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UNIVERSITY OF THE PHILIPPINES  
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**ESCAPING THE MIDDLE INCOME-TRAP: CHAINS FOR CHANGE**

# **Resilience of Organic Rice and Supermarket Value Chains during the COVID-19 Pandemic:**

## The Case of the Global Organic Wellness Corporation

*Elaine Tacubanza  
Ernest Barreiro  
Tara Abrina  
Jane Lynn Capacio*

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**COVER IMAGE CREDIT**

Photo provided by EMIT C4C. From organic production and certification, to packaging and labeling, Glowcorp ensures their organic products are made with high-quality and proper care.



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# Resilience of Organic Rice and Supermarket Value Chains during the COVID-19 Pandemic: The Case of the Global Organic Wellness Corporation

*Elaine Tacubanza, Ernest Barreiro<sup>1</sup>,  
Tara Abrina, and Jane Lynn Capacio<sup>2</sup>*

## Abstract

With the widespread growth of healthy lifestyle trends came the increased popularity and demand for organic and natural commodities worldwide. Alongside the worldwide booming organic market, some studies documented a “supermarket revolution” because of the global simultaneous expansion of supermarkets. The Philippines’ local organic demand used to cater mainly to niche markets through specialty stores. However, due to this supermarket revolution, organic agriculture products started to become more accessible. These were the major opportunities maximized by the Global Organic Wellness Corporation (GlowCorp) and its board members and partners, including the Don Bosco Multipurpose Cooperative (DBMC). This action research performed industry and value chain analyses for

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both enterprises to see what makes organic agriculture value chains and social enterprises competitive, inclusive, and resilient. Numerous lessons emerged, showing how GlowCorp's and DBMC's value chains mirror each other because of their similar firm infrastructure. Both were founded on the objective to serve as the farmers' extension, whether it be in procurement, certification, or marketing. In addition, a relational type of value chain governance is possible when two firms in the same value chain are aligned in their business principles.

*Keywords: organic rice, organic agriculture, supermarket, GlowCorp, Don Bosco Multipurpose Cooperative, value chain analysis*

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## I. Introduction

With the widespread growth of healthy lifestyle trends came the increased popularity and demand for organic and natural commodities worldwide. In 2000, the Foreign Agriculture Service of the United States Department of Agriculture (USDA) estimated that the organic product market in the Philippines amounted to USD 6.2 million or PHP 266.7 million, whereas in 2006, Philippine organic product exports reached USD 18 million (National Organic Agriculture Board 2012). By 2010, Republic Act (RA) No. 10068, or the Organic Agriculture Act, was passed. Part of its objectives included promoting organic rice and converting rice production areas to sustainable agriculture. Alongside the worldwide booming organic market, some studies documented a “supermarket revolution” because of the simultaneous expansion of supermarkets globally (Reardon and Gulati 2008; Reardon et al. 2009). Large supermarket chains began to allot shelf spaces for organic products, responding to the growing public demand for natural and healthier alternatives (National Organic Agriculture Board 2012). The Philippines’ local organic demand used to cater mainly to niche markets through specialty stores, but because of this supermarket revolution, organic agriculture products started to become more accessible.

The Partnership for Development Assistance in the Philippines (PDAP) saw this as a potential catalyst for rural industry development. From 2005 to 2011, this nongovernment organization (NGO) implemented its program called “Promoting Rural Industries and Market Enhancement” (PRIME). The program intended to reduce poverty by supporting rural producers from sunrise industries, specifically muscovado, organic rice, and seaweed (Partnership for Development Assistance in the Philippines, Inc. 2012). This six-year program, with headquarters in Quezon City and a regional office in Cagayan de Oro, equipped organic microenterprises with financial, technical, and field capacities to enable sustainable development. PRIME was a timely program as the global demand for organic food and beverages continued to skyrocket, reaching USD 15.6 billion in 2009, with an average growth of over USD 5 billion every year (National Organic Agriculture Board 2012).



PRIME's partner farmer beneficiaries realized they had established their expertise in production. However, they knew they needed to sustain the institutionalized marketing support from the program. Thus, towards the tail end of the program in May 2010, nine farmer groups and NGOs, with PRIME's former Senior Program Officer, Mr. Bernie Berondo, registered their own company called Global Organic Wellness Corporation (GlowCorp), which is based in Cabuyao, Laguna province. GlowCorp directed efforts in advancing two sunrise industries—organic rice and muscovado sugar—by implementing marketing strategies for these natural commodities to gain greater market share at fair prices. GlowCorp was the first farmer-led corporation that served as the organic producers' marketing arm to bridge product competitiveness gaps, enabling smallholders to gain collective bargaining power.

To continue with this role, the Peace and Equity Foundation (PEF) granted GlowCorp a credit line worth PHP 6 million in 2013, as the farmer-led marketing venture navigated the challenges of reaching mainstream markets. Thus, almost a decade after its first credit line, this study is an inquiry into this partnership. What were the impacts of funding this marketing arm on smallholder farmers' competitiveness? How did their model—organic products entering supermarket chains—fare with the ongoing COVID-19 pandemic? And what might we learn in terms of social enterprise resilience? Within the framework of a value chain analysis, PEF, EMIT C4C, and the Partnerships Resource Centre of the Rotterdam School of Management (Erasmus University) project's impact team chose to study these lines of inquiry.

This study is an action research project of PEF and EMIT C4C. Action research is a scientific method that simultaneously investigates and solves a concern. It uses data and evidence to propel actions from relevant actors. One of EMIT C4C and PEF's action research outputs is this case study on GlowCorp, which is an important undertaking for both institutions. In EMIT C4C's case, unlocking strategies for making agriculture value chains competitive and inclusive is important since this is a pathway for escaping the Philippines' (lower) middle-income trap. Since most of the poor in the country are in agriculture, understanding and undertaking efforts in increasing agriculture-based income is important to escape the income trap.

Organic agriculture is of particular interest because it is part of an unstandardized, nontraditional value chain where players like GlowCorp and the Don Bosco Multipurpose Cooperative (DBMC, which is based in North Cotabato, Philippines) could compete, where value-added is feasible, and productivity could still be improved. As this action research case study shows, one of the ways to compete in agriculture is to participate in niche industries and chains since these are not proliferated by highly dominant players that depress prices.

Selling to supermarkets is also highly interesting for EMIT C4C since it could yield lessons for other value chains. In prior studies, EMIT C4C has looked at various end-buyers and identified the lead firms (Gereffi et al. 2005; Balaoing-Pelkmans 2020) that work to make chains inclusive and able to meet their end-buyers' requirements. Among other research questions, it is important for EMIT C4C to identify the lead firm that enables smallholder farmers and bridges the gaps between farmer-suppliers and supermarket buyers in the value chain where GlowCorp, DBMC, and PEF participate.

To complete the picture, one of GlowCorp's board members and major sources of organic rice was chosen to be part of the case study. DBMC has been a registered cooperative since January 2010. It hails from M'lang, North Cotabato. The cooperative's organic rice supplies are tagged as premium products as these are "certified organic" by the government-accredited Organic Certification Center of the Philippines (OCCP). It is also the country's first cooperative to receive certification from the Europe-based Certification of Environmental Standards (CERES). Aside from these, DBMC also holds a certification from the USDA's National Organic program (Gonzales 2017).

The paper is structured as follows: the following section explains the value chain analysis' methodology and how GlowCorp provides the entry point. Next, section III provides a deeper dive into GlowCorp's social enterprise ecosystem, which provides the context for the value chain study. Then, context is provided for the organic rice industry in the Philippines, followed by DBMC's context in M'lang, North Cotabato. With these provided, we then dive deep into DBMC and GlowCorp's value chain, where we identify how and why we think the chain's resilience is conditional on the partners' shared values. The final section concludes and provides recommendations.

## II. Methodology

This action research seeks to understand GlowCorp's value chain from DBMC, one of its main organic rice producers, to the supermarkets' shelves. DBMC's case study is thus said to be embedded within the GlowCorp case study. The paper discusses and establishes GlowCorp's baseline status before the pandemic, highlight the activities and characteristics that allow the company's organic rice value chain to be resilient, and show how it continues to operate albeit and amid shocks. Porter's (1985) value chain model is the framework used to examine how GlowCorp and its partner cooperatives create shared value for its consumers and producers, as well as across three interlinked markets.

Porter developed the value chain tool in 1985 to analyze a firm's sources of competitive advantage and compare them to other firms in the same industry. This tool may help a business improve its margins by demonstrating the possible cost optimizations and/or differentiation in the activities involved for its product or service. The production processes need to be examined to distinguish the roles required and to identify the players involved in each role. Seeing the key players of the roles in each activity enables the study of value distribution in the supply chain.

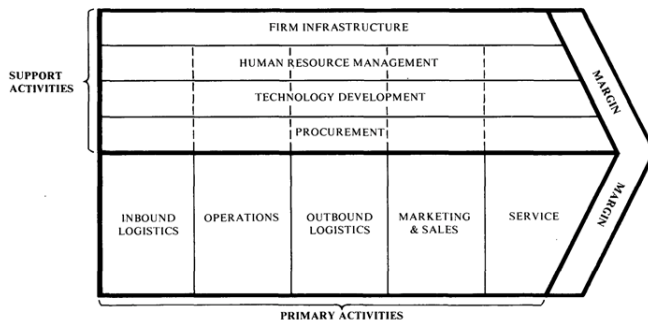


Figure 1. Value chain analysis (Porter 1985, 37)

The United Nations Food and Agriculture Organization (UN FAO) defines *value chain analysis* as a means to examine a part of an economic system's economic, technical, institutional, territorial, and social relationships that link the upstream roles in production and

distribution to the downstream partners. One point of entry in this study will be DBMC's production of organic brown and black rice, which are some of the main raw materials that GlowCorp provides. DBMC, as the production entity, will be a reference point separating the upstream from the downstream agents.

Various data-gathering instruments were used in this action research, with the main data sources coming from key informant interviews (KIIs) of the cooperative and social enterprises discussed in this study. Given the limitations of the COVID-19 pandemic, meetings were conducted online in August 2021, July 2022, and November 2022 via Zoom to facilitate deep-dive conversations and process insights with Mr. Bernie Berondo, GlowCorp General Manager; Mr. Mario Alolosan, DBMC Chairperson; Ms. Wilma Guinto, Senior Area Officer of PEF; and Ms. Anna Vibar, PEF Knowledge Management Officer. Secondary data gathering mostly came from online publications and financial reports from GlowCorp and DBMC. Lastly, the Impact Team's reflection memos, or field notes synthesizing information from various KIIs, were also referred to in the study.

This study is limited to using GlowCorp as an alternative entry point due to the challenges associated with directly obtaining information from the start and endpoints of the organic brown and black rice value chain. These startpoints and endpoints are the supermarket customers as the end consumers, and the farmers as producers. GlowCorp does not transact with end consumers as the company's primary business model is to directly supply to institutional and retail buyers. GlowCorp also indirectly interfaces with smallholder farmers through intermediaries such as cooperatives and other associations. For this reason, we included a brief case study on DBMC, one of the founding farmer cooperatives and shareholders of GlowCorp, within the GlowCorp case study.

### **III. Global Organic Wellness Corporation (GlowCorp)**

Before GlowCorp became a formally registered company, its founders pooled PHP 270,000 as initial working capital and looked for further financing opportunities. GlowCorp joined the 2009 Business in Development (BiD) Challenge Philippines–Intensifying the Link to

the Global Marketplace, a business plan competition organized by the Philippine Business for Social Progress (PBSP). GlowCorp bagged the top third Most Outstanding Business Plan (BiD Challenge Philippines 2009) and an additional PHP 150,000 fund for their working capital. The benefits of being its own marketing arm and, in effect, trader of its own organic farmer owners attracted support and recognition. This was achieved despite the tough challenge of contending with other development enterprises. Aside from the financial gain, GlowCorp also gained loftier business goals, with a first-year target of PHP 60 million in sales through organizational and overseas organic markets.

