

## Factsheet

# Best Green Business Practices among MSMEs in the Food Processing Industry of the Philippines

The case study contains assessment results of ongoing best greening efforts being practiced among 12 micro, small, and medium enterprises (MSMEs) from selected food processing industries: coffee, cacao, processed fruits and nuts. The study aims to promote pioneering cases of individuals sharing their stories on how their committed actions to protect the surrounding environment and resources became beneficial both financially and socially.

### Background and Context

Roles and actions of micro, small, and medium enterprises (MSMEs) are enormous in building a sustainable world. As a group, MSMEs play a huge role in global economy, particularly in equitable income generation, employment creation, innovation and growth. In the Philippines, the MSME sector accounts for 99.5% of established businesses, employs 62.8% of the total workforce, and contributes 35.7% of the country's total value added. MSMEs play a key role in increasing competitiveness and promoting rural and global value chain development, thereby achieving inclusive growth and poverty reduction.

With such magnitude, MSMEs contribute not only to the economic growth, but also climate change adaptation and mitigation policies through implementation of resource efficient measures and inclusive business practices to respond effectively to the increasing pressures on ecosystems. With the ever-strengthening movement on sustainable development, it is high time to attempt converting traditional operational processes of MSMEs to greening practices.

### About the Business Case Study

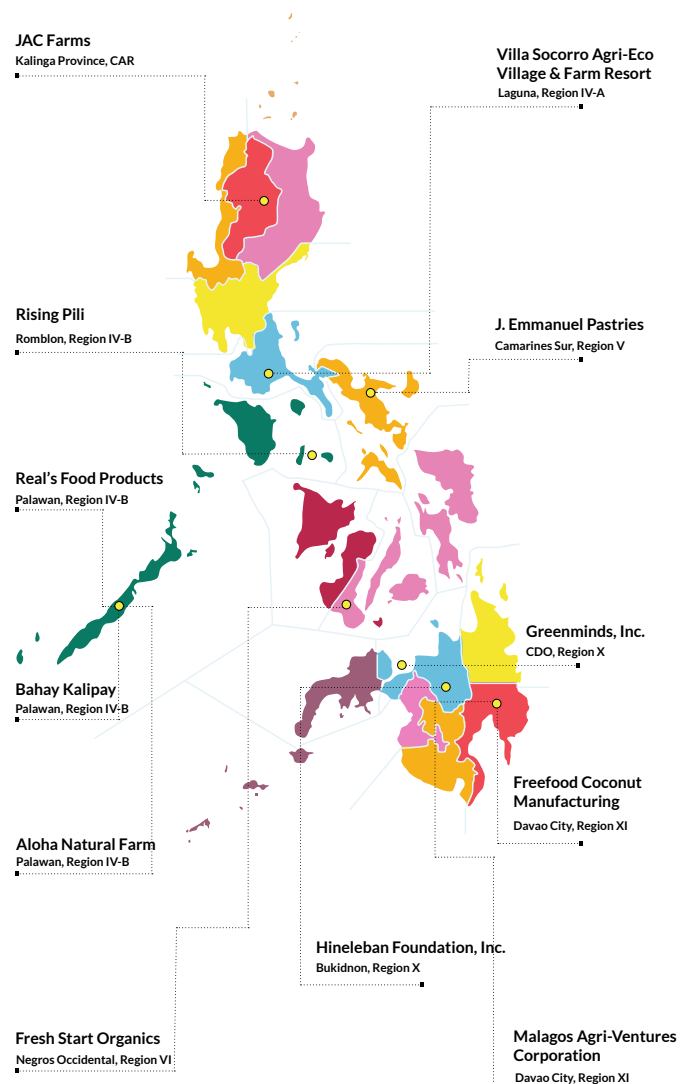
This case study was conducted with the aim of both encouraging and inspiring MSMEs in the Philippines to start engaging in greening practices in their production/manufacturing processes. Such greening practices pertain to the efficient use of energy and resource that result in avoided carbon footprint and reduced resource consumption while simultaneously achieving high productivity and yield.

