THE COST-BENEFIT STUDY OF INTEGRATING SUSTAINABLE CONSUMPTION AND PRODUCTION INTO BUSINESS OPERATIONS OF FOOD SERVICE ESTABLISHMENTS

Report on the Results of the e-CBA

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The Cost-Benefit Study of Integrating Sustainable Consumption and Production into Business Operations of Food Service Establishments Technical Working Group:
Benvenuto Icamina, Melvie Espejo, Vicente Paqueo, Ryan Salvanera, Allanne Mae Tiongco, Christopher Miguel Saulo, Rachel Rodica, Luz Teresa Baskiñas, Melody Melo-Rijk, Alexa Jeanne Lasch, Lorayne Therese Roque, Liezl Stuart del Rosario, Iris Joy Abrigo, Monique Mahusay, Jonna Ellaine Jordan, Kristan Gabriel Villalon, Jenette Callada

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WWF-Philippines has been working as a national organization of the WWF network since 1997. As the 26th national organization in the network, WWF-Philippines has successfully been implementing various conservation projects to help protect some of the most biologically-significant ecosystems in Asia.

WWF-Philippines works to improve Filipino lives by crafting solutions to climate change, providing sustainable livelihood programs, and conserving the country's richest marine and land habitats.

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For further information, please contact:
World Wide Fund for Nature (WWF) Philippines
4th floor, JBD Plaza
65 Mindanao Avenue, Bagong Pag-asa
Quezon City 1105, Philippines
kkp@wwf.org.ph
www.wwf.org.ph

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ABBREVIATIONS & ACRONYMS

BAU	Business as Usual
BCR	Benefit Cost Ratio
BMU	German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety
CAPEX	Capital Expenditure
CBA	Cost-Benefit Analysis
CSR	Corporate Social Responsibility
DA	Department of Agriculture
DTI	Department of Trade and Industry
e-CBA	Extended Cost-Benefit Analysis
EPA	US Environmental Protection Agency
GHG	Greenhouse Gas
IRR	Internal Rate of Return
IKI	International Climate Initiative
LCA	Life Cycle Analysis
LGU	Local Government Unit
MRF	Materials Recovery Facility
NEDA-ICC	National Economic and Development Authority – Investment Coordination Committee
NPV	Net Present Value
O&M	Operations and Maintenance
RFI	Raw Food Ingredient
S0A	Baseline Restaurant/Scenario 3-0 Restaurant
S1A	Scenario 1-A Restaurant
S1B	Scenario 1-B Restaurant
S2A	Scenario 2-A Restaurant
S2B	Scenario 2-B Restaurant
S3A	Scenario 3-A Restaurant

S3B	Scenario 3-B Restaurant
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
SDR	Social Discount Rate
TOR	Terms of Reference
WACC	Weighted Average Cost of Capital
WBF	Wallace Business Forum
WWF	World Wide Fund for Nature

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DEFINITION OF TERMS

Baseline	[Data/Restaurant] pertains to the status quo, ground zero, point of comparison, the restaurant not currently participating in The Sustainable Diner program of WWF and has little to zero knowledge of SCP practices.
Benefit Cost Ratio	Is a feasibility indicator. BCR measures the ratio of the sum of the discounted annual streams of benefits and the sum of the discounted annual streams of costs and should be greater than 1.0 for the practice to be considered viable.
Bokashi	A Japanese word meaning "fermented organic matter". It is a system of odorless composting, where carefully selected, "effective" microbes are used to decompose organic kitchen waste.
Carbon Footprint	The amount of carbon dioxide (CO_2) emissions associated with all the activities of a person or business. It includes direct emissions, such as those from the production of electricity, heating, etc. and waste associated with goods and services consumed.
Compost	An organic material mainly comprised of discarded food wastes that has underwent decomposing process and is often used as fertilizers in farming and gardening.
Cost-Benefit Analysis	Cost-benefit analysis (CBA) in this study is the determination of the benefits of implementing sustainability plans into day-to-day business operations of a fully functioning restaurant, weighed against their corresponding costs.
Cost-Benefit Monitoring Tool	Also referred to as – "technology tool" – in this study, refers to the technological intervention applied in aid of CBA and project sustainability. In this case, the utilization of an excel worksheet to efficiently track and monitor specific indicators meant to measure the cost and benefit of the application of SCP principles into business operations.
Economic Benefits/Costs/Analysis	Often written as simply "economic" or appended to terms such as benefits, costs, analysis, etc. in this study. The term economic in project feasibility analysis and CBA is universally accepted among bilateral and multilateral lending institutions to encompass society-at-large viewpoints, externalities such as economy, social, environmental and other non-financial factors. This study follows this universal definition. (see also*, Financial* definition)
Extended Cost Benefit Analysis	An expanded form of CBA that internalizes environmental impacts in the economic analysis. This means that the economic analysis in this study is focused primarily on the externalities and its effect on the environment.
Financial Benefits/Costs/ Analysis	Often written as simply "financial" or appended to terms such as benefits, costs, feasibility, sustainability, etc. in this study. Financial CBA analysis is conducted to assess the viability of the project from the proponent's/business viewpoint, including the project's ability to meet its debt-service obligations. *(*see also *Economic* definition*)*

Food Stock	Flavored liquid preparation. In cooking, this is the liquid that determines the flavor profile of all the main dishes in restaurants and can be used as base for cooking, soup and sauces. Typically created from food preparation discharges such as meat & fish bones, vegetables peelings and cuts, and fruits.
Food Waste	This pertains to the unused and unconsumed primary product – food- in restaurants. This consists of both kitchen waste, either uncooked or spoiled raw food, and dining waste, the served meal not consumed by the customers or leftovers.
Greenhouse Gas (GHG) Emissions	The amount of carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O) and Fluorinated gases emitted by activities undertaken by persons, business and other entities and trapped in the atmosphere. A greenhouse gas is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. Greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming.
Local Sourcing	The sourcing, purchasing or procurement of food, ingredients and other consumable products within a specific radius (distance) from where they will be used, in this case the restaurant. The distance can be relative, such that the local source is the country where the user is located when the comparison of sourcing is imports; or the city or province of the user, if the comparison is sourcing outside of the city or province.
Net Present Value	Is a feasibility indicator. NPV compares the sum of the annual streams of benefits with those of costs, with future values translated into present values (their future values at today's prices). NPV should be greater than zero for a project to be feasible.
Non-Food Waste	In this study, this mainly refers to food packaging and dining necessities such as cutlery, paper napkins, straws/liquid stirrers, etc.
Rain Water Harvesting	The process of collecting rain water in tanks or containers for the purpose of using stored water for supply needs, typically for gardening or farm production.
Reduction of Global Warming	The reduction of global warming is quantitatively defined as keeping the temperature rise below "*$2^{O}C$ above pre-industrial stage*", to be achieved by reducing CO_2 emission by 40-70% from the signing of the Paris Accord to the middle of this century.
SCP Integration	The level of adoption of SCP Principles in partner food service establishments.
SCP Practice	The adoption of SCP Principles (see SCP Principle definition). This study focuses on measures or practices involving the reduction of waste, both food and non-food waste; and more efficient use of energy, water, and other resources
SCP Principle	Sustainable consumption and production (SCP), as defined in the 1994 Oslo Symposium, is the use of services and related products which responds to

	basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations. It is one of the 17 (Goal 12) United Nations Sustainable Development Goals (SDGs).
Sustainable Development Goals (SDG)	The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The SDGs are the blueprint to achieve a better and more sustainable future for all. SCP is Goal Number 12 under the SDGs. There are 17 SDGs.
The Sustainable Diner	A four-year initiative funded by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) under the International Climate Initiative (IKI) and is an affiliated project to the One Planet Network Sustainable Food Systems Programme of the United Nations.
Waste Audit	Waste audit in this study refers to the survey of food and non-food waste stream of a food service establishment. This involves sorting, recording and analyzing of food and non-food waste.
Water Footprint	Indicator of water use that looks at the direct and indirect water use of partner food service establishment restaurants and its impact on the environment.

EXECUTIVE SUMMARY

Sustainable consumption and production (SCP), as defined in the 1994 Oslo Symposium, is the use of services and related products which responds to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations. It is one of the 17 (SDG 12) United Nations' Sustainable Development Goals (SDGs). The SDGs describe this goal as "*promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all. Its implementation helps to achieve overall development plans, reduce future economic, environmental and social costs, strengthen economic competitiveness and reduce poverty*."

This study reviewed what SCP practices are currently applied in the business operation of food service establishments in the Philippines for purposes of analyzing whether these SCP practices have been beneficial financially and economically for all stakeholders.

The analytical framework used to compare cost and benefit is the standard cost-benefit analysis approach. The values of indicators of feasibility were derived, specifically net present value (NPV) and benefit-cost ratio (BCR). NPV compares the sum of the annual streams of benefits with those of costs, with future values translated into present values (their future values at today's prices). NPV should be greater than zero for the practice to be considered financially rewarding.

The formula for determining the NPV is as follows:

$$NPV = K + (B_1-C_1) + (B_2 – C_2)/(1 + r) + (B_3 – C_3)/(1 + r)^2 + ,,, + (B_N – C_N)/(1 + r)^{N-1}$$

Where K = Capital cost
B_n = Annual Benefit at Year n; n = 1, 2, 3, …, N
C_n = Annual operating and maintenance costs at Year n; n = 1, 2, 3, …, N
r = weighted average cost of capital (WACC), expressed in percentage

While for computing the BCR, the formula is:

$$BCR = [B_1 + B_2/(1+r) + B_3/(1 + r)^2 + … + B_N/(1 + r)^{N-1}]/[B_1 + B_2/(1+r) + B_3/(1 + r)^2 + … + B_N/(1 + r)^{N-1}]$$

The discount rate used in translating benefits and costs into present values is the weighted average cost of capital (WACC), or the weighted average yield of the combination of the loan (where the yield is the interest rate paid) and owner's cash (the yield is the earnings if the cash was invested instead in the highest-yielding financial instrument) used to invest in the SCP practice. The e-CBA, however, assumed that the practices would be purely financed by own funds or cash, with an alternative return of 3.1%, the highest yield of long-term peso bonds in February 2021, which was also the WACC.

The BCR measures the ratio of the sum of the discounted annual streams of benefits and the sum of the discounted annual streams of costs. It should be greater than 1.0 for the practice to be considered viable. A practice may have large positive NPV relative to another, which means the establishment gets more in absolute amount of net financial benefit from the former. But if the latter has higher BCR, it means it is more cost-effective or generates "bigger bang for the buck" and could be more beneficial if there is an opportunity for scaling it up.

Both financial and economic (economic, environmental, and social) analyses have been performed for each of the selected SCP practices and found that:

- SCP practices in food service establishments in the Philippines are categorized in four SCP categories – Energy, Water, Waste and Sourcing. Specifically:

- Energy
  (1) Use of energy-saving or 5-star rated air-conditioners
  (2) Use of energy-saving or 5-star rated freezers/chillers
- Water
  (1) Own production of purified water
- Waste
  (1) Repurposing into new meal selection
  (2) Use as animal feed
  (3) Bokashi composting
- Sourcing
  (1) Own farm/garden production of raw/fresh food ingredient (vegetables and/or herbs and spices)
  (2) Contract growing (vegetables)
  (3) Import replacement (beef)

- There are also soft measures or other unspecified SCP practices and interventions applied in food service establishments to conserve energy and water, and reduce food waste.
- Of the four SCP practices categories, the greatest number of SCP practices are applied in the management of food wastes at eight (8) SCP practices.
- In terms of records-keeping and measure, most food service establishments in the Philippines have been tracking the benefits of their applied SCP practices in Energy the most.
- The cost-benefit analysis of Energy SCP practices show that it is beneficial financially, economically and environmentally for food service establishments to do so.
- The use of energy efficient air-conditioning units yield benefits exceeding costs by an impressive ratio of 4 to 1 (BCR = 3.98). Meanwhile, for use of chillers and freezers the cumulative amount of 5-year benefits exceed their comparative 5-year costs, and with NPV at a positive PHP 21,620. Moreover, benefits exceed costs by a ratio of slightly above 2 to 1 (BCR = 2.3).
- The economic benefits recognized in the use of energy-saving air-conditioning units and energy efficient chillers and freezers were two-fold: (1) the energy conserved, as energy is among society's vital resources; and (2) reduced carbon footprint or carbon emissions (CO2-e) resulting from reduced energy usage.
- Of the four SCP practice categories studied, it is in the water category that has the most impressive benefit versus cost. Although 3 out of 6 food service establishments in the Philippines practice it.
- The use of water filtration by restaurants to produce their own drinking and cooking water generated tremendous financial benefits as measured by NPV at an extremely high positive value of PHP 2.6 million, which is greater than zero; while BCR is a multiple of 23 times, or benefits are 23 times more than the SCP practice's costs. These are strong financial incentives for integrating this specific SCP practice into the food service establishments operations.
- The SCP practice of repurposing food waste and unused ingredients into a new meal selection appears to be the highest usage of food waste among restaurants in the Philippines.
- Food wastes repurposed are mainly raw vegetable and fruit scraps and tops, unused ingredients, and unconsumed meals. This accounts for about one-third (31%) of food waste. The "waste" is made into soup, side dish, or food stock for main meal selection.
- The results of the financial cost-benefit analysis on the use of food wastes as repurposed food showed a cumulative amount of 5-year benefits exceeding their comparative 5-year costs, and with NPV at a hugely positive PHP 9.293 million. Benefits exceed costs by a ratio of almost 2 to 1 (BCR = 1.96). These results indicate the potential of an added boost in financial earnings by producing new meal selection or using as added ingredients unused food ingredients or meals instead of throwing them away.
- The extended cost-benefit analysis on the use of food waste in the practice of using it as animal feed and organic compost was not as conclusive as repurposed food waste. It is suggested in the recommendations of this study as in need of further research.
- The results of the financial cost-benefit analysis on the SCP practice of sourcing – having own farm - show that production of fresh vegetables and other commodities from the establishments' own farm or garden

can potentially be financially viable. Net present value (NPV) is a positive PHP 17,250, while the benefit cost ratio (BCR) is 1.17 or above zero. Meanwhile, the economic cost-benefit analysis demonstrated the economic viability of own farm production of restaurants, with much better results than the financial CBA. Net present value (NPV) computed at PHP 63,370 and BCR at 2.0, or the SCP practice yields PHP 2 worth of economic benefit for every PHP 1 of economic cost.

The e-CBA indicated that the most financially beneficial SCP practices for restaurants are the combined soft and residual measures in energy, water and food waste; repurposing food waste for new meal selection; the use of filters, purifiers, or treatment devices for drinking and cooking water; and, use of energy-saving air-conditioning units. The soft and residual measures, repurposing food waste, and the use of own purification system to produce drinking and cooking water are also the most economically viable SCP practices, where society has the most gains.

Except for import replacement, which showed divergent financial and economic analysis results, all other SCP practices had consistent feasibility outcomes – and are mostly feasible. Only food waste used as animal feed is not feasible from both financial and economic standpoints. Practices involving food production and food waste reduction generally yielded better economic results than financial results.

COST-BENEFIT STUDY OF INTEGRATING SUSTAINABLE CONSUMPTION AND PRODUCTION INTO BUSINESS OPERATIONS OF FOOD SERVICE ESTABLISHMENTS

REPORT ON THE RESULTS OF THE e-CBA

1.0 OVERVIEW

1.1. OBJECTIVES OF THE STUDY

On October 2018, the World Wide Fund for Nature Philippines (WWF-Philippines) and the Wallace Business Forum (WBF) entered into a service agreement to conduct a cost-benefit study of integrating sustainable consumption and production (SCP) practices into business operations of food service establishments. The study forms part of the WWF-Philippines project called, *"Establish Low Carbon Consumption and Production in the Philippines*" better known as "*The Sustainable Diner: A Key Ingredient for Sustainable Tourism"*. The Sustainable Diner Project is a four-year initiative funded by the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) under the International Climate Initiative (IKI) and is an affiliated project to the One Planet Network Sustainable Food Systems Programme of the United Nations. The study consists of two (2) parts, an e-CBA of SCP practices in food service establishments in the Philippines and the development of SCP practices monitoring tool for use in participating restaurants in the project.

Following the approval of the technical and financial proposal, Phase 1 of the project commenced with the following objectives in mind:

- Determine specific areas in the operations of food service establishments where sustainable consumption and production (SCP) principles can be applied.

- Develop the conceptual framework for measuring the impact of SCP practices adopted by food establishments.

- Identify and develop indicators of benefits and costs of integrating SCP practices in the food service industry, specifically restaurants and related businesses. Benefits and costs from the standpoint of the food establishments (financial) and the society at large (economic and social) will be identified. SCP externalities (e.g., environmental benefits and costs) will also be specified and, if difficult to quantify, discussed qualitatively.

- Conduct e-CBA – Two (2) levels of cost-benefit analysis will be performed: (a) from the viewpoint of the food service businesses; and (b) from the standpoint of society. The first will justify the use of SCP principles in the business operations of the food service establishments. The second will show the positive impact to the population and the entire economy of restaurants practicing SCP, which could help rally popular and policy support.

- Recommend and guide food establishments on SCP practices that would maximize their net benefits.

Phase 2 of the project focuses on the development of an SCP Monitoring Tool and its subsequent cascade, application and training with identified WWF partner restaurants participating in the study. Phase 2 has three (3) objectives:

- Develop a tracking tool for restaurants that would enable them to monitor the financial benefits of integrating SCP principles into their operations.

- Conduct training and prepare a simplified instructional guide on the use of monitoring tool (financial tracking model)

- Track the operations of participating restaurant(s) using the SCP monitoring tool to ensure proper usage, possible fine-tuning and modification of the tool based on the results of this tracking.

1.2 REVIEW OF LITERATURE

The review of related literature was conducted with the main objective of obtaining guidance and insights on the development of conceptual framework and approach in performing the cost-benefit analysis of adopting SCP practices in food service establishments. This includes identifying and quantifying the benefits and costs – the financial and economic (i.e. all non-financial factors including environment, social, economy and other non-financial factors), associated with these practices.

1.2.1 Defining Sustainable Consumption and Production in the Food Industry

The understanding of what SCP actually means is a critical first step in developing an indicator set[1], which is one of the main purposes of this Study. In simpler terms, SCP is about having more efficient and profitable production while using fewer raw materials as well as adding value to the product while creating less pollution and waste in the process[2]. For the food industry, the practice seeks to fulfill consumer needs for nourishment with minimum food loss and waste, health risks, and adverse environmental impacts such as air pollution, water pollution, and greenhouse gas emissions.

Three theories have been advanced to explain this: institutional theory; dynamic capabilities; and, stakeholder theory[3]. Institutional theory focuses on the role of environmental pressure and how this pressure, such as rules and regulations, social and cultural norms, and other coercive actions, influences a company to adopt a particular practice. Dynamic capabilities involve the firm's ability to integrate, build and reconfigure internal and external competencies to address a rapidly-changing environment, thereby maintaining relevance with the present times and keeping ahead of competition. Stakeholder theory deals with direct stakeholder pressure in the pursuit of their own welfare and interests (e.g., health issues, conservation, clean environment, etc.) to influence organizational practices.

Despite the presence of drivers, adoption of SCP practices faces constraints. Some identified by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) were – information deficits, behavioral routines and path dependencies, availability of affordable alternatives, and lifestyles and social norms[4] as well as lack of waste infrastructure, few take-back mechanisms, and global integration of production processes. Quantification of the net impact of SCP can help bolster the argument for SCP among various actors in the food supply chain, but identification of indicators that can help measure SCP is a subject of continuous research[5].

A holistic approach in monitoring the impact of SCP dictates that it should cover the entire food supply chain, from farming to final food consumption. Tracking food service establishments, which is the focus of the cost-benefit study,

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[2] Govindan,Kannan (2017)"*Sustainable Consumption and Production in the Food Supply Chain: A Conceptual Framework"* International Journal of Production Economics

[3] Ibid.

[4] Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (2018) *"National Programme on Sustainable Consumption. From Sustainable Lifestyles towards Social Change"* Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, 53048 Bonn , Germany

[5] United Nations Environment Programme (2015*). "Sustainable Consumption and Production Indicators for the Future SDGs"* UNEP Discussion Paper, March 2015. And also, Govindan, Kannan. (2017)

constitutes only one segment of the supply chain. But even this approach is confining, as SCP involves not only sustainability in terms of preparing, serving and consuming meals, but also covers other aspects of sustainability in restaurants, such as the use of resources for sanitation (e.g., water for kitchen and toilet use) and customer comfort (air conditioning). Many SCP-related studies done in the food industry largely focuses on a few aspects of sustainability, essentially food waste reduction, donation, and recovery[6].

1.2.2 The Three Scenarios on SCP

Of the many literature that covers SCP integration and the movement towards sustainable practices in industries, only a few such as that conducted by Nidumolu, et. al. (2009) gave a clear distinction of scenarios to determine a business's level of sustainability. According to Nidumolu, et. al. a way to determine the stage or level of sustainability of a business are as follows: Stage 1 – Viewing compliance as opportunity – The establishment complies with the law and pressures from voluntary codes as a strategy for or a means of fostering innovation; Stage 2 – Making value chains sustainable – The establishment becomes more proactive about environmental issues, working with suppliers and retailers to develop eco-friendly raw materials and components, and reduce waste; Stage 3 – Designing sustainable products and services – Existing products are redesigned, new ones are developed to meet growing demand for sustainable, eco-friendly products by consumers; Stage 4 – Developing new business models – Novel ways of capturing revenues and delivering services are developed; Stage 5 – Creating next practice platforms – The establishment explicitly focuses and commits resources including personnel on addressing sustainability issues. [7].