By July 2010, despite struggles with product positioning and revolving funds, GlowCorp was able to supply its first 250 sacks of organic rice. With apt timing of addressing current market gaps, as well as the support from PDAP and PBSP, GlowCorp started with high enthusiasm and risk appetite. At first, the company targeted institutional buyers and export markets since one of the original board members was already in the retail business. Unfortunately, only 50 sacks, or 20 percent of this supply, passed the client's organic quality standards.

Despite the capacity to supply large quantities, smallholders were not ready for high export quality standards. Additionally, a number of farmers were not yet internationally certified to enter the export market. GlowCorp's 2011 revenues came from its being the first supplier of organic, pigmented rice to Sunnywood, a local, wholesale trader of conventional rice.

Realizing the high entry barrier in the quality standards, as well as the organization being uncertified for the export market, the general manager knew that the company needed to pivot to retail first before relying on exports to keep the business afloat. Despite becoming the direct competition of one of its incorporating farmer groups, the company and the farmers' organizations agreed to implement this strategy. It defined GlowCorp as the farmer groups' primary marketing and distribution arm in grocery outlets. This quick shift enabled GlowCorp to become successful in its first five years as a startup business. The incorporators' and general manager's grassroots experience from their farming communities and groundwork in PDAP

became the foundation of the company’s firm infrastructure during this time. These were the first few of the many challenges in the organic market where GlowCorp learned to build its quick organizational decision-making and business acumen.

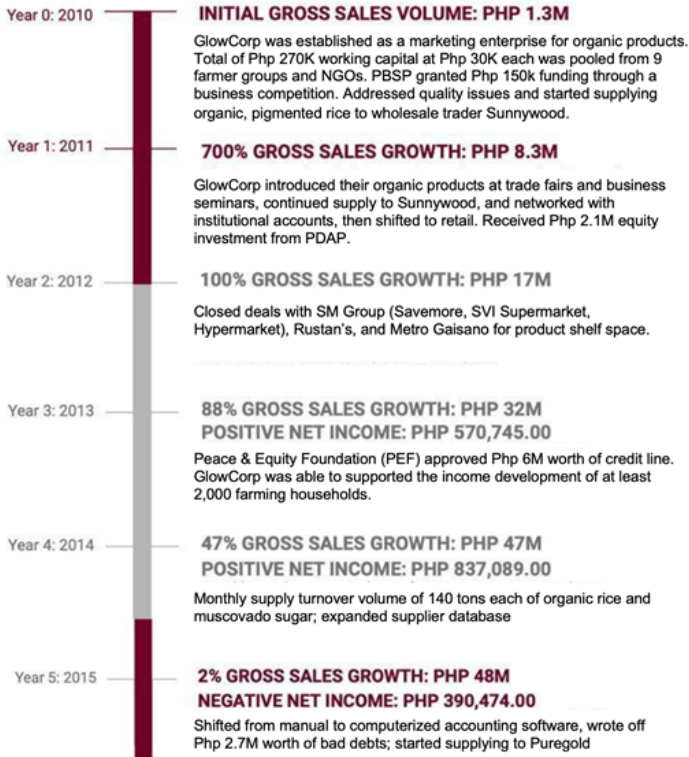


Figure 2. GlowCorp’s sales growth in its first five years of operation (2010–15). Created by the authors based on the interview with Mr. Bernie Berondo, GlowCorp General Manager 2021, and on the report, “Gains and Prospects of the Global Organics and Wellness Corporation 2010–2014.”

After suffering losses in its first two years of operations, GlowCorp immediately bounced back with a positive net income in its third year, achieving the company’s breakeven point by its fifth year of operations (Global Organics and Wellness Corporation, 2015). In 2012, PDAP estimated that the local organic product market grew from USD 20 million or PHP 860 million to USD 30 million or PHP 1.3 billion. Concurrently, GlowCorp’s sales volume growth reached 80 to 100

percent in 2011 and 2012. The company experienced this rapid increase in revenues when GlowCorp decided to shift to retail outlets, where they focused on marketing organic rice and muscovado sugar.<sup>3</sup> The growth in retail revenues was a sharp contrast against wholesale or bulk sales, where the company only received orders once every three months.

As shown in the company's 2020 Annual Report, GlowCorp successfully penetrated the supermarket segment, maintaining 615 outlets nationwide. In 2020, 91 percent of GlowCorp's total revenue came from its three major products, organic rice, muscovado, and coco sugar. Other products are *adlai* (*Coix lacryma jobi*, an heirloom grain grown in the regions of Cordillera), gourmet *tuyo* and *tinapa* (both types of dried fish), banana chips, calamansi concentrate, roasted cashew, as well as turmeric and *salabat* (ginger) powder. These products are sold under GlowCorp's 15 various brands, namely Bios Dynamis, Prime Organics, Pecuaría, Hygeia, Island's Best, Cordillera Treasures, Mindoren-C, Triple L, Tagbanua's Best, Ginger 45, Kitchen Hub, and CSI Sikwate! Aside from these, GlowCorp also supplies organic rice, muscovado, and coco sugar for different house brands or private labels of Rustan's Supermarkets' Royal Majesty, Shopwise's SureBuy, and Robinsons Supermarkets' Healthy You.

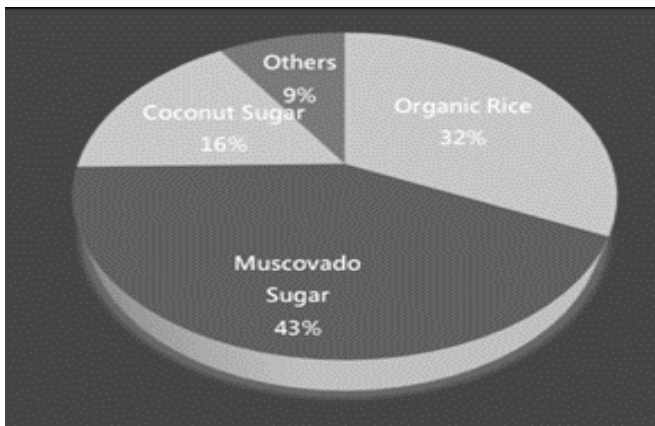


Figure 3. Sales contribution per product in GlowCorp's 2020 Annual Report (5)

3 Interview with Mr. Bernie Berondo of GlowCorp. GlowCorp Office, Cabuyao, Laguna, August 18, 2019.



Thirty-two percent of its revenue (PhP 88.8 million) in 2020 was attributed to its organic rice products. This was six percent lower than the previous year.<sup>4</sup> Among the five varieties that GlowCorp offers, brown rice experienced the biggest decrease of 10.5 percent in terms of sales volume at 99 metric tons (MT) in 2020. This was far from its previous two years’ sales growth, with a 62 percent increase in brown rice sales volume from 69 MT in 2018 to 111 MT in 2019. Despite the decrease in sales, GlowCorp was still able to purchase PHP 18 million worth of organic and commercial rice in 2020. Twenty percent of this purchase came from DBMC, amounting to a total cost of PHP 3.7 million.

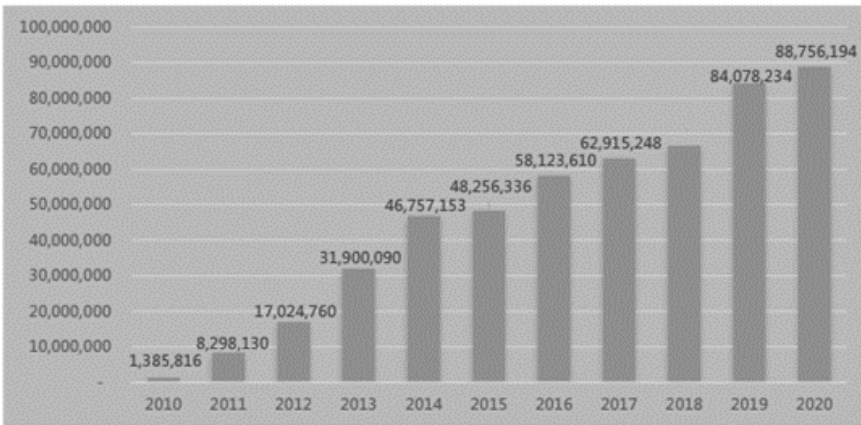


Figure 4. Annual gross sales trend from 2010 to 2020 (GlowCorp’s 2020 Annual Report)

However, coming from an all-time high of 26.25 percent sales growth in 2019, pandemic restrictions caused the slowest sales growth for GlowCorp in the past five years, pulling it down to 5.56 percent in 2020.

GlowCorp obtained PHP 3,658,586 net income before tax, which was 45 percent less than the 2019 records. Compared to the 2019 numbers, GlowCorp’s 2020 audited financial statement showed increased expenses in cost of sales—merchandise inventories, other

4 GlowCorp experienced a 5.56 percent decrease in its total revenue over the same period.



production expenses incurred for sticker labels and production supplies in the packaging process of inventories, as well as general and administrative expenses.

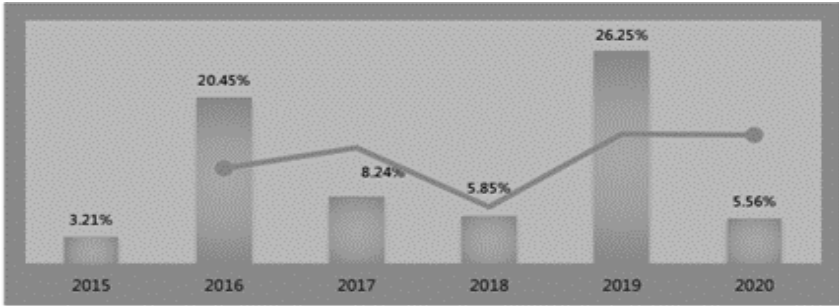


Figure 5. Percent sales growth from 2015 to 2020 in GlowCorp’s 2020 Annual Report (4)

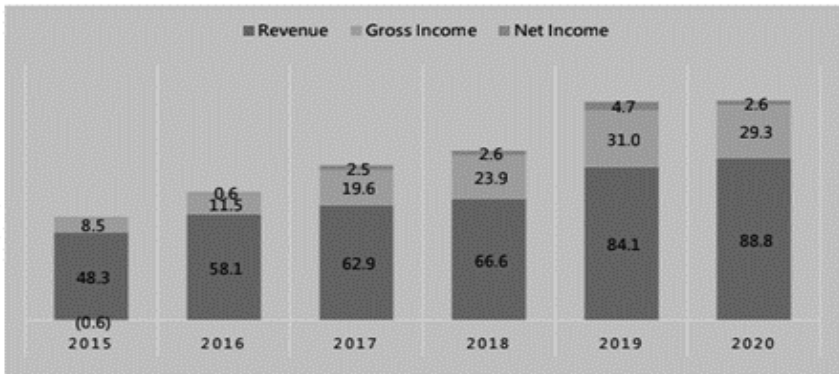


Figure 6. Revenue, gross income, and net income over six years in GlowCorp’s 2020 Annual Report (4)

As stated in GlowCorp’s 2020 Annual Report, the firm’s vision is to be “the market leader in organic and natural products distribution and promote the economic development and empowerment of at least 6,500 farming households.” By 2020, GlowCorp’s total purchase of rice, muscovado, sugar, packaging materials, and other processed goods had amounted to more than PHP 372 million since 2010. GlowCorp’s widening market and network reach is said to have trickled up the value chain to benefit its partners: 6,459 farmers, micro and small entrepreneurs, and fisherfolks. This will be elaborated on in the value chain analysis section.

## IV. Crop Context

### *The Green Revolution and Organic Farming*

For centuries, the Philippines employed traditional farming methods using natural resources on hand. These crop-growing practices can be currently classified as organic (Suñer et al. 2016). However, a massive campaign for chemical agriculture began in the 1970s. Called “The Green Revolution,” it started to drastically alter the agricultural landscape and practices when the local government based its agricultural programs on this method. The Green Revolution systematized the means of the Philippines’ rice production with increased usage of rice monocropping, chemical fertilizers, pesticides, and power tillers. One of the most popular hybrid seed varieties during this time was “miracle rice” or IR8. Although annual domestic rice production increased from 3.7 to 7.7 million tons with IR8, the compounded use of chemical fertilizers eroded the soil, polluted the waters, and depleted the water supply. Farmers’ debts increased from procuring these chemical inputs, and their health declined. By 1999, local rice fields were no longer qualified as productive because of multiple nutrient deficiencies. By 2012, 18 percent of a farmer’s gross income was allotted for the acquisition of the next cropping season’s chemical inputs, whereas 30 percent was earmarked for debt payment (Tadeo and Baladad 2012).

