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EXPERTISE FRANCE

Rethinking Plastics
Circular Economy Solutions to Marine Litter

COMPILATION OF SELECTED ALTERNATIVES TO SINGLE USE PLASTIC ITEMS AND PACKAGING USED FOR FOOD CONSUMPTION, TAKEAWAY AND DELIVERY

Carrier Bag, Beverage Cup, Food Container, Plate, Spoon And Fork, Drinking Straw, Stirrer

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INTRODUCTION

Single-use plastics (SUPs) contribute significantly to the solid wastes generated by typical food service establishments. SUPs have become the material of choice for many of the food products we consume today due to its convenience, cheaper cost, and its excellent properties. Plastics are lightweight, can extend the shelf life of food and are easily molded into desired shapes.

However, plastics do not degrade in the environment. These can leak in waterways, clogging drainage and increasing susceptibility to flooding. They can accumulate and break down into microplastics that contaminate the environment. Plastics finding their way in the marine environment can physically or chemically harm marine life, can negatively impact biodiversity and ecosystem functions, and can move up the food chain when ingested by marine life, possibly reaching humans. Plastic pollution can also pose threat to livelihood like fishing and tourism activities.

In the Philippines, some local government units (LGUs) have passed ordinances banning or regulating the sale and use of plastic bags and polystyrene foams due to their perceived role in the clogging of waterways, increased flooding and water pollution. An example of such initiative is the implementation of plastic regulations in Quezon City, where single-use plastic ban in restaurants and hotels through City Ordinance No. SP-2876 (21st Quezon City Council, 2019) is implemented starting July 2021.

The ordinance prohibits the distribution and/or use of SUPs for dine-in purposes in all hotels and restaurants in Quezon City. It covers prohibition of use of disposable plastic spoon and fork, knives, disposable plastic and paper cups, disposable coffee stirrers and food containers when serving food for customers who are dining in. Single-use sachets of condiments for dine-in are prohibited, as well. All dine-in service should use materials that can be washed and reused.

However, this ban is not yet implemented for takeaway and deliveries as this will involve not only careful study on suitable alternative materials but will also require alternative delivery systems. Nevertheless, the Quezon City local government has started encouraging food establishments to adopt a “by request protocol”, where customers are given the choice to opt-out of single-use cutleries and condiment sachets for takeaway orders.

This document provides a compilation of selected alternatives to single-use plastic products which are used for food consumption, takeaway and delivery. The list includes products that are available in the Philippine market, but is not in any way, an exhaustive list. It provides information about the unit cost of the products, as well as an estimate of its cost per use to make the costs of multi-use alternatives comparable with single-use products. Unit costs were obtained from Lazada and Shopee, two of the major online selling platforms in the country, and from the websites of suppliers.

The reference units selected in the compilation are those that can hold comparable amounts of food items or beverages. Equivalent reference units across the same type of application are selected as much as possible to make meaningful cost comparisons. Photos used in this document were sourced from the online shops or from the suppliers' websites.

It should be noted that the costs reported reflect consumer price only and do not include externalities arising from the negative environmental and health impacts of the products listed. References for service life of SUPs and alternatives which are used in this document to estimate the cost per use, include various sources such as manufacturers of the products, internet publications and pertinent life cycle assessment (LCA) studies.

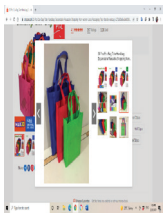
LIST AND COST COMPARISON OF SUPs AND ITS ALTERNATIVES

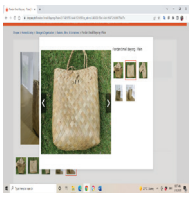
Cost is a major driver in deciding the material of choice for food consumption, takeaway and delivery, especially for businesses in the retail and food services sector. The National Solid Waste Management Commission (NSWMC) is mandated to update a list of Non-Environmentally Acceptable Products and Packaging Materials (NEAP) for phasing-out, in the condition that the NEAP alternatives cost no more than 10% of the cost of the NEAP and that the prohibition of NEAP is backed by science-based studies.

The following tables presents a summary of the cost estimates of SUPs and its currently available alternatives in the Philippines.