Under these classifications, Scenario 1 restaurants would at best fall under Stage 1; Scenario 2 establishments could go up to Stage 2; and Scenario 3 establishments operate beyond Stage 2.

Freeman (2011)[8] further expanded this study and noted that the following attributes or focus areas define sustainability in a restaurant: (a) education – the establishment is aware of the collective impact of their business, and strives to inform and educate their suppliers, staff and customers on what they do on environmental stewardship; (b) process – practices and actions are in place for the cumulative, long-term achievement of desired results; (c) community participation – active involvement in the community and engagements with stakeholders on collective actions towards common aspirations for the community and society; (d) future conditions – a vision exists which is oriented towards the long-term vitality of all generations, ensuring that they are all well-provided for.

In relation to the study's three scenarios, Freeman's work suggest that the level of SCP integration can be viewed in terms of the degree of internalization of core attributes related to sustainability, specifically education, process, community participation and future conditions. Scenario 1 establishments are presumed to hardly show understanding of or barely embrace these attributes; Scenario 2 establishments show some degree of presence of these attributes; and Scenario 3 establishments demonstrate significant presence of these attributes in their operations.

Another approach, suggested by Jacobs and Klosse (2016) proposes that the process of a restaurant's transition towards sustainability can be determined by looking at three elements – "supply", as embodied by the restaurant owner, the "demand" embodied by the guest and the link that binds the two together – the "product" (the menu)[9].

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[6] See, for example, US Environmental Protection Agency, "Reducing Wasted Food and Packaging: A Guide to Food Services and Restaurants" (n.d.); WWF, "Fighting Food Wastes in Hotels" (2017); Covec, "Recycling: Cost Benefit Analysis," Report prepared for the New Zealand-Ministry of the Environment (April 2007); Industrial Economics, "Benefit-Cost Analysis of Potential Food Waste Diversion Legislation," Study conducted for New York State Energy Research and Development Authority (NYSERDA, March 2017).

[7] Ram Nidumolu, C.K. Prahalad and M.R. Rangaswami, "Why Sustainability is Now the Key Driver of Innovation," Harvard Business Review (September 2009).

[8] Freeman (May 2011).

[9] Davies, Terry and David M. Konisky (2000). "Environmental Implications of the Food Service and Food Retail Industries." Resources for the Future. Discussion Paper 00-11.

However, the study did not provide details on how this can be applied in evaluating the level of transition towards sustainability in restaurants.

1.2.3 Sustainability Practices and Indicators

Defining what is a sustainable practice within the context of the food service industry has limited precedent in review of related literature. Most studies focused on measuring SCP at the national, policy or macroeconomic level and few covered its application at the retail production level. There are also vast amount of research into sustainability of tourism and the hospitality industry in general but scarce literature into the sustainability of food served in restaurants, specifically[10]. However, some literature, the most prominent and often quoted of which, is Legrand, et. al (2010)[11], do exist. Legrand's study served as a good starting point for this study. Further, a 2008 UN report[12] which details what needs to present within all UN cafeterias to ensure that it is sustainable had helped determine what indicators are relevant in the study, especially in sustainability areas of energy and water.

The result was the identification of sustainability indicators (or practices) in the areas where the food service industry has the most significant impact on the environment, which are listed in **Table 1** below.

Table 1 – SUSTAINABILITY AREAS AND INDICATORS

SUSTAINABILITY AREA	INDICATORS
Energy	Use energy-efficient equipment in the kitchen
	Focus on appliances certified as energy-efficient
	Allow innovative, energy-efficient technologies to address food preparation, sanitation and refrigeration consumption
	Offset non-renewable energy use with carbon-offsetting scheme
	Track energy data
Water	Install low-flow fixtures in the kitchen and restrooms
	Use aerators, water-efficient pre-rinse spray valves, water-saving washers and waterless urinals in men's toilet
	Use equipment that are certified water-efficient
	Track water data
Waste	Follow "*reduce, reuse, recycle*" approach, train staff and encourage suppliers to also do

[10] Jacobs, George and Klosse, Peter (2016) "Sustainable Restaurants: A Research Agenda" Research Centre Gastronomy in Food Service. Zuyd University of Applied Sciences, Maastricth, The Netherlands. Research in Hospitality Management. 2016, 6(1): 33–36.

[11] Willy Legrand, Philip Sloan, Claudia Simons-Kaufman and Sarah Fleischer, "A Review of Restaurant Sustainable Indicators," Advances in Hospitality and Leisure, Vol. 6 (2010), pp. 167-183

[12] United Nations Environment Programme – Division of Technology, Industry and Economics (UNEP-DTIE)(2008) *"Sustainable Procurement Guidelines for UN Cafeterias, Food and Kitchen Equipment. Background Report"*. UNEP-DTIE, 15 rue de Milan, F-75441 Paris.

SUSTAINABILITY AREA	INDICATORS
	Put in place sorting and collecting system for waste with separate bins
	Use recyclable paper
	Minimize if not avoid the use of plastic, aluminum and polystyrene foam
	Reuse and compost organic waste
	Properly collect, dispose or reuse grease and oil
Food source (*Note: only indicators/practices applicable to local conditions are listed down*)	Purchase a percentage of organically certified food products
	Purchase a percentage of locally-sourced food products, and food products purchased directly at the local farms in fair prices
	Adjust menu to seasonal food products
	Purchase a percentage of sustainably sourced seafood
	Options of vegetarian, meat and fish dishes are on the menu
	Option of meals that cater to specific dietary needs and food allergies (gluten-free/lactose-free choices)
	Menu is labelled in regard to menu choices, e.g., "*low fat*", "*vegetarian*", "*gluten-free*", "*vegan*", etc.
	Menu communicates sustainable practices and initiatives of the restaurant

Source: WBF Project Research Team (2018). CBA of Integrating SCP in Business Operations of Food Service Establishments

Other areas of sustainability and their indicators were presented – site choice, construction and design, furniture and fittings, and corporate social responsibility – and need to be analyzed as well. But for the restaurants, they were deemed to have less impact on the environment as compared to the four areas discussed above.

The indicators provide a basis for the assessment of the integration of sustainability in the operations of the establishments. It is the initial step towards defining the variables for the cost-benefit study. But for the purpose of this study, the benefits and costs need to be quantified.

1.2.4 Benefits and Costs of SCP in Food Service Establishments

The benefits and costs of a particular SCP practice/indicator/variable need to be identified and quantified to facilitate assessment of its merits through CBA. The analysis will have to be conducted on an incremental basis, --i.e., a comparison of the benefits and costs with vs. without the SCP practice, and from the financial (firm or restaurant level), and economic (society-at-large) viewpoints. In the evaluation of projects (and practices), it is the accepted standard that cost-benefit analysis is performed essentially on two fronts, financial and economic, with the latter capturing all other non-financial benefits and costs, including social and environmental, where quantifiable.

The Asian Development Bank, which generated project economic analysis (cost-benefit analysis) guidelines based on its review of past theoretical and empirical studies on project evaluation, defined project economic analysis as "an analytical framework for computing costs and benefits of a project to comparable monetary units, so they can be compared systematically in a measure of project worth… external effects affecting the rest of the economy but

not reflected in market transactions – such as environmental impacts [*underscoring supplied*] – where they can be identified, must be included."[13]

The NEDA-ICC, which developed project evaluation guidelines for proposed development projects and adopted the approaches of international financial institutions for this purpose, specifies the presentation of financial and economic (cost-benefit) analyses. Financial CBA is conducted to assess the financial viability of the project to meet its debt-service obligations; economic analysis is conducted to ascertain the program/project's desirability in terms of its net contribution to the economic and social welfare of the country as a whole[14].

A practice with negative net financial benefit but with positive net economic benefit may not be financially worthwhile for restaurant owners to pursue, but policy intervention such as tax breaks or subsidies could support this practice and achieve its benefit to society.

1.2.4.1 Financial Benefits and Costs

The US Environmental Protection Agency (EPA) identified ways to reduce wasted food and packaging in food service centers and restaurants – source reduction or preventing waste before it is created, reuse, and recycling/composting – and specified the benefits out of these practices[15]. The financial benefits consist of saving money by reducing over-purchasing and disposal costs; reduced sewer treatment, plumbing and electricity costs for garbage disposal and other kitchen plumbing needs; revenues from selling compost or using it for landscaping or growing food; revenues from selling recycled materials. Disposal cost savings – hauling and tipping costs – were also identified as benefits in a study done for the New York State Energy Research and Development Administration (NYSERDA)[16] other studies dealing with food waste reduction.

David and Konisky (2000) has a wider coverage of impacts of the food service and retail industries. It covers not just food waste but also energy consumption for cooking, lighting and refrigeration; water emission; and, food safety[17]. But the paper dealt more on environmental impacts and how these could be reduced by engaging with the food service and retail industries' suppliers and consumers, rather than an explicit discussion of financial benefits. The paper, though, has pointed out that energy, water, and solid waste (food waste, packaging materials) are major sources of environmental impact in the food industry that need to be addressed for sustainability goals.

Most of the benefits and costs being cited are external (environmental/ecological, economic, social, human well-being). The financial benefits implied in the study are reduced food transport costs, reduced food storage costs and lower food procurement costs (if produced in own farms).

The same studies also mentioned the costs incurred in adopting SCP practices. In waste reduction, the major costs would be the costs of equipment (including repair and maintenance), systems, training and personnel for tracking and sorting waste; costs of equipment, land, materials and/or personnel for recycling/composting; and, costs of re-packaging and delivering donated food (if done by the restaurant owners).

The financial costs of energy-related SCP practices mainly involve the acquisition of energy-saving equipment, including their repair and maintenance. Similarly, for water-saving practices the costs pertain to the acquisition, installation, and upkeep of low-flow fixtures, devices and equipment.

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[13] Asian Development Bank, "Cost-Benefit Analysis for Development: A Practical Guide," 2013

[14] NEDA-ICC, "Project Evaluation Procedures and Guidelines," June 2004.

[15] US EPA, "Reducing Wasted Food and Packaging: A Guide to Food Services and Restaurants"

[16] Industrial Economics, "Benefit-Cost Analysis of Potential Food Waste Diversion Legislation" (March 2017)

[17] Tony Davies and David M. Konisky, "Environmental Implications of the Food Service and Food Retail Industries," Resources for the Future Discussion Paper 00-11 (March 2000),

Local food system (LFS) sourcing has been discussed in a number of literature and the views have been mixed on whether or not the benefits from practices pertaining to this area outweigh their costs[18]. Hence, the analysis needs to be approached on a case-to-case basis.

For food sourcing, the costs are also mostly economic (external) in nature, with Schönhart (2009) pointing out a few costs that may accrue to restaurant owners practicing local sourcing. These are the cost of transport from the farm to the establishment (gasoline and maintenance expenses if the vehicle is owned by the restaurant), cost of local production inputs and cost of land. The latter two apply if the restaurant grows its own food and if the land is leased, respectively. There are also other costs that are difficult to quantify, such as reduced customer demand if locally produced food are of less quality in terms of taste, nutritional value, etc. than externally procured food.

1.2.4.2. Economic Benefits and Costs

For all the sustainable practices, the literature unanimously considers the reduction of greenhouse gas (GHG) emissions, especially CO_2 (carbon dioxide), CH_4 (methane) and CFC (chlorofluorocarbon) as the biggest benefit. Guidelines such as the UK Government GHG Conversion Factors[19], for example, convert all GHG emissions into carbon emissions for simplicity and ease of assessment. Even water emission/pollution have an equivalent amount of CO_2 emission under the UK Government guidelines.

Quantifying benefits out of reduced carbon emission would require the amount reduced to be multiplied by the price per unit (the unit used is usually kilogram or ton) of carbon captured or reduced in the international carbon market, converted into its economic value. The appropriate price to be used can be obtained from international organizations like the World Bank[20], which more or less are aligned with the pricing set forth under the Paris Agreement of 2016 that seeks to reduce global warming to "*below $2^{O}C$ above pre-industrial levels*" by achieving net carbon emission of zero in the 2nd half of the 21st century.

Other economic benefits include:

- Reduced cost of maintaining landfill/dumpsite (recycling, reuse, recovery of waste practices)
- Value of materials recovered (recycling, reuse, recovery of waste – if value accrues to parties other than the restaurant)
- Sanitation, health and odor concerns reduced (recycling, reuse, recovery of waste practices)
- Methane for energy use (Reuse, recovery of waste practices)
- Food donation benefit to society – reduction of hunger
- Reduced hauling frequency/less frequent food waste collection (will also mean less emissions from transport)
- Reduced environmental effects of transportation due to local food sourcing
- Fresh, better tasting food (local sourcing)

A treatment of social benefits in economic analysis mainly deals with measuring the distribution of net economic benefits among the major groups – consumers, workers, investors, suppliers and government (the groups can be further disaggregated)[21]. There could be other ways of presenting social benefits, such as the project's impact on poverty reduction (as measured by the increment of income that accrues to the population living below the poverty line) and job generation. The review of literature continues to more firmly establish what these benefits are and how they are quantified.

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[18] Martin Schönhart, et al. (2009).

[19] UK Government Conversion Factors for Company Reporting (2008), www.gov.uk/defra

[20] World Bank Group, "State and Trends of Carbon Pricing" (May 2018). Other sources of carbon pricing include Asian Development Bank, "Guidelines for establishing greenhouse gas emissions of Asian Development Bank Projects: additional guidance for clean energy projects" (2017); and, OECD, "Effective Carbon Rates: Pricing CO_2 through Taxes and Emissions Trading Systems," (2016).

[21] Asian Development Bank, "Guidelines for the Economic Analysis of Projects," 2017.

Economic costs mostly consist of financial costs converted into their economic values using shadow pricing, especially for the foreign exchange (import), unskilled labor, land and utilities (power and water) components of the costs, and with taxes and subsidies taken out[22].

Emissions associated with the production and distribution (e.g., transport) of recovered/recycled wastes, locally produced food, compost, etc. can also be regarded as economic costs. Other costs, albeit difficult to quantify, would be less efficient operations and lack of economies of scale in local sourcing, breakdown of industry value chain/specialization also due to local sourcing.

1.3 KEY INSIGHTS FROM INITIAL COST-BENEFIT ANALYSIS

The Study focused on the experiences of a sample of six (6) partner establishments classified under three (3) scenarios with two (2) establishments representing each of the three (3) scenarios:

Table 2 – SCENARIO CLASSIFICATION OF RESTAURANTS SAMPLED

Scenario 1	Restaurants who have low awareness of SCP and is only starting to apply SCP principles in its operations.	**Scenario 1-A Restaurant** **Scenario 1-B Restaurant**
Scenario 2	Restaurants are aware of the importance of SCP and are in the process of observing them in their operations. They also have plans for investment or have just started investing in tools in aid of SCP application.	**Scenario 2-A Restaurant** **Scenario 2-B Restaurant**
Scenario 3	SCP practices are present in most of the four (4) areas and are actually incorporated in the vision, plans, programs and operations of the business. SCP principle is integrated in its business model.	**Scenario 3-A Restaurant** **Scenario 3-B Restaurant**

Annex 1 details the process of redefining the scenario classification used in this study.

From the on-site visits, questionnaires, and interviews of sample partner restaurants, it was discovered that there were 22 SCP practices applied in the areas of sustainability – energy (mainly electricity), water, food waste, non-food waste (paper, plastic, glass and metal) and local (food) sourcing. **Table 3** summarizes these SCP practices.

Table 3 - SUMMARY LIST OF SCP PRACTICES IN SAMPLE RESTAURANTS

SUSTAINABILITY AREAS/ SCP PRACTICES	RESTAURANT SCENARIO					
	3A	**3B**	**2A**	**2B**	**1A**	**1B**
ENERGY (ELECTRICITY)						
1. Turning off of Air-con &/or lights in certain areas at certain hours; rules or schedule set for opening air-con, lights, etc.	**X**			**X**	**X**	**X**
2. Use of LED &/or energy saving, higher efficiency rating appliances, and their proper maintenance	**X**	**X**	**X**	**X**	**X**	**X**
3. Maximizing use of chiller capacity, use of refrigerators/freezers	**X**					

[22] In the Philippines, the National Economic and Development Authority Investment Coordination Committee (NEDA-ICC) provides a guide on how to derive the economic cost of projects. For details, refer to NEDA, "ICC Project Evaluation Procedures and Guidelines" (June 2004), pp. 6-8.

SUSTAINABILITY AREAS/ SCP PRACTICES	RESTAURANT SCENARIO					
	3A	3B	2A	2B	1A	1B
WATER						
1. Checking of unclosed faucets and leaks regularly	X					
2. Use of other materials or water-saving methods to clean dishes/kitchen utensils (no equipment or devises are used)	X					X
3. Use of water filters, purifiers or treatment devices (e.g., oxygenator) for drinking &/or cooking water	X	X				X
4. Re-using water (e.g., water used for washing dishes also used for cleaning floors)				X		
FOOD WASTE (INCLUDING PACKAGING)						
1. Menu planning, market list, JIT delivery of food supply, quality inspection of deliveries	X		X	X		
2. Re-using food waste for the preparation of other meals	X	X				X
3. Composting – Bokashi, etc.	X	X	X			
4. Using food waste as animal feed	X	X			X	
5. Kitchen/meal surpluses given/sold to employees		X				X
6. Use of non-plastic (e.g., paper) bags and packaging materials for take-outs			X		X	
7. Encouraging customers to bring home unconsumed meals				X		
NON-FOOD/GENERAL WASTE						
1. Recycling of paper into bags, baskets and other items	X				X	
2. Recycling of plastic materials into eco-bricks, etc.	X					
3. Applying practices such as waste segregation; brings/sells some non-food waste to MRF, original suppliers	X	X	X	X	X	X
LOCAL SOURCING						
1. Producing some amount of herb, vegetable, and/or fruit supply from own farm; sells some to restaurant customers	X	X		X		
2. Sourcing some vegetables and/or fruits from contract farms		X	X			
3. Sourcing some vegetables, fruits and other farm products from local (non-contract) farms/producers		X		X		
OTHER SCP PRACTICES						
1. Staff training on restaurant's sustainability mission and practices/maintenance of a list of SCP practices, regularly updated	X	X				

The greatest number of SCP practices applied was in food waste management where eight SCP practices were found. The most prevalent SCP principles integrated into business operations were the use of energy-saving or high efficiency-rated equipment and lights and waste segregation, where all sample restaurants claimed to be part of their operations. It appears that the prudent choice of equipment has the most significant financial impact on their business, while waste segregation is mandated by local governments which is a condition for issuing the business permit and which is mainly responsible for collecting their garbage.

On food waste management, the predominant practice is menu planning and quality control of ingredients (reduction), re-use of ingredients and unconsumed meals for the preparation of other dishes (re-use), use as animal feed (re-use/donation), and composting (recycling). Although giving of unused supply or unconsumed meals to employees got modest response, it is felt that many restaurants could be adopting this practice as a matter of culture.

SCP practices on water do not seem to register well among the sample restaurants, perhaps due in part to the challenge posed by the relatively inadequate water supply infrastructure in the location of many of the restaurants. This meant having to generate their own water supply, which compared to baseline conditions could be less efficient and more costly, even with the adoption of sustainable practices.

Annex 2 specifies the practices of each of the partner restaurants in the sample.

The initial cost benefit analysis showed that financial benefits and costs for restaurants are highest in SCP practices applied in energy. However, lack of details on the restaurants' energy-saving devices and their comparative conventional equipment, especially their energy consumption ratings and costs, as well as their repair and maintenance expenditures preclude proper benefit-cost evaluation.

There are less restaurants adopting SCP in water, and the financial benefit is also lower. But for those doing their own water purification/filtration system, there appears to be significant potential financial savings out of this practice.

The initial analysis also showed that the benefits of managing food waste especially through composting and use as animal feed appear low and, in the cases presented, costs exceed the benefits. It is assumed that this could be partly because the volume of waste involved is low, while costs as provided by restaurants may not be totally attributable to the practice, such as the statement that gardeners spend 25% of their time on composting.

Initial analysis also showed that the benefits out of the use of food waste as animal feed is also relatively small due to the small amount of waste involved. The highest benefit is the re-use of food for the preparation of other meal selection, at PHP 600,000 to 700,000 per annum, practiced by two (2) sample restaurants. Moreover, cost of the practice is minimal if there is cost at all, because it uses existing facilities and staff performing regular functions.

The same could be true for own farm production, where harvests as declared by the restaurants do not seem commensurate with the cost of labor and materials (cost of land and land improvements were even excluded as this was assumed to be previously owned by the restaurants and not just recently acquired to operate a farm). This raises some issue on the productivity of farms due perhaps to lack of scale economies (the literature shows yield for a particular crop to be at least four (4) times higher than the claim of one (1) restaurant), understated production (some harvests not declared as they could be sold elsewhere other than delivered to the restaurant), farmers/gardeners performing other tasks other than tending to the restaurant's small plot, etc.