Organic agriculture was thus reintroduced as a response to these problems. It was first institutionalized in the Philippine legal system through Executive Order (EO) No. 481 signed in 2005. Stressing the need for government support for alternative production systems, the EO aimed for economically, socially, and environmentally sound agriculture, according to its proponents. The goal of organic agriculture was to “enhance productivity without destroying the soil and harming the farmers, consumers, and the environment as defined by the International Federation of Organic Agriculture Movement (IFOAM),” excluding biotechnology from genetically modified organisms (Organic Agriculture Act of 2010, p. 3759). Being organic essentially meant the chemical-free management of seed selection, soil fertility, and varietal breeding (Tadeo and Baladad 2012). By removing the hazardous effects of chemical-intensive conventional farming, organic agriculture

reduces the health risks of producers and consumers alike (Melo and Garcia 2020).

Organic farming is also centered on strengthening place-based resources, allowing smallholders to maximize what is available and accessible in their area. It was originally thought to significantly reduce dependence on external inputs<sup>5</sup> and capacitate farming communities to produce their own natural pesticides and fertilizers. In turn, their debts from purchasing chemicals may be reduced, and profit maximized.

In the long run, organic practices are said to enhance farm productivity, resulting in higher yields and income. Sustainable farming practices increase the organic matter content of the soil, enhancing not only the soil's nutrients but also its holding capacities that make the land relatively resistant to droughts (Tadeo and Baladad 2012). This improves the soil's potential to mitigate crop failure (Heckelman 2019) and serves as climate change adaptation. Overall, these contribute to more agricultural opportunities with the revitalization of rural economies, helping achieve the country's goal of food security (Tadeo and Baladad 2012).

Following EO No. 481, the Organic Agriculture Act of 2010 (Republic Act No. 10068) was institutionalized as a national development strategy. Section 1 declares that it is "the policy of the State shall be to promote, propagate, develop further and implement the practice of organic agriculture in the Philippines in order to enrich the fertility of the soil, increase farm productivity, reduce pollution and destruction of the environment and prevent the depletion of natural resources [ . . . ]" (Organic Agriculture Act of 2010). From 2010 onwards, the Philippine government mandated the DA to allocate at least PHP 1 billion for the promotion of organic agriculture programs. This portion comprised one to two percent of the DA's total budget. However, there was no clear funding or subprogram dedicated to transitioning from chemical-based farming to organic agriculture (Montemayor, Mendoza, and Villegas 2021).

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5 In practice, organic farmers still rely on external producers for natural pesticides and fertilizers. The difference from conventional farming is that these methods are more accessible to local farmers.

Although the Organic Agriculture Act paved the way for established organic farmers, the high standards for third-party certification were still a major barrier. Therefore, in December 2020, RA No. 11511 was enacted to amend the Organic Agriculture Act. The new provisions included a nationwide educational campaign for consumers, the adoption of a community-based certification process through the Participatory Guarantee System (PGS), protection against cross-contamination from genetically engineered organisms, and marketing support. The amendment helped lower the barrier to entry caused by third-party certification, with the inclusion of local quality assurance systems in the national organic standards, and greatly supported established organic farmers in their certification. However, 97–98 percent of conventional farms needed support in their transition, as their yields would decrease to as much as 50–60 percent without chemical fertilizers (Montemayor, Mendoza, and Villegas 2021). The amendments in RA No. 11511 still did not cover the funding for this transition.

In the Philippines, one of the approaches to organic agriculture is biodynamic farming. Since each region requires its own tailor-fitted organic practices, sustainable agriculture systems should be customized according to the varying conditions of every farm. Biodynamic methods seek to address this by applying minuscule substances derived from local animal manure, herbs, and minerals (Carpenter-Boggs, Reganold, and Kennedy 2000). This study's focus, which is the organic brown and black rice that DBMC supplies to GlowCorp, revolves around products of biodynamic farming.

### *The Rice Tariffication Law*

DBMC's Mario Alolosan, commonly known as Sir Mayong, mentioned that many smallholders in M'lang wished to switch to organic farming. This desire stemmed from the adverse effects of the Rice Tariffication Law (RTL) or RA No. 11203 on their income.

Signed into law in 2019, the RTL removed the quantitative restrictions on importing rice in compliance with the World Trade Organization (WTO) Agreement on Agriculture. This meant that there would no longer be any limit on rice importations from the Association

of Southeast Asian Nations (ASEAN) as long as there was a 35-percent tariff. This also holds true for non-ASEAN countries, albeit at a 50-percent tariff rate. Ten billion pesos of the revenues from this tariff were to be allocated yearly to the Rice Competitiveness Enhancement Fund (RCEF). Fifty percent of this RCEF would then be used as a grant to support farmer associations, rice cooperatives, and local government units (LGUs) with farm mechanization. Meanwhile, 30 percent would then go to inbred rice seeds, 10 percent would be allocated as low-interest loans, while the remaining 10 percent would serve as funds for nationwide extension services to farm schools.

The goal of this influx of cheap, highly subsidized rice was to regulate the country's domestic rice prices and supply. After passing the RTL in 2019, the Philippines became the world's largest rice importer in the same year because of the sudden swell in rice imports. The inflation rate remained below zero, and the average prices of *palay* and rice fell in the year following the RTL's passage. In effect, local farmgate prices also fell.

IBON Foundation reported that palay prices ranging from PHP 11 to PHP 15 per kilogram were seen in North Cotabato after the RTL was passed. Rice farmers' net income per hectare decreased by 38 percent on average in 2019 compared with the previous year. This meant a significantly reduced profitability ratio for conventional rice farmers. The average farmer lost PHP 142.08 of income per day, which was not offset by savings from the lower-priced regular milled rice in 2019 amounting to PHP 4.65 per day (Guzman 2021).

Thus, the higher farm gate price and lower input costs for certified organic rice increased organic farmers' net income relative to that of conventional farmers (Pantoja, Badayos, and Rola 2016), making organic farming an attractive alternative, especially for those in North Cotabato.

### *Unpolished Rice Versus Milled, White Rice*

In the Philippines, from 2018 to 2019, 35.2 percent of the mean one-day household food intake consisted of the rice and rice products food group. This translated to an average food group consumption of 1,064

grams (g) for each household daily, which accounted for 20 percent of an average Filipino household's total food spending. It is also a major source of income (Gumapac 2011). The various stages of production, processing, and marketing in the rice industry employ more than three million farmers and thousands of millers, traders, and retailers (Mataia et al. 2020).

The DA launched the Food Staples Sufficiency Program (FSSP) in 2011, aiming for a 100 percent local rice supply for every Filipino by 2014. This would be achieved primarily by expanding rice production areas. However, FSSP also saw the importance of promoting the production and consumption of brown rice to help achieve the program's primary goal. Brown rice has a milling recovery rate at 10 percent higher than that of white rice, resulting in greater yield and higher volume of rice produced in the country. Aside from providing a higher output, its bran makes brown or unpolished rice more nutritious and more filling, reducing people's consumption<sup>6</sup> by 20 to 40 percent compared to white or polished rice. Thus, brown rice can help address both the malnutrition and domestic rice supply issues in the Philippines (Department of Agriculture–Philippine Rice Research Institute 2013).

As seen in Figure 7 and the rice stages mentioned, brown rice is defined by its processing stage, not its color. It is technically unpolished or dehulled rice, a whole rice grain with an intact bran layer. Romero (2013, 8) states, "any kind of rice, including black, red, or other pigmented rice, can be converted into brown rice when dehulled, as opposed to the common notion that only certain varieties can be turned into brown rice." Thus, brown rice is simply one processing step away from becoming white or milled rice. This way, brown rice also benefits millers, as there is a 50-percent decrease in fuel needs and a shorter milling time when the polishing and whitening stages are removed from the rice processing.

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6 The per capita consumption of brown rice was at 84 kg compared with white rice at 110 kg in 2012 (Tadeo and Baladad 2012).

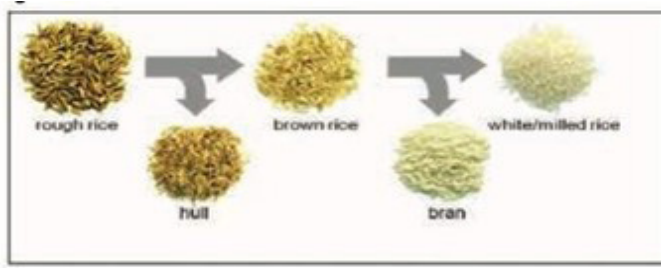


Figure 7. Different forms of rice (Romero 2013, 8)

Despite the number of benefits of brown or unpolished rice, the consuming public still prefers white or milled rice. Aside from its nutty taste and chewy, coarse texture that many may not prefer, brown rice takes 45 minutes to cook because of the impermeable bran layer. This is more than twice as long as the cooking time, white or milled rice, which only needs 20 minutes.

Aside from these local consumer preferences, the biggest limitation of brown rice is its short shelf life. It is more prone to rancidity because of the microbes on the bran. Its keeping quality is three to six months, compared to the 12-month shelf life of milled rice (Romero 2013). This makes brown rice more expensive than its milled type. Despite the savings generated from less milling, the demand is unable to compensate for the cost of producing and storing unpolished rice. Comparing the prices of a 2-kg retail pack, brown rice must, therefore, cost twice as much as well-milled rice. Because of its high price, the market segment that prefers brown rice purchases it primarily for its health benefits. This niche market is fully aware of brown rice's nutritional superiority and has the means to pay the premium for it. These are the high-income consumer groups of class A, class B, class C, overseas Filipino workers (OFWs), and foreign nationals. Aside from its higher cost, brown rice is not readily available to the public. It is mostly accessible in supermarkets with special packaging due to its shelf-life limitation (Romero 2013). Interestingly, consumers have a misconception that brown rice is automatically organic (Bon Liong 2013).

On the other hand, black rice is classified as pigmented rice, one of the three main types of specialty rice (SR), aside from glutinous or



aromatic kinds. SR is differentiated from milled, white rice and brown rice based on eating and cooking qualities, as well as grain appearance. It is often called “traditional,” “indigenous,” “heritage,” or “heirloom rice” (Department of Agriculture and International Rice Research Institute 2021). PhilRice’s 2021 publication on Philippine specialty rice classifies pigmented rice into two major categories: black and red rice.

### *The Organic Versus the Conventional Rice Value Chain*

In the conventional rice value chain, the outbound logistics, marketing, and sales primary activities are traditionally long because there are plenty of participating actors in between each part of the chain. For example, in delivering milled rice from the mills to the various distribution points to consumers, rice trading, storage, and transportation, the process goes through miller-traders, wholesalers, wholesaler-retailers, and retailers. These steps typically involve brokers. There are brokers involved in paddy aggregation and milled rice distribution. Paddy and rice are owned by five to seven actors from the farmer to the end user.

To summarize the differences between conventional milled rice and organic unpolished rice, their suppliers, inputs, processes, outputs, and customers (SIPOC) are compared in the diagram below. This shows a straightforward and simplified process map to highlight the similarities and differences between the two rice variants. The *suppliers* are providers of the inputs that directly impact the output or finished product. The *inputs* are resources needed to produce the output. The *process* shows the high-level steps of converting the inputs into outputs. The *outputs* are the finished products. Lastly, the *customers* are those who benefit from outputs.

