Asia-Pacific Economic Cooperation

Workshop on Reducing Food Loss and Waste through Packaging Innovations and Progress Review of FLW in the APEC Region

Member economy report: Progress review on FLW reduction

Philippines

DIONISIO G. ALVINDIA, Ph.D.

June 05 2025

Asia-Pacific Economic Cooperation

The Progress of Food Loss and Waste in the Philippines

Target

Under the Philippine National Climate Change Action Plan 2011–2028:

1. Develop “green cities and municipalities” by intensifying waste segregation at source, discard recovery, composting and recycling.
2. Formulate “climate-sensitive agriculture and fisheries policies, plans and program” under which the government intends to scale up best practices in agricultural and fisheries waste recycling and composting.

Measurement

Food Loss

Commodity	Area covered	Year	Loss percentage	Food supply stage
Bananas		2022	20.05%	Whole supply chain†
Lettuce and chicory	Mindanao	2011	11.50%	Wholesale
Maize (corn)		2022	14.69%	Whole supply chain†
		2011	15%	Whole supply chain
Mangoes, guavas and mangosteens	Bataan	2018	9.26%	Farm
		2018	2.14%	Transport
	Calabarzon	2018	6.70%	Wholesale
	Oriental	2018	4.89%	Farm, Sorting
	Mindoro	2018	3.33%	Transport
	Blumentritt	2018	2.5 – 5.5%	Wholesale
	Divisoria	2018	2.5 – 5.5%	Wholesale
Papayas	Mindanao	2011	15.30%	Wholesale
		2011	40.10%	Transport

Measurement

Food Loss

Commodity	Area covered	Year	Loss percentage	Food supply stage
Rice		2022	18.10%	Whole supply chain[†]
		2013	2 – 6%	Storage
		2013	3 – 10%	Farm - Handling
		2013	1 – 5%	Farm - Drying
		2013	2 – 6%	Farm - Threshing
Tomatoes	Laguna	2018	0.28%	Farm
		2018	0.60%	Packing
		2018	3.60%	Wholesale
		2018	1.48%	Distribution
	Mindanao	2011	10.80%	Wholesale

[†] Pastolero, A., and Sassi, M. (2022). Food loss and waste accounting: the case of the Philippine food supply chain. *Bio-based and Applied Economics 11*(3), 207–218. https://doi.org/10.36253/bae-11501.

Measurement

Food Waste

	Tonnes		Kg/capita	
	2019	2022	2019	2022
Households	9,334,476.59	2,954,580.30	84.57	25.57
Out of Home Consumption	2,989,215.82	4,660,965.97	27.08	40.33
Retail	1,690,968.34	5,113,255.41	15.32	44.25

Measurement

Food Waste

The UNEP Food Waste Index Report 2024 cites an unpublished UN Habitat report that shows data for household food waste for some provinces:

- Cagayan de Oro : 26 Kg/capita/year
- Legazpi : 33 Kg/capita/year
- Ormoc : 18 Kg/capita/year

Measurement

From the FAO State of Food and Agriculture 2019, Table A6 (p.141), FLW Estimates from Grey Literature, [Economy] and Sectoral Reports between 2000 and 2017 are aggregated:

Observation	Mean	Median	s.d.	Min.	Max.
17	6.9	8.4	4.4	1.0	15.5

Measurement

Commodity	Production		Handling & Storage		Processing & Packing		Distribution		Consumption		Total FLW	
	2015	2022	2015	2022	2015	2022	2015	2022	2015	2022	2015	2022
Cereal	1,098	1,500	1,204	1,645	1,492	2,100	395	553	581	812	4,769	6,610
Roots & Tubers	184	176	546	524	30	20	262	175	71	47	1,092	942
Oilseeds & Pulses	726	717	1,157	1,143	48	78	28	39	14	19	1,973	1,996
Vegetables	886	939	452	479	60	63	508	528	310	323	2,217	2,333
Fruits	2,237	1,553	1,141	621	116	375	922	248	562	175	4,978	2,972
Meat	100	86	5	4	84	73	263	295	150	169	602	627
Fish	187	153	262	240	186	171	467	463	62	62	1,164	1,089
Eggs	42	66	0	0	0	0	11	20	7	13	61	99
Milk	1	1	1	2	0	0	11	343	1	34	14	380

Source: APEC-FLOWS. https://apec-flows.ntu.edu.tw/database.aspx

Actions

1. Several bills for food waste reduction have been proposed in the legislature since 2016 (Santiano 2024), the most recent one was the Zero Food Waste Act of 2022 (Senate Bill No. 240) (Austria 2023), but none have passed into law.

