places where vanilla is grown, plant densities were rarely over 200 plants, making it nearly impossible to earn significant income from the crop. Farmers and traders alike spoke of vanilla more in the past tense in Mananjary. CRS was able to identify only two processors and exporters of vanilla in Mananjary, neither of which were processing high volumes of vanilla. Both had diversified their product lines to include other spices such as cinnamon and clove. The landscape was clearly more degraded than that of Mananara, with higher levels of deforestation and erosion. Farmer interviews revealed a high dependence on annual staple crops (cassava, sweet potato, rice) for food subsistence, with little to no cash crop source.

The following are the primary challenges and opportunities for CRS to carry out vanilla value chain programming support in Mananjary:

Challenges

- A new initiative will need to motivate farmers to grow vanilla again after abandoning the crop in previous years due to lack of profitability.
- A soil analysis and clear assessment of agroclimatic conditions are needed to determine if vanilla can be grown with potentially high production levels.
- Conduct a market analysis to determine if the vanilla supply chain can be competitive in Mananjary based on origin reputation, quality of postharvest processing services and local price differential.

- Accessibility of genetic plant material needs to be improved. With an average of only 100 plants or less per farm, plant material would need to be brought in from other regions of the country.
- A larger investment per farmer would be needed to increase plant densities from the current 100 plants to at least 1,000 per hectare.
- There is little to no farmer organization around vanilla to organize economies of scale.
- Few supply chain actors or services are present.



A woman manually pollinates the vanilla flower in a rural village outside of Mananjary, Madagascar. This kind of local knowledge of vanilla production is common in Madagascar. Jefferson Shriver/CRS.

Opportunities

- There is existing farmer knowledge of vanilla production and postharvest methods.
- Farmers interviewed expressed interest in planting vanilla again if market incentives and technical assistance are present.
- A number of farmers interviewed have begun to plant clove trees. The planting of clove intercropped with vanilla will increase profitability at the farm level.
- Vanilla planted in agroforestry systems represents an opportunity to restore degraded landscapes. An agroforestry system could be designed from scratch, increasing the chances of success over the long term.
- Temperature and annual rainfall are adequate for vanilla.

Net Income Projections

The following is a summary of net income projections per hectare for farmers over a six year period based on both green and vanilla in conventional and certified markets. The calculations were made based on the following assumptions:

- Plantation density: 2,000 plants per hectare
- First harvest beginning Year 3
- Production cost based on those reported by farmers in Mananjary and Mananara
- Cost of establishing new plantations
- Yield: 1 kg of green vanilla per plant
- Green vanilla price: \$2.38 per kg conventional; \$5.60 fair trade
- Cured vanilla price: \$19.05 per kg conventional; \$45 fair trade

As can be interpreted from the summary below, average annual incomes per hectare are as follows:

- Green Vanilla Conventional Market: \$1,579
- Green Vanilla, Fair Trade Market: \$5,871
- Cured Vanilla, Conventional Market: \$3,068
- Cured Vanilla, Fair Trade Market: \$9,988

Green Vanilla, Conventional Market

Green Vanilla	Production Costs	Gross Income	Total Net Income
Year 1	2,071.43	—	- 2,071.43
Year 2	1,500.00	—	- 3,571.43
Year 3	1,500.00	4,761.90	- 309.52
Year 4	1,500.00	4,761.90	2,952.38
Year 5	1,500.00	4,761.90	6,214.29
Year 6	1,500.00	4,761.90	9,476.19

Green Vanilla, Fair Trade Market

Green Vanilla	Production Costs	Gross Income	Total Net Income
Year 1	2,071.43	—	- 2,071.43
Year 2	1,500.00	—	- 3,571.43
Year 3	1,500.00	11,200	6,128.57
Year 4	1,500.00	11,200	15,828.57
Year 5	1,500.00	11,200	25,528.57
Year 6	1,500.00	11,200	35,228.57

Cured Vanilla, Conventional Market

Cured Vanilla	Production Costs	Gross Income	Total Net Income
Year 1	2,071	—	- 2,071.43
Year 2	1,500	—	- 3,571.43
Year 3	2,123	7,619	1,923.65
Year 4	2,123	7,619	7,418.73
Year 5	2,123	7,619	12,913.81
Year 6	2,123	7,619	18,408

Cured Vanilla, Fair Trade Market

Green Vanilla	Production Costs	Gross Income	Total Net Income
Year 1	2,071.43	—	-2,071.43
Year 2	1,500.00	—	-3,571.43
Year 3	2,123.97	18,000.00	12,304.60
Year 4	2,123.97	18,000.00	28,180.63
Year 5	2,123.97	18,000.00	44,056.67
Year 6	2,123.97	18,000.00	59,932.70

IV. FINAL RECOMMENDATIONS AND NEXT STEPS

CRS Madagascar sought to answer the question of whether vanilla is a value chain that offers significant opportunities for small holders, and whereby support from CRS will create social, environmental, and economic benefits. Results from the field investigation and literature review indicate that vanilla is a viable value chain for Malagasy small holders and worthy of CRS Madagascar support. Geographic targeting of Mananara for vanilla supply chain support is a good bet for a successful project. Given current conditions, support for vanilla in Mananjary carries with it additional risks and formidable challenges. The authors of this study do not make an unequivocal recommendation to support vanilla production in Mananjary at this time, given these risks. Further information and analysis are needed.

Additionally, as a unique, triple win, high-value crop, vanilla is also of interest to CRS agriculture globally. Applying a value chain approach within a Title II food security program is innovative and forward looking. CRS global agriculture staff would seek to monitor closely progress made under this initiative and share lessons learned to internal and external audiences.



Catholic Relief Services
228 West Lexington Street
Baltimore, MD 21201 USA
Tel: (410) 625-2220

crsprogramquality.org