Recycling of non-food waste, especially paper, seems to have few advocates. Although the results indicate financial benefit to outweigh financial cost, the market value of the paper by-products need to be validated further with respect to nearly equivalent items sold in the market.

In the initial analysis, the economic benefits are mostly environmental, specifically the greenhouse gas (GHG) emissions, as reflected in carbon emissions (CO_2-e) avoided as a result of savings in the use of resources and in the disposal of wastes; and the value of new goods created (which already incorporates benefits to workers in terms of labor costs and to other sectors which provide inputs to production) through recycling and re-use. Benefits derived from CO_2-e avoidance turned out to be low, quite lower than the financial benefits from the SCP practice, as accounting for residual effects such as emissions is almost always smaller than the value of output or of use of the resources presented in the financial analysis.

Also, in quantifying the benefit due to new value creation, the price to be used in the valuation should be the social price rather than the market price, which involves either a survey on how much people are willing to pay for the good or a deeper study on various prices paid for the good or service and getting their weighted average. For example, for water, it can be sold by the water utility company, private water delivery trucks, suppliers of bottled water, etc. In general, the social or economic price of a scarce commodity is higher than its market price.

The analysis also does not present values for the third class of benefits, the externalities or gain to society beyond the direct impact of the practice on business finances, direct emissions, and economic valuation of output. The recurrent theme in the case studies on the cost of materials (e.g., plastic bottles) saved and emissions avoided from fuel consumption of delivery vehicles (delivery of purified water, farm produce outside of local sources) are illustrations of these benefits. Unfortunately, these were not measured in the study.

In short, it is likely that the economic, environmental and social benefits as presented in the initial analysis was understated. Corresponding costs, however, would require fine-tuning to reflect all major cost components. Although financial costs were converted into economic costs using standard conversion factors in project evaluation of the national government, more accurate cost structure for each of the new products created out of waste would be necessary for a more realistic economic assessment.

The results of the economic benefit-cost comparison follow a similar pattern as the financial assessment. SCP in energy was most beneficial, followed by water filtration/purification. Food waste management, notably applied in converting food waste into animal feeds and compost, yielded benefits, but again were overshadowed by costs possibly due to flaws in the cost data provided. Local sourcing, as a result of conversion of financial costs into economic costs, recorded positive net benefits, and benefits higher than food waste management SCP practices.

Annex 3 and **Annex 4** summarizes the financial and economic benefits and costs used in the initial cost-benefit analysis.

1.4 PLANNED NEXT STEPS

While the initial cost-benefit analysis was broadly indicative of the scale of benefits derived from SCP practices applied in food service establishments in the Philippines, the results could still benefit from improved accuracy and confidence in the values used as parameters for the development of the cost-benefit tracking and monitoring system.

On the financial aspect, there is a need to enhance the cost structure of the commodities produced and new products created out of the SCP practices, and on the particulars of the equipment acquired to optimize resource use. Specifically, the following areas need to be improved on, either through further consultations and data gathering with the sample restaurants, discussions with industry experts, and further literature review:

- Relevant details on the energy-saving equipment used by the restaurants: cost of acquisition, capacity, energy rating/usage, annual repair, maintenance and other operating expenses

- Volume of own production of purified water (daily or monthly) and costs incurred in the production apart from water consumption, i.e., labor, materials, etc.

- Details on own farm production: production/harvests per year, farm area (sqm), major costs per year (labor, materials such as fertilizer and seedlings, water supply, etc.), and capital expenditures if applicable such as land acquisition and land improvement

- Cost items on composting: labor, materials (e.g., bran), initial investments like containers; corresponding production of dry compost (kg) out of waste input (kg), corresponding to costs provided.

For the economic/environmental benefit and cost assessment, most of the additional information needed could be secured from further review of the literature. Essentially, enhancements need to focus on establishing social prices of the incremental output generated from the SCP practices, as well as the presentation of external benefits or positive externalities previously mentioned.

It was intended that in the next stage of the study, which is the development of tracking and monitoring tool, many of these data gaps can already be addressed.

1.5 THE IMPACT OF COVID-19

The timeline for this study was slated to conclude with the conduct of a training on the SCP monitoring tool and a test-run of the tool with partner restaurants. This last phase was intended to validate and improve the accuracy of the initial findings from the study by adding the data taken from the SCP monitoring tool and by engaging partner restaurants to confirm and plug the gaps in information that they were unable to provide at the start of the study. Unfortunately, the study plans needed a re-adjustment when the coronavirus pandemic made it impossible to conduct face-to-face trainings and closed the operations of food service establishments in the Philippines for several months. The disruption led to several changes in the original plans in the study:

- On-site trainings and cascading of the SCP monitoring tool was canceled and instead a video training was recorded by the team and sent to the partner restaurants.
- The data encoded in the SCP monitoring tool will no longer be actual data gathered from the two-month operations of the restaurant but would instead be historical data from past operations of the restaurants when they were still operating normally.

There were also some partner restaurants that were originally part of the study that have ceased operations because of the coronavirus pandemic.

2.0 MODIFIED ANALYTICAL APPROACH IN THE CONDUCT OF EXPANDED COST BENEFIT ANALYSIS

Constraints in obtaining additional information from the sample of WWF partner restaurants, due especially to the challenges faced by the establishments as a result of the pandemic, have prompted the Study Team into modifying their approach in carrying out expanded cost-benefit analysis (e-CBA). Moreover, as mentioned as early as the start of the study engagement, it was already noted that standard and full-blown cost-benefit analysis may not be applicable for the sustainable practices, as the purpose is not evaluating the feasibility of a proposed project but simply making a case for the adoption of these practices in food service establishments.

2.1 SCOPE AND LIMITATIONS

The e-CBA covered only a limited number of sustainable practices, under the four major areas of sustainability – energy (electricity), water, food waste, and local sourcing. The choice on what to analyze was based on those which are already integrated into the operations of two (2) or more of the six (6) sample partner food service establishments, and where sufficient data have been provided by the establishments for facilitating the analysis. Even the focus on the four (4) areas of sustainability was dictated by the results of the interviews with the WWF partner restaurants, which confirmed that most, if not all, their SCP practices are within these areas.

There were, however, certain SCP practices that were excluded in the analysis, specifically those dealing with non-food waste management (packaging, paper, plastic, etc.) as it was noted that urban local government units (LGUs) already have re-use and recycling programs through materials recovery facilities (MRFs). Restaurants simply have to segregate their recoverable trash for collection, which in turn are delivered by the collectors to the MRF, or sell these materials to the MRF or to those reselling them to MRFs. One (1) restaurant, however, was observed to maintain a

program for paper recycling (into bags, fashion accessories, etc.) as part of its corporate social responsibility (CSR) endeavor with an adopted community.

The practices covered by the expanded cost-benefit analysis were as follows:

Energy (Electricity)

(a) Use of energy-saving (5-star rated) air-conditioners
(b) Use of energy-saving (5-star rated) freezers/chillers

Water

(c) Own production of purified water

Food Waste Management

(d) Repurposing into new meal selection
(e) Use as animal feed
(f) (Bokashi) composting

Soft Measures

(g) Other unspecified SCP practices and interventions to conserve energy and water, and reduce food waste

Local Sourcing

(h) Own farm/garden production of raw/fresh food ingredient (vegetables and/or herbs and spices)
(i) Contract growing (vegetables)
(j) Import replacement (beef)

The analysis was performed over a five-year operating period but with an initial year (Year 0) set for the acquisition of major tools and capital equipment, where applicable. The five-year operating period assumes that the life of a typical restaurant (or farm/garden) equipment is five (5) years. It could be more than five (5) years, however. An air-con, for example, could last up to ten (10) years, but the added assumption was that efficiency falls after five (5) years and the owner replaces the units with new and more efficient ones. The old ones are resold – as these would still be working – for a small percentage of their book value at replacement cost (i.e., the percentage of value is adjusted for inflation).

2.2 MODIFIED ANALYTICAL FRAMEWORK

Just like the standard cost-benefit analysis approach, values of indicators of feasibility were derived, specifically net present value (NPV) and benefit-cost ratio (BCR). NPV compares the sum of the annual streams of benefits with those of costs, with future values translated into present values (their future values at today's prices). NPV should be greater than zero, i.e., cumulative benefits at today's prices exceed the comparable costs, for the practice to be considered financially rewarding.

The formula for determining the NPV is as follows:

$$NPV = K + (B_1-C_1) + (B_2 – C_2)/(1 + r) + (B_3 – C_3)/(1 + r)^2 + ,,, + (B_N – C_N)/(1 + r)^{N-1}$$

Where K = Capital cost
B_n = Annual Benefit at Year n; n = 1, 2, 3, …, N

C_n = Annual operating and maintenance costs at Year n; n = 1, 2, 3, …, N
r = weighted average cost of capital (WACC), expressed in percentage

While for computing the BCR, the formula is:

$$BCR = [B_1 + B_2/(1+r) + B_3/(1 + r)^2 + \ldots + B_N/(1 + r)^{N-1}]/[B_1 + B_2/(1+r) + B_3/(1 + r)^2 + \ldots + B_N/(1 + r)^{N-1}]$$

Incidentally, the discount rate used in translating benefits and costs into present values is the weighted average cost of capital (WACC), or the weighted average yield of the combination of the loan (where the yield is the interest rate paid) and owner's cash (the yield is the earnings if the cash invested instead in the highest-yielding financial instrument) used to invest in the SCP practice. The e-CBA, however, assumed that the practices would be purely financed by own funds or cash, with an alternative return of 3.1%, the highest yield of long-term peso bonds in February 2021, which was also the WACC.

The BCR measures the ratio of the sum of the discounted annual streams of benefits and the sum of the discounted annual streams of costs. It should be greater than 1.0 for the practice to be considered viable. A practice may have large positive NPV relative to another, which means the establishment gets more in absolute amount of net financial benefit from the former. But if the latter has higher BCR, it means it is more cost-effective or generates "bigger bang for the buck" and could be more beneficial if there is an opportunity for scaling it up.

Both financial and economic (economic, environmental, and social) analyses have been performed for each of the selected SCP practices. Financial CBA determines the viability of the practice from the viewpoint of the restaurant owner in terms of financial rewards it potentially reaps. Economic CBA ascertains the viability or desirability of the practice to society-at-large, which can make a case for the formulation of policy measures and/or programs by the national or local governments to support or mandate the adoption of the practice, especially if it is not financially attractive for restaurants to adopt.

For economic CB analysis, financial costs were converted into economic costs and financial/market prices into economic prices where necessary or applicable. The rate used for discounting the streams of benefits and costs into present values was the NEDA Investment Coordination Committee prescribed social discount rate (SDR) of 10%.

The analysis was standardized to apply for a restaurant with uniform physical characteristics, specifically size (floor area of dining + kitchen + storage + office), number of diners, dining seat turnover (number of diners per seat per day), daily usage of electricity, etc. This way, the NPVs and BCRs derived for each of the practices can be seamlessly compared with the others such that meaningful conclusions can be made. The standard features or characteristics were based on the average values for each of the attributes of the sample food service establishments. **Table 3** details the characteristics of a "standard" establishment used in the analysis for this study.

Table 4 – CHARACTERISTICS OF A STANDARD ESTABLISHMENT

Establishment floor area (sqm)	347.5
Number of diners per day	133
Number of diners per seat per day	1-2 (1.5)
Air-conditioner usage per day (hours)	11.37
Raw food ingredient (RFI) requirement per day (kilos)	57.0
Meal order per diner (kilos)	0.343
Value of meal order per diner (PHP)	686.00
Operating days per year	360

Source of basic data: Interviews and data provided on the operations of sample partner food service establishments

2.3 DATA SOURCES

In the initial CB analysis it was already challenging to obtain data from the sample restaurants, it became even more so with the COVID-19 pandemic. The initial attempt at CB analysis had numerous data gaps from the establishments themselves which were supposed to be addressed by follow-up data requests, but which were not responded to. Nonetheless, to come up with broad results and conclusions, the e-CBA relied on the following resources to facilitate some meaningful analyses:

- Data, information, and results of initial e-CBA presented in the Baseline Data and Cost-Benefit Analysis Report (finalized February 2020) – these were based on interviews and consultations with the six WWF Partner Restaurants representing three Scenarios of integration of sustainability into their operations, review of literature, and conversion factors used by environmental agencies (e.g., US EPA, UK Government, World Bank, ADB, etc.)

- Additional review of literature, internet resources on standard cost ratios and conversion factors, especially costs to address gaps related to the Baseline Data and CBA Model Report, such as:

    - Cost structures in the cultivation of certain crops (vegetables, herbs, and spices): obtained from selected studies especially of the Department of Agriculture (DA), Department of Trade and Industry (DTI), and PCARRD of the Department of Science and Technology

    - Cost and efficiency rating, electricity consumption of air-con, freezers and other electrical equipment from the Department of Energy, DTI, and US EPA

    - Additional baseline data on food waste (Finland 2012 and UAE 2015 studies)

    - Conversion of market prices into economic prices based on values extracted from 2012 Input-Output Tables, and figures from previous feasibility studies conducted by consultants

    - Operations and maintenance (O&M) expenses based on standard costs in feasibility study guidelines of government agencies like LWUA, DPWH; restaurant cost studies from online sites; and previous feasibility studies prepared by the consultants

    - Relevant parameter values from parallel WWF and other studies, specifically the UNEP GACMO tool of measuring the carbon emission impact of specified restaurant equipment and importation of fresh produce (e.g., beef, fish, etc.)[23] and the Life Cycle Analysis (LCA) study by WWF Philippines and Philippine Center for Environmental Protection and Sustainable Development, Inc. (PCEPSDI).

3.0 RESULTS OF THE EXPANDED COST BENEFIT ANALYSIS

This section focuses on the identification and valuation of benefits and costs, key assumptions used in the valuation of benefits and costs, and results of the CB analysis (NPV and BCR) for the sustainable SCP practices. Separate results for the financial and economic (economic/environmental/social) CB analyses are presented. The final section summarizes the results for all SCP practices and derives conclusions from the summarized results.

3.1 ENERGY SCP PRACTICES

[23] http://www.unepdtu.org/publications/the-greenhouse-gas-abatement-cost-model-gacmo/

3.1.1 Use of energy-saving air-conditioning units

a) Financial CB Analysis

Based on discussions with sample restaurants, it appears that the use of energy-saving air-conditioning units is the most common SCP practice in energy. This is in large part due to the increasing availability of more energy efficient models relative to the less efficient ones. The so-called "conventional" air-conditioning units are now those that are relatively less efficient (but still efficient or star-rated) compared to the highly efficient latest models. The lowest-rated models available in the market, it would seem, are still 3-star rated.

The rationale behind the prolific take up of energy-saving air-conditioning units among food service establishments stems from cost-savings. This Energy SCP practice gives restaurant owners practical financial advantage to prefer the use of air-cons that consume less electricity given its huge share in the electricity bill even though the restaurant does not consciously observe sustainable practices.

The financial benefits in the use of the highest star-rated air conditioners are expressed in terms of practical cost savings in electricity bill compared to the "conventional" model (in this case, 3-star rated equipment which are still available in the market). Based on internet research on specifications of each of the units, it was estimated that electricity consumption of a 5-star unit is 5,100 watts, while for the conventional unit it is 5,180 watts. Hence, for every hour of usage, the most energy efficient unit saves 80 watts of electricity.

The assumptions used in the computation of financial benefits are found in **Table 5.**

Table 5 – ASSUMPTIONS USED IN THE ESTIMATION OF FINANCIAL BENEFITS FROM ENERGY-SAVING AIR-CONDITIONING EQUIPMENT

Item	Assumed Value	Remarks
Floor area to be served by air-con (sqm)	347.5	From Section 2.2
Size/cooling capacity required	147,500 KJ/hour (17 HP)	@ 1 HP/20 sqm
Number of air-con required	3	Capacity of each air-con is 6-7 HP
Number of hours of daily operation	11.4	From Section 2.2
Energy consumption 5-star unit (watts)	5,100	
Energy consumption conventional unit (watts)	5,180	
Cost of 5-star unit (PHP/unit)	94,370	phpriceprice.com (Carrier ASBFM)
Cost of conventional unit (PHP/unit)	45,883	Phpriceprice.com (Samsung AFLI8M41MAEENTC)

The air-conditioners were assumed to be replaced after Year 5 to maintain energy efficiency. The old units are presumed to be resold, as these are still functioning albeit with less energy efficiency, at 10% of their book value adjusted for inflation. The resale value is added to the financial benefits. However, only the incremental (the difference between the cost of the 5-star and conventional units) of the so-called salvage value was recognized.

Financial costs are capital cost and operating and maintenance (O&M) expenses. Capital cost is the difference between the cost of acquisition of the 5-star units and the conventional units if the latter were acquired instead.

This was calculated at PHP 145.6 thousand. O&M expenses were set at 3% of equipment cost[24] , applied to the difference between the cost of the energy efficient unit and the conventional unit. This was computed at PHP 4,125 a year.

In the conduct of cost-benefit analysis, the WACC or discount rate used was, to reiterate, 3.1%. The comparison of the annual streams of benefits and costs, adjusted to present or today's values using WACC as discount factor, as well as the results of the analysis are found in **Table 6**. The cumulative amount of 5-year benefits exceed their comparative 5-year costs, notwithstanding their translation into present values. NPV is a positive PHP 475,000, the amount of savings in electricity cost generated by the 5-star air conditioners, which is more than what it would haveyielded the owner in interest earnings if the money was invested instead in highest yielding financial placements. Moreover, benefits exceed costs by an impressive ratio of 4 to 1 (BCR = 3.98). This certainly is a reason why even non-Scenario WWF partner and non-WWF partner food service establishments embrace energy-saving air-con devices.

Table 6 – USE OF ENERGY-SAVING AIR-CONDITIONING UNITS:
RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS
(PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		145.61		145.61	(145.61)
1	140.07		4.12	4.12	135.95
2	140.07		4.12	4.12	135.95
3	140.07		4.12	4.12	135.95
4	140.07		4.12	4.12	135.95
5	156.95		4.12	4.12	152.83
Total	717.24			166.24	551.00

Net Present Value (NPV, PHP'000) : 474.9
Benefit Cost Ratio (BCR) : 3.98

b) Economic (Economic/Environmental/Social) CB Analysis

The economic benefits recognized in the use of energy-saving air-conditioning units were two-fold: (1) the energy conserved, as energy is among society's vital resources; and (2) reduced carbon footprint or carbon emissions (CO_2-e) resulting from reduced energy usage.

The first benefit is simply financial savings in electricity but translated into economic value or their true value to society. This involves the use of economic price of electricity. In this case, the economic price was derived using the cost structure of electricity in the latest input-output table (2012), converting the relevant components of the cost structure – especially foreign (import), unskilled labor, taxes and subsidies – into their economic values based on NEDA-ICC's prescribed conversion factors. Electricity rate then became slightly higher (by 0.8%) because of the conversion of foreign component by 1.2 times its value, but which was partly offset by the exclusion of taxes and subsidies as required by the economic analysis.

[24] Data obtained from research as well as those used in recent feasibility studies done by the consultant provided a range of 2-5% of capital equipment expenditures

For the benefit of reduced CO_2-e, the kilowatt-hours of electricity saved was translated into carbon emissions avoided then multiplied by the estimated economic price of carbon coupon traded in the carbon market, using the assumptions presented on **Table 7**.

Table 7 – ASSUMPTIONS USED IN THE ESTIMATION OF ECONOMIC BENEFITS FROM ENERGY-SAVING AIR-CONDITIONING UNIT

Item	Assumed Value	Remarks
Economic cost of electricity (PHP/Kw-H)	9.48	Deleted net taxes, increased foreign component which is 7% of cost by 1.2 conversion factor (cost structure source: 2012 I-O Table)
CO_2 emission per Kw-H of electricity	0.56	ADB (2017) & Brander, et. al. (2011)
Economic price of CO_2-e (USD/ton)	50.00	World Bank (2018)
Economic price of CO_2-e (PHP/ton)	2,880.00	Using shadow exchange rate of PHP 57.6/USD 1 (market rate of 48 x 1.2 NEDA-ICC conversion factor)

Total economic benefits were estimated at PHP 165.37 thousand annually (energy resource conservation: PHP 141.33K; CO_2-e reduction: PHP 24.04K).

Based on the NEDA-ICC prescribed methodology, financial costs were converted into economic costs using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). Consequently, economic costs were determined to be 96.7% of financial costs.

The results of the economic cost-benefit analysis are presented in **Table 8**. In the economic run, the (social) discount rate used was the NEDA-ICC guidepost of 10%. The resultant figures were slightly lower for NPV and slightly higher for BCR than those generated in the financial analysis. Higher economic price of electricity, additional benefit in CO_2-e reduction, and lower economic costs were offset by higher social discount rate. Nonetheless, the SCP practice was determined to be economically viable or socially desirable. NPV was computed at positive PHP 428.21 thousand, while BCR was 4.02, hence the use of energy-saving air-conditioning units are beneficial to society.