The Global Green Growth Institute (GGGI) and the Department of Trade and Industry (DTI) of the Philippines has established a Memorandum of Understanding (MOU) in November 2015, followed by this collaborative initiative on developing business case studies for greening practices of MSME operations, launched in 2016.



Project Activity Name:	Case Study on Best Green Business Practices among MSMEs in the Philippines
Commissioned by:	Department of Trade and Industry (DTI)
Executed by:	Global Green Growth Institute (GGGI) and ASSIST Asia
Duration:	1 August 2016 - 31 November 2017
Location:	Philippines

### Map of selected MSMEs



The study aims to promote pioneering cases of micro, small and medium enterprises (MSMEs) sharing their stories on how their committed actions to protect the surrounding environment and resources became beneficial both financially and socially.

## Scope and Methodology

This project revolved around the conduct of a business case study for selected MSMEs from the industry of cacao, coffee, and fruits and nuts processing to assess their greening interventions. The project team deployed set of methodological steps including development of assessment criteria, content analysis and qualitative data analysis that are commonly used in practice-oriented research projects.

Finally, 12 MSMEs were selected to be part of the actual case study research upon application of two-step selection method where first step consisted of preliminary screening of around 500 enterprises and pre-assessment survey among 70 shortlisted ones. Step two provided an opportunity for the joint team to do on-site field assessment in combination of interviews and data collection to further understand and validate the firms' greening practices and experiences. The greening practices of the enterprises were assessed in the areas of energy use, water use, waste treatment, as well as emissions. These interventions were also assessed depending on the extent of investment made and type of interventions implemented.

The study also included Cost-Benefit Analysis (CBA) of applicable greening interventions of 4 out of the 12 MSMEs, representing each cluster. In the same manner, SWOT (Strengths, Weaknesses, Opportunities, Threats) was applied to the same 4 companies to have in-depth analysis.

In parallel to the abovementioned research methods and field visits, continuous consultations and feedback sessions with involved stakeholders including national and sub-national level government officials in particularly DTI staff and business owners were conducted as part of the holistic approach that allowed the study team to gain in-depth knowledge and practical insights of local circumstances.

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### Technological Solutions

Level 3  
High Investment

Level 3 means a substantial amount of investment was made to modify the production processes and/or the equipment making them more energy efficient, generating less waste and/or less pollution (particularly GHG emissions).

2

### Affordable Purchase

Level 2  
Low Investment

Level 2 means a very low investment was made to adjust the existing production processes, such as low cost operations and maintenance processes or introduction of affordable equipment.

1

### Change of Mindset

Level 1  
No Investment

Level 1 means no monetary investment has been made to change production processes, but specific improvements such as behavioral and mindset changes were introduced.

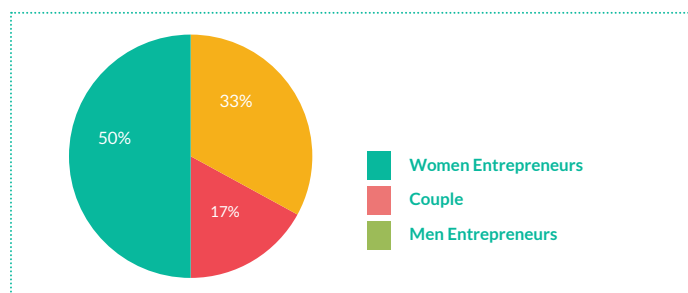
## Summary of MSMEs in the Case Study

MSMEs highlighted in the case study represents various regions of the Philippines: 2 MSMEs from Region XI (Davao), 4 from Region IV-B (Palawan, Romblon), 1 from Region IV-A (Laguna), 1 from CAR (Kalinga), 1 from Region X (Bukidnon), 1 from Region V (Camarines Sur), 1 from Region VI (Negros Occidental) and 1 MSME from Region X (Cagayan de Oro).

