



REFMAD-Vⁱ Enterprise's Vine of Life: Quo Vadis?ⁱⁱ

Nanayⁱⁱⁱ Edita Aguinaldo-Dacuycuy had just ended her day of supervising her Ilocos Norte, Philippines-based dragon fruit plantation on a humid afternoon in April 2016 when her phone rang. Imee R. Marcos, the governor of the province, was on the line. Immediately, Aguinaldo-Dacuycuy picked up the call.

"Good afternoon $po,^{iv}$ governor," she politely answered.

"Manang" Edith," Marcos said. "A group of Canadian businessmen paid a courtesy call to my office and they are very interested in importing our local variety of dragon fruit at a rate of 20 tons every two weeks. Can you make this happen, Manang — and open up your farm for the exportation of our Saniata?"

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ⁱ Rare Eagle Forest Marine Agricultural Development-Venture

[&]quot; Quo vadis? is a Latin phrase meaning "Where are you going?"

Manay literally means mother, but it is also culturally used to show respect to an old woman.

^{iv} In Philippine culture, "po" and "opo" are used during conversations with an older person or one with authority or higher position.

^{*} Manang is an Iluko (local dialect spoken in Ilocos Norte, Philippines) term used to address an older female to show respect.

vi The dragon fruit or pitaya is called Saniata in Ilocos Norte, Philippines which means blooming and promising.

It had been Marcos' dream to make Ilocos Norte the "dragon fruit capital" of the Philippines. To export *Saniata* to Canada would be an opportunity to promote the product overseas and create a bigger market for the country's dragon fruit industry.

"Where and when I can possibly meet with them, Ma'am?" Aguinaldo-Dacuycuy asked. She had mixed emotions. She was delighted to hear there was an interest in the fruit from her enterprise, REFMAD-V, but she was worried that she would not be able meet the demand. In fact, her current production capacity could only meet 10% of local demand.²

"My secretary will call you back, *Manang* Edith. We will make the necessary arrangements," Marcos said.

"Thank you very much, governor," Aguinaldo-Dacuycuy ended the conversation. Nevertheless, she thought: Is our company ready to export? Are we biting off more than we can chew?

The Owner

Aguinaldo-Dacucycuy was a psychology graduate of the University of the Philippines-Diliman and a former division manager of an insurance company. She was blessed with four children. Her eldest daughter became a successful physical therapist in the U.S., while her only son became a pediatrician and established a clinic in his hometown. Her second eldest daughter obtained a mass communications degree and worked in London, but returned home to become the operations manager of REFMAD-V. Her youngest child and special daughter, Merodith was the reason for the venture.³

Merodith had been diagnosed with cerebral palsy^{vii} and her medicines failed to improve her health. In search for alternatives, Aguinaldo-Dacuycuy came across the medical wonders of the dragon fruit. After Aguinaldo-Dacuycuy included dragon fruit in Merodith's daily diet, her daughter seemed to be more relaxed and her seizures and constipation became less frequent.⁴

The Vine of Life (Dragon Cactus)

The Dragon cactus (see **Appendix A**) is called the "vine of life" because all of the plant's parts are utilized. From its roots to its fruit, nothing goes to waste. The fruit is nutritious and has medicinal and economic value.⁵

Dragon fruit is a perennial climbing cactus with triangular, fleshy jointed green stems that grow to about six meters long. It requires minimal irrigation and thrives in sand dunes.⁶ Its life span is 45 to 50 years and the cactus produces fruit continuously once it reaches maturity.⁷

Dragon fruit is rich in fiber and contains high levels of vitamin C, calcium, and phosphorous. It also possesses vital antioxidants, which aid in the prevention of cancer, heart disease, high blood pressure, rheumatism, and urinary tract infections.⁸ It can also control asthma and cough.⁹

The oblong fruit of the dragon plant usually weighs at least ¼ kilo and has triangle-like tassels. ¹⁰ The varieties grown in the province (see **Appendix B**) have deep-pink skin and white flesh (*Hylocereus*

vii The Cerebral Palsy Alliance defines cerebral palsy as a group of disorders that affect movement. It can be mild and cause only a slight disruption to a person's daily life. It can also be so severe that it affects the whole body and may significantly impact a person's daily activities. Merodith was of the latter type.

undatus), deep pink skin and magenta flesh (*Hylocereus costaricensis*), and yellow skin with white flesh (*Hylocereus megalanthus*).¹¹

The deep-pink dragon fruit with magenta flesh most often planted in the Philippines due to its sweet taste. The pulp of the fruit was embedded with tiny edible seeds that helped clean the intestines and helped in controlling blood glucose levels in people with non-insulin-dependent hyperglycemic diabetes. Is