It is evident that the SIPOC of the two rice varieties are almost the same. However, they vary in suppliers and inputs because of the certifying body’s requirement for the production and transformation of organic unpolished rice, and because of the need for additional steps of polishing and whitening in producing conventional milled rice. As mentioned, organic, unpolished rice outputs have shorter shelf lives and special packaging. Lastly, regarding customers, buyers of conventional, well-milled rice are not as limited as those for organic rice. The SIPOC components, such as third-party organic certification,



dedicated millers for organic rice, and special packaging entail additional costs for the farmers. Natural inputs result in savings for organic unpolished rice producers, and their niche markets bring price premiums.

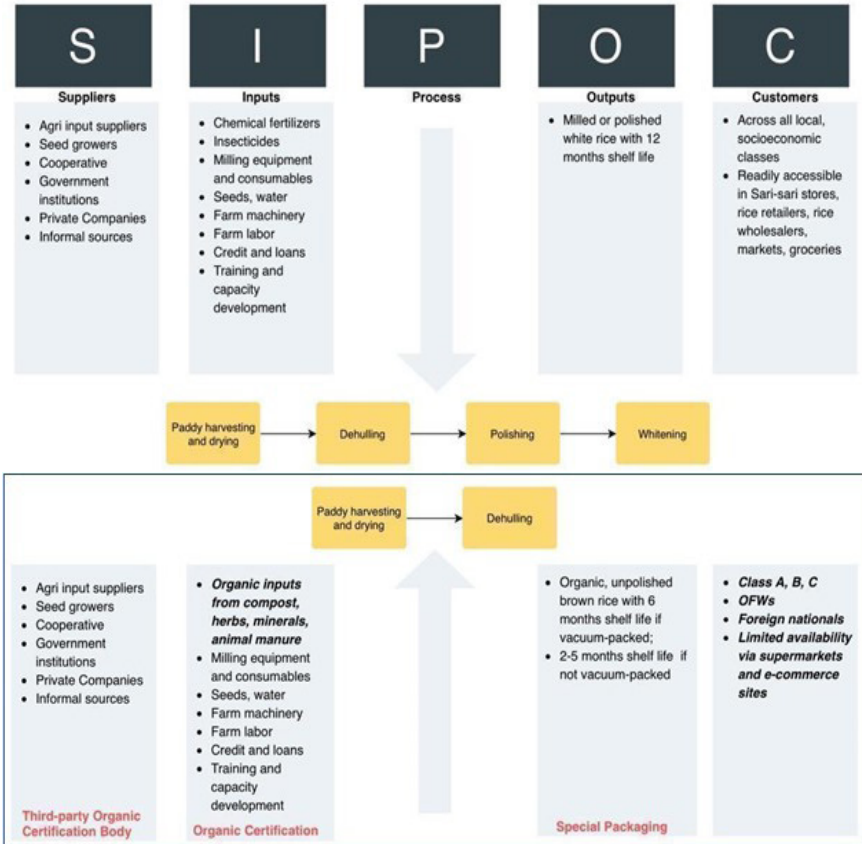


Figure 8. SIPOC diagram of conventional milled rice and organic unpolished rice created by authors

The DA published in January 2020 that PSA recorded regular milled rice’s lowest average retail price in six years, dipping to PHP 36.53 per kilogram. This was 12.3 percent lower than its price a month before, and lower by 11 percent compared to PHP 41.82 per kilogram a year before, in January 2019. On one hand, the price dip of milled rice was “the heart and soul of Rice Tariffication Law,” as DA Secretary William Dar stated. On the other hand, special rice retail prices, including that of organic brown rice, remained at an average of PHP 40 and above per kilogram.

To provide additional context for Don Bosco Multipurpose Cooperative Chairman Mario Alolosan's statement about smallholders wanting to transition to organic rice farming, it's worth noting that the country's unemployment rate was at its lowest level in October 2019. Meanwhile, in July 2020, Bangko Sentral ng Pilipinas (BSP) published an employment loss of 1.5 million in the agricultural sector as typhoons hit the country, coupled with interprovince transport restrictions (Bangko Sentral ng Pilipinas 2021). Aside from rural-urban bottlenecks, the mobility of agricultural industry workers was also impeded. The pandemic restrictions negatively affected the costs and availability of agricultural input supply, such as chemical fertilizers for conventional milled rice farmers.

Alolosan also notes that imported, well-milled rice flooded the market due to the Rice Tariffication Law (RTL). This situation was further compounded by logistical difficulties caused by the pandemic and a loss of income due to typhoons. Thus, local farmers in M'lang sought to move towards organic agriculture where retail prices are not as negatively affected by the RTL. Moreover, key drivers, such as continuing healthy lifestyle trends and collaboration between social enterprises and organic rice producers, helped advance the organic rice market and value chain development. These external factors make the shift toward organic agriculture enticing to smallholder farmers. Despite the costly certification costs and lack of institutional support for the transition from conventional and milled to organic rice farming, the higher retail prices remain attractive.

### *Industry Analysis*

The markets for agricultural products have transformed in the past several decades, particularly in developing countries. Liberalization has paralleled the global integration of agriculture and decreasing state support. Supermarkets became major actors in local food supply chains. These structural changes in agricultural markets result in a greater need for vertical (buyer-seller relationships) and horizontal (interfirm coordination, as well as linkages to service providers and to policymakers) coordination along the value chain. Information sharing is needed to ensure that the activities are aligned with customer needs and that innovations can be adopted quickly across the entire value

chain. Market changes necessitate a stronger connection between the upstream, farmer-cooperative transactions, as well as downstream, cooperative-buyer transactions. This is true even for specialty agricultural products like unpolished rice. To delve deeper into the crop context, Porter's five competitive forces (2008) will be used as the framework to examine the underlying structure of the organic unpolished rice industry.

### Barrier to Entry

There is unequal access to distribution channels since organic rice has found its niche in supermarkets and their patrons. In these grocery stores' display shelves, the industry provides incumbency advantages as existing brands occupy the shelf spaces.

The additional costs and efforts from specialized packaging limit new entrants in the industry, including smallholder farmers. The third-party certification, mandated by the Organic Agriculture Act, also heightened the entry barrier because of additional costs, longer transition periods, and tedious paperwork. For instance, the high standards for export quality and certification hindered GlowCorp in its first year of operations. This pushed the company to shift to retail, where the farmer groups gained linkages to supermarkets nationwide.

Aspiring farmer entrants face the challenge of sudden yield decreases by 50–60 percent upon shifting to organic, and the three-year transition to chemical-free farming leaves much to be desired in terms of financial and capital support. The government continues to favor conventional agriculture. The DA, for example, is perceived as traditionally trained and focuses on high-yield rice varieties and commercial inputs—the legacy of the Green Revolution paradigm. A case in point was the establishment of the International Rice Research Institute's (IRRI) headquarters in the country, which was viewed to accelerate the promotion of high-yielding rice varieties and chemical-based agriculture.

### Bargaining Power of Suppliers

Incumbents, or current suppliers of organic unpolished rice found in supermarkets, offer value-adding activities such as labeling, packaging,

quality control, and advertising that highlight the product's distinctive health benefits. Despite the additional costs from these activities, the product differentiation and the relatively low negative impact of the Rice Tariffication Law on organic rice still allow the value chain to maintain a competitive advantage over conventional chains. Therefore, if they are more integrated, organic farmers are in a position to absorb more margins from the market sections willing to pay a premium for the product.

The newly amended Organic Agriculture Act hopes to enable smallholders to work with Participatory Guarantee Systems (PGS) to label their produce as organic. This helps lessen switching costs for new entrants and reduce input costs over third-party certification, thereby letting farmers absorb more premium. The trade-off, however, is that for product differentiation to be a source of competitive advantage, the product must be exclusive to a few farmers. Therefore, unless marketing effort increases proportionately, there are limits to using organic labeling as a resilience mechanism that can be replicated and scaled up.

### Bargaining Power of Buyers

Research studies refer to the supermarket waves of expansion worldwide as the “supermarket revolution.” The annual sales growth of modern, food-selling retail chains is illustrated in the table below.

Table 1. Sales of leading modern retail chains that sell food over selected Asian countries (2001–9), in billions of US dollars

Wave	Country	2001 Sales	2005 Sales	2009 Sales	2001–9 Annual Compound Sales Growth Rate (%)
First	SouthKorea	19.1	38.5	41.7	10.3
	Taiwan	7.1	13.9	17.6	12.0
Second	Indonesia	1.8	4.0	7.3	19.1
	Malaysia	2.0	3.6	7.1	17.2
	Philippines	1.9	3.5	6.8	17.3
	Thailand	5.4	10.9	17.7	16.0

Third	China	13.1	40.2	91.5	27.5
	India	0.2	0.9	5.1	49.9
	Vietnam	0.1	0.7	2.0	45.4

*Source:* Reardon, Timmer, and Minten (2010, pp. 12332-12333), based on raw data from Planet Retail (<https://www.planetretail.net/>). They report that Planet Retail only reports sales data from large, national retail chains that sell food. It does not include data from smaller, local and regional retail chains. This means that Planet Retail's sales data is an underestimate of the total amount of food sold by modern retail chains in the countries that it covers. Planet Retail notes that this underestimation may be significant, because the retail sector in most countries is still fragmented, meaning that there are many small, independent retailers. The title of the table is taken virtually verbatim from Reardon, Timmer, and Minten (2010).

As the main distribution channel of organic rice in this study, the supermarkets that GlowCorp supplies possess the negotiating leverage to lower purchase costs and impose additional fees. National supermarket chains like Puregold, Rustan's, and SM, among others, have separate company purchasers for each commodity, such as organic rice, muscovado sugar, coco sugar, and so on. The supermarkets also obtain more leverage, as suppliers bargain with several, different company purchasers per commodity. This bargaining practice results in missed opportunities for maximizing client relations, as well as negotiating costs for listing fees and logistics. For example, GlowCorp separately negotiates with the SM Group for Savemore, Hypermarket, and Kultura, dealing with several category purchasers for each account. Purchaser attrition affects supermarkets' institutional memory with the incumbents, requiring sellers to reinvest in physical and social capital to keep client relations.

Puregold requires an initial listing fee of PHP 3,000 per commodity or stock-keeping unit (SKU) for each branch. This easily translates to a cash outlay of PHP 2.55 million for five new products in 170 branches. After signing up with the listing fee, the supermarket also imposes an opening support of five-percent discount for the first six months and a lifetime discount of 10 percent. This means 15 percent less in total for the first half year of sales. Discounts that supermarkets impose on the suppliers range between 7 and 15 percent. The store adds up to 25

percent markup when the product is displayed on the shelves. Sellers are also asked to participate in mailers (PHP 200,000 per product, with a total of PHP 1 million for five SKUs) and store sales that incur additional costs.

Some grocery chains also set long payment terms (30 to 90 days) for bulk payment. The producers shoulder the cost outlay when they need to replenish supplies between the last delivery and payment deadline. Others spread the payment issuance across the terms.

## The Threat of Substitutes

One of the popular, healthier alternatives to organic unpolished rice is adlai, which is commercially sold in Northern and Southern Mindanao and the Davao and Zamboanga regions. A type of crop belonging to the same family of rice and corn, adlai is identified by the DA as one of the best rice alternatives due to its medicinal properties, high fiber, and crop resilience.

Adlai is more nutritionally and energy-dense than pigmented rice, with higher fiber, protein, and calcium content but at a higher cost. One kilogram of adlai costs around PHP 275 on an e-commerce site, which sells higher than two kilograms of organic rice at around PHP 265 to PHP 280. Despite the significant market cost difference, the DA stated that the crop is cheap and resilient to climate change, and thus helpful to the farmers (BusinessMirror 2022).

Various scientific institutions, such as the Bureau of Agricultural Research (BAR), Department of Science and Technology-Philippine Nuclear Research Institute (DOST-PNRI), and the Philippine Center for Postharvest Development and Mechanization (PhilMech), are researching the production and marketing of adlai to promote the said grain. Aside from classifying adlai as a rice alternative in the Food Staples Sufficiency Program, DA is also eyeing to capture the Japanese market for adlai exportation.