Cluster	Name of Company	Location	Company Size	Type of Study
Cacao	Freefood Coconut Manufacturing (Company 1)	Davao City, Region XI	Small	Main
	Malagos Agri-Ventures Corp. (Company 2)	Davao City, Region XI	Small	Mini
Coffee	JAC Farms (Company 3)	Kalinga Province, CAR	Small	Main
	Hineleban Foundation, Inc. (Company 4)	Bukidnon, Region X	Small	Mini
	Fresh Start Organics (Company 5)	Negros Occidental, Region VI	Small	Mini
Processing Fruits (Banana)	Villa Socorro Agri-Eco Village & Farm Resort (Company 6)	Laguna, Region IV-A	Small	Main
	Real's Food Products (Company 7)	Palawan, Region IV-B	Micro	Mini
	Bahay Kalipay (Company 8)	Palawan, Region IV-B	Small	Mini
	Aloha Natural Farm (Company 9)	Palawan, Region IV-B	Small	Mini
Processing Nuts (Pili)	J. Emmanuel Pastries (Company 10)	Camarines Sur, Region V	Medium	Main
	Greenminds, Inc. (Company 11)	Cagayan De Oro, Region X	Micro	Mini
	Rising Pili (Company 12)	Romblon, Region IV-B	Medium	Mini

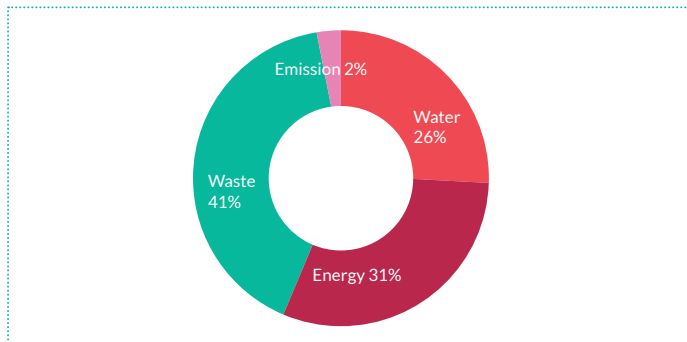
12 MSMEs represent wide range of micro, small, and medium enterprises. 1.7% of MSMEs represent micro (1-9 employees), 83.3% of MSMEs represent small (10-99 employees) and 1.7% medium (more than 100 employees).

## Ownership and Management (Gender)



4 MSMEs (33%) are owned and managed by women entrepreneurs (Malagos Agri-Ventures Corp., JAC farms, Bahay Kalipay, J.Emmanuel Pastries), whereas 2 MSMEs (17%) are jointly owned and operated by a couple (Real's Food Product, Aloha Natural Farms), well representing women's active entrepreneurial role and leadership in food processing businesses.

## Results: Green Interventions



Majority of MSMEs studied have a number of corollary activities and it is evident that a number of products were produced using single resources, such as organic farming, tourism, bed and breakfast, training and eco-cultural farm.

As food-processing industry generates significant volumes of organic waste in the form of inedible materials and rejected products, the study shows majority (41%) of green interventions are implemented in areas of waste reduction and recycling. Also, food processing requires good amount of thermal heat energy and energy is the major cost of processing. Energy saving and efficiency interventions (31%), particularly in fuel switch, change of heating processes and replacement of light bulbs were noticed. Rainwater harvesting and water reuse were common intervention in saving water resources (26%). There was only one initiative in emission reduction.

There is a range of level of intervention among the MSMEs. It can be further observed that:

1. Majority (7 firms) of the 12 firms have implemented level 1 greening intervention.
2. As to the range of intervention, a majority is in the range of 1-2 (JAC Farms, Real's Food, Bahay Kalipay, Greenminds, Rising Pili).
3. Only two firms – Villa Socorro and J. Emmanuel Pastries – hit the 2-3 level mark of greening intervention.

Data yielded results that the MSMEs, across all clusters, share common basic value chain processes: Production, Processing, Packaging and Distribution. Organic farming or sourcing organic produce is the most practiced greening intervention. Most firms also engaged in waste reuse and reduction, water reuse and consumption reduction, use of renewable energy, and use of biodegradable materials/reused materials for packaging and distribution.