REFMAD-V Background

The company was born out of a mother's love for her special child. In Aguinaldo-Dacuycuy's search for things to ease her daughter's pain and suffering she discovered a little known fruit from the cactus family called dragon fruit. A friend from Macau recommended that her daughter try dragon fruit to relieve her frequent constipation¹⁴ which is common among cerebral palsy patients.¹⁵

The dragon fruit therapy was so effective that it convinced Aguinaldo-Dacuycuy to grow it in her backyard to ensure a constant supply for Merodith. She started with 20 saplings in 2005. It worked like magic for Merodith — it not only eased her constipation, but also reduced her seizures and spasms. Upon learning that the cost per kilogram at that time was Php 450 (USD 9.70), Aguinaldo-Dacuycuy decided to cultivate the plant for sale. She decided to expand her backyard production in 2006 and register the plantation as a business. Production grew over the years to 20 hectares in 2016.

The Plantation

The dragon fruit plantation housed a resort, restaurant, and fish farm which attracted tourists, farm enthusiasts, businessmen, and even movie makers. There were home-stay facilities for visitors who wanted to watch the flowers of the vine bloom and glow in the dark while taking in the aromatic scent that enveloped the farm.²⁰ REFMAD-V's steady market included traders from the neighboring provinces of Ilocos Sur, Cagayan Valley, Isabela; Dole Philippines in Metro Manila; and hotels in Ilocos Norte.²¹

The farm had become an agri-tourism site offering research and livelihood training to locals. Mariano Marcos State University, Ilocos Agriculture and Resources Research and Development Consortium (ILARRDEC), and the Department of Science and Technology partnered to establish a science and technology-based farm for organic production of dragon fruit at REFMAD-V. The project showcased the effectiveness of science and technology interventions in improving productivity and income derived from dragon fruit. Moreover, the Department of Trade and Industry (DTI) had designated dragon fruit as the one-town-one-product^{ix} of Burgos, Ilocos Norte, and the Department of Tourism had included REFMAD-V farms as part of its itinerary for local and foreign tourists.²²

Dragon Fruit Cultivation Technology

The dragon fruit cultivation technology at REFMAD-V featured chemical-free production²³ and a zero-waste management system.²⁴ All farm waste was turned into organic fertilizer. This was done

viii Exchange rate as of June 26, 2016: USD 1 = Php 46.36.

^{ix} One Town One Product (OTOP) is a promotional program of the government of the Philippines that aims to promote goods and products of towns, cities, and regions as well as provides funding for small businesses.

through vermiculture technology.* The company maintained more than 30 kilos of African night crawler earthworms kept in compost pits.²⁵ Grasses, dried leaves, and other waste from the cactus plant were chopped and thrown into the compost pits for the earthworms to decompose. The worm humus or manure that was produced was used to grow stems organically. This ensured a sustainable and chemical-free growth of the dragon fruit cactus.²⁶

REFMAD-V Farms served as a laboratory for farmers and investors who wanted to produce dragon fruit all year. It had established two wind pumps^{xi} with a capacity of 2,000 gallons to sustain the growth of dragon fruit cactus plants when water was scarce during the summer months from March to May.²⁷

Dragon fruit is considered photoperiodic, which means its flowering is affected by the length of darkness. When the nights are long, it will not flower.²⁸ So to grow dragon fruit in the off-season, the farm used extended daylight technology that exposed the cactus plant to artificial sunlight. This technology was in place from December to April when the plants received less sunlight due to the effect of winter solstice.^{xii} The technology involved the use of 6-watt light-emitting diode bulbs and 26-watt compact fluorescent lamps which were used to light the plants between 10 p.m. to 2 a.m.²⁹ With this technology, harvesting was expected to last until the end of April when natural flowering of the dragon fruit started.³⁰

Income Generator

REFMAD-V made money from dragon fruit in both the regular season and off-season. The company estimated that lighting each for off-season production cost about Php 10 (USD 0.21).³¹ This cost was covered by the increase in price for off-season fruit from January to March when it could go up to Php 150 (USD 3.23) to Php 180 (USD 3.88) per kilo. During the regular season the price ranged from Php 75 (USD 1.61) to Php 80 (USD 1.72) per kilo. Some growers in the province competed with other farmers by lowering their prices to Php 50 (USD 1.07) to Php 60 (USD 1.29) per kilo.³²

The fruit's regular season is from May to November with at least five to six harvesting cycles. When properly harvested, the fruit has a shelf life of one month or more and each pole produces 30 to 40 kilos of fruit per year.³³