## *Rivalry Among Existing Competitors*

A few local incumbents are selling similar organic and vacuum-packed rice in supermarkets. They offer nearly identical goods. With the price

of the raw product itself being the highest cost driver, price rivalry becomes competitive among the players.

Sunnywood Superfoods Corporation (Sunnywood) is a single proprietorship established in 1997 to supply local branded rice in supermarkets. With products sold under three popular brands, Harvester's, Jordan Farms, and Farmboy, Sunnywood identifies itself as the market leader of organic, unpolished rice (Sunnywood Superfoods Corporation 2018). The company also claims to be at the forefront of promoting and helping organic farming cooperatives. Aside from the physical stores, Sunnywood's brands are also sold through the supermarkets' online stores and other e-commerce sites. Harvesters Healthy Brown Rice is sold at PHP 344 per 5-kg pack (PHP 68.80/kg), whereas Jordan Farm Organic Black rice sells at PHP 575 per 5-kg pack (PHP 115/kg).

The Federation of People's Sustainable Development Cooperative (FPSDC) ventures into the marketing and distribution of community products as part of its nonfinancial services (FPSDC 2019). This enables FPSDC's advocacy for the sustainable development of disadvantaged producers by giving them access to fair market prices. This encourages these suppliers to continue environmentally and socially sound practices. FPSDC sources its organic rice from Bicol, Nueva Ecija, and South Cotabato, and sells it under the Farms and Cottages (F&C) brand. F&C is currently sold in 457 outlets through major supermarkets in Metro Manila. A 5 kg-pack of F&C Healthy Organic Brown Rice costs PHP 533.40 (PHP 106.68/kg), whereas its 500 g-pack of F&C Forbidden Black Rice sells at PHP 80.80 (PHP 161.60/kg).

REJ Commercial Corporation is a wholesaler of agricultural products established in 1987. Sourcing from Luzon's rice granaries, REJ sells its products in supermarket chains, institutional accounts, and wet markets. Its organic rice carrier brand is Healthy Alternative, which costs PHP 340 per 5-kg pack for brown rice (PHP 68/kg) and PHP 562 per 5-kg pack for black rice (PHP 112.40/kg).

Aside from having various category buyers, separate purchasers exist for supermarkets' house brands and brands that suppliers, such as GlowCorp, sell. For instance, GlowCorp supplies the organic rice

repacked and labeled as Royal Majesty in Rustan's. Royal Majesty brown rice is sold for PHP 205 for each 2-kg pack or PHP 102.50 per kilogram, and black rice for PHP 219 for each 2-kg pack or PHP 109.50 per kilogram. At the same time, the supermarket also carries the company's main brands like DBMC's Bios Dynamis on its shelves. This marketing strategy appears to provide options and variety to grocery consumers, yet the suppliers shoulder the burden of capturing market segments.

## V. Area Context

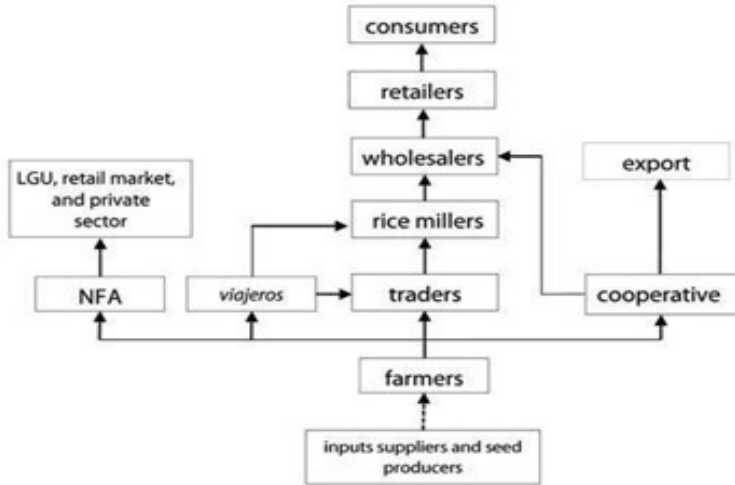
DBMC is situated in the main agricultural municipality of M'lang, North Cotabato. The topography of the province is mostly classified as upland, but M'lang is situated in ground level or thereabouts. North Cotabato is also landlocked by Bukidnon, Lanao del Sur, Davao del Sur, and Davao City (Special Area for Agricultural Development 2021). Even so, river irrigation systems, such as the one along the M'lang and Malasila Rivers, helps provide some water to and within the area. DA-PhilRice and the National Irrigation Administration of the region have also implemented Alternate Wetting and Drying (AWD) to help improve efficient and cost-reducing technologies within the region (Quiring 2021). In 2021, the region's DPWH also reported the completion of a PHP 35-million access road improvement project, which includes the installation of solar lights. This is expected to lower costs, not only for rice farmers but also for others as well (Fernandez 2021).

Considered as Mindanao's food basket, North Cotabato is a major producer of cereals, fruits, and vegetables. It is also Mindanao's top rice-producing province. In 2014, despite having only 64 percent of its 22,868-hectare (ha) farmland irrigated, M'lang produced 20 percent of the total rice volume in North Cotabato. M'lang's production output was 7 percent higher than that of the provincial average of 4.8 MT/ha (metric tons per hectare), yielding 116,692 MT or 5.10 MT/ha. This was made possible by its 37 barangays and 8,636 rice growers. Figure 9 maps North Cotabato's rice value chain.

After the farmers' operational activities from production, crop management, and harvesting, the palay are sold to DBMC, roving traders (*viajeros*), other traders, or the National Food Authority (NEA).



These buyers, in turn, proceed with the next steps of postproduction and processing for outbound logistics, as well as marketing and sales for retailing until rice reaches consumers. Organic rice in M'lang has similar value chains to those of conventional rice. However, the crop management of organic rice requires added personnel. Meanwhile, conventional rice passes through more steps in the chain, with separate actors for processing and logistics.



LGU = local government unit; NFA = National Food Authority  
Sources: Authors' rendition based on key informant interviews (2015); WB (2014)

Figure 9. Rice value chain map in North Cotabato (Balgos and Digal 2017, 18)

Chemical sprays are not allowed in organic crop management, since it doubles the labor requirement and costs for weeding. The farmers plant insect-repellent crops and place the leaves of *madre de cacao* (*Gliricidia sepium*) adjacent to the production areas as a substitute for chemical pesticides. Chemical fertilizers and pesticides for conventional farming are very expensive, accounting for almost 20 percent of total production costs (Balgos and Digal 2017). This inhibited the use of the whole farming area, decreasing the production volume and harvests. In addition, lower profit and productivity from conventional farming limited agricultural expansion.

Because M'lang's access to irrigation is insufficient, the farms' cropping frequency and intercropping potential are limited. Some existing facilities require rehabilitation. Meanwhile, many farms

still have not been irrigated. In some rain-fed areas, the use of water pumps will not be economical because the water source is too deep, requiring more fuel for the water pumps. Thus, the producers are limited to planting one cropping a year during the rainy season. DBMC Chair Alolosan also mentioned as factors affective productivity the notable changes in rainfall, flooding, and droughts in North Cotabato. In 2016, the provincial government declared a state of calamity as El Niño brought a six-month-long drought to the province. The drought affected approximately 28,000 hectares of agricultural land and damaged around PHP 15 million worth of rice crops.

Another production constraint encountered in M'lang is the "limited access to effective and sustained extension services," (Balgos and Digal 2017, p. 12). which the DA delegated to the local government unit (LGU). Because of the LGU's lack of resources and expertise to provide these technical inputs to the farmers, it remains dependent on limited national programs. Thus, members of organized farmer groups have higher productivity and net income relative to those not belonging to any farmer's group in North Cotabato (Balgos and Digal 2017).

With the PHP 50,000 total production cost for seeds, fertilizer, and labor, farmers struggle with limited access to credit that could help them acquire the necessary inputs. North Cotabato farmers use their own capital as the primary source of financing operations. Other options include either borrowing cash from friends and relatives or procuring inputs from traders on credit with interest. Farmers unable to obtain credit could not procure the production inputs and would have to wait for the next cropping season (Balgos and Digal 2017). The yield of organic production was 60 bags per cropping, whereas conventional farming produced up to 100 bags. However, conventional rice in M'lang sells at around PHP 38 to PHP 45 per kilogram in the market, whereas DBMC's organic rice has a market price of PHP 60 to PHP 65 per kilogram. Additionally, conventional palay costs PHP 12 to PHP 15, while organic rice costs PHP 19 to PHP 51, depending on the certification status. The premium market prices of organic rice, coupled with the farmers' ability to create their own organic spray inputs, can relatively uplift the organic rice producers' socioeconomic situation.

## VI. Value Chain Analysis

### *DBMC Value Chain*

DBMC is the social enterprise venture of the Don Bosco Foundation for Sustainable Development, Inc. (DBFSDI). DBFSDI is a Mindanao-based NGO and a member of the Federation of People's Sustainable Development Cooperative (FPSDC). Because of cropping frequency limitations and the subsequent long accrual periods for M'lang rice farmers, DBMC first sought to provide access to credit for its farmers through FPSDC and DBFSDI. Together, these two extended credit lines to DBMC to expand operations and help sustain its development (see Figure 10, first column).

For instance, DBFSDI assisted DBMC in obtaining a production loan from the Land Bank of the Philippines (LandBank) for a short-term credit line worth PHP 13.4 million that helps finance the members' production. Therefore, it can be said that DBMC started out by looking for credit or funding sources for its farmer members. Then, DBFSDI started shifting to its role as financial enabler, as well as provider of organic fertilizer and seeds to the cooperative (Figure 11, Enablers row). Because of this, DBMC can now provide emergency loans, credit lines, and inputs to its farmer members. This will be discussed more in the latter part of this section where the support activities are discussed.

To fulfill its primary activities, DBMC utilized around 500 farmer members, with 207 hectares of production area, as of August 2021. They opted for two croppings a year to give resting time for the soil and avoid a decline in production yield. The average yield of organic rice paddy per hectare is approximately 60 bags of 100 kg each or 1,200 MT of rice per cropping. DBMC then supports this rice's processing and sale through Alternative Marketing Services (AMS), which mostly sells the product under the Bios Dynamis brand. DBMC hauls, stores, packs, and transports the goods in a 20-footer container van to distribute the products to their own retail stores in Davao, Kidapawan, and Manila, as well as other domestic resellers, such as GlowCorp and Healthy Options.

DBMC supplies around 10 MT (200 fifty-kilogram bags) to Healthy Options per month, which are repacked into two-kilogram and five-kilogram bags in their warehouse. The repacking work gives additional job opportunities for DBMC's laborers, compared to buyers that buy in bulk packaging. Thus, Healthy Options' total purchase cost from the cooperative becomes more expensive because of the high prices of thick packaging boxes to maintain shipment quality to Manila. This practice is different from GlowCorp's, where DBMC supplies its products in 50-kg sacks which GlowCorp repacks and repackages (own packaging) for sale in Manila. DBMC charges both clients/buyers the same product cost for the organic rice supplied; however, it expresses no preference for either set-up. During the lockdowns, online selling through popular e-commerce sites like Shopee and Lazada became an option. However, DBMC chose not to pursue this market channel so that it would not compete with GlowCorp, which is already on those platforms to sell their products.

On top of the local market, DBMC also supplies 10 MT of organic brown and red rice to Hong Kong. This product exits the Philippines through Davao City every three months. In 2013, DA identified DBMC as the cooperative that revived the Philippines' global rice exportation after 40 years. It started exporting organic rice to the United Arab Emirates and the United States in 2012. DBMC captured the international market in 10 countries by 2017, exporting around 150 MT of certified organic black, brown, and red rice per year. Thus, the DA helped promote the cooperative through local and international trade fairs. The Mindanao Development Authority also promoted the Bios Dynamis line of organic pigmented rice with the Philippine Trade and Investment Center-Los Angeles by linking the cooperative to Filipino-American businesses in 2019. The Philippine Overseas Labor Office's Dubai EntrePinoy Program had overseas Filipino workers "adopt-a-farm" for PHP 30,000 per hectare.<sup>7</sup> In DBMC's case, it can

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7 The cash infusion from Overseas Filipino Workers (OFWs) in Dubai was part of Philippine Overseas Labor Office's Dubai EntrePinoy Program to provide investment opportunities. OFWs invested PHP 30,000 per hectare for a maximum of five hectares as an "adopt-a-farm" concept to fund production and marketing for organic farms. The investment guaranteed an annual profit of PHP 9,000 per hectare, or a 30 percent return on

be said that government institutions act as enablers for start-and-end primary activities in the value chain: inbound logistics and marketing and sales. This end point of primary activities, marketing, and sales, is traditionally operated by traders, wholesalers, and retailers.