Table 8 – USE OF ENERGY-SAVING AIR-CONDITIONING UNITS: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		140.75		140.75	(140.75)
1	165.37		3.99	3.99	161.39
2	165.37		3.99	3.99	161.39
3	165.37		3.99	3.99	161.39
4	165.37		3.99	3.99	161.39
5	165.37		3.99	3.99	161.39

Total	826.86			160.86	666.18

Net Present Value (NPV, PHP'000): 428.2
Benefit Cost Ratio (BCR) : 4.02

3.1.2 Use of energy-saving freezers/chillers

a) Financial CB Analysis

Freezers and refrigeration equipment are perhaps the second largest consumer of electricity in restaurants after air-conditioners. Like air-conditioner CB analysis, the financial benefit of this SCP practice is expressed in terms of savings in electricity bill. Also, in the near absence of "conventional" units in the market, the comparison is made between a 5-star model (energy efficiency factor or EEF $\geq$ 200) and a model having among the lowest EEF for units with similar storage capacity.

Given the daily raw food ingredient (RFI) , or the gross quantity by weight of main ingredients used in the preparation of a meal, of 57 kilos for the analysis' standardized restaurant and assuming further that the establishment maintains an inventory of food items in the freezer equivalent to one week customer demand, and that a 25% allowance in storage capacity is provided for an expected 5% annual increase in diners over 5 years, the freezer capacity has been computed at 1,454 liters. Hence, this would require three units of chillers/freezers of about 18 cubic feet (500 liters) each.

For analysis, the freezers are projected to be operated 24/7. Although the capacity of the units is roughly similar capacity (near 18 cubic feet), the 5-star unit (Whirlpool upright freezer) consumes 1.75 Kw-H in 24 hours while the "conventional" unit (Haier chest freezer) consumes 4.2 Kw-H, which means PHP 8,290 per annum savings for the operation of three (3) units of the energy-saving freezers.

Similar also to air-conditioners, it was assumed that after a 5-year operating period, the freezers would be replaced with new and more efficient units, and the old ones resold at 10% of book value adjusted for inflation. The salvage value was recognized as benefit, which was estimated at PHP1,740, the difference between the value of re-selling old 5-star units and old conventional units.

Financial costs consisted of capital cost and operating and maintenance (O&M) expenses. Capital cost was the difference between the cost of acquisition of the 5-star units and the conventional units. Based on data obtained on the market prices of the units, the difference was calculated at PHP 15,000. O&M expenses were set at 3% of equipment cost applied to the difference between the cost of the energy efficient units and the conventional units. This was computed at PHP 450 a year (PHP 2,700 for energy efficient units less PHP 2,250 for conventional units).

The results of the financial cost-benefit analysis are found in **Table 9**. The cumulative amount of 5-year benefits exceed their comparative 5-year costs, and with NPV at a positive PHP 21,620. Moreover, benefits exceed costs by a ratio of slightly above 2 to 1 (BCR = 2.3). These results indicate financial savings potential for the restaurant in operating energy-efficient freezers/chillers, although the net beneficial impact appears to be less than that of energy-saving air-conditioning units.

Table 9 – USE OF ENERGY-SAVING FREEZERS/CHILLERS:
RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS
(PHP'000)

WACC: 3.1%

Year	Benefit	Costs	Net

		Capital	O & M	Total	Benefit
0		15.00		15.00	(15.00)
1	8.29		0.45	0.45	7.84
2	8.29		0.45	0.45	7.84
3	8.29		0.45	0.45	7.84
4	8.29		0.45	0.45	7.84
5	10.03		0.45	0.45	9.58
Total	43.18			17.25	25.93

Net Present Value (NPV, PHP'000): 21.62
Benefit Cost Ratio (BCR) : 2.31

b) Economic (Economic/Environmental/Social) CB Analysis

As in air-conditioning units, the economic benefits recognized in the use of energy-saving freezers/chillers were the same: (1) the energy resource conserved by society; and (2) reduced carbon footprint or carbon emissions (CO_2-e) avoided from reduced energy usage.

Again, similar to 3.1.1 b (economic benefit of use of energy-saving air-conditioners), the first benefit is also the financial savings in electricity translated into its economic value. Conversion into economic value involves the use of economic price of electricity. For the second benefit of reduced CO_2-e, the Kilowatt-hours of electricity saved from the use of energy-efficient freezers was similarly translated into carbon emissions avoided then multiplied by the estimated economic price of carbon coupon traded in the carbon market, using the assumptions also presented on the preceding **Table 7**.

Total economic benefits were estimated at PHP 9,790 annually (energy resource conservation: PHP 8,363; CO_2-e reduction: PHP 1,422).

Financial costs were converted into economic costs, also using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). Economic costs were determined to likewise be 96.7% of financial costs.

The results of the economic cost-benefit analysis are presented in **Table 10**. Net present value (NPV) was estimated at a positive PHP 19,042, indicating economic feasibility for the practice, although lower than the NPV in the financial analysis as the beneficial higher economic price of electricity, additional CO_2-e reduction, and lower economic costs were offset by the higher social discount rate. The BCR was 2.3, also reflecting viability and cost effectiveness, and which was the same as the figure obtained in the financial CB analysis.

Table 10 – USE OF ENERGY-SAVING FREEZERS/CHILLERS:
RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS
(PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		14.50		14.50	(14.50)
1	9.79		0.43	9.35	9.35

2	9.79		0.43	9.35	9.35
3	9.79		0.43	9.35	9.35
4	9.79		0.43	9.35	9.35
5	9.79		0.43	9.35	9.35
Total	48.93			16.67	32.25

Net Present Value (NPV, PHP'000): 19.04
Benefit Cost Ratio (BCR) : 2.30

3.2 WATER SCP PRACTICES

3.2.1 Use of filters, purifiers or treatment devices for drinking and cooking water

a) Financial CB Analysis

Three of the six sampled WWF partner restaurants produced their own purified water for drinking and cooking instead of purchasing bottled water from third party suppliers, with one having a relatively sophisticated oxygenation system. In the financial analysis, it was assumed that the standardized restaurant adopts a simple water purification system with disposable filter which was observed to be the practice in the other two establishments.

At any rate, the financial benefit is the same regardless of the method of water treatment used: savings in the alternative purchase of bottled water. The standardized features of the food service establishments adopted for the analysis of this SCP practice included monthly consumption of water (388 cubic meters a month), and percentage of water consumption used for purified drinking and cooking water (3%). These were based on the weighted average values from the responses of the interviewees, 5 restaurants for the monthly water consumption, 3 for the water purification SCP practice. Moreover, it was assumed that the number of diners increase by 5% annually, and accordingly water consumption also increases by that pace of growth.

The assumptions used in the computation of financial benefits are summarized in **Table 11**.

Table 11 – ASSUMPTIONS USED IN THE ESTIMATION OF FINANCIAL BENEFITS FROM USE OF FILTERS, PURIFIERS OR TREATMENT DEVICES FOR DRINKING AND COOKING WATER

Item	Assumed Value	Remarks
Water consumption (m^3/month)	388	Average of 5 sample restaurants
Own purified water production (% of water consumption)	3.0	Average of 3 sample restaurants with water filters/purifiers
Growth in purified water production (%)	5.0	Annually
Cost of bottled water (PHP/gal)	15	
Gallons per cubic meter	264	

Given the above assumptions, own-restaurant production of purified water rises from nearly 140 cubic meters (36,900 gallons) in Year 1 to about 170 cubic meters (44,860 gallons) in Year 5. This translates into savings in the purchase of bottled water of PHP 554 thousand in Year 1, increasing to PHP 673 thousand in Year 5 – the financial benefit of the SCP practice.

The simple filtration system, according to interviews, require the installation of water filters costing around PHP 900 (December 2020), and replaced every month. In addition, the e-CBA Team incorporated into the analysis a one-time capital expenditure of a conservative (on the high side) PHP 10,000 for the installation of a dedicated water connection for producing purified drinking and cooking water. Allocation was also provided for the annual repair and maintenance of the installation at 3% of capital cost or PHP 300 per annum.

The most significant operating expense for the own water purification practice would be the cost of "raw" (piped) water used to produce safe and better-quality drinking and cooking water. With an average cost of unfiltered water of PHP 85/cubic meter derived from the responses of 5 sample establishments, the expenses on this cost item were projected from PHP 11,870 in Year 1 to PHP 14,430 in Year 5.

As can be gleaned from **Table 12,** water filtration by restaurants to produce their own drinking and cooking water generates tremendous financial benefits given the high cost of purchasing the same from third party suppliers. NPV is an extremely high positive value of PHP 2.6 million, which is greater than zero; while BCR is a multiple of 23 times, or benefits are 23 times more than the SCP practice's costs. These are strong financial incentives for integrating the practice into the food service establishments operations. The one establishment adopting a relatively more sophisticated filtration system, which produces safer, better quality, and healthier drinking water, remained feasible even with higher cost outlay (PHP 30,000 in 2016) and operating expenses (PHP 250,000 annually).

Table 12 – USE OF FILTERS, PURIFIERS OR TREATMENT DEVICES FOR DRINKING AND COOKING WATER: RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		10.00		10.00	(10.00)
1	553.55		22.97	22.97	530.58
2	581.23		23.57	23.57	557.66
3	610.29		24.19	24.19	586.10
4	640.81		24.84	24.84	615.96
5	672.85		25.53	25.53	647.32
Total	3,058.73			131.10	2,927.63

Net Present Value (NPV, PHP'000): 2,584.77
Benefit Cost Ratio (BCR): 23.13

b) Economic, Environmental and Social (Economic) CB Analysis

The economic benefits of the use of filters, purifiers or treatment devices by restaurants for drinking and cooking water were identified as the following: (1) the fuel (gasoline) conserved by society due to non-delivery of bottled water by external suppliers to the restaurant; (2) reduced carbon footprint or carbon emissions (CO_2-e) from the gasoline consumption avoided due to this non-delivery; (3) providing diners safe and good quality drinking water for free instead of charging them for each order of personalized bottle of drinking water.

For the first benefit, the assumptions adopted consisted of the distance of the restaurant from purified water supplier (the presumption is the restaurant will prefer nearby reliable suppliers), gasoline consumption per distance

travelled, and economic price of gasoline. Assumptions were also specified for quantifying the second benefit of reduced CO_2-e, notably the carbon emissions generated by each liter of gasoline consumed and the estimated economic price of carbon coupon traded in the carbon market. For the third benefit, the key factors considered in its valuation included the number of diners ordering water, quantity ordered, and the price of water. It was assumed that each diner orders a bottle (237 ml) of purified water. These are all presented on **Table 13**.

Table 13 – ASSUMPTIONS USED IN THE ESTIMATION OF ECONOMIC BENEFITS FROM USE OF FILTERS, PURIFIERS AND OTHER TREATMENT DEVICES FOR DRINKING AND COOKING WATER

Item	Assumed Value	Remarks
Average delivery distance (km)	1	Restaurant will order purified H_2O from nearest quality supplier.
Gas consumption of delivery vehicle	10	Kilometers/liter
Economic price of gasoline (PHP/liter, diesel)	39.66	3% higher than average market price (Feb 2021); estimated using cost structure of petroleum products in 2012 I-O Table
Number of 5-gallon bottles per delivery	12	Consultant's estimate
CO_2 emission per Kw-H of electricity	0.56	ADB (2017) & Brander, et. al. (2011)
Economic price of CO_2-e (USD/ton)	50.00	World Bank (2018)
Economic price of CO_2-e (PHP/ton	2,880.00	Using shadow exchange rate of PHP 57.6/USD 1 (market rate of 48 x 1.2 NEDA-ICC conversion factor)
Per diner savings per purified H_2O request (PHP)	10.00	Cost of 237 ml bottled water served to each diner

Total economic benefits were estimated to rise from PHP 483,500 in Year 1 to PHP 587,700 in Year 5. Benefit from incremental drinking water for diners yields the highest value, from PHP 480,600 in Year 1 to PHP 584,270 in Year 5. The benefit of gasoline consumption avoided due to non-delivery of purified water by third parties ranges from PHP 2,440 in Year 1 to PHP 2,960 in Year 5. The value of CO_2-e avoided is minimal, only about PHP 500-600 annually.

Financial costs were converted into economic costs, also using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). Economic costs – both capital and O&M – were determined to be 93% of financial costs.

The results of the economic cost-benefit analysis are presented in **Table 14**. Although lower than the values derived from the financial analysis, net present value (NPV) was nevertheless still at a large, positive PHP 1.74 million, indicating economic feasibility for the practice. Lower recognition of direct benefits from production of purified water – only the savings of diners as drinking water is provided for free – and higher social discount rate lowered the value of economic net benefits. The BCR was 21.3, also reflecting viability and cost effectiveness, although barely half of the figure obtained from the same indicator in the financial CB analysis.

Table 14 – USE OF FILTERS, PURIFIERS OR TREATMENT DEVICES FOR DRINKING AND COOKING WATER: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		9.30		9.30	(9.30)
1	483.50		21.37	21.37	462.14
2	507.68		21.92	21.92	485.76
3	533.06		22.50	22.50	510.56
4	559.72		23.11	23.11	536.61
5	587.70		23.75	23.75	563.95
Total	2,671.67			121.95	2,549.71

Net Present Value (NPV, PHP'000): 1,738.68
Benefit Cost Ratio (BCR) : 21.29

3.3 FOOD WASTE SCP PRACTICES

3.3.1 Repurposing of food waste/unused ingredients into new meal selection

a) Financial CB Analysis

The SCP practice of repurposing food waste and unused ingredients into a new meal selection appears to be the highest usage of food waste among restaurants in the Philippines. Food wastes repurposed are mainly raw vegetable and fruit scraps and tops, unused ingredients, and unconsumed meals. This accounts for about one-third (31%) of food waste, based on the data provided by three food service establishments which confirmed that this is part of their operations. The "waste" is made into soup, side dish, or food stock for main meal selection.

For the e-CBA, the financial benefit of repurposing consists of its contribution to dining sales, with the value derived using various assumptions. The value of the repurposed meal was set at 60% of regular meal, given the observed price differential between soups/salads/side dishes and main courses, and the entire quantity of repurposed food are assumed to be fully consumed. Diner demand for repurposed food is projected to grow by 5% annually, the same pace as the projected increase in diners.

The assumptions used in the computation of financial benefits are summarized in **Table 15**.

Table 15 – ASSUMPTIONS USED IN THE ESTIMATION OF FINANCIAL BENEFITS FROM REPURPOSING OF FOOD WASTE/UNUSED INGREDIENTS

Item	Assumed Value	Remarks
Raw food ingredient requirement (kg/d):	57	Average for 6 sample restaurants
Average food waste as % of RFI:	25.4	Average for 5 sample restaurants
Repurposed (% of food waste):	31.0	Data from 3 restaurants observing this SCP practice
Value of repurposed food (% of regular meal value):	60.0	Based on the % difference of the value between soups/side dishes and main courses

Average value of regular meal order	686.00	PHP/diner (translates into PHP 2,000/kg as each order is 0.343 kg), from 6 sample restaurants

Given the above assumptions and projection of the number of diners, the benefit grows uniformly by 5% p.a. from PHP 3.878 million in Year 1 to PHP 4.713 million in Year 5.

Financial costs were computed based on the assumption that new/original RFI will be mixed with food waste/unused ingredient/unconsumed meals for repurposing at a 50:50 ratio. This implies that the former is valued at 25% of regular meal value while the latter have almost zero value. For the analysis, repurposed food is valued at the amount it requires to dispose them, estimated at PHP 1.50 per kilo based on data from solid waste management plans. The resulting average is PHP 250.75/kg of raw materials or food ingredients.

The cost of operations (labor, fuel, etc.) was also valued, at 30% of the value of repurposed meal. Capital costs, however, were not recognized. The practice does not require the purchase of additional tools and equipment. It will use kitchen gadgets and utensils that already exist.

The results of the financial cost-benefit analysis are found in **Table 16**. The cumulative amount of 5-year benefits exceed their comparative 5-year costs, and with NPV at a hugely positive PHP 9.293 million. Benefits exceed costs by a ratio of almost 2 to 1 (BCR = 1.96). These results indicate the potential of an added boost in financial earnings by producing new meal selection or using as added ingredients unused food ingredients or meals instead of throwing them away.

Table 16 – REPURPOSING OF FOOD WASTE/UNUSED INGREDIENTS:
RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS
(PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		-		-	-
1	3,877.79		1,973.63	1,973.63	1,904.16
2	4,071.68		2,072.31	2,072.31	1,999.36
3	4,275.26		2,175.93	2,175.93	2,099.33
4	4,489.02		2,284.73	2,284.73	2,204.30
5	4,713.47		2,398.96	2,398.96	2,314.51
Total	21,427.22			10,905.56	10,521.66

Net Present Value (NPV, PHP'000): 9,293.11
Benefit Cost Ratio (BCR) : 1.96

b) Economic, Environmental and Social (Economic) CB Analysis

The economic benefits of repurposing of food waste, unused ingredients and unconsumed meals recognized in the e-CBA were the following: (1) value creation, as repurposing transforms resources with practically zero value into a

good with significant value to the economy; (2) reduced carbon footprint or carbon emissions (CO_2-e) from the reduction in volume of food waste disposed occasioned by the practice.

For value creation, the value of the benefit is computed in the same manner as the practice's financial benefit, except that the financial or market price of the repurposed meal is converted into economic price. Breaking down the major cost component of the good – ingredients, labor, fuel, etc. – and applying the applicable economic conversion factor for the corresponding component, the economic value of the repurposed meal was estimated at 94% of its financial value or PHP 1,129.34/kg.

In quantifying the second benefit of reduced CO_2-e, the carbon emissions generated per kilogram of food waste (0.627 kg) was multiplied by the volume of food waste avoided by the repurposing. This was then multiplied by the estimated economic price of carbon coupon traded (PHP 2,880 per ton at shadow exchange rate of PHP 57.6/USD on exchange rate economic conversion factor of 1.2) in the carbon market.

Total economic benefits were estimated to rise from PHP 3.651 million in Year 1 to PHP 4.438 million in Year 5. Benefit from value creation was computed at PHP 3.649 million in Year 1, rising to PHP 4.436 million in Year 5. The value of CO_2-e avoided is a minimal PHP 1,640 in Year 1, rising to PHP 2,240 in Year 5.

Financial costs were converted into economic costs, also using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). The economic price of raw food ingredient was set at 25% of the value of the economic value of repurposed meal, while the economic price of food waste was set at 89% of its financial price of PHP 1.50/kg. Again, the practice does not entail capital expenditure.

The results of the economic cost-benefit analysis are presented in **Table 17**. Although lower than the values derived from the financial analysis, net present value (NPV) was nevertheless still at a large, positive PHP 7.279 million, indicating economic or societal feasibility for the practice. Lower economic price of repurposed meal and higher social discount rate lowered the value of economic net benefits. The BCR however was about equal to the financial analysis' 2-to-1 ratio, also reflecting viability and cost effectiveness.

Table 17 – REPURPOSING OF FOOD WASTE/UNUSED INGREDIENTS:
RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS
(PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		-		-	-
1	3,651.10		1,897.63	1,897.63	1,753.47
2	3,833.74		1,992.51	1,992.51	1,841.23
3	4,025.52		2,092.14	2,092.14	1,933.38
4	4,226.90		2,196.75	2,196.75	2,030.16
5	4,438.36		2,306.58	2,306.58	2,131.78
Total	20,175.63			10,485.62	9,690.01

Net Present Value (NPV, PHP'000): 7,278.61
Benefit Cost Ratio (BCR) : 1.92

3.3.2 Food waste used as animal feed

a) Financial CB Analysis

Three of the six WWF partner food service establishments allocate part of their food waste for animal feed, with one bringing them to their small organic pig farm and the rest allowing third parties to pick them up at the latter's expense. From these three establishments, the average quantity of waste used as animal feed was established at about 19%. The belief is that the practice helps backyard hog raisers reduce their feed costs and is part of the food service establishment's CSR programme.

The financial benefit of this food waste management practice is mostly realized where hog raising is integrated into the operations of the restaurant, as there is potential savings in the purchase of feed in this case. There is little or no benefit to the restaurant if the waste is given for free to small backyard hog raisers, except perhaps goodwill as it has been part of the culture and being a good neighbor to assist marginal raisers through this means. But, as will be shown later, the practice has economic benefit. Nonetheless, for analytical purposes, it was assumed that use as animal feed is related to hog raising where the restaurant is directly or indirectly involved in, hence beneficial in terms of savings on cost of feed.

Given that 19% of the standard waste generation of 25.4% of the average raw food ingredient requirement of 57 kilos per day is used as animal feed, the equivalent cost per kilo of the feed is PHP 10 (using the median price of rice bran in 2019/2020 as proxy), and the volume grows by 5% annually, the benefit increases from PHP 9,810 in Year 1 to PHP 11,930 in Year 5.

Going further with the own-restaurant pig farm assumption, and assuming further that the pig farm is located some distance away from the establishment for environmental and sanitary reasons, financial costs were estimated. These costs, guided in part by information given by the one restaurant with its own organic hog farm, consisted of containers (2 units of 80-liter heavy duty containers totaling PHP2,000); transport of the food waste to the hog farm (driver and gasoline, two trips a week at one liter per trip – PHP 18,850 per year); and feed preparation, consisting of one laborer devoting one hour per day to prepare the feed and feed the animals (PHP 1,750 per month or 12.5% of the laborer's daily wage rate + 15% social benefits).

This brings the cost of capital (the containers) at PHP 2,000 and of annual operations of PHP 39,550.