CARRIER BAGS

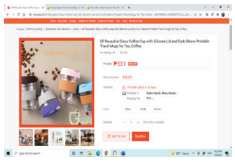
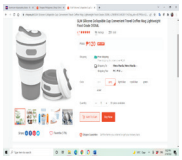
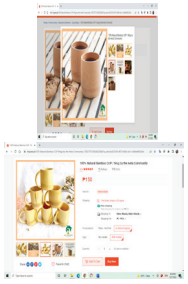
TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE, PhP/ use	PHOTO
Single-use	Thin bag Tiny – 22 x 36 cm M - 25 x 46 cm L – 31 x 48 cm Sando bag Mini-16.5x8.5x33cm Tiny-20.5x10.5 x36cm M-25x12x45cm L-30x15x45cm	Plastic (LDPE, HDPE)	0.34 – 1.00 0.45 – 1.45	1 1	0.34 – 1.00 0.45 – 1.45	 
Single-use	14x35cm 25x40cmx40mic 33x40cmx 40mic	Cassa-va-based	7.70 – 9.85	1	7.70 – 9.85	
Single-use	#8, #12, #16, #2 meal bag S- 22x10x30cm M- 25x8x36cm L-28x13x39cm XL - 30x8x46cm	Kraft Paper	0.9 – 6.8	1	0.9 – 6.8	

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE, PhP/ use	PHOTO
Single-use	10.5x18x5.5cm 12x21.5x8cm 13.5x26x7.5cm 15x28x9cm 15.5x30x9cm 16.5x32.5x9cm 17x32.5x10.5cm	Paper	1.30 – 2.40	1	1.30 – 2.40	
Multi-use	53 x 43 x 20 cm	Non-woven PP (eco-bags)	35.00 - 100.00	50	0.70 – 2.00	
Multi-use	XS, S, M, L, XL	rPET (eco-bags)	2.70 – 5.00	50	0.05 – 1.00	
Multi-use	37.5 x 32 x 10.5cm	Food grade silicone	1,520.00	1,000	1.52	
Multi-use	23x26x12 cm 25x25x16 cm 32x21x13 cm 37x17x27 cm	Abaca bags	109.00 – 178.00	50	2.18 – 3.56	
Multi-use	16.5 x 21.5 cm 21.5 x 26.5 cm 25 x 30.5 cm 30.5 x 35.5 cm 34 x 40.5 cm	Cotton cloth bags	38.00 - 88.00	50 - 150	0.25 – 0.59	

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE, PhP/ use	PHOTO
Multi-use	13x8x15 cm 15x8x15 cm 15 x 8 x 20 cm 18 x 8 x 23 cm 18 x 10 x 30 cm	Bayong (buri)	38.00-50.00	50	0.76 – 3.00	
Multi-use	13 x 20 x 20 cm 13 x 25 x 25 cm 13 x 30 x 25 cm	Bayong (pandan leaf)	40.00 45.00 50.00	50	0.80 – 1.00	
Multi-use	18 x 14 x 7cm 20 x 15 x 6cm 21 x 15 x 8cm	Reusable plastics	44.00 45.00 46.00	50	0.88 – 0.92	
Multi-use	27 x 32 x 10cm	Sack bag	25.00	50	0.50	

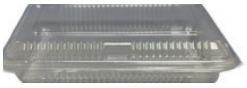
BEVERAGE CUPS

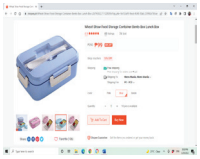
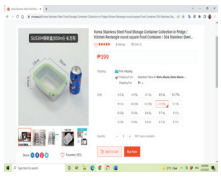
TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Single-use	240 ml	Plastics (PP, PE, PET)	0.78 – 2.40 (range: thin party cups to thicker milk tea cups)	1	0.78 – 2.40	 
Single-use	240 ml	Plastics (PS)	1.40	1	1.40	
Single-use	270 ml	Sugarcane bagasse-based	5.00	1	5.00	
Single-use	240 ml	Paper	1.56	1	1.56	
Multi-use	240 ml	Reusable Plastic	16	25 - 35	0.64	

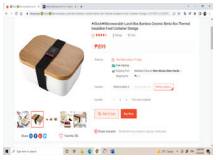
TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	350 ml - 450 ml	Glass	100 - 250	2,500	0.04 – 0.10	
Multi-use	350 ml	Glass	218.00	2,500	0.09	 with silicone cover and sleeves
Multi-use	350 ml	Food grade silicone	195.00	1,000	0.195	
Multi-use	250 ml	Bamboo	120.00–150.00	365	0.33 – 0.41	
Multi-use	450 ml	Bamboo Fiber	130.00	365	0.36	 with silicone cover and sleeves