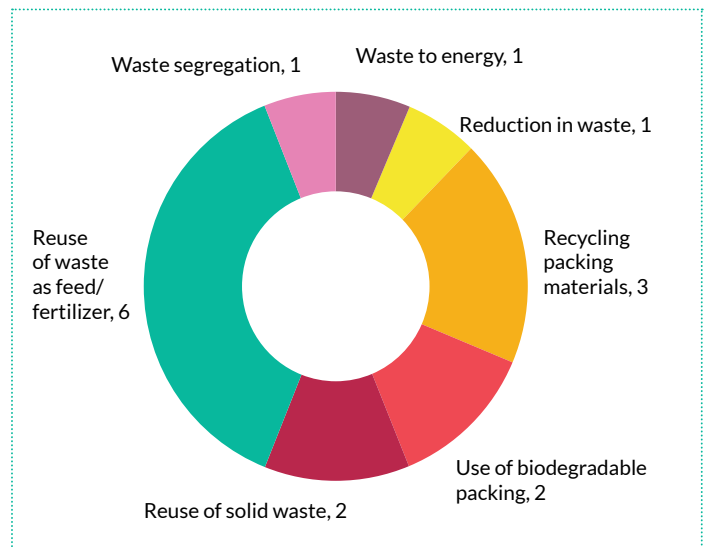
In the production stage that greening practice is employed by all MSMEs. This is mostly through organic farming.

## Levels of Greening Practices

Level 1 - No Investment - Change of Mindset	9
Level 2 - Low Investment - Affordable Purchase	21
Level 3 - High Investment - Technological Solutions	9

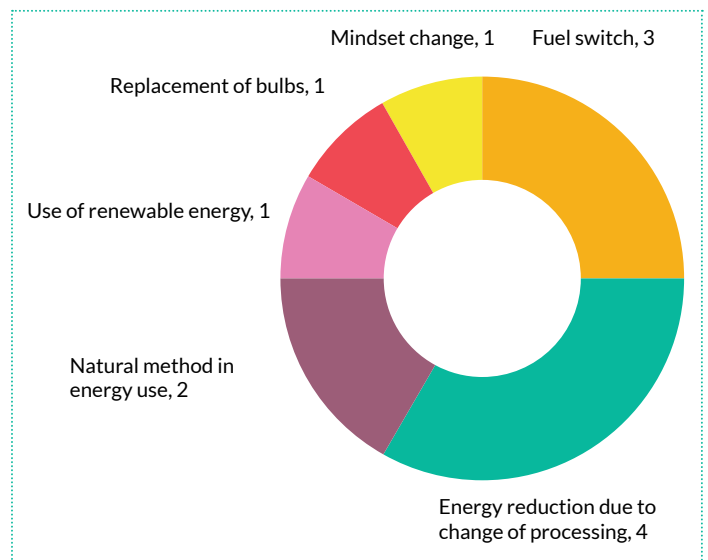
## Waste Recycling and Reusing

Reuse of wastes is greening intervention mostly practiced by MSMEs. There are some MSMEs that invested in machines that reduce waste. Some, meanwhile, reuse waste such as chocolate shavings for cleaning, carton boxes as rugs, or pails converted to trash cans. Sacks are reused until totally worn out. As one of the respondents noted, "Nothing is thrown until it's fully used." On packaging, Hineleban uses biodegradable packaging for their coffee. Meanwhile, JEP uses biodegradable sando bags for shoppers going to their store, House of Pili. JAC Farm and Real's Food make use of old carton boxes to pack their products for delivery.



## Energy Saving and Emission Reduction

In processing, it can be observed that some MSMEs are engaging in ways to reduce energy use such as utilization of cheaper fuel as an alternative, such as pili shells or rice husks instead of LPG. Some, meanwhile, tried to make operations more efficient, by reducing the number of processing operations, and thereby, saving on LPG consumption. JEP meanwhile use natural light in order to save on energy usage.