It appears from the results of the financial cost-benefit analysis in **Table 18** below that this SCP practice is not financially viable. The NPV is at a negative PHP 129,220, while the BCR is significantly less than one at 0.27. This strengthens the alternative of just giving these wastes away for free to be picked up by small backyard raisers wishing to earn from this extra livelihood activity at their expense. Another approach to consider is to drop or reduce the costs via some accounting machinations. This may include giving the delivery vehicle and the driver errands other than, simultaneously with, and are more important than the delivery of food waste to the pig farm, so this cost is absorbed by the more important errand; disregarding the cost of one hour devoted by the laborer for feed preparation by treating this task just a small part of the laborer's routine job not directly attributable to the payment of his wage.

Table 18 – FOOD WASTE USED AS ANIMAL FEED: RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	

0		2.00		2.00	(2.00)
1	9.81		39.55	39.55	(29.74)
2	10.31		39.55	39.55	(29.24)
3	10.82		39.55	39.55	(28.73)
4	11.36		39.55	39.55	(28.19)
5	11.93		39.55	39.55	(27.62)
Total	54.23			199.75	(145.52)

Net Present Value (NPV, PHP'000): (129.22)
Benefit Cost Ratio (BCR) : 0.27

b) Economic (Economic/Environmental/Social) CB Analysis

Three benefits were identified and quantified in the economic cost-benefit analysis of use of food waste as animal feed, namely: (1) value creation, as a new product (feed) is generated out of the waste; (2) reduced carbon emissions (CO_2-e) from the non-disposal of the food waste in landfill or dumping area; (3) reduced cost incidental to disposal of food waste as garbage.

For value creation, the value of the benefit is computed in the same way as in the practice's financial benefit, and hence also with the same annual values, as the market price of organic feed was also considered as its economic price.

The second benefit of reduced CO_2-e was also quantified using similar approach as in the other SCP practices. Carbon emissions generated per kilogram of food waste (0.627 kg) was multiplied by the volume of food waste avoided by its use as animal feed. This was then multiplied by the estimated economic price of carbon coupon traded in the carbon market[25].

The third benefit simply multiplied the volume (by weight) of food waste used as animal feed by the cost per kilo of waste disposed as trash or garbage, obtained earlier as PHP 1.50 per kilo.

Allowing for a growth of 5% p.a. for each of these benefits, the total economic benefits were estimated to reach from PHP 13, 060 in Year 1 to PHP 15,870 in Year 5. Benefit from value creation is PHP 9,814 in Year 1, rising to PHP 11,929 in Year 5, which are akin to the values of the financial benefit. The benefit from CO_2-e avoided is PHP 1,772 in Year 1, rising to PHP 2,154 in Year 5; while savings to society in the cost of garbage disposal is PHP 1,472, rising to PHP 1,789.

Financial costs were converted into economic costs, also using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). Using the preceding approach, the market cost of capital was also determined to be its economic cost; the economic price of gasoline, after deconstructing and applying appropriate economic conversion factors to its major cost components as described in the 2012 Input-Output Table, was set 3% higher than its financial or market value; the financial value of the drivers' pay was retained for economic analysis; the value of labor for feed preparation was set at 60% (the conversion factor for unskilled labor) of its financial value.

An additional cost was incorporated in the economic analysis – carbon emission of the vehicle used to pick up the food waste and deliver to the organic hog raising site. This was, however, estimated to have a rather small economic value of PHP 760.

[25] This is computed as: PHP 2,880 per ton at shadow exchange rate of PHP 57.6/USD on exchange rate economic conversion factor of 1.2.

Although better than the figures obtained in the financial cost-benefit analysis, the SCP practice of food waste used as animal feed appears to be not economically feasible. As shown in **Table 19**, net present value is negative PHP 77,200, while benefit cost ratio is less than one at 0.45. This could be in large part due to the direct use of the financial analysis' annual O&M costs, which were then converted into economic values. But as discussed in the financial analysis, a significant part of these costs may have been inappropriately attributed to the SCP practice and can be reduced if, for example, a large part of the delivery (driver and gasoline) and feed preparation costs can be attributed to other more important operations in the restaurant or hog farm.

Table 19 – FOOD WASTE USED AS ANIMAL FEED: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		2.00		2.00	(2.00)
1	13.06		31.39	31.39	(18.33)
2	13.71		31.39	31.39	(17.67)
3	14.40		31.39	31.39	(16.99)
4	15.12		31.39	31.39	(16.27)
5	15.87		31.39	31.39	(15.51)
Total	72.16			158.93	(86.77)

Net Present Value (NPV, PHP'000): (77.22)
Benefit Cost Ratio (BCR) : 0.45

3.3.3 Food waste used as organic fertilizer (compost)

a) Financial CB Analysis

Part of the food waste of three of the six sample WWF partner food service establishments are used for composting, mainly through the Bokashi method. One establishment uses the spoiled portion from kitchen waste (peelings, scraps, etc.) with the small amount of compost generated applied to their own farm. Another devotes significant time and effort producing up to 10 drums of compost for its own organic vegetable and herbal garden plot and selling portion of it commercially. The third one delivers part of the waste to their contract farms for composting.

The financial benefit of this food waste management practice is the volume of waste converted into organic fertilizer valued at the prevailing market price of the by-product. Under the Bokashi method, only 50% of the waste (dry waste) is converted into fertilizer. But another 50% of the by-product by weight comes from the use of other inputs or additives, mostly rice bran, resulting in finished good at almost the same weight as the food waste used.

For an assumed standardized restaurant practicing this SCP based on the unit values observed from the three sample establishments, 12% of the food waste is composted, with the value set based on the prevailing market price of organic fertilizer of PHP 20.00/kg. Growth in compost production was assumed to be 5% yearly, the same increase in the number of diners in the standardized restaurant used in the analysis. The key assumptions used in the computation of benefits are presented in **Table 20**.

Table 20 – ASSUMPTIONS USED IN THE ESTIMATION OF FINANCIAL BENEFITS FROM COMPOSTING

Item	Assumed Value	Remarks
Raw food ingredient requirement (kg/d):	57	Average for 6 sample restaurants
Average food waste as % of RFI:	25.4	Average for 5 sample restaurants
Used for composting (% of food waste):	12.0	Data from 3 restaurants observing this SCP practice
Price of organic fertilizer (PHP/kg):	20.00	Retail prices can range from PHP 15-100/kg (phpriceprice.com), lower if purchased by bulk (50kg bag).

Given the above assumptions and projection of the number of diners, the benefit grows uniformly by 5% p.a. from PHP 12,520 in Year 1 to PHP 15,220 in Year 5.

Financial costs were computed based on the assumption that composting is performed through the Bokashi method. Based on literature[26], the major cost components rice bran, labor, and other materials. Capital cost consists of containers where Bokashi fermentation of waste and storage of dry compost is done. The assumptions used the computation of costs are found in **Table 21**.

Table 21– ASSUMPTIONS USED IN THE COMPUTATION OF FINANCIAL COSTS OF BOKASHI COMPOSTING

Item	Assumed Value	Remarks
Rice bran (kg/kg of compost)	0.5	REAP data
Cost of rice bran used for composting	1.00	PHP/kg, REAP data
Labor (PHP/kg)	1.30	REAP data
Other materials (% of compost value)	2.0	REAP data
Capital cost (PHP)	24,000.00	80 li @ PHP 3,000/10 li – interviews with 2 partner restaurants

The results of the financial cost-benefit analysis, as presented in **Table 22**, indicate financial viability of composting as SCP practice. Net present value (NPV) is a positive PHP 31,100. The BCR is 2-to-1, or the present value of the sum of annual benefits is double the PV of the sum of annual costs.

Table 22 – FOOD WASTE COMPOSTING: RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		24.00		24.00	(24.00)
1	12.52		1.38	1.38	11.14
2	13.14		1.45	1.45	11.70
3	13.80		1.52	1.52	12.28
4	14.49		1.59	1.59	12.90

[26] See, for instance, Resource Efficient Agricultural Production (REAP) – Canada (2006), which was used as the analysis main reference, but with values escalated to 2020 prices using inflation rate data.

5	15.22		1.67	1.67	13.54
Total	69.17			31.61	37.56

Net Present Value (NPV, PHP'000): 31.10
Benefit Cost Ratio (BCR) : 2.04

b) Economic, Environmental and Social (Economic) CB Analysis

The economic benefits derived from Bokashi composting are the same as those in converting food waste into animal feed: value creation, carbon emissions (CO_2-e) avoidance, and garbage disposal avoidance.

The value creation benefit is also equal to the practice's financial benefit, as the market price of organic fertilizer was also considered as its economic price. The second benefit of reduced CO_2-e was also computed by multiplying carbon emissions generated per kilogram of food waste (0.627 kg) by the volume of food waste avoided through composting, the results multiplied by the estimated economic price of carbon coupon traded (PHP 2,880 per ton) in the carbon market. The third benefit simply multiplied the volume of food waste converted into compost by the cost per kilo of waste disposed as trash or garbage, at PHP 1.50 per kilo.

Allowing for a growth of 5% p.a. for each of these benefits, the total economic benefits were estimated from PHP 14,590 in Year 1 to PHP 17,730 in Year 5. Benefit from value creation increases from PHP 12,520 in Year 1 to PHP 15,220 in Year 5, the same as the values of the financial benefit. The benefit from CO_2-e avoided is PHP 1,130 in Year 1, rising to PHP 1, in Year 5; while savings in the cost of garbage disposal is PHP 940, rising to PHP 1,140.

Financial costs were converted into economic costs, also using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). However, in the analysis of composting, only labor cost was converted into economic value at 60% of market value, while the cost of other materials was reduced by the estimated amount of taxes imposed on these items.

The SCP practice of food waste used as in Bokashi composting is seen to be economically feasible as shown in **Table 23**. Net present value (NPV) is positive PHP 29,330, while benefit cost ratio (BCR) is more than one at 2.14. As discussed in the financial analysis, costs may be reduced if a large part of the delivery (driver and gasoline) and feed preparation costs can be attributed to other more important operations in the restaurant or hog farm.

Table 23 – FOOD WASTE COMPOSTING: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		24.00		24.00	(24.00)
1	14.59		1.03	1.03	13.56
2	15.32		1.08	1.08	14.23
3	16.08		1.14	1.14	14.95
4	16.89		1.19	1.19	15.69
5	17.73		1.25	1.25	16.48

Total	80.61			29.70	50.91

Net Present Value (NPV, PHP'000): 29.33
Benefit Cost Ratio (BCR) : 2.14

3.4 SOFT AND RESIDUAL MEASURES ON ENERGY AND WATER CONSERVATION AND FOOD WASTE REDUCTION

a) Financial CB Analysis

As observed in the sample of six WWF partner food service establishments, all of them undertake some form of SCP practice but which are mostly unquantified in terms of impact to operations. These include mandatory switch-off of lights and air-cons at certain hours of the day and in certain circumstances such as diner traffic conditions; regular check of faucet and toilet contraptions for failure to close properly and leaks; methods of washing and re-use of water for cleaning the floor; menu planning and JIT delivery of food supply; and, no plastic policy (soft measures). Also, there are some other energy efficient devices used but which sufficient data were not obtained, such as use of LED lights, convection ovens, etc. (residual measures).

For e-CBA, the focus was mainly on three major areas or resources of SCP where many of these soft and residual practices were found to be covering – energy (electricity), water, and food waste. Using the basic methodology introduced in the Baseline Data and Cost-Benefit Analysis Model Report (February 2020), specific values of parameters or measures of unit usage of these three resources were compared between the so-called baseline[27] and the average for partner restaurants with soft and/or residual practices in the same resource.

The positive difference if latter is deducted from the former reflects the benefit from the soft/residual practices.

The parameter values, however, were adjusted (subtracted) for the use of resources that was already accounted for in other SCP practices, specifically electricity consumption for air-conditioners and freezers, and water consumption for production of purified water. For the electricity consumption, the electricity used by establishments adopting energy-efficient devices was deducted in establishments with soft/residual practices on electricity while for the baseline, the energy usage from conventional units was deducted.

For clarity, the baseline values, adjusted values for those with soft/residual practices, and their difference are presented in **Table 24**. The basis for deriving baseline values are explained. Moreover, projected benefits using the parameter values in said Table for the assumed standardized restaurant are also presented in **Table 25**. As can be seen from this latter table, the benefits from soft and residual measures appear to be significant, from PHP 2.771 million in Year 1 to PHP 3.019 million in Year 5. The largest contributor is electricity at PHP 1.623 million annually, although annual benefit from water soft practices are rising steadily from PHP 837,000 in Year 1 to PHP 1.018 million in Year 5.

Table 24 – COMPARISON OF PARAMETER VALUES BETWEEN BASELINE AND ESTABLISHMENTS WITH SOFT AND RESIDUAL SCP MEASURES

Resource/SCP Area	Parameter	Baseline	With soft practices	Difference	Remarks

[27] The average or median value yielded by a sample of establishments which are presumed to mostly not significantly adopt SCP practices in the specific resource.

Electricity	Kw-H/ m^2/mo. (m^2 = Ave. FA of sample partner restaurants)	50.83	9.40	41.43	Baseline consists of 1 BAU casual diner; 1 partner restaurant w/o electricity SCP; and data from USEIA CBES 2012 & ASHRAE USDOE 2009 (LA & Miami)
Water	m^3/diner (Ave. # of diners in sample partner restaurants)	0.30	0.10	0.20	Baseline consists of 1 BAU casual diner; 2 partner restaurants w/o water SCP; & data from deq.nc.gov/ document/baseline-water-consumption-worksheet; Murakawa 2003; and VanSchenkhof 2011
Food waste	% of raw food ingredient (Ave. kg of RFI needs of partner restaurants)	26.1	19.5	6.6	Baseline consists of 3 partner restaurants w/o food waste SCP; S. I. Pirani & H. A. Arafat (UAE), 2015; and MTTS Agri-Food Research Finland, 2012

Table 25 – PROJECTED FINANCIAL BENEFITS FROM SOFT AND RESIDUAL SCP MEASURES (PHP'000)

Year	Electricity	Water	Food Waste	Total Benefits
1	1,623.45	837.20	310.55	2,771.20
2	1,623.45	879.06	326.08	2,828.59
3	1,623.45	923.01	342.38	2,888.85
4	1,623.45	969.16	359.50	2,952.12
5	1,623.45	1,017.62	377.48	3,018.55

It is presumed that tangible costs are incurred in carrying out these soft measures. Information provided by one partner (Scenario 3) restaurant seriously pursuing these measures determined the basic cost structure adopted for e-CBA. The major cost components consisted of capital cost, training and orientation expenses, enforcement, and monitoring and evaluation.

Capital costs presume that equipment will be needed for training, monitoring, report preparation, and documentation and updating of list of practices. These include computers, printer, overhead projector, screen, etc. although most of these facilities are assumed to be shared for other tasks and activities in the food service establishments hence with pro-rated valuation. The pro-rated value of capital expenditure was set at PHP 29,500 (50% for one unit of computer, 25% for overhead projector and screen, 100% for the rest of small equipment items).

For training and orientation expenses, it was assumed that there will be four trainings annually, as new and existing staff undergo SCP seminar and workshop on a staggered basis and are conducted for half a day over two days so as not to disrupt restaurant operations. The main expense items are the fee for the training director/facilitator/key resource person (PHP 40,000 for all four training events), and meals, coffee, and training materials for the participants. Enforcement essentially entails the pro-rated costing of marshals assigned to check compliance (1-2 hours a day). Monitoring involves the recording of the report of marshals and of observed outcomes of the practices, integrated into regular reports and recommendations on improving the implementation of the SCP practices or adopting new practices. The time spent by those preparing the report and recommendations, as well as supplies and materials used, are valued as expense items.

The projected annual operations and maintenance cost incidental to the adoption of the soft measures is PHP 178,250. The breakdown of this cost is detailed in **Table 26**.

TABLE 26. BREAKDOWN OF PROJECTED ANNUAL COSTS INCIDENTAL TO ADOPTION OF SCP SOFT MEASURES

PERSONNEL	
Training Director/Resource Person	PHP 40,000
Marshall/Monitor	34,500
M & E Personnel	51,750
Total	126,250
MATERIALS, SUPPLIES, DOCUMENTATION	
Training and Orientation	40,000
M&E Report, SCP Manual Update	12,000
Total	52,000
TOTAL ANNUAL O&M COSTS	178,250

The results of the financial cost-benefit analysis, as presented in **Table 27**, indicate significant financial viability of the soft and residual measures in energy and water conservation, and food waste reduction. Net present value (NPV) is a hugely positive PHP 11.974 million. The BCR is a multiple of nearly 16 times (15.6). This suggests that with a well thought-of energy and water demand management plan, as well as effective initiatives at food waste reduction, involving investment in equipment, studies, values formation and behavioral change, the return to the food service establishment can be several-fold.

Table 27 – SOFT AND RESIDUAL MEASURES: RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		29.50		29.50	(29.50)
1	2,771.20		178.25	178.25	2,592.95
2	2,828.59		178.25	178.25	2,650.34
3	2,888.85		178.25	178.25	2,710.60
4	2,952.12		178.25	178.25	2,773.87
5	3,018.55		178.25	178.25	2,840.30
Total	14,459.32			920.75	13,538.57

Net Present Value (NPV, PHP'000): 11,974.23
Benefit Cost Ratio (BCR) : 15.64

b) Economic, Environmental and Social (Economic) CB Analysis

The economic benefits derived from the soft practices and residual measures on electricity, water and food waste are: (a) the savings from reduced or more efficient usage of these resources, and (b) carbon emissions (CO_2-e) avoidance due to these resource savings.

The savings is the same as the reduced volume of usage that reflected the benefits in the financial analysis but applying economic price instead of financial or market price to the volume saved. As presented in the previous analyses of electricity-related SCPs, the economic price of electricity was computed at PHP 9.48/Kw-hour. The economic price of water was derived from previous water supply feasibility studies performed by the consultant[28] and averaged PHP 98.50/cubic meter. The economic unit value of raw food ingredient was estimated at PHP 446/kilo after breaking down its key costs and applying appropriate economic conversion factor for each major cost component.

CO_2-e avoided was computed by multiplying carbon emissions generated per unit of the resource – 0.56 kilogram per Kw-hour of electricity; 0.708 kg per cubic meter of water; 0.627 kg per kg of food waste – with the results multiplied by the estimated economic price of carbon coupon traded (PHP 2,880 per ton) in the carbon market.

The total economic benefits were estimated from PHP 3,512 million in Year 1 to PHP 3.855 million in Year 5. Benefit from resource savings/conservation accounts for more than 90% of total benefits, from PHP 3.21 million in Year 1 to PHP 3.549 million in Year 5. Electricity soft and residual measures generate the highest benefit among the three areas/resources, at PHP 1.916 million annually. See **Table 28**.

Table 28 – PROJECTED ECONOMIC BENEFITS FROM SOFT AND RESIDUAL SCP MEASURES (PHP'000)

Year	Resource Savings/Conservation				Carbon Emission Avoided				Total Benefit
	Electricity	Water	RFI	Total	Electricity	Water	RFI	Total	
01	1,638.07	970.17	602.20	3,210.43	278.63	20.08	2.44	301.15	3,511.58
02	1,638.07	1,018.68	623.31	3,289.05	278.63	21.09	2.56	302.28	3,591.33
03	1,638.07	1,069.61	663.92	3,371.60	278.63	22.14	2.69	303.36	3,675.06
04	1,638.07	1,123.09	697.12	3,458.27	278.63	23.25	2.82	204.70	3,762.98
05	1,638.07	1,179.24	731,97	3,549.28	278.63	24.41	2.96	306.01	3,855.29

Financial costs were converted into economic costs, also using standard conversion ratios for specific major cost components (unskilled labor 0.6, foreign exchange component 1.2, taxes and subsidies deleted, price escalation not recognized, etc.). The economic cost of capital expenditure was calculated at 96.7% of financial cost. This percentage factor was also applied to the cost of materials and supplies. The financial cost of labor was also adopted as its economic cost.

The economic cost-benefit analysis as presented in **Table 29** generated even better results than financial CBA, with net present value (NPV) computed at PHP 12 million and BCR with nearly 20x multiple of discounted benefits over discounted costs. From the viewpoint of society and the overall economy, the benefits from conservation programs for energy, water and food – even those simply involving awareness, values formation, and behavioral change on the environment and sustainability – far outweigh their costs.

Table 29 – SOFT AND RESIDUAL MEASURES: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

[28] Carmen Cebu Bulk Water Supply Project of Ayala Corp. in 2001; Angat Water Utilization and Improvement Program Aqueduct 6 Phase 2 Project in 2005; and Cavite Bulk Water Supply Project of San Miguel Corp. in 2012, with prices adjusted for inflation to reflect 2020 values.

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		28.51		28.51	(28.51)
1	3,511.58		176.51	176.51	3,335.07
2	3,591.33		176.51	176.51	3,414.81
3	3,675.06		176.51	176.51	3,498.55
4	3,762.98		176.51	176.51	3,586.46
5	3,855.29		176.51	176.51	3,678.78
Total	18,396.24			911.08	17,485.16

Net Present Value (NPV, PHP'000): 12,000.00
Benefit Cost Ratio (BCR) : 19.90

3.5 LOCAL SOURCING

3.5.1 Own farm/garden production of raw/fresh food ingredient

a) Financial CB Analysis

Three of the six sample WWF partner restaurants source part of their vegetables, fruits, and fresh herbs and spices from their own farm or garden plots. One even sells their fresh produce. But, as mentioned, the production only supplies part of the restaurant's requirement for meal preparation.