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	350 ml	Rice and/or Wheat Straw	110.00	365	0.30	 with silicone cover and sleeves
Multi-use	240 ml	Metal	105	3,000	0.035	
Multi-use	240 ml	Ceramic/Por-celain	180-300	2,500	0.05 – 0.12	

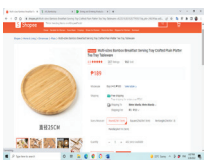
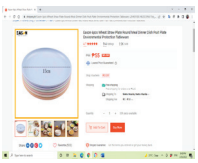
TAKEAWAY PACKAGING

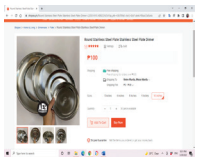
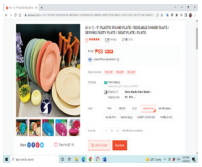
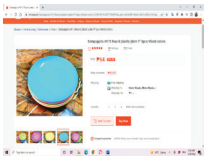
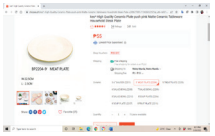
TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Single-use	1,760 ml	Plastic (PET, PP)	1.30	1	1.30	
Single-use	1,160 ml	Plastic (PS)	1.40 – 2.00	1	1.40 – 2.00	
Single-use	1,815 ml	Sugarcane bagasse-based	14.00	1	14.00	
Single-use	500 ml	Kraft Paper	3.60	1	3.60	 coated with wax or plastic
Single-use	500 ml	Paper	2.90	1	2.90	 coated with wax or plastic
Single-use	1,760 ml	Aluminum	12 - 14	1	12 - 14	
Multi-use	1,350 ml	Reusable Plastic (PP)	6.50 (thinner)	25 - 35	0.18 - 0.26	

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	1,950 ml	Reusable Plastic	32.00 (more rigid)	600	0.05	
Multi-use	1,040 ml	Glass	194	2,500	0.08	 with plastic lid
Multi-use	1,200 ml	Food grade silicone	228.00	1,000	0.228	
Multi-use	1,248 ml	Bamboo Fiber	250.00	365	0.68	 with bamboo lid
Multi-use	1,900 ml	Rice and/or Wheat Straw	82.00	365	0.22	
Multi-use	1,605 ml	Metal (stainless steel)	399.00	3,000	0.13	 with plastic lid

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	900 ml	Ceramic/Por-celain	886.00	2,500	0.35	 with bamboo lid

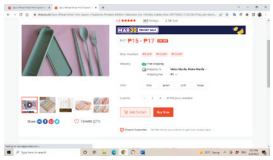
PLATES

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Single-use	18 cm/ 23 cm/ 25 cm	Sugarcane ba-gasse-based	3.20/ 5.50/ 7.00	1	3.20/ 5.50/ 7.00	
Single-use	15 x 18 x 20cm	Kraft Paper	18.10	1	18.10	
Single-use	23 cm	Paper	0.99	1	0.99	 silver and laminated
Multi-use	20 cm	Glass	30.00	2,500	0.1	
Multi-use	25 x 1.5 cm	Bamboo	189.00	365	0.52	
Multi-use	15 cm	Rice and/or wheat straw	9.17	365	0.025	

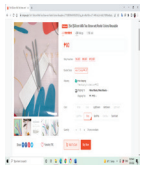
TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	20 cm/ 23 cm/ 25 cm	Metal	80.00/ 90.00/ 100.00	3,000	0.03	
Multi-use	23 cm/ 25 cm	Reusable Plastic	14.70/ 10.83	2,500	0.004 – 0.006	 
Multi-use	20 cm/ 23 cm/ 25 cm	Ceramic/Porce-lain	47.00/ 55.00/ 75.00	2,500	0.02 -0.03	

SPOON AND FORK

TYPE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Single-use	Plastic	0.80	1	0.80	
Single-use	Wood	1.20	1	1.20	
Multi-use	Food grade silicone	139.00 Price	3,000	0.05	
Multi-use	Bamboo	50.00	365	0.14	
Multi-use	Bamboo Fiber	82.00	365	0.22	

TYPE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	Wheat/Rice straw	15.00	365	0.04	 set with chopsticks and box
Multi-use	Metal	5.00	3,000	0.002	
Multi-use	Reusable Plastic	8.17	365	0.022	

DRINKING STRAWS

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Single-use	Straight and bent	Plastic	0.30	1	0.30	
Single-use	Straight	Wheat	1.20	1	1.20	
Single-use	Straight	Kraft Paper	0.80	1	0.80	
Multi-use	Straight and bent, small	Glass	20.00 - 70.00	2,500	0.008 – 0.03	 set with brush and case
Multi-use	Straight and bent, small	Food grade silicone	80.00	3,000	0.03	 set with brush and case