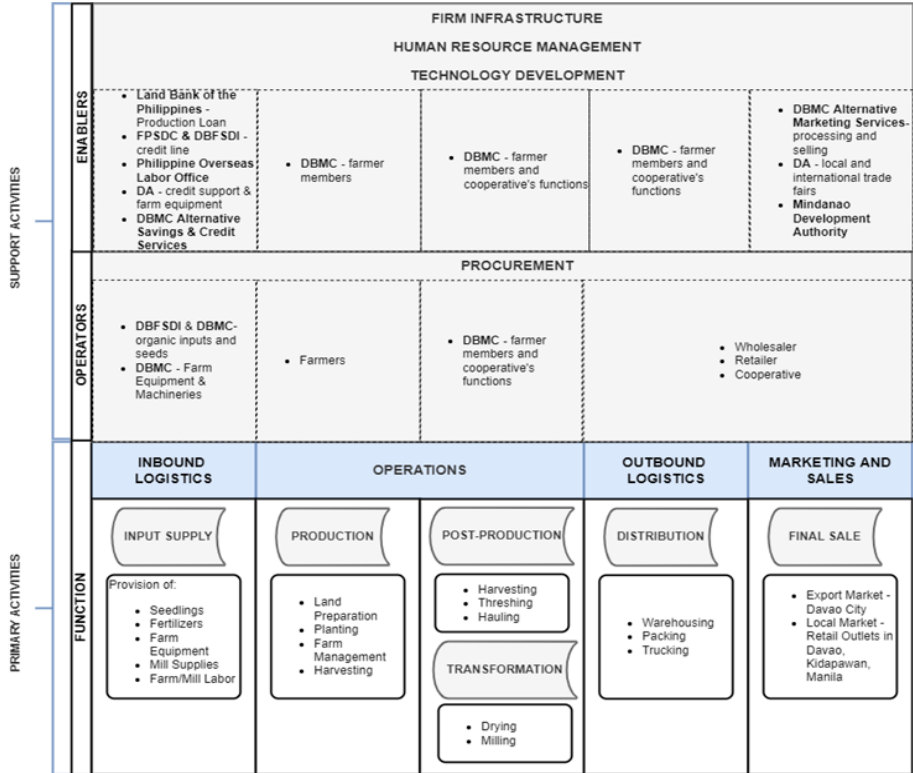


Figure 10. Value chain of DBMC Organic Rice in M'lang, North Cotabato. Created by authors based on Porter (1985)

investment in a year. The cooperative received an investment amount of PHP 2.3 million upon the program's launch in 2016.

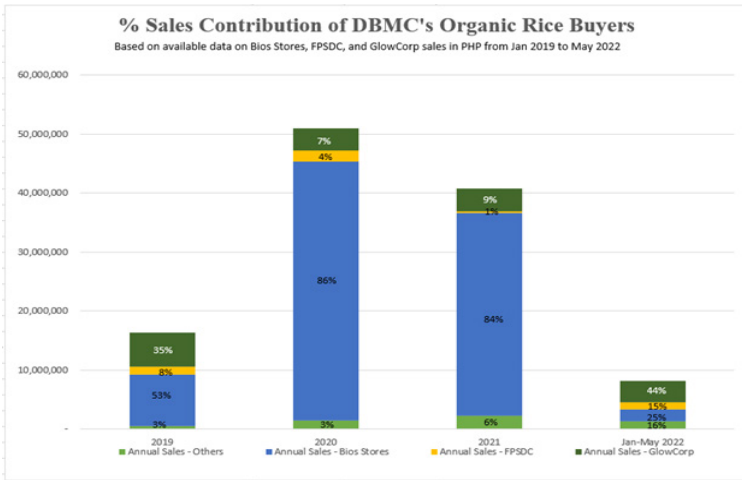


Figure 11. DBMC’s percentage breakdown of sales per buyer based on available data from January 2019 to May 2022. (Source: DBMC)

As shown in Figure 11, the bulk of DBMC’s organic rice revenues came from their own retail stores between 2019 and 2021. Besides such profits, GlowCorp provides the highest sales contribution to DBMC, compared with other local buyers. The combined annual sales from Healthy Options, DFSDI, local market, and so on comprise the “Others” category (3 percent in 2019 and 2020; 6 percent in 2021; and 16 percent from January to May 2022). Based on GlowCorp’s 2020 Annual Report, DBMC supplied 22 percent of GlowCorp’s rice requirements.

DBMC fulfills not only functions in primary activities, but also supports functions across the value chain. For firm infrastructure, the cooperative maintains daily operations by providing general management, accounting, and administrative functions. It manages the group organic certification requirements<sup>8</sup> of its members. DBMC also enables human resource management since it provides laborers for hauling, milling, repacking, warehousing, trucking, and retailing. It procures its members’ agri-products, purchases farm equipment, trucks, warehouses, and puts up retail stores for the cooperative.

8 The organic certification requirements remain the same as before the pandemic, where the total group certification cost is around ₱500,000, split among and charged to every farmer member per cropping.

As part of the technological development value chain support that DBMC enables, the organic rice producers were trained to create their own natural farming inputs and sustain their own seed banks. DBFSDI helped conduct this training. Through DBMC, financing and technical support from NGOs and government agencies are easily accessible. The members also benefit from additional income brought by investing activities, such as shares held as an organization acting collectively as a board member of GlowCorp, rental of trucking, as well as other facilities owned by the cooperative. Through DBMC, financing and technical support from NGOs and government agencies are easy to access and repay.<sup>9</sup>

To fulfill all these roles, DBMC vertically integrated all these activities in its value chain (Figure 10, see Enablers row). As seen in its organizational chart (Figure 12), the cooperative maintains control over the various functions throughout the chain—from production to processing and from warehousing to distribution. This enhances the coordination of value chain activities, improving the quality of information flow and driving cost efficiency. DBMC operates both the outbound logistics and marketing and sales with the cooperative's own Bios Dynamis retail stores. This is interpreted as a short food supply chain<sup>10</sup> as DBMC's ownership of the primary activities throughout the value chain reduces the number of steps connecting its farmers to final consumers.

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9 In DBMC's 2020 financial statement, the cooperative was able to pay off their total noncurrent loans payable from PHP 58.4 million in 2019 to PHP 44.2 million in 2020. The bulk of the paid off production loan was for LandBank, which amounted to PHP 13.4 million. The PHP 20 million DA support remained unpaid. Meanwhile, the loans payable with accrued interest to the Dubai EntrePinoy Program was paid off from PHP 1.7 million in 2019 down to PHP 1 million in 2020. The current loans payable to FPSDC was reduced from ₱33.7 million in 2019 to ₱30 million in 2020.

10 Short food supply chains attain positive impacts in economic, environment, social, and health-nutrition aspects. Producers gain better market access as the products go through less middlemen along the value chain to reach the consumers. The shorter geographical distance between areas of production and consumption tends to ensure higher quality and freshness of food, as well as lower energy usage for storage and transportation. The roles of producers and consumers, disconnected by intermediate operators such as retailers and processors, become less passive when more information (i.e., knowledge on the product and understanding of the production process) is shared between the two end-to-end roles (Belletti and Marescotti 2020).

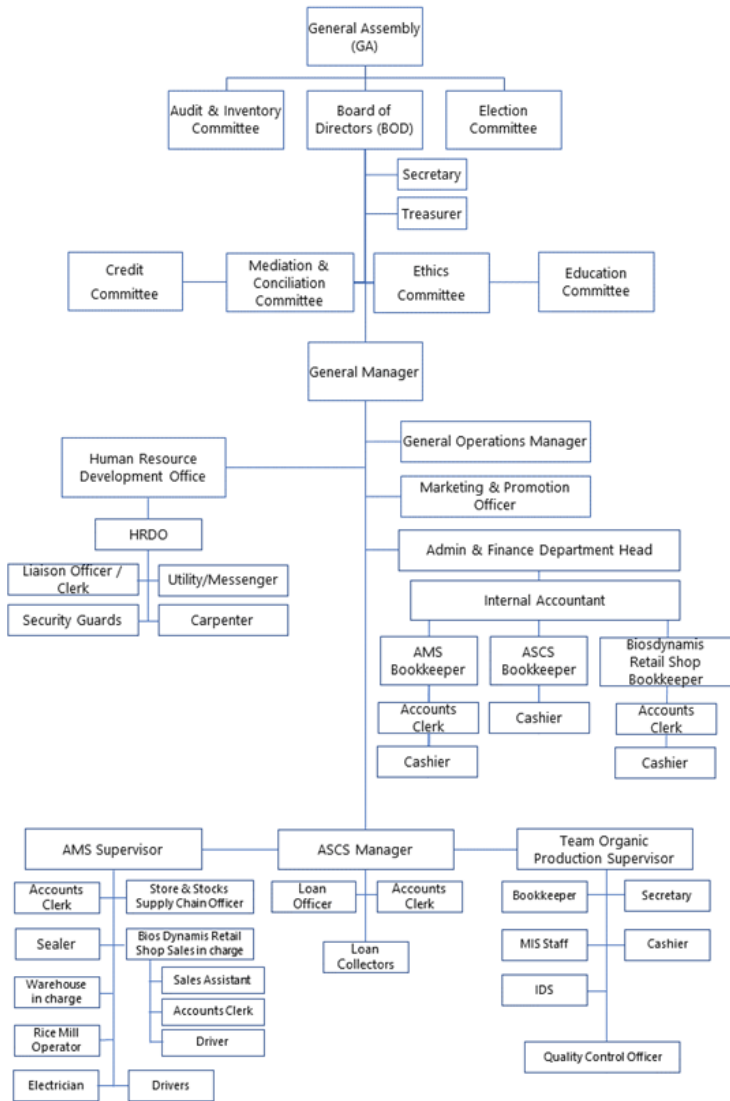


Figure 12. DBMC’s organizational and operational structure (DBMC)

Despite this, DBMC identified gaps hindering their desired expansion. Shifting from long, industrialized marketing channels to short food supply chains affects farmers because they can no longer focus on achieving scale economies for a few specific processes, i.e., input supply and production in the value chain’s primary activities.



Instead, they must be equipped to take ownership of processing, packaging, marketing, and distribution. In short, they will need to take on the firm infrastructure role, becoming both enablers and operators of the primary activities, as well as in outbound logistics, marketing, and sales. Taking on these new functions in the value chain results in increased costs, workforce, equipment investments, as well as new skill sets and competencies. Some cooperatives can only focus on input provision since they become bogged down by major production-related problems. Opportunities may also be restricted to specific areas close to the city or market. DBMC's Alternative Marketing Services (AMS) aims to help farmers with this load; however, having marketing as part of the cooperative's primary activities is still considered aspirational (Manalili 2003).

Moreover, despite all the funding opportunities, DBMC expresses that there is still a regular need for working capital. This is to directly and immediately acquire the palay from the farmers. Alolosan says that to buy the average yield for 50 to 100 hectares at PHP 20 per kilogram, the cooperative needs a cash outlay of about PHP 600,000. Farmer members tend to pole-vault and sell to other traders when DBMC is unable to buy their crop immediately. This is so despite the 25 percent lower purchasing price of PHP 15 per kilogram set by traders. To address the lack of working capital, DBMC was looking to supply the US market when the pandemic restrictions prevented the cooperative from accessing this export market.