For the e-CBA, it was assumed that own-farm production consists mainly of vegetables (a mix of lettuce, cucumber, tomato, and herbs and spices), and, based on information culled from the three establishments adopting this SCP practice, their own farms account for 1.6% of their raw food ingredient (5-7% of vegetable requirement). There are two harvests per year, with the farm harvest providing supply for 15 days, but it was assumed that supply is available almost all year round through staggered production schedule.

The assumptions used in the computation of farm production and benefits are summarized in **Table 30**.

Table 30 – ASSUMPTIONS USED IN THE COMPUTATION OF FINANCIAL BENEFITS FROM SOURCING OF RAW/FRESH FOOD INGREDIENT FROM OWN FARM/GARDEN

Item	Assumed Value	Remarks
Raw food ingredient requirement (kg/d) – Year 1:	57	Average for 6 sample restaurants
Own farm production as % of RFI (Year 1 only – in absolute volume, it is constant as farm area is constant hence falling as % of RFI as RFI rises beyond Year 1):	1.6	Average for 2 sample restaurants; additional information obtained from LCA Survey

No. of harvests/year:	2	But supply is assumed to be available almost whole year round due to staggered production schedule. A harvest can provide supply for 15 days.
Average wholesale price of produce	80.00	PHP/Kg, 2X farmgate price based on literature on lettuce, for example (Fang-asan, et al, 2009)
Average farmgate price of produce	40.00	PHP/Kg, consultant's estimate based on DTI, DA and PCARRD studies, updated to 2020 prices

For food service establishments, the financial benefit is the savings resulting from the alternative of purchasing the fresh supplies at wholesale prices. Given constant annual supply from the farms, the benefit is estimated at PHP 26,270 annually.

Based data on labor and material costs from DA, DTI and PCARRD studies for selected commodities (lettuce, cucumber & tomato)[29], adjusted to 2020 prices, annual labor cost was set at PHP 15,290 (0.17 man-day/kg output @ PHP 274/man-day), while annual cost of materials was established at PHP 4,200 (32% of farmgate value of production). Capital expenditure – for simple farm/garden tools and implements – equivalent to the value of one harvest cycle (50% of the value of annual production) was added to the cost analysis. This amounted to PHP 13,120. Land cost was excluded on the presumption that it already exists and the food service establishment is simply maximizing its use and is not acquiring new land specifically for own farm production.

The results of the financial cost-benefit analysis, as presented in **Table 31** show that production of fresh vegetables and other commodities from the establishments on farm or garden can potentially be financially viable. Net present value (NPV) is a positive PHP 17,250, while the benefit cost ratio (BCR) is 1.17 or above zero. The e-CBA already made some adjustment on the cost ratios based on the assumption that the plots of the restaurants, being smaller than a typical farm dedicated to producing output at commercial scale, are relatively higher cost producer of the commodities. One reason why the BCR indicates benefits are only slightly higher than costs.

Table 31 – OWN FARM/GARDEN PRODUCTION OF FRESH VEGETABLES, HERBS AND SPICES: RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		13.13		13.13	(13.13)
1	26.27		19.50	19.50	6.77
2	26.27		19.50	19.50	6.77
3	26.27		19.50	19.50	6.77
4	26.27		19.50	19.50	6.77

[29] Philippine Council for Agriculture, Forestry, and Natural Resources Research and Development (PCARRD), "Lettuce Production Guide," 2009; PCARRD, "Cucumber Production Guide," 2009; Department of Agriculture, "Tomato Production Guide," 2015; Fang-asan, Dugapen and Digal, "Lettuce Supply Chains and Marketing Margins in Benguet, Philippines," University of the Philippines in Mindanao, 2009.

5	26.27		19.50	19.50	6.77
Total	131.33			110.61	20.72

Net Present Value (NPV, PHP'000): 17.25
Benefit Cost Ratio (BCR) : 1.17

b) Economic, Environmental and Social (Economic) CB Analysis

The economic benefit of own farm/garden production of restaurants is basically the incremental output derived from this SCP practice, which is also the projected output of the farm in the financial analysis multiplied by the economic cost of the produce. For the economic cost, the average retail price of the mix of commodities produced by the farms was used. This was also presumed to reflect the consumers' "willingness to pay" for the fresh produce. The price was estimated at PHP 112/kg (40% above wholesale price).

Financial costs were converted into economic costs using standard conversion ratios for specific major cost components and deducting taxes from local and foreign costs, except labor. The breakdown of costs was based on the 2012 Input-Output Table and feasibility study manual of government agencies, especially LWUA. The assumptions for the major economic cost components are as follows:

- Capital expenditure was calculated at 93% of financial cost
- The economic cost of materials and supplies in O&M expenses also applied the 93% percentage factor to their financial cost
- The economic cost of labor was determined to be 72% of its financial cost (given that 70% of labor was assumed to be unskilled in which the economic conversion factor of 60% was applied)

The value of carbon emissions generated in the production of food (vegetable) was also added as economic cost. Vegetable farming generates 0.3 kg CO_2-e per kilo of output. This was multiplied by the economic price of CO_2-e of PHP 2,880.00 per ton to get the cost, which was PHP 280 a year.

The economic cost-benefit analysis as presented in **Table 32** demonstrated the economic viability of own farm production of restaurants, with much better results than the financial CBA. Net present value (NPV) computed at PHP 63,370 and BCR at 2.0, or the SCP practice yields PHP 2 worth of economic benefit for every PHP 1 of economic cost.

Table 32 – OWN FARM/GARDEN PRODUCTION OF FRESH VEGETABLES, HERBS AND SPICES: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M	Total	
0		12.22		12.22	(12.22)
1	36.77		15.16	15.16	21.61
2	36.77		15.16	15.16	21.61
3	36.77		15.16	15.16	21.61
4	36.77		15.16	15.16	21.61

5	36.77		15.16	15.16	21.61
Total	183.86			88.02	95.84

Net Present Value (NPV, PHP'000): 63.37
Benefit Cost Ratio (BCR) : 2.00

3.5.2 Contract growing

a) Financial CB Analysis

Two of the sample WWF Scenario food service establishments adopt contract farming/growing, including one which also produces vegetables, herbs, and spices from its own garden plots. On average, they source roughly 12% of their vegetable requirements from contract growers. This is equivalent to 1.9% of raw food ingredient requirement in the preparation of meals in the study's standardized, hypothetical restaurant, the figure used in determining the volume of vegetable output delivered by contract growers.

The financial benefit is the cost savings for the establishment resulting from the payment of farmgate price to contract farmers instead of wholesale price to traders/consolidators. The average farmgate price of the mix of vegetables is assumed at PHP 40.00/kg while wholesale price was set at PHP 80.00/kg. This yields a gain for the restaurant of P40.00 for every kilo of vegetables purchased from contract growers. The requirement increases annually by 5% or at the same pace of assumed growth of diners.

There is hardly any from production cost on the food service establishment under the contract growing arrangement. The establishment may, in some instances, advance the cost of planting materials, fertilizer, and pesticide, but at the end of the day these are deducted from the amount paid to farmers. Perhaps the only relatively significant cost would be the delivery from the farm to the restaurant. Regardless of who pays, the restaurant still pays in the form of delivery charge or add-on to the farmgate price. A value chain study on logistics and storage (cold chain) for fresh produce published by the DTI-BOI in March 2020 suggests that this cost should be around PHP 5.00 per kilo of produce coming from the farm.

It can be seen from the results of the cost-benefit analysis on **Table 33** that contract growing is a financially viable option of securing the food supply of the restaurant. NPV is a positive PHP 68,660, while BCR is greater than zero at 8.00. The results are much better than the alternative of the restaurant being engaged in farming and producing part of their fresh supply of vegetables, herbs, spices, etc. as there is hardly any cost involved and no worries over production-related risks. In fact, the NPV and BCR of contract growing is higher than those of own farm production (NPV = PHP 17,250; BCR = 1.17).

Table 33 – CONTRACT GROWING: FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Production (kg)	Price Savings (PHP/Kg)	BENEFIT (PHP'000)	Less: Cost of Delivery	NET BENEFIT (PHP'000)
0	-	-	-	-	-
1	390	40	15.60	1.95	13.65
2	409	40	16.37	2.05	14.33
3	430	40	17.19	2.15	15.04

4	451	40	18.05	2.26	15.80
5	474	40	18.96	2.37	16.59
Total			86.17	10.77	75.40

Net Present Value (NPV, PHP'000): 68.66
Benefit Cost Ratio (BCR) : 8.00

b) Economic/Environmental/Social (Economic) CB Analysis

In the economic analysis of contract growing, the same benefits gained from own farm production are also recognized using the same economic price (PHP 112/kg). The only difference is projected volume of production, which is 1.9% of RFI in contract growing vs. 1.6% of RFI in own farm production. Output in the former also increases by 5% p.a. while in the latter, it is fixed over the period of analysis at 1.6% of Year 1 RFI. In terms of treatment, this value creation benefit reflects SCP's contribution to income (especially farmers' and rural landless workers') as part of this value is labor value-added.

Production costs (which were not reflected in the financial CBA except for delivery cost), however, were fully recognized in the economic analysis as these are considered use of society's scarce resources that should be valued. The same approach, assumptions, cost structure, unit costs, and other parameter values used in the economic analysis of own farm production SCP were also used. Again, the difference was mainly the volume of production, as explained in the previous paragraph. The food production was also seen to entail the cost of generating carbon emissions.

The economic cost-benefit analysis as presented in **Table 34** demonstrated the economic viability of contract growing, but with lower results than the financial CBA on BCR due to the inclusion of farm costs in the former. BCR was computed at 2.0. which means PHP 2 of discounted economic benefits is produced for every PHP 1 of discounted economic costs. Net present value (NPV), was computed at PHP 85,730, higher than the value obtained in the financial CBA due to higher economic price of farm produce.

Table 34 – CONTRACT GROWING: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefit	Costs			Net Benefit
		Capital	O & M + Envi.	Total	
0		12.22		12.22	(12.22)
1	43.67		18.00	18.00	25.66
2	45.85		18.90	18.90	26.95
3	48.14		19.85	19.85	28.29
4	50.55		20.84	20.84	29.71
5	53.08		21.88	21.88	31.19
Total	241.29			111.70	129.59

Net Present Value (NPV, PHP'000): 85.73

Benefit Cost Ratio (BCR) : 2.08

3.5.3 Import replacement

a) Financial CB Analysis

Using local products to support the local economy is among the sustainability practices with significant number of adherents. From the economic standpoint, however, the impact of the practice would depend on certain factors. To be beneficial, for example, local production must reach a scale that results in efficiency gains; must reflect the inherent and potential skills and strength of the community such that the output produced is not only of good quality but also at competitive cost; and the environmental impact of production, processing, delivery, etc. is mitigated[30]. Otherwise, simply importing or externally sourcing the product will be more economically advantageous for the local economy.

Nonetheless, import replacement has been included in the analysis due to its popular appeal. The focus is on beef, which is among the most highly imported fresh food items, used mainly by top-tier restaurants for the preparation of high-quality steak and other banquet courses. Cattle raising and beef consumption entails high GHG emissions but is used by partner restaurants essentially because it is the main ingredient of many of its popular dishes.

The benefit to the food service establishment of import replacement would be the cost savings from using cheaper local beef. However, the meal would have to be priced lower than if the raw material used is imported with certification (e.g., by USDA). Nevertheless, it was assumed that the margin is maintained, i.e., raw ingredient is 25% of the price of the served meal. The analysis is performed on an incremental basis, which means that, more or less, the only item that mainly differs and needs to be accounted for is the cost of beef (the rest of the costs are almost the same and hence has no incremental financial impact whether cooking with imported or local beef).

The other important assumption was that the volume (in kg) of orders of the beef meal would not change with import replacement of the key ingredient.

The financial cost, incrementally, would be the difference in sales value between the same quantity of meal served using local beef and meal served using imported beef. As already mentioned, the price of the meal is scaled up at a uniform ratio to the cost of raw food ingredient used, for simplicity it is assumed that the ingredient is mainly beef, and that a ratio of 3-to-1 is applied to the cost of this ingredient to estimate the price of the meal. Given this approach, sales value would be lower using cheaper locally sourced meat, reflecting an incremental cost to the restaurant.

Table 35 encapsulates the key numerical assumptions used in the financial CB analysis.

Table 35 – ASSUMPTIONS USED IN THE FINANCIAL COST-BENEFIT ANALYSIS OF IMPORT REPLACEMENT (BEEF)

Item	Assumed Value	Remarks
Wholesale price of imported beef	310.74	PH/kg; CIF unit value of beef import from PSA converted into peso, with tariff rate (10%) added, and further adjusted by wholesaler's margin

[30] Schönart, Penker and Schmid, "Sustainable local food production and consumption: Challenges for implementation and research," Outlook on Agriculture, Vol 38 No 2, 2009, pp 175-182

Wholesale price of local beef	236.51	Retail price of local beef, reduced by assumed retail margin of nearly 28%
Ratio of beef meal price to raw beef cost	3:1	
Beef as % of raw food ingredient	5.0	Interview with 2 sample restaurants
Annual growth in beef requirement (%)	5.0	Same as growth in the number of diners

Import replacement appear to not be a financially attractive proposition for food service establishments serving imported beef meals (steak, etc.) especially those which have built a brand around the concept of serving high quality imported meat, only among the world's best beef. NPV is negative PHP 1.213 million and BCR is only 21% of cost (**Table 36**). Assuming they retain their diners, due to the provision of lower priced local alternative, or perhaps able to replace those who drop out in the absence of the delectable meal, the restaurant still loses the opportunity of generating higher sales value for the same quantity and percentage margin as lower meal price also means lower absolute peso gain per meal served. It will be worse if they incur a net loss in customers because of this re-branding local strategy.

Note, however, that negative net benefits (with unchanged volume of demand) do not mean loss for the business. It only means the alternative of using local meat generates less earnings than serving meals at higher prices using imported meat.

Table 36 – IMPORT REPLACEMENT: RESULTS OF FINANCIAL COST-BENEFIT ANALYSIS (PHP'000)

WACC: 3.1%

Year	Benefit	Costs	Net Benefit	
1	63.47	304.65	(241.18)	
2	66.64	319.88	(253.24)	
3	69.97	335.88	(265.90)	
4	73.47	352.67	(279.20)	
5	77.15	370.30	(293.16)	
Total	350.70		(1,332.67)	

Net Present Value (NPV, PHP'000): (1,213.55)
Benefit Cost Ratio (BCR) : 0.21

b) Economic (Economic/Environmental/Social) CB Analysis

From the viewpoint of the economy, two key benefits are recognized and quantified for e-CBA: value creation, as import substitution creates an opportunity to generate income for local cattle raisers and the entire domestic beef industry supply chain including suppliers and service providers; and carbon emission reduction, which has benefit not only locally but also globally as reduced air cargo deliveries collectively address the issue of climate change. The latter is a focal point in UNEP's GACMO methodology, and the e-CBA study adopts certain GACMO-prescribed parameter values, such as carbon footprint of aviation fuel usage (0.77 kg CO_2-e per ton of product per km of air transport) and distance from the origin of the commodity to the Philippines (3,216 km).

For value creation, the economic price of local beef was set at PHP304.08/kilo, its current (2020) average retail price, which presumably reflects the willingness to pay of consumers for the product. The economic price was applied to projected annual beef usage/demand of the standardized/hypothetical restaurant, which is also the data presented in the financial analysis.

The assumptions used in estimating the economic and environmental benefits are summarized in **Table 37**.

Table 37 – ASSUMPTIONS USED IN THE COMPUTATION OF ECONOMIC BENEFITS FROM IMPORT REPLACEMENT

Item	Assumed Value	Remarks
Economic price of local beef (PHP/Kg)	304.08	Average retail price of beef, from PSA Cattle Situation Report and consultant's estimate
Ave. distance from country of origin to Manila (km)	3,216	GACMO study; seems to presume that beef, although USDA-certified, originates from within Asia
Kg CO_2-e per ton of product per km of air transport	0.77	GACMO study
Economic price of CO_2-e (PHP/ton)	2,880.00	WB (2018), converted into PHP using the economic exchange rate

Economic costs consisted of the cost of locally producing raw beef cuts, expressed at economic prices; and the so-called domestic resource cost (DRC), or the incremental spending (or savings) in foreign exchange for each dollar of imports replaced by local production, which also determine if import replacement indeed leads to savings in the economy's scarce resources. DRC is also a measure used for establishing the competitiveness of a local industry, a critical factor in making a policy decision on either promoting an industry or simply resorting to importation.

In both costs, the values of the major cost components were estimated using Input-Output Table data; value chain analysis studies for related industries, such as cold chain for fresh agricultural (including meat) produce[31]; statistical reports[32]; and other online sources.

In the first economic cost item, the values of the major cost components – labor, capital, non-tradable inputs (utilities, services), tradable inputs, taxes less subsidies – are converted into their economic values using policy-prescribed or generally acceptable economic conversion factors. The cost was also broken down by key segment of the supply chain – breeding/fattening, slaughterhouse, transport services, storage/logistics, and retail.

Economic cost of beef production was estimated at PHP 105.47 per kilo, 72% of financial cost.

In the DRC, these same cost components were reclassified into domestic costs and foreign costs (imported inputs). Foreign costs per unit (say, kilo) of production were deducted from total unit cost of production, leaving purely domestic unit cost, expressed in local currency (pesos), which became the numerator of the DRC. The same foreign costs were converted into foreign currency using the economic exchange rate and were deducted from the dollar unit value (i.e., USD/kg) of import of the same product at border prices (CIF value, plus tariffs, plus margin), which was treated as the DRC's denominator. The quotient is the DRC, expressed in PHP per dollar. If DRC is greater than

[31] DTI-BOI, The Philippine Cold Chain Industry Roadmap, March 2020
[32] Philippine Statistics Authority, Cattle Situation Report 2019

the economic exchange rate, the difference reflects a cost to the economy. If otherwise, the result is a negative value which then indicates a benefit (negative cost) to the economy.

Capital cost was introduced on a prorated basis, equivalent to 5 years of depreciation noted in all supply chain components (capital consumption is reflected in the I-O Table) and converted into economic value using the 72% conversion factor derived from the production cost. Hence, capital cost was estimated at PHP 66,860.

In the economic CBA, DRC was less than EER, so cost is negative and import replacement is beneficial to the economy. The difference was established at PHP 12, or the amount saved per dollar of beef import forgone in favor of local production.

The results of the economic cost-benefit analysis starkly contrast those of the financial CBA. Import replacement appears to be economically viable, or worthwhile for society, with economic net present value registered at a positive PHP 891,150 while BCR is 3.84 (**Table 38**). It can therefore be argued that, given the likelihood of private food service establishments' reluctance to shift to local ingredient due to the possible opportunity loss to them as shown in the financial CBA, government and advocacy groups can step in to support the local industry and promote local consumption. This support is especially relevant given the findings on DRC indicating the potential of local beef to be competitive.

Table 38 – IMPORT REPLACEMENT: RESULTS OF ECONOMIC COST-BENEFIT ANALYSIS (PHP'000)

SDR: 10%

Year	Benefits			Costs			Net Benefit
	Local value creation	CO_2-e avoided	Total	Local prod. cost	DRC savings	Total	
0				66.86		66.86	(66.86)
1	311.99	7.32	319.21	148.84	(81.82)	67.02	252.28
2	327.59	7.68	335.27	156.28	(85.91)	70.37	264.90
3	343.97	8.07	352.03	164.10	(90.21)	73.89	278.14
4	361.17	8.47	369.64	172.30	(94.72)	77.59	292.05
5	379.22	8.89	388.13	180.92	(99.45)	81.46	306.65
			1,764.36			437.20	1,327.17

Net Present Value (NPV, PHP'000): 891.15
Benefit Cost Ratio (BCR) : 3.84

But there should be no policy intervention against establishments maintaining the use of imported beef on their menu. There should be no rules to compel them to shift to local beef. Market forces should be allowed to dictate their business decisions. The promotion to use local must be geared towards encouraging the establishment of restaurants that serve meals using local ingredients, diversification of existing restaurant groups towards chain stores serving local steaks and other meat dishes, and for more people to try to enjoy local prime beef cuts at home and on family occasions. Support to the industry, however, is essential, given the risk of supply shortage if demand kicks off due to promotional initiatives[33]. There are regions, for example Central Visayas (specifically Bohol), Bicol

[33] The Food Sufficiency and Security 2017 Report of the Philippine Statistics Authority (PSA) indicated that the Philippines was only 67% self-sufficient (33% deficient) in beef. PSA also noted that production of cattle declined

(Masbate), MIMAROPA, and certain parts of Mindanao, where the local cattle industry is seen as growth drivers and have programs for development under their respective regional development plans. These programs should be seriously considered for implementation.