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Multi-use	Straight small and big	Bamboo	365	0.22	365	 set with brush and case
Multi-use	Straight	Wheat and or rice straw	0.80	2,500	0.00003	
Multi-use	straight and bent small and big	Metal	24.00	3,000	0.008	 set with brush and case
Multi-use	straight	Reusable Plastic	3.24	25-35	0.09 – 0.13	

STIRRERS

TYPE	SIZE	MATERIAL	COST, PhP	ESTIMATED SERVICE LIFE, No. of use(s)	COST per USE	PHOTO
Single-use	14 cm	Wood	0.18	1	0.18	
Single-use	14 cm	Bamboo	0.20	1	0.20	
Multi-use		Food grade silicone	65.00	3,000	0.02	
Multi-use		Metal	24.00	3,000	0.008	

Legend: S – Small; M – Medium; L – Large; XL – Extra-large; cm – centimeter; ml – millimeter; PET – Polyethylene terephthalate; PP – Polypropylene; PS – Polystyrene; rPET – Recycled polyethylene terephthalate

Avoiding the unnecessary use of the product in the first place is economically and ecologically the best way to reduce SUPs. For instance, not using single-use drinking straws should be the first preferred alternative, except in cases where its use is necessary such as for persons with medical condition. It should also be noted that the use of alternatives must be part of a broader strategy towards more sustainable production and consumption patterns, particularly for packaging and other single-use items.

Based on this compilation, single-use plastic products particularly carrier bags, beverage cups, food containers, plates, cutleries, drinking straws and stirrers have the cheapest cost per unit. SUPs cost two (2) to seven (7) times cheaper than other single-use options, particularly those that are made from bio-based materials (e.g. cassava-based, paper, sugarcane bagasse-based, wheat and rice straw products).

Currently, bio-based plastics are not locally produced in the Philippines, but are available as imported products. Bio-based and biodegradable plastics are relatively new technologies compared with conventional plastics, which have already an established economy of scale. This may change if bio-based materials become more mainstream in the future, as the production phase becomes more established and efficient.

Multi-use alternatives have expectedly higher upfront costs than single-use products because these are more durable and designed for multiple re-uses. However, if the items are reused for a sufficient number of times within its service life, the cost per use becomes less expensive than single-use counterparts. This statement, however, does not consider additional costs associated with reusing the items such cost of water, detergent, energy and manpower during the cleaning or washing process.

It should be noted for all the products in this compilation that while single-use plastics often appear as the cheapest up-front cost option, its “true” cost will likely result in higher cost once externalities are factored in such as the health and environmental impacts over the product’s life cycle, ecosystem impacts, biodiversity impacts, cost of waste management, and the negative economic impacts such as in tourism and fisheries.

BEST PRACTICE EXAMPLES IN THE PHILIPPINES

This section presents some best practices examples in the Philippines on the use of non-SUPs and multi-use alternatives to SUPs. Photos shown in the following sections were obtained from the websites or Facebook pages, as referenced in-text.

Zero Waste Innovation in Sari-sari Stores

"Wala Usik" ("Nothing Wasted") is a project of the Philippine Reef and Rainforest Conservation Foundation (PRRCF) which promotes zero waste and circular enterprises in micro businesses such as sari-sari stores and cafes. It aims to reduce SUP consumption, thus reducing plastic wastes that may leak into the ocean.

The "Wala Usik" project was launched in 2018 in Negros Island. This project demonstrates micro-refilling stations in sari-sari stores where products usually sold in sachets and plastic-repacked products like rice, cooking oil, soy sauce, soap, and detergents, are sold in refillable and reusable containers made of glass. Based on Inclusive Business Action Network's interview with Dave Albao, Executive Director of PRRCF (2021), results of the project's first prototyping cycle show that 8 sari-sari stores prevented the use of more than 45,000 individual sachets over a period of 7 months.

The project also assists small canteens or *carinderias* to sell affordable meals without using plastic *labo* bags, by using *baunan* or food containers made of stainless steel instead. They use subscription method in tracking the containers for reuse.

Milk Tea in a Bamboo Cup

Darling's Milk Tea is a shop owned by a couple from Maasin, Iloilo and started operations in 2020 during the COVID 19 pandemic (Darling's Milktea, n.d.). In an effort to promote sustainability in their business and considering that Maasin is the Bamboo Capital in the Philippines, they serve milk tea using reusable bamboo cups and bamboo straws. At present, they are open for the semi-franchise of their business.