### *GlowCorp Value Chain*

Compared to DBMC which initially provided credit to farmers, GlowCorp was initially put up to act as the marketing arm of its founding member organizations. These founding member organizations were mostly producers and suppliers of its past and present products. However, like DBMC, GlowCorp has since taken on additional roles, such as consolidator, value-adder, financier, and an overall mechanism through which institutions can provide support to GC's partner-suppliers.

To start its process chain at the consolidation stage, GlowCorp checks other incumbents' pricing in the supermarket, and sets or negotiates the product costs with the producers based on prevailing prices. Purchase orders (POs) are then placed through email or text

message to formalize purchases from farmer suppliers. The signed POs are then sent back via email or Facebook Messenger. These are awarded based on monthly demand to avoid spoilage.

Upon receiving the orders, GlowCorp's quality assurance team inspects the products and analyzes the microbial content to ensure that they comply with market standards. Fifty-kilogram sacks of rice are delivered to GlowCorp's facility, where they are repacked into 2-kg packs. These are then vacuumed to extend the product's shelf life. For Puregold and Rustan's, they are also repacked so that consumers can buy per scoop. For DBMC, GlowCorp repacks its supplies from 50-kg sacks into 5-kg, vacuum-packed bags in addition to the 2-kg bags. GlowCorp also procures the branded packaging for DBMC one year in advance. The direct print plastic packaging cost for Bios Dynamis brand is amortized per batch of DBMC's delivery.

For storage and distribution outside Luzon, instead of establishing their own central warehouse in Visayas or Mindanao, GlowCorp opted to maximize the available freight arrangements with their clients. Robinsons and Puregold have their own central warehouses to which GlowCorp delivers their products directly. The company covers the freight charges, while the clients serve as the national distribution channels to ensure the products reach supermarkets' branches nationwide. According to their General Manager, Mr. Bernie Berondo, this is the most practical option for GlowCorp's current resources because the company has yet to have the capacity to set up its own logistics and distribution centers in Visayas and Mindanao. For the next couple of years, GlowCorp plans to enhance first the company's warehousing and inventory management system in Luzon to help strengthen its current operational capacity.

Part of GlowCorp's marketing strategy is to hire marketing officers and a sales manager to acquire the supermarket segment, expand its buyer network, and manage client relations. Other than gaining client accounts for GlowCorp, it had to build rapport with different purchasers for every category in each affiliate outlet to ensure product recall from buyers. For instance, in SM Group, GlowCorp maintains relations with separate buyers for rice, sugar, and beverages in Hypermarket, Savemore, and Kultura. It also hired merchandisers who promote and

hard-sell its products to consumers onsite. The packaging and special design for GlowCorp’s products is also part of its marketing strategy. To help cooperatives launch their products to the mainstream market, GlowCorp initially shoulders the packaging cost and then amortizes the bulk order amount to the cooperatives. Financing, along with its marketing and linkages, helped DBMC access the country’s main distribution channel of organic rice via supermarket chains aside from the cooperative’s own Bios Dynamis retail stores’ customer bases.

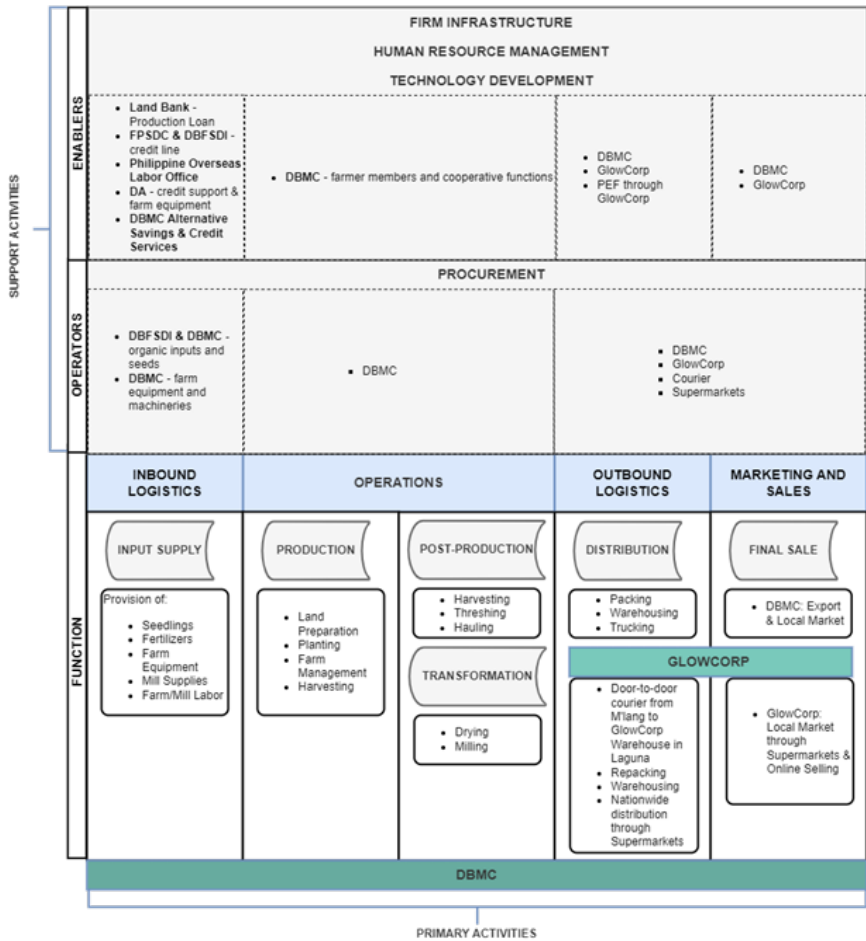


Figure 13. GlowCorp-DBMC value chain (Porter 1985; authors’ illustration based on interview with Mr. Bernie Berondo, GlowCorp General Manager, 2021)

At the selling and distribution stage, supermarket listing fees for new products were initially covered by GlowCorp and then amortized to the suppliers. These cost around PHP 1 million on average from 2018 to 2019 and were reduced to half in 2020 because of lockdowns and outlet closures. Puregold offers opening support, which requires a 5-percent discount for the first six months aside from the 10 percent trade discount and listing fee. Another NGO, People in Need, shouldered the listing fee for other GlowCorp products like *calamansi* concentrate, turmeric, and banana chips from Samar. GlowCorp's entire value chain, including that of DBMC, can be summarized in Figure 13.

According to Table 2, GlowCorp supplied a total of 615 physical stores in 2020—up by 24 outlets from the previous year, despite the reduced number of Puregold stores due to the pandemic. Some of Rustan's, Shopwise, Wellcome, and Marketplace outlets merged and rebranded as Robinsons Easymart, which no longer carried GlowCorp products. The merger and rebranding reduced the number of supplied Rustan's and Shopwise stores from 83 in 2019 to 67 in 2020. However, these outlet reductions were offset by 41 additional stores, such as Waltermart, Metro Gaisano, All Day, Merrymart, Kultura, Citimart, and other branches.

Table 2. Stores and the Number of their Outlets. Source: Glowcorp 2020 Annual Report (7–8)

STORES	NUMBER OF OUTLETS 2020	NUMBER OF OUTLETS 2019
PUREGOLD	195	202
SM	175	173
RUSTAN'S AND SHOPWISE	67	83
WALTERMART	39	35
METRO GAISANO	40	37
ALLDAY SUPERMARKET	30	22
KCC	3	3
LANDERS	4	4
MERRYMART	10	2
KULTURA	10	0
CITIMART	8	0
OTHERS	34	29

Ninety-four percent of the company's total revenue comes from its top 10 clients, which are mostly supermarkets operating nationwide, and the Assisi Foundation, an NGO that purchases commercial rice for its food distribution program. Puregold contributed 31 percent or PHP 27.4 million in total sales, whereas SM provided 27 percent of total sales or PHP 24 million. Meanwhile, Rustan's, including its affiliates, Shopwise, Wellcome, and Marketplace, contributed 11 percent of GlowCorp's 2020 revenues. However, relative to the previous year, there was a five-percent and two-percent decrease in sales from Puregold and SM respectively. This was due to store closures. The 4 percent sales increase from Rustan's resulted from higher consumption of organic rice and muscovado, as well as the new product supply of banana chips from one of GlowCorp's partner farmer groups.

At the payment collection stage, there was PHP 13 million worth of trade receivables from the sales of organic rice and muscovado sugar, where each client's payment or credit terms varied from 30 to 90 days. Thus, credit lines and investments are crucial in financing the primary activities of GlowCorp's value chain, which funds the consolidation, processing, and packaging stages while the company waits for payment collection from trade receivables.

Aside from its primary role of providing market linkages to its organic producers, GlowCorp also assisted its partner suppliers in advancing their entrepreneurship capabilities through improved packaging assistance, internal control systems, organic product certification, extended payment terms, quality checks, capacity-building, logistics, and others. GlowCorp also guided farmer startups in good manufacturing and/or agricultural processes, as well as product development. It addressed market gaps, such as payment terms and packaging, by obtaining support from its network of diverse social enterprises and NGOs. For instance, GlowCorp facilitated the training for labeling, printing, bottling, and other marketing and logistics-related processes to jumpstart the product development of banana chips from Samar. This was part of the international NGO People In Need's livelihood program for survivors of Super Typhoon Yolanda (Haiyan). GlowCorp also linked Mindoro farmers to the University of the Philippines (UP) to enhance their calamansi concentrate production.

Like DBMC, GlowCorp is part of a development ecosystem where the producers' capacities grew with the company. As a result of shared knowledge, capacities, and values, DBMC's value chain mirrors GlowCorp's comprehensive and vertically integrated value chain and vice versa, except in the crop production stage of the process. Where DBMC has farmers as suppliers, GlowCorp has farmers' cooperatives like DBMC as suppliers. As we will see in the next section, this mirroring and overlapping of value chains allows the two firms to create shared value for resilience.

## VII. Creating Shared Value for Resilience

### *Competitive Advantage from Two Sides, Three Markets*

In the conventional rice value chain, the outbound logistics and marketing and sales primary activities are traditionally long because there are plenty of participating actors in between. For example, in delivering milled rice from the mills to the various distribution points to consumers, rice trading, storage, and transportation go through miller-traders, wholesalers, wholesaler-retailers, and retailers. This typically involves brokers, who are involved in paddy aggregation and milled rice distribution. Five to seven actors, from the farmer to the end-user, own paddies and rice.

Meanwhile, DBMC operates both outbound logistics, marketing, and sales with the cooperative's own Bios Dynamis retail stores (See Footnote 10). DBMC's Alternative Marketing Services (AMS) aims to help farmers with this load.

According to Porter (1985), competitive advantage stems from the need to create buyer value. This differentiates one firm from its competitors in the same industry and also explains why firms can make and sustain their profits. In *Competitive Strategy* (Porter 1980), he posits that there are three generic strategies or sources for achieving competitive advantage: cost leadership, product differentiation, and focus.

From this framework, we can observe DBMC's sources of competitive advantage. For its end consumers, DBMC created a unique

product that caters to the niche preferences of its clients. DBMC offers rice that is certified organic and unpolished—two qualities of rice that appeal to consumers who are both health-conscious and have a relatively higher budget for food items. For institutional buyers, DBMC created value by supplying a minimum amount that allows these buyers to save on transportation costs. This is important, especially for those engaged in the export market. All these qualities that make DBMC stand out from similar suppliers allow them to command a premium for their products. This goes over and beyond the cost of product differentiation in various stages of DBMC's value chain. Thus DBMC maintains its competitive advantage by adopting a product differentiation strategy.

Although DBMC provided value for its consumers, it also provides value for its producers. Not only do they engage organic rice suppliers transactionally, it provides services in exchange for rice farmers' products. DBMC offers marketing services through AMS, credit for inputs and subsistence during the planting season, and funds and resources for organic certification and quality control. DBMC also assists farmers in their area and neighboring towns in quickly shifting to organic agriculture. Instead of three years, the shift can be hastened and achieved in just one cropping, despite the 50-percent lower soil fertility caused by chemical farming. DBMC's rice mills are also certified organic and open to other farmers. The simultaneous creation of buyer and supplier value solidifies DBMC's role in the value chain, allowing them to maintain their competitive advantage and thus, their own profits.