2. "Although there are no laws in the country exactly like the ones implemented in France, there is one that merely *encourages* the donation of food for charitable purposes, which is Republic Act No. 9803, also known as the 'Food Donation Act of 2009'" (Santiano 2024), which states on Section 2 thereof that the purpose of encouraging food donations is to "alleviate [Philippine] poverty and reduce food wastage"

Actions

3. Private initiatives: Ajinomoto Philippines Corporation reduce food loss by through, for instance, “recovery of fermentation liquids left over from making [its] umami seasoning, which are then used as organic fertilizer and animal feed.” Then, to tackle food waste, the company launched a “TOO GOOD TO WASTE” campaign in the Philippines “to raise awareness and offer food loss and food waste solutions…, providing recipes that use leftover ingredients, and helping consumers enjoy delicious food while doing something good for the planet.” (https://www.ajinomoto.com.ph/nutrition/too-good-to-waste-food-loss-and-food-waste-reduction-for-a-sustainable-future/)

Updates/Revisions

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	PROPOSED INTERVENTION
MANGO	28.65% (Perceived Postproduction Losses, 2023) 17.75% (Actual Postproduction Losses, Peak season, 2024)	Insect damage, cracks, harvesting injury, deformed, silay/ripened, immature fruit, bumps, weight loss, latex burn, compression, anthracnose, stem-end rot	651,886.34 MT (PSA, 2023)	186,765.4 MT (2023) 115,709.8 MT (2024)	• Establishment of postharvest facilities such as Hot Water Treatment (HWT) and Vapor Heat Treatment (VHT); • Capacity building through information dissemination on Good Agricultural Practices (GAP), proper post-production handling practices, effective management of pests and diseases of mango; • Provision of government aid in the form of production inputs and financing services/ loans; implementation of policy and regulations in establishing buying and selling price.

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	PROPOSED INTERVENTION
ONION (BULB ONION)	**31.49%** (Actual Postproduction Losses, 2014): **29.01%** (Perceived Postproduction Losses, 2022)	Immature, 'hubad' unharvested, cut, discolored, "kambalan", weight loss, rotten, 'lapis', pickles, oversized, sprouting, Rotten, immature, mechanical damage, weight loss, sprouting	**203,651.41 MT** (PSA, 2014) **241,033.06 MT** (PSA, 2022)	**64,129.83 MT** (2014) **69,923.69 MT** (2022)	• Pilot testing of a ten-row mechanical seeder, • Development of planting systems that will reduce seed requirement; • Localization of imported harvester and de-topping machines and adaptation to the present production practices of the local onion farmers (e.g., distance of planting and bulb sizes; absence of bulb curing); • Improve the PHilMech onion sorter; • Localization of imported onion sorter to adapt to the present practices of the traders;

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	PROPOSED INTERVENTION
ONION (BULB ONION)					• Information dissemination on the comparison of adopting high-temperature and cold-storage technologies in terms of cost and return to provide farmers with bases in making better marketing decisions; • Comparative study of storing cured and uncured bulb onions in cold storage in terms of reducing losses and cost and returns; • Application of Biological Control Agents (BCAs) and integrated pest management practices to prevent bulb rot diseases and control armyworm infestations; • Strengthen market linkages between onion growers and buyers to establish stable and transparent pricing mechanism

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	PROPOSED INTERVENTION
ONION (BULB ONION)					• Evaluate the effectiveness and feasibility of drip irrigation systems for onion cultivation in local conditions; • Promote the adoption of IPM practices among onion farmers through training and awareness programs; • Encourage farmers to conduct soil testing to determine nutrient requirements; • Development of a village-level cold storage facility. Establish small-scale cold storage units in onion growing areas to provide farmers with accessible and affordable storage options.

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	PROPOSED INTERVENTION
CALAMANSI	**14.76%** (Perceived Postproduction Losses, 2022)	Insect damage, Browning, Bruising, Yellowing, Cuts	**107,896.35 MT** (PSA, 2022)	**15,925.5 MT**	• Use of Modified Atmosphere Packaging (MAP) as an alternative method to extend postharvest life; • Capacity building through information dissemination on proper handling practices during harvesting, proper grading and standards; • Provision of wooden or plastic crates for bulk packaging; • Price watch by DTI and DA representatives to regularly inform the farmers on possible prices of calamansi on daily basis.

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	PROPOSED INTERVENTION
BANANA (CARDAVA)	**14.93%** (Actual Postproduction Losses, 2014) **13.71%** (Perceived Postproduction Losses, 2022)	Immature (1-2 bottom hands of the bunch), Cuts, Detached fingers, Deformed, Diseased or 'Bugtok', Weight loss, Rotten	**2,567,494.95 MT** (PSA, 2014) **2,522,309.60 MT** (PSA, 2022)	**383,327 MT** (2014) **345,808.65 MT** (2022)	• Provision of training on cultural management on the banana pests and diseases; • Dissemination of information on the benefits of practicing Good Agricultural Practices (GAP); • Adaptation of the farmer invented de-handing tool, a fabricated scoop over the practice of using bolo; • Creation of tramline for hauling and transport especially for sloping areas; • Development of partial shade in the assembly areas; • Provision of stackable plastic crates as transport containers to provide adequate protection during transport.