Retail Refill Stores

Salin PH in the Philippines offers fresh produce and refills for everyday Filipino household products such as spices, coffee and loose-leaf tea by delivering these products in returnable containers. The refill system works through an online store where customers can order products and have it delivered by their courier. Containers can

be returned to the store on the customer's next purchase in exchange for reward points which the customer can use to purchase in the Salin PH online store (Dumdum, 2022).

Back to Basics (BtB) Ecostore in Quezon City, Philippines is a refillery grocery eco-store providing affordable and convenient access to home, pantry and personal care products without the unnecessary packaging. Part of the mission of the company is to build community awareness of how living a life that aims for zero-waste or low impact is good for the pocket, the people and the planet and promote the use of essentials without unnecessary new packaging.

Their products can be bought at their physical store or online through their website. For online orders, the customers can indicate their shipping preference: (1) BtB can arrange the delivery of the orders; (2) Customer can arrange delivery of the orders; or (3) Customers will pick up orders from the physical store in Quezon City.

The customers also have packaging options for the orders: (1) "in repurposed container", wherein the refill order(s) are packaged in cleaned pre-used containers. For food items, they use sterilized glass jars, except for gallon-size orders and salts, in which they use clean food-grade plastic containers; (2) "in brown paper bag" for some food items. (3) "in new reusable container" where refill order(s) are packaged in new (i.e., unused) container(s). Sterilized glass jars are used for food items, except for gallon-size orders, in which they use clean food-grade plastic containers; and (3) "in own container" where the customers bring their own containers (*Back to Basics Ecostore,* n.d.).

Maginhawa Eco samut sari-sari Store, also located Quezon City is a low-impact store that serves as a refilling center and specialty grocery store with locally sourced food items, biodegradable/ organic household products, and hand-made self-care needs. The store was launched in February 2021 and encourages visitors to bring their own bags, jars, and bottles to refill essential household items like dishwashing liquid, bleach, liquid soap, ethyl alcohol, detergent and the like.

The owners decided to open the shop near their home to encourage the community to reuse containers, rather than having old bottles end up in the landfill. The refilling station, which revolutionizes the "*tingi*" system, allows people to buy items depending on their needs and budget. All items are priced by weight minus the packaging. Customers who just happen

to pass by and would like to purchase items can also buy containers like cassava bags or upcycled beverage bottles, which they can reuse (Santos, 2021).

The ***B.Y.O.B (Bring Your Own Bote) pop-up store*** located in Bonifacio Global City in Taguig, likewise, offer condiments and other cooking products by the gram. The operation of the store is in partnership with NutriAsia, one of the leading producer and distributor of condiments in the country. The store also serves as a drop-off point for customers to donate plastic wastes such as plastic bottles, sachets, snack packs and plastic utensils for recycling. The store itself is made out of eco-bricks using plastic residual wastes as component. All the proceeds from the plastic discards will be used to provide furnishings for Gat Andres Bonifacio High School (*Bring Your Own Bote Project* | *NutriAsia Philippines*, n.d.)

Banana leaf as plates and food container

"Binalot" is a Filipino method of wrapping and serving food meals, usually made of rice and viand, using banana leaves. It uses the old concept of packing food that uses banana leaf as containers. There are restaurants throughout the Philippines that serve "binalot" meals either for takeaway or for dine-in.

Repurposed coconut shell for serving ice cream

Cocomama is a small food business which sells coconut ice cream, with branches in Boracay and La Union. The business operates as pop-up stalls and serves their signature dessert composed of a combination of coconut-based ice cream, yellow mangoes, sticky rice, pinipig and freshly-shaved coconut, in repurposed coconut shell (Cocomama, n.d.).

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IMPRINT

This publication was produced with support of the ‘Rethinking Plastics – Circular Economy Solutions to Marine Litter’ project. ‘Rethinking Plastics’ is funded by the European Union and the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by GIZ and Expertise France. The contents of this publication are the sole responsibility of the author and do not necessarily reflect the views of the European Union, the BMZ, GIZ or Expertise France

Project:
Rethinking Plastics – Circular Economy Solutions to Marine Litter
https://beatplasticpollution.eu/rethinking-plastics/

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Design/ layout: Flor Ian Louie Bantawig

Photo credits/sources: LuiChan Creatives

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As of October 2022