When we look at GlowCorp's value chain, product differentiation also seems to be its strategy to maintain a competitive advantage. Supermarket consumers are likely to be health-conscious and have relatively more budget to buy higher-quality rice. Therefore, marketing its product as organic and unpolished allows GlowCorp to command said premium. For its institutional buyers, GlowCorp can comply with the supermarket's payment terms and maintain good relations with the purchasers. It can also offer supermarkets unbranded organic products, which they can then market under their own house brands.

Like DBMC, GlowCorp can provide value for its producers, which is possible when its relationship with suppliers is more than simply

transactional, with the company offering services and support activities. GlowCorp provides marketing services to its supplier cooperatives, as well as working capital and credit to immediately buy its member-farmers' harvest and source their (GlowCorp's) own packaging, respectively. GlowCorp also disseminates accurate and timely market information to help cooperatives set fair pricing, which, according to Berondo, is anchored on social conscience. GlowCorp also serves as the mechanism through which other institutions can assist its suppliers.

These two value chains mirror each other because of their similar firm infrastructure. Both were founded on the objective to serve as the farmers' extension—whether in procurement, certification, or marketing. They were founded to help producers obtain fair pricing for their differentiated products. In turn, both enterprises' social capital with their suppliers enables them to maintain supply despite payment delays due to their clients' long payment terms. When two firms in the same value chain are aligned in their business principles, this makes overlaps and a relational style of value chain governance possible (Gereffi et al. 2005; Balaoing-Pelkmans 2020).

Moreover, in the DBMC-GlowCorp relationship, mechanisms mitigating or managing hedging exist. Bios Dynamis stores stand on their own, having contributed over 50 percent of pre-pandemic sales of DBMC organic unpolished rice and over 80 percent of sales during the height of the pandemic (2020–21). This means that GlowCorp would not be able to hedge its market connections to demand lower costs from DBMC, since DBMC already has a strong primary market. Meanwhile, since GlowCorp procures organic rice from other farmer groups signals, DBMC should not solely rely on GlowCorp for marketing its products. Because DBMC is a GlowCorp shareholder, their potential dividends<sup>11</sup> from the success of GlowCorp discourages DBMC from becoming a competitor, particularly in the online market (e.g., Lazada and Shopee). Although DBMC creates job opportunities when it fulfills repacking (as for Healthy Options, as opposed to GlowCorp repacking), it is more important for DBMC to sell its products at the

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11 DBMC is a GlowCorp shareholder owning 4.72 percent or 5,048 shares amounting to around ₱500,000, according to GlowCorp's 2020 Annual Report.



agreed price. Through Alolosan, DBMC recognizes that GlowCorp is still a valuable asset for the former, one that significantly contributes to its sales beyond its retail stores and bolsters nationwide market exposure outside Mindanao.

More than this, service provision beyond organic rice transactions (credit and marketing) makes it difficult to disentangle the benefits that one firm receives from the other. The benefits of these services, much like sales contributions, fluctuate depending on the market situation in a year. This means that, if one were to sever ties with the other, they would be doing so in three different markets (credit, marketing, and organic rice).

Thus, the role of foundations and funders, such as DBSFDI and Peace and Equity Foundation (PEF), was simply to look at where working capital or credit is needed and inject funds into that stage in the value chain. With DBSFDI's assistance, the required organic inputs to replenish the soil fertility and quality seeds are readily available. They also help provide technology development and human resources in the support activities. PEF, on the other hand, granted GlowCorp a credit line in 2014 amounting to PHP 17 million, which was allocated as working capital for the procurement of raw products. GlowCorp was also granted PHP 1 million from shareholders' investments used as additional working capital. This was then renewed in October 2018 with a PHP 15 million shareholder loan, which was used as a revolving fund for GlowCorp's working capital.<sup>12</sup> This credit currently helps finance GlowCorp's primary activities until payments are received after 30–90 days upon delivery. However, any comment on where to best allocate this credit line requires a comparative analysis among GlowCorp's different organic rice suppliers. This is a limitation of the study since DBMC is the only supplier cooperative embedded within this case study.

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12 This project was called "Sustaining Market Growth for Organic Rice and other Agri-Products." Based on GlowCorp's 2021 audited financial statement, the repayment terms are as follows: "The amount that will be loaned from the fund bears an interest of 8% per annum based on the diminishing balance and a service fee of 1/10 of 1% of the amount drawn which is deducted upfront. Principal and interest are paid monthly with the loan maturing after one (1) year from the date of the drawdown."

Figure 14 illustrates the flow of funding from DBFSDI and PEF and the enabler roles that the two foundations play in GlowCorp and DBMC’s value chain. The credit lines they extend are part of the support activities for the cash flow gaps involved in GlowCorp and DBMC’s primary activities with the producers.

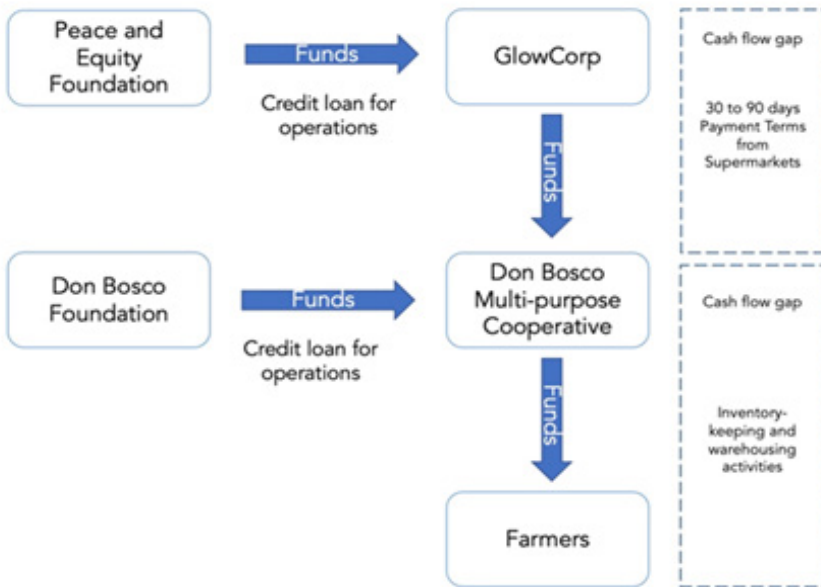


Figure 14. Flow of funding to address the cash flow gaps among GlowCorp, DBMC, and farmers, illustrated by authors

### *Resilience amidst the Pandemic*

For Porter (1985), competitive advantage must not only be made but also sustained. Although smallholder producers were among the hardest hit in the value chain during the first two years of the COVID-19 pandemic, GlowCorp’s revenue growth was similar to its prepandemic sales. Since its products were considered essential goods in lockdowns and sold in supermarket chains, GlowCorp took the opportunity to sell them via online platforms. Through Shopee and Lazada, the farmers’ agricultural products were given access to market digitalization. Not much changed occurred in their value chain set-up, except that Shopee and Lazada couriers picked up the final goods from GlowCorp’s Laguna warehouse for a small fee. The company also pivoted to conventional rice

to address the market demand for food dole-outs. These adjustments demonstrate strong organizational management in response to the pandemic shock, as the company expanded its market channels and product lines to meet consumer needs. Client relationship management was also important since the company presented more transportation requirements and experienced delivery delays because of pandemic restrictions.

During the lockdowns, GlowCorp's products as mentioned were considered essential goods. Thus, the company continued operating, albeit with less workforce and working hours caused by COVID-19 restrictions. DBMC even saw a large increase in revenues during this time, likely because the lockdowns momentarily made their goods attractive substitutes to imported rice. However, the 2020 revenue increase was offset by higher expenses in freight, logistics, and product returns. Ports added COVID-19 safety fees, and store delivery attempts increased because of congestion, limiting supplies to major supermarkets' provincial branches. With these limitations, GlowCorp decided to join the trend of online selling via e-commerce sites, Shopee and Lazada. Alolosan believed that these online platforms would positively impact the company's revenues.

The market expansion to online selling and conventional rice showed GlowCorp's value chain role in firm infrastructure. Quick planning and decision-making skills were also evident when they shifted from export to retail, as well as when they conceptualized the company. GlowCorp finalized its business model by transforming its learnings from PRIME during this time, where the founding farmer groups mobilized to close the marketing gap of their own products. Furthermore, the company has examined existing and potential markets, forecast the volume requirements, and laid out the timing for manpower and supply. This was no different during the pandemic lockdowns.

## **VIII. Conclusions and Recommendations**

The business principle of social impact is a firm strategy in and of itself. What sets GlowCorp apart is its ability to create value for consumers, justify premium prices, and share this value with its suppliers. Not

only does GlowCorp create shared value for its consumers, but it does so while maintaining healthy and balanced relationships with its suppliers. The same can be said for one of its major suppliers, DBMC.

Although DBMC has secured organic rice production in North Cotabato, there is also a need for system support in the organic food market to increase consumer awareness of organic goods. Securing such will translate to higher market demand. Alolosan expressed this need to the Department of Agriculture; however, the institution is mostly focused on production support. He stated that if there are one million consumers who consume ten kilograms of organic rice per month, this market demand will help convert 12 hectares of farmlands to organic agriculture. Making a dent in the market remains elusive with this institutional void.

Meanwhile, other countries promoted organic production by fortifying markets and promoting consumption to incentivize farmers to shift to organic (Tamayo, Castro, and Lim 2013). Examples are domestic demand models in public markets, specialized stores, public events, and institutions. DBMC filled this market support gap by selling through its own local retail store, Bios Dynamis, and supplying to GlowCorp, FPSDC, Healthy Options, and other local market options for nationwide distribution.

GlowCorp must handhold farmer groups and guide them through the initial development of their firm infrastructure, specially on pricing, packaging, and product development. This is particularly important during GlowCorp's onboarding of new suppliers, especially when they are startup farmer groups. Eventually, these farmers will understand the market better and build capabilities to manage their value chain's firm infrastructure. These farmer groups can also be endorsed to financing entities, such as the PEF, for access to potential financing or other organizations in GlowCorp's network to increase inputs and technology access. The success of the social enterprise ecosystem must not be understated.

One of the principles in Porter and Kramer's (2011) shared value framework is that it can generate shared value when it enables local cluster development beyond its direct value chain. DBMC did so by

opening organic certification and milling services to farmers outside its cooperative. However, it still faces institutional voids in organic transition support, subsidies, and organic product promotion. There is, therefore, a need to subsidize other cooperatives in the neighboring areas of M'lang to support the organic shift. Additionally, funding other alternative food systems is essential to expand market access.

Based on the case study, the shift to organic farming requires support not only in marketing but also in technical and 'extension' aspects such as certification and technology. If the lesson from GlowCorp is that finance, marketing, and technical support were its farmer partners' major needs, then bundling, also known as "interlinked credit" (Capacio, de Dios, and Van Tulder 2021), could tie these needs together in one contract or agreement (e.g., credit + certification support, credit + organic technical support, credit + marketing). For DBMC, despite its established presence in its market, it could consider aligning its pricing with organic rice varieties in the market and targeting lower-income segments. For example, red and brown rice could be priced lower than black rice, especially considering that black rice is a relatively low-yielding variety.

This study offers insight into supermarket chains as viable buyers of products of smallholder farmers through their social enterprises. To reach scale and reduce cost, a social enterprise like GlowCorp is needed to play the role of the lead firm—the economic actor in value chains who addresses challenges, performs value addition and distribution, and externalizes low value-added activities. GlowCorp, in turn, needs financing partners that provides human and financial resources. Moreover, although GlowCorp is the more obvious lead firm of this value chain, DBMC also provided lead firm functions in its provision of various services to farmer-suppliers. Having more than one lead firm is consistent with relational-style value chains. That both are lead firms is evident in the mirroring and overlaps of DBMC's and GlowCorp's value chains. Future studies may benefit from introducing other GlowCorp's suppliers, rival firms for both DBMC and GlowCorp, and the firms that opted out of being GlowCorp suppliers.

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