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	EXPORTS	PER CAPITA CONSUMPTION	TOTAL CONSUMPTION (Population)	DEFICIT/ SURPLUS	PROPOSED INTERVENTION
BROCCOLI	18.08% (Perceived Postproduction Losses, 2020)	Immature, hollow stem, insect damage. overmature, loose curd, yellowing, decay/ rot, weight loss, compression, cracks, cuts	3,339.35 MT (PSA, 2020)	603.75 MT	Less than 1 MT (PSA, 2020)	0.03 KG/CAPITA	3,271.00 MT (population based on PSA 2020 that is 109,033,245)	-536.4 MT	• Development of mechanized planting and harvesting of broccoli suitable in Benguet terrain; • Development of sustainable irrigation system in the area; • Concerned DA units to organize and conduct training on postharvest handling of vegetables among farmers; • Development of the market through supply chain improvement.

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	EXPORTS	PER CAPITA CONSUMPTION	TOTAL CONSUMPTION (Population)	DEFICIT/ SURPLUS	PROPOSED INTERVENTION
CARROTS	**44.45%** (Actual Postproduction Losses, 2019)	Over-mature, weight loss, mechanical damage, insect damage	**65,069.67 MT** (PSA, 2019)	**28,923.47 MT**	**Less than 1 MT** (PSA, 2020)	**0.49KG/CAPITA** (PSA's SFD, 2015-2016)	**53,426.29 MT** (population based on PSA 2020 that is 109,033,245)	**- 17,279.09 MT**	• Training courses and seminars regarding good agriculture practice and IPM ; • Provision of solar water pump and rain collection system; • Provision of storage facilities; • Seminar/training on proper handling of carrots; • Training on carrot processing;

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	EXPORTS	PER CAPITA CONSUMPTION	TOTAL CONSUMPTION (Population)	DEFICIT/ SURPLUS	PROPOSED INTERVENTION
CAULIFLOWER	**19.50%** (Perceived Postproducti on Losses, 2020)	Insect damage, small curd, immature, over-mature, wilted leaves	**11,983.20 MT** (PSA, 2020)	**2,336.72 MT**	**Less than 1 MT** (PSA, 2020)	**0.1 KG/ CAPITA**	**10,903.32 MT** (population based on PSA 2020 that is 109,033,245)	**-1,257.84 MT**	• Installment of cost efficient irrigation facilities or use of low-priced technology for diverting water for irrigation purposes; • Seminar/training on preparation and use of organic pesticides and insecticides; • Improvement of varieties with enhanced resistance to priority pests and diseases; • Development of sustainable seed/planting material system

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	EXPORTS	PER CAPITA CONSUMPTION	TOTAL CONSUMPTION (Population)	DEFICIT/ SURPLUS	PROPOSED INTERVENTION
SWEET POTATO					Less than 1 MT (PSA, 2020)	4.53 KG/CAPITA (PSA's SFD, 2015-2016)	493,920.60 MT (population based on PSA 2020 that is 109,033,245)		
WHITE POTATO	**21.82%** (Perceived Postproducti on Losses, 2020)	Immature, deformed, scab, greening, overmature, soft rot, bacterial wilt, Rhizoctonia, weight loss, compression damage, cracks, cuts	**113, 562.36 MT** (PSA, 2020)	**24,779.31 MT**	**Less than 1 MT** (PSA, 2020)	**0.91 KG/CAPITA** (PSA's SFD, 2015-2016)	**99,220.25 MT** (population based on PSA 2020 that is 109,033,245)	**-10,438.20 MT**	• Development of mechanized planting and harvesting of potato suitable in Benguet terrain; • Development of sustainable seed/planting material system;

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	EXPORTS	PER CAPITA CONSUMPTION	TOTAL CONSUMPTION (Population)	DEFICIT/ SURPLUS	PROPOSED INTERVENTION
WHITE POTATO									• Financial support by government-regulated lending institutions that can offer lower interest rates; • Development of eco-friendly pest management systems; • Concerned units of the DA to organize and conduct trainings on good postharvest practices to improve and retain the productivity of stored tubers/planting materials. • Appropriate storage technology.