## Innovation and Research

It is interesting to note that some MSMEs are also engaging in research and developing wastes generated from processing. One case in point is Villa Socorro, which regularly holds dialogue with students from University of the Philippines Los Baños on the by-products of banana and banana peels. Some of the innovations that have arisen in the conversations include banana cider and binder for vegetarian burger patties. Freefood, meanwhile, is currently experimenting on using the burnt rice husk as toothpaste. Malagos for instance is now studying the possibility of converting chocolate shavings to soap. JEP is researching on converting rejected pili to oil, to be used in massage or as moisturizers. The removed peeling of the raw pili called testa is now being studied as a raw material for pili coffee. Meanwhile, JEP, for their other product "Galletas Dobles", is using good quality testa as an ingredient.

## How MSMEs can contribute to the SDGs

Roles and actions of MSMEs are enormous in building a sustainable world. As a group, MSMEs play a huge role in the global economy, particularly in equitable income generation, employment creation, and innovation and growth. MSMEs have the potential to contribute, directly and indirectly, to all of the goals. In particular, four goals (SDG8, SDG9, SDG11 and SDG12) pertain to economic growth and sustainable consumption and production patterns, which MSMEs can play a leading role to achieve.



The case studies exhibit strong evidence of MSMEs contributions in SDGs. In all cases, MSMEs are engaged with local rural farmers and workers, who either work in their farms or supply agricultural products. All MSMEs support poverty alleviation (SDG1) providing jobs creation and income to low-skilled local people (SDG8). MSMEs highlight their commitment in learning and improving. MSME staff farm communities are trained in Good Manufacturing Practices, toxic chemicals, organic products, eco-labeling and other Corporate Social Responsibility programs, strengthening knowledge and skill of workforce, suppliers and clients (SDG4). Women are active entrepreneurs and equal partners in decision-making (SDG5), as almost half of owners and partners and majority who are working in food processing stages are women. More than 80% of companies have implemented greening practices in efficient use of water, improving access to water, wastewater management and making water resources available for others (SDG6). 67% of companies implemented energy saving measures through replacement of fuels, implementing heat efficient practices and replacing light bulbs (SDG7). Innovation has been a key driver of change in many MSMEs, not only in their product design, packaging, marketing and production, but also in finding resource efficient solutions through greener measures in saving energy, water and waste (SDG8). Hinelaban Foundation Inc. and Greenminds Inc. are partnering with indigenous communities in organic farming and reforestation, and maintaining environmental and social activities to provide better opportunities (SDG10).

Responsible consumption and production (SDG12) is at heart of these MSMEs through adoption of efficient production practices and making sustainable use of local resources. By reducing energy consumption, Freefood, JAC Farms, Fresh Start Organics, Villa Socorro, Real's Food Products, JEP, Greenminds and Rising Pili contributes in action against climate change (SDG13). By reducing waste and preserving biodiversity, all MSMEs have their small share in improving life on land (SDG15).

## Message to Partners and Donors

In terms of increasing opportunity to learn green interventions, access to funds, education in fiscal and financing options, encouraging green interventions, harmonizing efforts and facilitated access to green technology or scaling up such successful stories we need your partnership and dedicated support to contact us for bringing the positive impact.

## Key Messages

If managed well and monitored systematically, adoption of green business practices among MSMEs can lead to greater socio-economic impacts resulting cost savings, employment generation, drive innovation and competitiveness to create inclusive green growth.