Dragon fruit had become a promising source of income. REFMAD-V estimated the income from a single post of dragon fruit to be of Php 1,000 (USD 21) a year. This meant that for every hectare of land with 1,500 dragon fruit posts, the return on investment per year could be as much as Php 1.5 million (USD 32,349). This projection was based on an average harvest of one ton from May to November. This was in addition to the income generated from dragon fruit-based food and beauty products.³⁴

Product Lines

While fresh dragon fruit sustained the industry REFMAD-V developed dragon fruit-based products that had found a steady market. The plant's roots were turned into dragon fruit tea; it pulp into ice cream, cupcakes, cookies, hopia,xiii bread sticks, toasted mammon,xiiv otap,xv macaroons, and wine; its fruit

^{*} A simple system of rearing earthworms for rapid decomposition of organic farm and home waste.

xi A type of windmill used in pumping water.

 $^{^{}xii}$ When the earth is at its farthest axis from the sun.

xiii Pastry filled with dragon fruit paste.

xiv Sponge cake with buttery dragon fruit paste.

peel into jam, marmalade, and pickles; its dried flower into shanghai lumpia, x^{ij} pancit canton, x^{ij} and tea; and its fruit and leaf extract into herbal soap.³⁵

The Business

REFMAD-V Farms was the country's leading dragon fruit producer and processor. The plantation covered 20 hectares.³⁶ On average, each hectare had 1,500 posts. The company recorded a total net income of more than Php 21 million (USD 452,898) from dragon fruit production in 2009, three years after it started operations.³⁷

In an effort to increase production for local and foreign demand, REFMAD-V partnered with Dragon Fruit Philippines to establish a 100-hectare plantation farm in Pampanga, Philippines. The first phase of the project covered 20 hectares which was slated for completion in 2016. Forty hectares would be planted in 2017 and another forty hectares in 2018.³⁸

Meanwhile, Aguinaldo-Dacuycuy continued her community work by promoting dragon fruit production in Ilocos Norte through demonstrations and lectures in schools and to interested individuals, groups, and fellow farmers.³⁹

Strategic Partnership

Aguinaldo-Dacuycuy organized a group of dragon fruit growers in the province, known as the Kailukuan Saniata Cooperative. In 2016 there were about 100 members who collectively produced as much as 1,000 tons per year.⁴⁰

A separate 1,000 square mile plot on REFMAD-V's farm had been reserved for the dragon cactus plantation of the Ilocos Agriculture and Resources Research and Development Consortium (ILARRDEC) for its research work. The output of ILARRDEC's research were implemented on REFMAD-V's farm.⁴¹

Aguinaldo-Dacuycuy also formed the Association of Dragon Fruit Growers of the Philippines where she readily shared her technology and assisted growers interested in farming the plant.⁴²

Headed by Aguinaldo-Dacuycuy, the Philippine Dragon Fruit Growers and Processors National Council was organized in 2014 to make its presence felt in the export market. The newly organized council was backed by various government agencies such as the Department of Agriculture, Department of Agrarian Reform, and ILARRDEC.⁴³

In 2016, there were at least 40 active members on the council composed of large players in the agriculture industry from Luzon, Visayas, and Mindanao. They wanted to make the Philippines known for its quality dragon fruit products.

With the support of the provincial government of Ilocos Norte and ILARRDEC, REFMAD Farms was also promoted as an agri-tourism spot.

v Oval-shaped crunchy puff pastry.

xvi A savory snack made of thin crepe pastry skin called "lumpia wrapper" enveloping a mixture of savory fillings consisting of dried dragon fruit flower.

xvii Flour sticks or tossed noodles.

Competition

Dragon fruit growers continued to increase in number throughout the country. This form of farming was gaining ground in the provinces of Cavite, Bicol, and Davao. Commercial dragon fruit farms were also established in Pangasinan, Nueva Ecija, and Quezon.⁴⁴ With little investment and maintenance required for growing dragon fruit, the Department of Agriculture - Bureau of Agricultural Research (DA-BAR) classified the plant as a cash crop.⁴⁵

However, REFMAD's owner was so selfless that she did not consider other growers as competitors. 46 The company offered business partnerships and expansion to other farmers and potential investors. She had helped Sarah Balorio to establish a dragon fruit plantation in Dumanjug town, Cebu; Felipe Uygongco on Guimaras Island; Jose Fortunato Uy in General Santos City; and Raffi Catalan of Bacolod City, among others. 47 In her home province of Ilocos Norte, she had helped hundreds of farmers by providing free saplings, conducting seminars and cultivation demonstrations, and showcasing technologies used at the farm. 48

Exporting

Leonardo Pascua, one of the consultants of the National Council for Dragon Fruit Growers of the Philippines (NCDFGP), said that dragon fruit growers needed to collectively have at least 1,000 hectares of dragon fruit plantations to supply the global market.⁴⁹

While Ilocos Norte's production was still below the export target with just 300 hectares⁵⁰, growers in the province continued to produce dragon fruit-based products that had found a steady market.