Finally, it should be noted again that the unviable results of the financial analysis do not mean that import replacement creates financial loss to the restaurant. Rather, it suggests that, all things being equal especially profit margin, the cheaper dish using local beef yields lower profit in absolute peso value than a more expensive dish using imported beef. But if the analysis is reformulated as a proposition to serve meals using local beef on a stand-alone basis, the value-creation benefit compared with the cost of local beef production in the economic analysis (and reconverting the benefit and costs into their financial values) would seem to suggest that this could be a viable proposition. The financial analysis, however, was constrained by the observation that many of the e-CBA study's sample partner establishments are already serving imported beef and the issue being investigated is the impact to them if they will be transitioning from imported to local beef cuts.

3.6 EVALUATION OF OVERALL RESULTS

Table 39 presents the summary results of the e-CBA for the 10 selected sustainable consumption and production (SCP) practices among the sample of six (6) Scenario partner restaurants of WWF.

3.6.1 Financial Cost-Benefit Analysis: NPV vs. BCR

The e-CBA indicated that the most financially beneficial SCP practices for restaurants are the combined soft and residual measures in energy, water and food waste; repurposing food waste for new meal selection; the use of filters, purifiers, or treatment devices for drinking and cooking water; and, use of energy-saving air-conditioning units.

The methodology used in measuring the benefits of soft and residual measures, which compares the difference in per unit usage of the three resources between a baseline and a set of sample restaurants adopting these practices for each area of sustainability (energy, water, or food waste), could be the reason for the practice delivering the highest discounted net benefit or NPV at nearly PHP 12 million over a 5-year period of analysis. The results could be sensitive to the choice of establishments for the baseline, or on how the baseline is specified, and would probably need more refinement to further validate the results. Nonetheless, it would be reasonable to expect a high NPV given that the SCP is a catch-all for all other practices under the sustainability areas that are not covered by the 9 other SCPs analyzed. It has also among the highest BCR at 15.6, hence generates huge benefit out of each peso spent for the practice, which was determined in the CBA to be PHP 176,500 annually.

The use of filter, purifier, or treatment devices for drinking and cooking water yielded the highest BCR at 23 and the third highest NPV at PHP 2.585 million. This is due in large part to the high price of bottled water, the alternative to own-restaurant production of purified water for drinking and cooking, which is more than 46 times the cost of untreated water. This huge price differential makes it financially advantageous for restaurants to generate their own purified water.

The second highest NPV is recorded by repurposing of food waste/unused raw food ingredient/unserved meals at PHP 9.293 million. This is because it is the highest and best use of food waste among restaurants observing food waste-related SCP practices, and the value of the waste used as ingredient is almost zero while the new meal resulting from the repurposing is still significant at about 60% of the value of a regular meal. BCR, however, is just about 2, which still makes the practice feasible although not as cost-effective as the three other best financially performing SCP practices.

by nearly 8% in the 4th quarter of 2020 from year-ago levels ("Mindanao to boost Wagyu meat output for food self-sufficiency," Manila Bulletin, Feb. 16, 2021, mb.com.ph).

The use of energy-saving air-conditioning units records the fourth highest NPV at PHP 475 million, as well as notable BCR of nearly 4.0. Even Low-Scenario and some BAU restaurants are adopting the practice, although they may not be aware that it is an SCP practice, due to the clear financial advantage it provides in terms of reduced electricity bill, and the proliferation of energy-saving units in the market.

Food waste used as animal feed does not appear to be financially beneficial to the restaurant. Part of its non-viability could be due to the recognition of costs, specifically the cost incidental to the delivery of food waste to the hog farm. Alternatively, this cost could be attributed to other restaurant activities if the delivery of the food waste appears to be just a minor activity. Labor for feed preparation, another major cost, could also be minimized by accounting operation if such task is just a slight diversion from the normal work routine of the hog farm helper. At any rate, the results suggest that restaurants may be better off giving the food waste to third party hog raisers, with the pick-up of the waste at the latter's expense.

Other SCP practices – composting, own farm production, and contract growing – turned out to be financially viable, but their scales of activity as percentage of raw food ingredient requirement are relatively small such that their positive financial impact are also small.

Import replacement (beef) does not appear to be a financially attractive proposition for restaurants serving meals using imported beef. This is due to the reduced peso sales from use of lower-priced local beef for the same volume of meals served. This SCP practice registered the worst feasibility results among the practices analyzed, with NPV at -1.2 million and BCR of 0.21 or with benefit of just 21% of cost.

3.6.2 Economic (Economic/Environmental/Social) Cost-Benefit analysis: NPV vs. BCR

The soft and residual measures, repurposing food waste, and the use of own purification system to produce drinking and cooking water are also the most economically viable SCP practices, i.e., the economy or society has the most to gain. Although still having significant positive economic impact, the use of energy-saving air-conditioning units has been overtaken by the SCP practice of import replacement, which failed in the financial feasibility test.

To reiterate, with few exceptions, the benefits specified and quantified in economic analysis were mostly value creation, or the incremental transformation of resources into new products attributable to the practice, and reduced carbon emissions due to practices that minimize the use of energy, water, as well as reduce waste.

Soft and residual measures remained the top SCP practice in terms of discounted net benefit, with NPV calculated at PHP 12 million. Repurposing of food waste also followed with NPV of PHP 7.278 million, and likewise next was use of filters, purifiers, etc. for drinking and cooking water with NPV of PHP 1.739 million.

What is interesting is import replacement yielded a substantial discounted net benefit of PHP 891 thousand, even higher than the use of energy-saving air-conditioning units' PHP 429 thousand. In contrast with its negative NPV in the financial analysis, the robust results of import replacement in the economic analysis derives from its treatment of benefit, which is the value to the economy of local production resulting from the practice instead of just focusing on the opportunity loss of a restaurant from serving cheaper local meals.

Food waste used as animal feed remained unviable under the economic CBA, and as mentioned previously this could be due to the attribution and valuation of incidental costs. Composting and local sourcing practices (other than import replacement) had favorable NPV results. Although their impact seems to be relatively small, if practiced by an increasing number of establishments in the entire restaurant industry, the benefit to society (increased farmers' income, alternative livelihoods, etc.) could be significant.

In terms of cost-effectiveness as measured by BCR, production by restaurants of their own purified water (21.3), soft and residual measures (19.9), use of energy-saving air-conditioning units (4), and import replacement (3.8) lead all other SCP practices. Hence, barring any physical constraints (e.g., a critical mass of restaurants may already be

practicing them; they could not be increased if there are also efforts to maximize benefits from other practices such as soft measures in food waste vs. repurposing of food waste), initiatives can be considered to scale these up by encouraging more establishments to adopt them.

Table 39 – SUMMARY RESULTS OF e-CBA

SCP Practice	Financial CBA		Economic CBA	
	NPV (PHP'000)	BCR	NPV (PHP'000)	BCR
Use of energy-saving air-conditioning units	474.98	3.98	428.29	4.02
Use of energy-saving freezers/chillers	21.62	2.31	19.04	2.30
Use of filters, purifiers, or treatment devices for drinking and cooking water	2,584.77	23.13	1,738.68	21.29
Repurposing of food waste/unused RFI for new meal selection	9,293.11	1.96	7,278.61	1.92
Food waste used as animal feed	(129.22)	0.27	(77.22)	0.45
Food waste used as organic fertilizer (compost)	31.10	2.04	29.33	2.14
Soft and residual measures: energy, water, waste reduction	11,974.23	15.64	12,000	19.90
Own farm/garden production	17.25	1.17	63.37	2.00
Contract growing	68.66	8.00	85.73	2.08
Import replacement (beef)	(1,213.55)	0.21	891.15	3.84

3.6.3 Financial Cost-Benefit Analysis vs. Economic Cost-Benefit Analysis

Except for import replacement, which showed divergent financial and economic analysis results, all other SCP practices had consistent feasibility outcomes – and are mostly feasible. Only food waste used as animal feed is not feasible from both financial and economic standpoints.

Practices involving food production and food waste reduction generally yielded better economic results than financial results. Such is found to be true for local sourcing, specifically own farm/garden production, contract growing, and import replacement, although this may not be a general rule for import replacement as it only turned out that the country has the potential to be competitive in local beef production. This cannot be said for other agricultural commodities, as some studies has shown[34].

4.0 CONCLUSIONS AND AREAS FOR FUTHER RESEARCH

4.1 SUMMARY OF RESULTS AND CONCLUSIONS

[34] Using the DRC methodology, Briones (2015) evaluated the competitiveness of selected Philippine agricultural commodities, although cattle/beef was not among those covered by the evaluation. Yellow corn, sugarcane, bananas, and milkfish were among the globally competitive commodities; rice, hogs and broilers were uncompetitive. See Rhoelano M. Briones, "Domestic Resource Cost in Philippine Agriculture: Measuring Global Competitiveness of Key Commodities," Philippine Journal of Development, Volumes 41 (2014) and 42 (2015) Numbers 1 and 2.

The expanded cost-benefit analysis performed two layers of analyses: (a) from the viewpoint of the food service businesses; and (b) from the standpoint of society. The first will justify the use of SCP principles in the business operations of the food service establishments. The second will show the positive impact to the population and the entire economy of restaurants practicing SCP, which could help rally popular and policy support. In each of these two e-CBA levels, benefits differ. In the financial CBA, the benefits are mostly sales and other revenue sources that boost the financial bottom line of the food service establishments. In the economic CBA, which is a catch-all phrase that also includes environmental (e.g., net impact on GHG emissions) and social (e.g., net impact on employment and livelihood), the benefits are their positive effects on the overall economy and society, such as reduction of GHG/carbon emissions, creation of value such as new products and services, and savings scarce resources such as energy and water. Costs also differ, with capital expenditures and operating and maintenance expenses recognized in financial analysis; while in economic analysis, these financial costs are converted into economic values or their true cost to society, and other indirect and external costs (e.g., pollution, depletion of resources, etc.) are included as well.

Expanded cost-benefit analysis was conducted for 10 sustainable consumption and production (SCP) practices integrated into the operations of a sample WWF partner restaurants and covering four (4) areas of sustainability namely electricity, water, food waste and local sourcing. The selection of the SCP practices was based on the observation that at least two restaurants are adopting the practice, and hence are candidates for pushing other restaurants to also consider adopting if proven feasible. There were SCP practices, however, that were not subjected to e-CBA because policies, programs, or rules are already in place at either the national or LGU level promoting their practice, such as non-food waste reuse and recycling through established materials recycling facilities (MRFs).

The cost-benefit analysis approach was modified or simplified to directly address the issue of simply determining if the benefits from the practice outweigh their costs, hence covered only five (5) years of analysis and presented only the most relevant viability indicators, which are net present value (NPV) and benefit-cost ratio (BCR). No attempt was made to make a full-blown CBA, which applies more in project evaluation. Rough assumptions derived from extensive survey of the literature, field visits and interviews with partner and BAU restaurants prior to the community quarantines, and previous cost-benefit studies conducted by key members of the Team were also made to generate certain values due to constraints of direct observation, field visits, consultations, physical data gathering, etc. given the pandemic situation.

The results of the e-CBA determined that 8 of the 10 SCP practices are financially beneficial or generates financial gains to restaurants, led by soft and residual SCP measures in energy, water, and food waste; repurposing food waste for new meal selection; the use of filters, purifiers, or treatment devices for drinking and cooking water; and, use of energy-saving air-conditioning units[35]. Two SCP practices yielded negative NPVs, although they may not necessarily mean actual loss to the restaurant but only perhaps an accounting loss due to attribution of costs that may not totally and accurately accrue from the practice, as in the case of use of food waste as animal feed, or foregone sales or opportunity loss in the case of import replacement.

Nine (9) SCP practices were ascertained to be economically beneficial, with import replacement resulting in gains to society as it creates the opportunity to produce more goods (beef, in this instance) and hence boost household livelihood and income, and at the same time saves the economy foreign exchange. For the top four SCPs in terms of financial viability as mentioned in the previous paragraph, which are also the top SCPs in terms of economic viability, financial gains appear to be greater than their economic gains. But for the agriculture-related composting and local sourcing, economic gains are higher than their financial gains.

4.2 IMPLICATIONS ON FOOD SERVICE ESTABLISHMENTS

[35] Measures that were not covered by the other 9 SCPs, were difficult to directly quantify their impact due to limited data and observation, and with benefits that are primarily being discussed qualitatively were presumed to be incorporated in the analysis of soft and residual SCP practices.

One can view the results of the financial analysis as having direct impact on the operations and finances of food service establishments. And given the negative results of the financial CBA on use of food waste as animal feed and import replacement, it may be difficult to sell these practices to these establishments. However, the use of waste as animal feed, despite the possibility of incurring financial loss, could still be pursued by restaurants with integrated organic hog raising operations as the loss associated with the production of feed may be small and can be absorbed by the hog raising component of the restaurant's operations. Without the component of hog raising, the restaurant will be better off giving the food waste for free to backyard hog raisers.

Soft and residual measures showed most encouraging viability results, but the benefit numbers need to be further validated and presented in clear, measurable terms to convince restaurants with, say, 350 square meter dining, kitchen and storage area, 130 dining guests a day, and 90 dining seats to spend up to PHP 200,000 a year (the standard characteristics of restaurants used in the analysis) for these measures. The approach taken in this study to determine viability can be a good starting point that can still be improved.

4.3 POLICY IMPLICATIONS

Economic analysis determines SCP practices where state/LGU policies and programs can focus on, especially if negative financial viability results suggest that there is no financial advantage for food service firms in adopting the practice. One such example is beef import replacement, where government can provide technical and financial assistance, and marketing support to the local cattle/beef industry, including interventions along critical segments of the industry's supply chain, to increase local production of quality beef cuts. Although the intervention does not directly address imports, it promotes the use of local beef to the entire food service industry through increased availability of good quality and reasonably priced product, as well as potential diversification into various quality levels of beef meals in restaurants that already use imported beef on their menu.

Policy intervention can also help reinforce organic farming, composting, and other practices in which economic net benefits exceed financial net benefits, through technical assistance, training, dissemination of technical and market information, and fiscal incentives. Intervention should not just be on the supply side, but also in educating, raising awareness and shaping the behavior of consumers. Private advocacy groups can be an ally and partner in the promotion of these sustainability practices.

Also, in cases where it is a challenge to convince establishments to take up certain SCP practices which are seen to be beneficial to society and also beneficial to the establishments, but the latter fail to see the benefit because they are difficult to measure, policy can step in and rules can be imposed to encourage the establishments to make the needed change. Some system of rewards and punishments can be put in place by authorities, national or local, for this purpose. This may be helpful in pushing the food service industry to adopt soft and residual measures, where the benefits as specified in the e-CBA may still need to be specified in more concrete terms.

4.4 AREAS FOR FURTHER RESEARCH

The conduct of the study faced many challenges, notably the COVID-19 pandemic which made it even more difficult to secure information or fill in information gaps from partner restaurants, and provided limited opportunity to undertake field research and data gathering. The gaps were filled by secondary data or figures that resulted from previous studies, but there could have been issues of data accuracy, choice, treatment and assumptions used to reflect certain narratives, with all these possibly able to skew conclusions to certain biases. Hence, the study can be taken to the next level with improved quality of data.

One instance where improvement can be made is in the specification and estimation of capital expenditures, as most references used on agricultural production cost structure, for example, mainly provided operating expenses. Better articulation of capex will also allow the period of analysis to be adjusted based on the life in years of the major fixed

asset (not just 5 years), thereby more accurately reflecting the values of feasibility indicators specifically NPV and BCR.

On benefits, given the findings of the study of the huge positive impact of soft and residual measures, hence the need to convince establishments to spend money on their implementation, specifying the benefit in terms of the difference between baseline values and values on energy consumption, water consumption, reduced food waste, among others, may still be an abstract concept and might need more concrete measure of performance to truly get the establishments convinced. Estimation of the baseline can be improved using domestic data, such as a survey of a significant sample of local BAU establishments, while the sample of Scenario partner establishments practicing soft measures can be expanded. Residual measures, which can be quantified if data had been provided by or with closer observation of the sustainability or resource-saving facilities of sample establishments, may need to be presented in detail at least for the major devices in the same manner as the use of energy-saving air-cons and freezers. Results from the monitoring tool can hopefully provide inputs for more accurate accounting of benefits of these soft and residual practices.

Economic valuation and conversion of financial prices and costs into economic prices and costs can also be improved. For example, the popular measure of economic price of a product or service is willingness to pay of consumers, which is derived from a survey. The alternative is computing for the weighted average of the amount spent by consumers corresponding to the various ways of accessing the resource, e.g., for water, access of households can be through a mix of piped connection, bottled purified water, truck/tricycle vendors, and queueing in public faucets/wells. In the e-CBA, these values were either proxied by retail price or deconstruction of cost components of the product using input-output table data and applying assumed economic conversion ratios to each of these major cost components.

Annex 1 -HOW PARTNER RESTAURANTS WERE CLASSIFIED TO SCP LEVELS AND STUDY SCENARIOS

From the start, the Study Terms of Reference (TOR) provided the guidelines on how the scenarios should be broken down into three scenarios with definitions stated as follows:[36]

- Scenario 1 – Baseline/Level 1 SCP Integration – a case for business as usual (BAU), or the status quo of the restaurant is described;
- Scenario 2 – Level 2 Integration of SCP Principles – SCP practices are integrated into the business operations, but without any major technology or investment in SCP-related programs, equipment and training;
- Scenario 3 – Level 3 Integration of SCP Principles – SCP practices are performed with introduction of technological tools to improve efficiency.

The definitions of the scenarios in the TOR was interpreted and expounded by the study team to mean:

- Scenario 1 – the restaurant has not articulated any goal to integrate SCP principles into their business operations, or the restaurant may have committed to adopt SCP principles, but may have done little to that effect yet.[37]

- Scenario 2 – Where the restaurant is, or claims to be, incorporating SCP practices into their business, and indeed some of these practices could be observed, but there is no significant investment in SCP-related program/system, training and facilities.

- Scenario 3 – Where the restaurant is integrating SCP principles into its operations, with visible programs and plans, staff training and education, and acquisition of facilities and equipment that support SCP.

Classifying Partner Restaurants into SCP Levels

The methodology to classify partner restaurants was determined by the Study Team through an exhaustive review of relevant literature.

SCENARIO/LEVEL OF INTEGRATION OF SCP PRINCIPLES IN FOOD SERVICE ESTABLISHMENTS

CRITERIA	SCENARIO 1	SCENARIO 2	SCENARIO 3
Four (4) areas/ attributes of sustainability	Establishment is not aware, nor is considering any activities in support of any of the four (4)areas.	Establishment is aware of the importance of the four (4) areas, and is in the process of observing them in its operations.	Most of these four (4) areas are actually incorporated in the vision, plans, programs and operations of the business.
Five (5) stages towards sustainability	Up to partial compliance with Stage 1 requirements only at best.	In the process of undertaking activities that align its operations with Stage 2.	Clearly showing the characteristics of Stage 2 or beyond.
Sustainability indicators	Very few indicators if at all are hardly present in the operations of the establishment, and	Consciously practicing sustainability, with a number of significant indicators	Indicators significantly exist in all four (4) major focus of sustainability – water, energy, waste and food

[36] This is a modification from the original TOR where the sample is supposed to come from 2 partner establishments in each of the 3 locations, not 2 establishments per Scenario.

[37] The TOR specifies that for the purpose of the cost-benefit study, the baseline should include the situation in a restaurant before SCP principles were integrated into its operations. This is applicable for the cost-benefit study, which require incremental analysis, i.e., with SCP vs without SCP comparison of costs and benefits, but for the classification of establishments, the Scenario 1 as described above should suffice.

	establishment is hardly aware that these are being done for sustainability.	present in the establishment's operations.	source – and perhaps even in other items like building design, CSR, etc.

The results of this initial assessment became the basis for the creation of the diagnostic form which was eventually used to interview the identified restaurants targeted to be part of this study and assist in classifying them per the three scenarios. The interview for purpose of scenario classification was conducted with assistance from WWF and was the first step undertaken in the data-gathering process. All six (6) restaurants that were sampled in this study went through the diagnostics at least once.

DIAGNOSTICS FOR CLASSIFYING RESTAURANTS INTO SCP LEVELS

DIAGNOSTICS FOR CLASSIFYING RESTAURANTS INTO SCP LEVELS
Tick off the box if the statement is true for the partner restaurant

LEVEL 1 SCP INTEGRATION

	Food establishment has low awareness on the impact of their business on the environment and society.[(a)]
	Food establishment complies with environmental, sanitation and health regulations and standards.
	Low level of staff awareness on sustainability principles (Level of knowledge about climate change, carbon footprint, sustainable dining, sustainable consumption and production).
	Limited SCP practices have been implemented with regards to the four areas: water, energy, waste, and food source.
	Food establishment has no strong campaign on environmental sustainability (aside from The Sustainable Diner).

LEVEL 2 SCP INTEGRATION

	Vision, Mission, Core Values or Goals of the restaurant includes promoting sustainability/sustainable development. [(c)]
	Food establishment has adopted some sustainability practices with regards to the four areas: water, energy, waste, and food source.
	Food establishment has adopted a program or system for conserving energy, but without using any equipment needing capital expenditures. [(d)]
	Food establishment has adopted a program or system that reduce water consumption, but without using any equipment needing capital expenditures. any equipment [(d)]
	Food establishment has adopted a program to reduce food wastes, plastic wastes and other non-food wastes. [(e)]

	Food establishment practices waste segregation.
	There is staff awareness on some sustainability principles (Level of knowledge about climate change, carbon footprint, sustainable dining, sustainable consumption and production).