- **Going green is possible.** The results of the case study show that going green is possible and, in fact, can bring both monetary and non-monetary benefits for the businesses.
- **Greening intervention does not always require investment.** Though some interventions (bulb replacement, rainwater harvesting, change in processing) require initial investment, other green interventions involve no cost (alternative fuel from wastes (pili shells, rice husks), change in coffee roasting methods, re-used materials, use of waste for fertilizing and greywater from manufacturing to farming). Some greening interventions involve no cost at all but offer an innovative approach (i.e. alternative fuel from waste reuse of materials and use of waste for fertilization).
- **Green is profitable.** All greening interventions analyzed have shown positive cost saving (58%-75%), positive Net Present Values (NPVs) over 5 and 10 years, above 1 Benefit-to-Cost Ratios (BCR)s and high Internal Rate of Returns (IRR)s (19%-224%). For example: replacement of 21 CFL bulbs to LED in one micro enterprise saved 1,309kW energy, resulted Php 9,433 savings in electricity consumption and reduced 690kg CO<sub>2</sub> emission
- **Green can be competitive and inclusive.** Engaging in greening practices also translates into social relevance of the firms in the communities they are operating in. They can be considered as advocates of green practices. Some partnered with the women entrepreneurs and marginalized communities and trained them on green technologies and efficient practices, which provided more competitiveness and stable income.
- **Green MSMEs are contributing to the Global Agenda on Sustainable Development Goals (SDG.)** At larger scale MSMEs play a huge role in the global economy, particularly in equitable income generation, employment creation, and innovation and growth..In particularly, four goals (SDG8, SDG9, SDG11 and SDG12) pertain to economic growth and sustainable consumption and production patterns, which MSMEs can play a leading role to achieve.



## CONTACT

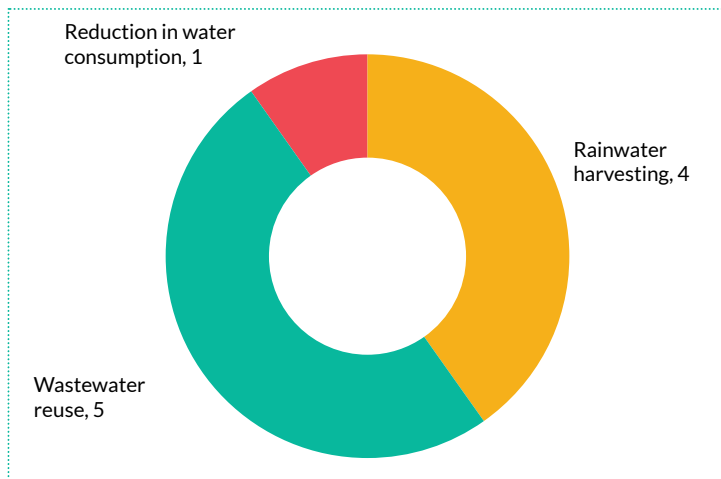
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## Water Saving

Still in the processing phase, water consumption is also reduced by rainwater harvesting and wastewater reuse.



## Monetary Benefits

For this study, there are four firms that underwent the Cost-Benefit Analysis (CBA) – Freefood Coconut Manufacturing Company, JAC Farms, Villa Socorro Agri-Eco Village & Farm Resort and J. Emmanuel Pastries. CBA is a financial technique that compares the monetary value of benefits with the monetary value of costs in order to evaluate and prioritize alternatives, in this case study Business As Usual or Industry Average Practice.

Based on the tabular data below, greening practices under CBA can be both in the form of investment in equipment or a simple change in the processing method. For instance, some of the firms have invested money in purchasing rainwater catchment, cooking equipment for clean/cheaper fuel (e.g. rice husk burner), LED lights and biodegradable bags. Meanwhile, some companies simply adjusted their processes with little to no cost (e.g. reuse of carton boxes for delivery, reuse of wastes such as banana peels).

The data also shows that such greening interventions are mostly concentrated within the processing level.