Awards

In 2008, Aguinaldo-Dacuycuy was named outstanding farmer-scientist by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development's (PCAARRD) Science and Technology-based Farm Project on organic dragon fruit production.⁵¹ Her passion for the dragon fruit business also earned her the National Gawad Saka Award (Presidential Award) for cultivating a high-value commercial crop in 2011.⁵² The award was presented by no less than Philippine President Benigno Aquino III.

She was also invited by the U.S. government to be a panelist during the Asia Pacific Economic Cooperation (APEC) - Women and Economy Summit in San Francisco, California in September 2011.⁵³ At the same event she was recognized as a female innovation leader in the field of agriculture.⁵⁴

The Philippine Center for Entrepreneurship — Go Negosyo — also recognized her inspiring entrepreneurship and named her as one of the Filipina Starpreneurs in 2014. The latest addition to her accolades was the Golden Globe Award for Business Excellence in 2015.⁵⁵

Dragon Fruit Festival

REFMAD-V Farms staged an annual dragon fruit picking festival that was first held in 2011.⁵⁶ During the festival, the farm was open to tourists from 7:30 a.m. to 5 p.m. The tourists experienced picking

fresh dragon fruit and buying it at the farm gate price of Php 100 (USD 2.15) to Php 150 (USD 3.23) a $kilo.^{57}$

The farm also offered free tasting of dragon fruit varieties like Thai white, Vietnam white, Morrocan, Red China, and Ilocos Saniata, a local variety named by the Association of Dragon Fruit Growers.

Community Effect

With the high demand for this exotic fruit known for its therapeutic properties, idle public and private lands in Ilocos Norte including village roadsides, backyards and school compounds had been turned into pocket dragon fruit farms.⁵⁸

Aside from putting these lands to use, these types of projects could also help in poverty alleviation efforts for inhabitants and mitigate climate change.⁵⁹

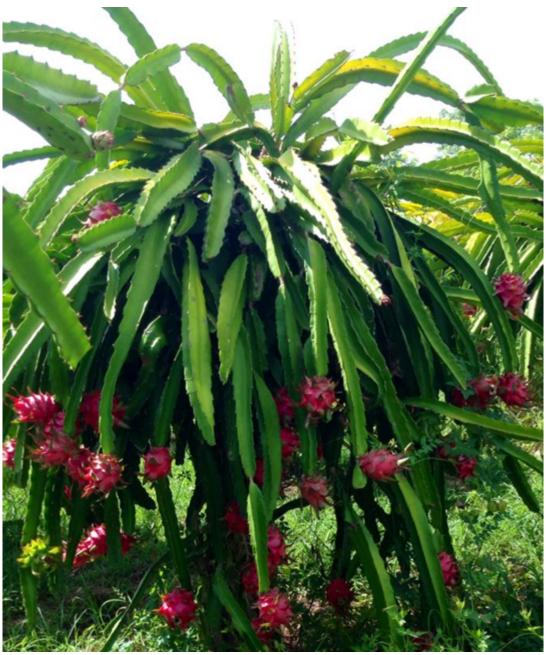
Daunting Decisions

The governor's secretary called Aguinaldo-Dacuycuy a few minutes before the office closed at 5 p.m. The secretary requested that she meet with the Canadian businessmen the next day at Ilocos Norte Provincial Capital. She was told that the Provincial Agriculturist, Norma Lagmay would also be there.

With a high demand for this exotic fruit known for its therapeutic properties, Aguinaldo-Dacuycuy knew that dragon fruit growers and investors could earn a good return if they could penetrate the international market. However, She was also aware that currently only 10% of local demand was being met. Could production be increased? Was the company ready to export? These questions weighed on her mind as she thought about tomorrow's meeting.

Appendices

Appendix A
A Single Post of Dragon Cactus with Matured Fruit



Source: REFMAD-V

Appendix B

Deep-pink skin with white flesh (*Hylocereus undatus*) and deep-pink skin with magenta flesh (*Hylocereus costaricensis*), the two most commonly grown dragon fruit varieties in Ilocos Norte, Philippines.



Source: Wordpress. https://blauearth.files.wordpress.com>.

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