LEVEL 3 SCP INTEGRATION

	Food establishment is innovating/designing sustainable products, meals and services, new business models and business approaches, and technologies to reduce waste and recover value from waste, and commits funds and other resources in addressing environmental issues.
	Food establishment actively promotes the adoption of eco-friendly practices, materials, and components among its suppliers and customers.
	Practices food and/or non-food waste reduction, re-use/recycling, donation, diversion
	Food establishments uses locally- and/or own-produced and seasonal food (e.g. has own garden or farm, or sourced from nearby local communities).
	Food establishment has invested in energy-saving equipment and/or appliances, specifically energy saving equipment used in food preparation, sanitation and refrigeration.
	Food establishment has invested in equipment, fixtures, technology and/or systems that reduce water consumption (e.g. Water-saving facilities, such as low-flow fixtures, water-efficient pre-rinse spray valves, water-saving washers and urinals, are installed in the restaurant.)
	Food establishment aims to reduce food and non-food wastes, and has invested in sorting, collecting and tracking equipment for food and non-food wastes, such as separate bins.
	Food establishment participates in or conducts community projects on the environment, nutrition, health, sanitation or assisting disadvantaged groups. [(b)]
	Menu communicates SCP initiatives of the restaurant (e.g., menu is adjusted to seasonal food products, portion options, etc.)
	Regular staff trainings outside of the pre-requisite by legislation are conducted on environment conservation and sustainable practices, thus a higher level of staff awareness on SCP.
	Sustainability information is integrated into the food establishment's reporting cycle.

	Food establishment offers plant-based dishes in the menu.

MEASUREMENT:

- Food establishment likely belongs in Scenario 1: If tick marks are mostly in level 1 SCP, with 2-3 tick marks in level 2 and no/zero tick marks in level 3.
- Food establishment likely belongs in Scenario 2: If tick marks are mostly in level 2, with 2-3 tick marks in level 3.
- Food establishment likely belongs in Scenario 3: If tick marks are mostly in level 3.

Notes:

a/ The level of awareness of business impact on the environment and society can be measured by how satisfactorily leadership of partner restaurants could answer the question, *"What does sustainability mean to you?,"* or "*What is your business' role/contribution to promoting sustainable development?"* In essence, businesses that volunteer and agreed to participate in the Sustainable Diner project of WWF, should have a certain degree of awareness of their role in sustainable development. It is up to the surveyor/investigator to determine based on observation and interview the extent of this awareness.

b/ A "yes" answer should be supported by proof, such as pictures, promotional materials, social media posts, etc.

c/ A copy of the business' vision, mission, core values and goals and/or annual report, if available, should be requested to validate the answer.

d/These are the basic energy conservation practices of businesses such as turning off lights and water taps when not in used, closing restaurants in non-peak hours of the day, replacement of bulbs to LED lights, etc.

e/ These are practices that does not involve investment in equipment and technology. An example is the business policy of discouraging use of plastic straws or the conscious use of disposable packaging for take-outs and/or food purchases.

Modifying the Definition of the Scenarios

The diagnostic form to determine the SCP level in restaurants, the subsequent interviews and data-gathering that followed were useful to validate the working definition of the Scenarios used in this study. The important learnings from these were:

- It validated the study team's hunch that Scenario 1 restaurants have some understanding of and/or adopt some form of SCP practices (Level 1), hence were not necessarily baseline nor "*business-as-usual*" restaurants.
- The unsuitability stems from the restaurants difficulty in recalling experiences in the past, and especially if old records of this past are no longer available or the personnel involved in the operations of the past is no longer part of the food service establishment.
- Baseline indicators that would form the basis of cost-benefit comparison and analysis of the value of SCP principles applied in restaurants should reflect the majority of the restaurants in the Philippines

that are not part of the WWF's #TheSustainableDiner project or have not even heard of SCP principles to be suitable sample for business-as-usual scenario.

- Baseline restaurant is therefore not the same, or cannot be the same as Scenario 1 restaurants with level 1 SCP principle implementation.

Classification of Restaurants Sampled

Following the learnings from the data-gathering, the sample of restaurants for this study was expanded from the original six restaurants to seven restaurants. The baseline restaurant, labeled Scenario 0-A was sourced from WBF's own network and is not part of WWF's current SCP program or connected to any WWF initiatives.

SCP Cost-Benefit Analysis Study Sample

SCP Scenario	SCP Level Definition	Sample Restaurant
Scenario 0 (Baseline)	The real business as usual scenario represents restaurants that are unaware that they are practicing SCP principles and whose management, ownership or leadership have never considered the application of SCP practices or is grossly unaware of it.	**Scenario 0-A Restaurant**
Scenario 1	Restaurants who have low awareness of SCP and is only starting to apply SCP principles in its operations.	**Scenario 1-A Restaurant** **Scenario 1-B Restaurant**
Scenario 2	Restaurants are aware of the importance of SCP and are in the process of observing them in their operations. They also have plans for investment or have just started investing in tools in aid of SCP application.	**Scenario 2-A Restaurant** **Scenario 2-B Restaurant**
Scenario 3	SCP practices are present in most of the four areas and are actually incorporated in the vision, plans, programs and operations of the business. SCP principle is integrated in its business model.	**Scenario 3-A Restaurant** **Scenario 3-B Restaurant**

Annex 2 - SPECIFIC SCP PRACTICES IN SAMPLE RESTAURANTS

SUSTAINABILITY AREA/SCP PRACTICE	SPECIFIC PRACTICES OF SAMPLE RESTAURANTS					
	S3A	**S3B**	**S2A**	**S2B**	**S1A**	**S1B**
ENERGY						
1. Policy on use of air-con, lights, etc.	Shut-off of lights & air-con in offices one hour a day; "Earth Hour" observed.	N/A	N/A	Air-con turned on only if 2-3 tables are occupied, 8 hours in the offices, one hour before an event.	Air-con turned on if there are diners, 30 minutes before an event; lights turned on 30 minutes before an event, reduced 30 minutes before closing.	Only 1-2 of the 6 air-conditioning units are turned on if there are no diners.
2. Use of LED, inverters & other energy saving appliances; proper maintenance	Purchase of equipment is based on efficiency rating; equipment is properly maintained.	LED lights, LED TV, inverters are used. S3B invested a substantial amount to upgrade its electricity supply.	Uses energy-saving equipment, specifically LED lights, inverters and low-energy freezers and ovens.	Uses LED lights.	Uses LED lights and inverter air-conditioning units.	All 6 of the restaurant's air-conditioning units are inverters.
3. Maximizing chiller capacity	Other chillers are no longer used if capacity in operating ones can be maximized.	N/A	N/A	N/A	N/A	N/A
WATER						
1. Regular checks for unclosed faucets and leaks	Marshals are assigned to check for unclosed faucets of leaks	N/A	N/A	N/A	N/A	N/A
2. Use of other materials or water-saving methods to clean dishes/ kitchen utensils	To some extent, paper napkins are used to clean plates to minimize use of water.	N/A	N/A	N/A	N/A	Soaking chopsticks in a container with soap & water; spoon & fork cleaned in separate basins

SUSTAINABILITY AREA/SCP PRACTICE	SPECIFIC PRACTICES OF SAMPLE RESTAURANTS					
	S3A	**S3B**	**S2A**	**S2B**	**S1A**	**S1B**
3. Use of water filters, purifiers or treatment devices for drinking and cooking water.	Produces own oxygenated water (PH 8) for drinking and cooking.	S3B has water purification system for drinking and cooking with filters replaced monthly.	N/A	N/A	N/A	A kitchen faucet is installed with filter to produce purified water for drinking and cooking.
4. Re-uses water	N/A	N/A	N/A	Water used for dishwashing also used for cleaning floors.	N/A	N/A
FOOD WASTE (INCLUDING PACKAGING)						
1. Pre-service interventions (Menu planning, market list, JIT delivery of food supply, quality inspection of deliveries)	S3A plans and purchases only the quantity of ingredients needed for preparing meals to meet projected demand of diners based on planned menu; JIT delivery system adopted for non-perishable food items.	N/A	Practices menu planning in the procurement of ingredients.	Enforces quality control guidelines for suppliers of ingredients; careful planning of food quantities for events.	N/A	N/A
2. Re-use for the preparation of other meals	Some unused or unconsumed food ingredients, mostly fruits and poultry, are re-used for certain meal selection.	Portion of pre-food waste (unused ingredients in the kitchen) are used as food stock.	N/A	N/A	N/A	Some unused or unconsumed food ingredients are re-used for certain meal selection in other restaurants of the chain.
3. Composting – Bokashi, etc.	Bokashi composting practiced since 2015 using kitchen	Practices Bokashi composting, with the compost used	S3A gives kitchen waste to its contract farm for	N/A	N/A	N/A

SUSTAINABILITY AREA/SCP PRACTICE	SPECIFIC PRACTICES OF SAMPLE RESTAURANTS					
	S3A	S3B	S2A	S2B	S1A	S1B
	waste consisting of peelings, spoiled portions, etc. The juice extracted is sprayed as fertilizer to the plants in the restaurant's garden. The dry portion is deposited in a plot, then used in the restaurant's farm in another location.	in S3B's own herb and vegetable farm and some portion sold to customers. Up to 10 drums (80 liters capacity each) are filled with food waste materials for composting every two months.	composting. This farm provides the restaurant about 10% of its vegetable supply.			
4. Used as animal feed	Part of kitchen waste goes to a small organic hog farm of the restaurant chain and accounts for 10% of the waste used as animal feed (the rest comes from the other restaurants) in the hog farm.	About half of post-food (plate) waste is given to the community to produce organic feed.	N/A	N/A	All food wastes are used as feed for hogs in the local community. These are collected daily, usually reaching 80 liters during peak days and 40 liters for non-peak days of the restaurant.	
5. Kitchen/meal surpluses given/sold to employees	Part of pre-food (kitchen) waste, mostly vegetables, are sold to employees.	N/A	N/A	N/A	N/A	Portion of unconsumed or surplus meals is given to restaurant staff
6. Use of non-plastic (e.g., paper) bags and packaging materials for take-outs	N/A	N/A	Strictly adheres to no plastic policy. Uses more expensive corn-based paper bags for takeout meals.	N/A	Uses paper bags of various sizes for take-outs and doggy bags for leftover meals.	N/A

SUSTAINABILITY AREA/SCP PRACTICE	SPECIFIC PRACTICES OF SAMPLE RESTAURANTS					
	S3A	**S3B**	**S2A**	**S2B**	**S1A**	**S1B**
7. Customers are encouraged to bring home unconsumed meals	N/A	N/A	N/A	S2B encourages diners, especially during events, to take excess food home to avoid wastage. Guests are given takeout box for this purpose.	N/A	N/A
NON-FOOD/GENERAL WASTE						
1. Recycling of paper into bags, baskets and other items	Used paper is made into baskets, paper bags and accessories (bracelets, necklaces) by housewives in a community who are paid for each piece of the item sold to S3A.	N/A	N/A	N/A	The restaurant re-uses paper, producing order slips and signages out of this waste.	N/A
2. Recycling of plastic materials into eco-bricks, etc.	Plastics, mostly PET bottles, are transformed into eco-bricks which are used as walls/separators in the MRF center's composting area.	N/A	N/A	N/A	N/A	N/A
3. Practices waste segregation; brings/sells some non-food waste to MRF,	S3A maintains trash at no more than 2 bags a day: 1 biodegradable & 1 non-biodegradable. Rest of the non-	Food waste segregation was practiced starting 2017 to reduce the high cost of manning of wastes.	Practices waste segregation. Wastes are collected daily. Trash bins are provided separately	S2B has one trash bin for each of the following wastes: cans; biodegradable; non-biodegradable;	Wastes are segregated between biodegradable and non-biodegradable. This also complies	The local government strictly mandates waste segregation among business establishments in

SUSTAINABILITY AREA/SCP PRACTICE	SPECIFIC PRACTICES OF SAMPLE RESTAURANTS					
	S3A	**S3B**	**S2A**	**S2B**	**S1A**	**S1B**
original suppliers	food waste goes to S3A's MRF for recycling, while scrap metals are sold to junk shops. Food waste are composted, converted into feed, etc.	The local government mandates the segregation of wastes by restaurants as part of conditions for securing business permit.	for biodegradable, non-biodegradable, plastic.	and leftovers. A private garbage collector picks up the garbage every day and is paid on a monthly basis.	with existing ordinance of the local government on waste segregation. Trash will not be picked up by the LGU's garbage collectors if not segregated. Bottles are disposed separately, returned to their original suppliers.	the city. Different entities collect different types of trash, and mixed trash on a single bag will not be collected.
LOCAL SOURCING						
1. Produces some amount of herb, vegetable, and/or fruit from own farm	S3A maintains a farm in a town in Rizal province. It produces fruits and vegetables (lettuce, eggplant, okra). Part of the produce is delivered to the restaurant about twice a month.	S3B has 3 herbal farms, all Bokashi areas, which produce lettuce, kale, tomatoes, cucumber. 10% of produce are sold, 90% goes to the kitchen.	N/A	The restaurant runs a small farm where 5% of its vegetable requirement comes from.	N/A	N/A
2. Sources some vegetables and/or fruits from contract farms	N/A	S3B's contract farms supply 15% of the restaurant's vegetable requirements (herbs, lettuce, other vegetables)	Contract cooperative farms, where kitchen food waste is given to be used as compost, supply 10% of restaurant's vegetable requirements.	N/A	N/A	N/A
3. Sources some vegetables,	N/A	Other local suppliers provide	85-90% of meat are locally sourced,	N/A	N/A	N/A

SUSTAINABILITY AREA/SCP PRACTICE	SPECIFIC PRACTICES OF SAMPLE RESTAURANTS					
	S3A	**S3B**	**S2A**	**S2B**	**S1A**	**S1B**
fruits and other farm products from local farms		up to 15% of S3B's fresh produce requirement	especially pigs for roasting (*lechon*).			
OTHER SCP PRACTICES						
1. Staff training on restaurant's sustainability mission and practices/ maintenance of a list of SCP practices	New staff get orientation and training on sustainability practices of the restaurant. Existing staff get refresher courses, especially on newly adopted best practices. S3A also has a list of best/sustainable practices.	S3B discusses SCP practices in staff meetings held monthly. Food waste segregation was introduced in a series of these meetings.	N/A	N/A	N/A	N/A

ANNEX 3 - SUMMARY OF FINANCIAL BENEFITS AND COSTS FROM INITIAL COST-BENEFIT ANALYSIS STUDY (PHP'000)

SUSTAINABILITY AREA/SCP PRACTICE	SCENARIO 3-A			SCENARIO 3-B			SCENARIO 2-A			SCENARIO 2-B			SCENARIO 1-A			SCENARIO 1-B		
	BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST	
		Capex	O&M		Capex	O&M		Capex	O&M		Capex	O&M		Capex	O&M		Capex	O&M
ENERGY																		
1. Policy on use of air-con, lights, etc.	3,907	NA	NA	2,457	1,000	NA	14,709	NA	NA				675	NA	NA	2,748	NA	NA
2. Use of LED, inverters & other energy saving appliances; proper maintenance																		
3. Maximizing chiller capacity																		
WATER																		
1. Regular checks for unclosed faucets and leaks	336	NA	NA	386	NA	NA	0	0	0				0	0	0	2,108	NA	NA
2. Use of other materials or water-saving methods to clean dishes/ kitchen utensils																		
3. Re-uses water																		
4. Use of water filters, purifiers or treatment devices for	1,080	30	252	1,527	0	28	0	0	0				0	0	0	521	0	16

drinking and cooking water.																		
FOOD WASTE (INCLUDING PACKAGING)																		
1. Menu planning, market list, JIT delivery of food supply, quality inspection of deliveries	NA	NA	NA	0	0	0	NA	NA	NA				0	0	0	0	0	0
2. Re-use for the preparation of other meals	596	0	0	0	0	0	0	0	0				0	0	0	707	0	0
3. Composting – Bokashi, etc.	3.6	0.8	28.9	55.5	10.0	31.3	9.0	0	0				0	0	0	0	0	0
4. Used as animal feed	5.0	0.1	10.8	21.0	0	0	0	0	0				8.7	0	0	0	0	0
5.																		
6. Kitchen/meal surpluses given/sold to employees	0	0	0	NA	NA	NA	0	0	0				0	0	0	1.055	0	0
7. Use of non-plastic (e.g., paper) bags and packaging materials for take-outs	0	0	0	0	0	0	NA	NA	NA				NA	NA	NA	0	0	0
8. Customers are encouraged to bring home unconsumed meals	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NON-FOOD/GENERAL WASTE																		
1. Recycling of paper into	60	0	45	0	0	0	0	0	0				4	0	0	0	0	0

bags, baskets and other items																	
2. Recycling of plastic materials into eco-bricks, etc.	NA	0	12	0	0	0	0	0	0				0	0	0	0	0	0
3. Practices waste segregation; brings/sells some non-food waste to MRF, original suppliers	NA	NA	NA	NA	NA	NA	NA	NA	NA				NA	NA	NA	NA	NA	NA
LOCAL SOURCING																		
1. Produces some amount of herb, vegetable, and/or fruit from own farm	NA	NA	NA	9.6	0	10.7	0	0	0				0	0	0	0	0	0
2. Sources some vegetables and/or fruits from contract farms	0	0	0	4.8	0	0	4.8	0	0				0	0	0	0	0	0
3. Sources some vegetables, fruits and other farm products from local farms	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
OTHER SCP PRACTICES																		
1. Staff training on restaurant's sustainability mission and practices/ maintenance	NA	NA	NA	NA	NA	NA	0	0	0				0	0	0	0	0	0

of a list of SCP practices																		

Annex 4 - SUMMARY OF ECONOMIC, ENVIRONMENTAL & SOCIAL BENEFITS AND COSTS FROM INITIAL COST-BENEFIT ANALYSIS STUDY (PHP'000)

SUSTAINABILITY AREA/SCP PRACTICE	SCENARIO 3-A			SCENARIO 3-B			SCENARIO 2-A			SCENARIO 2-B			SCENARIO 1-A			SCENARIO 1-B		
	BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST		BEN-ENFIT	COST	
		Capex	O&M		Capex	O&M		Capex	O&M		Capex	O&M		Capex	O&M		Capex	O&M
ENERGY																		
4. Policy on use of air-con, lights, etc.	504	NA	NA	390	NA	NA	1,750	NA	NA				96.4	NA	NA	436	NA	NA
5. Use of LED, inverters & other energy saving appliances; proper maintenance																		
6. Maximizing chiller capacity																		
WATER																		
5. Regular checks for unclosed faucets and leaks	7.6	NA	NA	7.9	NA	NA	0	0	0				0	0	0	47.6	0	0
6. Use of other materials or water-saving methods to clean dishes/ kitchen utensils																		

7. Re-uses water																		
8. Use of water filters, purifiers or treatment devices for drinking and cooking water.	NA	30.6	251	386	0	251							0	0	0	521	0	15.4
FOOD WASTE (INCLUDING PACKAGING)																		
9. Menu planning, market list, JIT delivery of food supply, quality inspection of deliveries	NA	NA	NA	0	0	0	NA	NA	NA				0	0	0	0	0	0
10. Re-use for the preparation of other meals	2.5	0	0	NA	NA	NA	0	0	0				0	0	0	3.7	0	0
11. Composting – Bokashi, etc.	3.8	0.7	28.7	59.0	8.8	20.0	9.6	NA	11.9				0	0	0	0	0	0
12. Used as animal feed	5.8	0.8	10.8	24.4	0.9	13.0	0	0	0				10.1	0	0	0	0	0
13.																		
14. Kitchen/meal surpluses given/sold to employees	0	0	0	NA	NA	NA	0	0	0				0	0	0	5.6	0	0
15. Use of non-plastic (e.g., paper) bags and packaging materials for take-outs	0	0	0	0	0	0	NA	NA	NA				0	0	0	0	0	0
16. Customers are encouraged to bring home	0	0	0	0	0	0	NA	NA	NA				0	0	0	0	0	0

unconsumed meals																	
NON-FOOD/GENERAL WASTE																	
4. Recycling of paper into bags, baskets and other items	60.4	0	20	0	0	0	0	0	0				4.2	0	0	0	0	0
5. Recycling of plastic materials into eco-bricks, etc.	NA	0	5	0	0	0	0	0	0									
6. Practices waste segregation; brings/sells some non-food waste to MRF, original suppliers	NA	NA	NA	NA	NA	NA	NA	NA	NA				NA	NA	NA	NA	NA	NA
LOCAL SOURCING																		
4. Produces some amount of herb, vegetable, and/or fruit from own farm	NA	NA	NA	9.6	0	6.1	0	0	0				0	0	0	0	0	0
5. Sources some vegetables and/or fruits from contract farms	0	0	0	14.4	0	13.2	14.4	NA	7.4				0	0	0	0	0	0
6. Sources some vegetables, fruits and other farm products from local farms	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0

OTHER SCP PRACTICES																		
2. Staff training on restaurant's sustainability mission and practices/ maintenance of a list of SCP practices	NA	NA	NA	NA	NA	NA	0	0	0				0	0	0	0	0	0

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