## Summary of Greening Practices in Value Chain

Cluster	MSME	Greening Practice	Value Chain
Cacao	Freefood Coconut Manufacturing Company	Reuse of rice husks as fuel for the burners	Processing
		Use of rainwater catchment	Production / Processing
Coffee	JAC Farms	Change in roasting process	Processing
		Reuse of carton boxes	Distribution
Processed Fruit (Banana)	Villa Socorro Agri-Eco Village & Farm Resort	Reuse of rice husks as fuel for the burners	Processing
		Use of rainwater catchment	Production / Processing
		Use of banana peels as fertilizers	Processing
Processed Nut (Pili)	J. Emmanuel Pastries	Use of pili shells as fuel instead of LPG	Processing
		Use of LED lights and natural lights	Processing
		Use of biodegradable sando bags	Distribution

Investments in equipment ranged from PhP4,000(US\$80) to PhP200,000 (US\$4,000). Cost in changing processing methods range from as low as PhP300 (US\$6) to PhP500 (US\$10). Savings, depending on the investment and cost ranged from PhP10,000 (US\$200) to PhP470,000 (US\$9,400).

In CBA, all greening interventions analyzed have positive cost savings, positive Net Present Values (NPVs) over 5 to 10 years, above 1 Benefit-to-Cost Ratios (BCRs) and high Internal Rate of Returns (IRRs) (19%-290%).

## Summary of CBA and Cost Savings \*

Cluster	MSME	Greening Practice	CBA and Cost Savings
Cacao	Freefood Coconut Manufacturing Company	Reuse of rice husks as fuel for the burners	NPV(5) = PhP 82,952.12 (US\$1,659) NPV(10) = PhP 215,504.38 (US\$4,310) IRR = 19%
		Use of rainwater catchment	NPV(5) = PhP 41,701.45 (US\$834) NPV(10) = PhP 69,852.66 (US\$1,397) IRR = 187%
Coffee	JAC Farms	Change in roasting process	Fuel Cost Savings 72% PhP 7,735 (US\$155) annually
		Reuse of carton boxes	Cost Savings 80% PhP 2,287.50 (US\$46) annually
Processed Fruit (Banana)	Villa Socorro Agri-Eco Village & Farm Resort	Reuse of rice husks as fuel for the burners	NPV(5) = PhP 289,244.50 (US\$5,785) NPV(10) = PhP 595,152.21 (US\$11,903) IRR = 35%
		Use of rainwater catchment	NPV(5) = PhP -18,970.46 (US\$-379) NPV(10) = PhP 96,240.70 (US\$1,925) IRR = 22%
		Use of banana peels as fertilizers	Cost Savings PhP 360,345.60 (US\$7,207) annually
Processed Nut (Pili)	J. Emmanuel Pastries	Use of pili shells as fuel instead of LPG	Cost Savings 75% PhP 21,813 (US\$436) annually
		Use of LED lights and natural lights	NPV(5) = PhP 20,038.68 (US\$400) NPV(10) = PhP 83,546.34 (US\$1,671) IRR = 290%

\* Net Present Value (NPV) is the difference of discounted (value of money changes with time) benefits and costs over a project/investment time. In this study, 10% discount rate and duration of 5 and 10 years has considered. If NPV of the green intervention is positive, it means benefits of green intervention outweighs its costs. Benefit-Cost Ratio (BCR) is ratio of the discounted benefits and the discounted costs, the intervention has higher benefits if the ratio is higher than 1. The Internal Rate of Revenue (IRR) defines the specific interest rate that balances costs and benefits. Higher IRR means the project/intervention has higher return comparing to alternatives.



## Social Benefits

Data on the non-monetary benefits of the study reflected more social relevance of the MSMEs in the community they are operating in. Greenminds and Hineleban have partnered with the indigenous people (IP) communities in Bukidnon, providing them income generation. The IPs are community partners who are suppliers of peanuts and coffee beans respectively for Greenminds and Hineleban. The firms provide trainings on organic farming as well as value formation sessions. They also employ IPs or providing employment to those with insufficient educational attainment. According to Greenminds, the IP communities they have partnered with take pride that their technology is 100% organic certified. Other MSMEs essentially create jobs in their community.



## Environmental Benefits

In addition to the green practices implemented, all of the MSMEs participating in this case study have strong environmental awareness. As an offshoot, they all have farms that showcase greening technologies and this can be considered as well as an advocacy heeding for greening the industry. Malagos has Malagos Garden Resort, Greenminds has Umanika Eco-Cultural Farm, Hineleban has Hineleban Farm while the rest of the MSMEs have sites/facilities that demonstrate organic farming practices and reduction of resource consumption (e.g. waste reduction, energy and water reuse reduction). These are good practices that can demonstrate that environmental protection, merged with operations, is possible.

## Green practices that can be implemented by other MSMEs

Greening a business can start with very basic measures. It does not always require considerable investments to be green and to position themselves as “green”. As food processing industry is highly energy, water and waste intensive, a number of greening measures that the study suggest are evident in these areas.



## Waste Recycling

**Proper segregation of waste into biodegradable and non-biodegradable waste.** Simple color-coded or properly-labeled trash bins can help kick this off.

**Reuse of certain waste as compost, animal food, fuel, or other functions.** Freefood uses cacao peels and coconut husks for compost while rice husk is used as fuel for the burners.

**Use of discarded banana peels for compost, vermicompost, or animal feed.** It also uses old rice sacks as planters for yam and other root crops. In JEP, the outer peels of the pili nut are composted and used as organic fertilizer, which they say is a good alternative to chicken manure.



## Energy and Emissions

**Use of natural lighting and LED lights in the production facility.** In Rising Pili, the factory is constructed in a way wherein natural lighting is maximized, therefore cutting down need for electric lights. JEP also uses natural lighting and LED lights, and so are able to save on energy costs.

**Sun-drying of raw material.** Companies like Freefood and JAC harness the energy of the sun to sun-dry their cacao and coffee beans, respectively.

**Use of biomass for stoves.** In this study, it was found that rice husks, made into charcoal briquettes, are favored fuel for stoves. The by-product is then used for soil conditioning. JEP, meanwhile, uses pili shells as fuel for the blanching process of their operations.

**Efficient scheduling of energy-consuming activities.** Sometimes, just a tweak in one's planning can save energy. JAC reduced its LPG expenses by roasting 16 to 20 batches for two days instead of one or two batches every other day. This saves time and gas as the roasting machine needs four hours of pre-heating before the process.

**Simpler but more efficient technology.** In Aloha Farms, a rocket stove is used. It's a small, hot burning portable stove using wood broken up into small pieces. According to research, rocket stoves uses 18 to 35% less fuel compared to the traditional stoves.



## Water

**Wastewater reuse.** Whether through simple or complex means, use of wastewater can save a company tens of thousands of pesos. A basic example is Rising Pili, which reuses the water used to wash pili nuts to water the plants around its factory. A more complex or expensive method is the use of Freefood's recirculating cistern or Villa Socorro's secondhand tanks and rainwater catchment. Aloha Farms uses a closed aquaponics cycle in its fishponds, which is used to water plants that provide feed for the fish. Malagos has invested in a technology that allows reduction of water consumption during grinding stage of its cacao beans. This is with the use of insulated tanks powered by electricity in order to maintain water heat for reuse instead of regularly refilling water to be heated.



## Machine innovations

**Custom-made machines.** Through observation and research, a few of the companies presented here have come up with their own innovations to save time and energy in their respective processes. Brenda Claver of JAC, for instance, made her own revisions to the pulping machine by adding a motor.



## Social Benefits

**Fair trade.** Firms like Fresh Start, Hineleban, Freefood, JAC, Rising Pili, Villa Socorro, and Malagos source directly from the farmers and deal directly with the indigenous tribes in their areas of production. This cuts out the middleman, and provides direct benefits to the communities that in turn take pride in their produce and place in the firm's value chain.

**Green jobs.** MSMEs can provide green jobs by ensuring livable wage and benefits, skills enhancements and opportunities for mobility, non-discrimination practices such as equal pay, and appropriate health and safety measures.

**Hiring local.** Instead of bringing in employees from the city or faraway provinces, all of the companies in this report give opportunities to the people in their immediate communities. This helps raise the communities' standard of living as a whole—exposing them to more awareness about green practices that they in turn can share with their families and own communities.