Measurement

CROP	LOSS (%) (based on the data gathered from the field)	CAUSES	TOTAL PRODUCTION (MT) (based on the year the loss data were gathered)	ESTIMATED LOSS	EXPORTS	PER CAPITA CONSUMPTION	TOTAL CONSUMPTION (Population)	DEFICIT/ SURPLUS	PROPOSED INTERVENTION
CABBAGE	**16.75%** (Perceived Postproductions Losses, 2020)	Insect damage, decay/soft rot, weight loss, compression damage, torn leaves, bruising	**129,803.39 MT** (PSA, 2020)	**21,742.07 MT**	**Less than 1 MT** (PSA, 2020)	**1.13 KG/CAPITA** (PSA's SFD, 2015-2016)	**123,207.57 MT** (population based on PSA 2020 that is 109,033,245)	**-13,652.51 MT**	• Development of mechanized planting and harvesting of cabbage suitable in Benguet terrain; • Development of eco-friendly pest management systems; • Provision of trainings and seminars on how do farmers control and manage insect pests and diseases of cabbage; • Improvement of varieties with enhanced resistance to priority pests and diseases • Municipal ordinance re: proper use of pesticides

Measurement

SUMMARY OF PADDY/RICE POSTPRODUCTION LOSSES

Table 1. Paddy/rice postproduction losses (harvesting to milling), 2008-2009

POSTPRODUCTION OPERATION	MEAN LOSS (%)
Manual Harvesting	2.03
Piling	0.08
Mechanical Threshing	2.18
Sundrying	5.86
Storage	0.80
Milling	5.52
TOTAL	**16.47**

Source: Salvador, A.R., D.R. Miranda, V.E.B. Camaso, R.Q. Gutierrez and R.R. Paz. 2012. Assessment of the State and Magnitude of the Paddy Grains Postproduction Losses in Major Rice Production Areas. PHilMech Journal Socio-Economic and Policy Research. 2(1): 19-37.

Measurement

SUMMARY OF PADDY/RICE POSTPRODUCTION LOSSES

Table 2. On-farm paddy postproduction losses (manual harvesting to sundrying), 2016-2017

POSTPRODUCTION OPERATION	MEAN LOSS (%)
Manual Harvesting	2.72
Piling	0.04
Mechanical Threshing	1.91
Sundrying	3.52
TOTAL	**8.19**

Source: Salvador, A.R and M.M.N. Dulay. 2020. Effect of Mechanization to the Paddy Postharvest Losses. Asian Journal of Postharvest and Mechanization. 3(1): 76-86.

Measurement

SUMMARY OF PADDY/RICE POSTPRODUCTION LOSSES

Table 3. Updated paddy postproduction losses (manual harvesting up to milling), 2017

POSTPRODUCTION OPERATION	POSTPRODUCTION LOSSESS (%)
Manual Harvesting	2.72
Piling	0.04
Mechanical Shelling	1.91
Sundrying	3.52
Storage	0.80*
Milling	5.52**
TOTAL	**14,51**

**Storage and milling losses based on 2008-2009 loss figures

Measurement

SUMMARY OF PADDY/RICE POSTPRODUCTION LOSSES

Table 4. Paddy postproduction losses using rice combine and mechanical dryer, 2016-2017

PH MACHINES/FACILITIES	MEAN LOSS (%)
Rice Combine Harvester	2.59
Mechanical Dryer	1.85

Source: Salvador, A.R and M.M.N. Dulay. 2020. Effect of Mechanization to the Paddy Postharvest Losses. Asian Journal of Postharvest and Mechanization. 3(1): 76-86.

Measurement

SUMMARY OF PADDY/RICE POSTPRODUCTION LOSSES

Table 5. Milling losses per type of rice mill, 2018-2019

RICE MILL	MILLING LOSSES	
	Range	Average
Single Pass	1.96-9.68	4.53
Multipass	0.06-2.47	0.48

Source: Salvador, A.R, D.J.N. Bernardo and C.M.S. Palma. 2021. Assessment of the Rice Milling System. Unpublished terminal report. DA-PHilMech, Science City of Muñoz, Nueva Ecija, Phils.

Measurement

SUMMARY OF CORN POSTPRODUCTION LOSSES

Table 6. Summary of yellow corn postproduction losses, 2005-2006 & 2019-2020

POSTPRODUCTION OPERATION	POSTPRODUCTION LOSSESSN (%)	
	2005-2006[1]	2019-20202[2]
Manual Harvesting	1.05	1.25
Piling	0.00	0.18
Mechanical Threshing	0.52	0.41
Sundrying	4.54	3.52*
Hauling Marketing	0.56	0.56**
Storage	0.51	0.51**
TOTAL	**7.18**	**6.43**

Source: [1] Salvador, A.R, H.G.Malanon, G.B. Calica, P.C.Castillo, R.O. Vereña and R.S. Rapusas. 2012. Quantitative and Qualitative Assessment of Corn Postharvest Losses. PHilMech Journal Socio-Economic and Policy Research. 2(1). 38-53.

[2] Salvador, A.R., K.R.Lingbawan and D.J.N. Bernardo. 2021. On-Farm Postproduction Loss Assessment of Yellow Corn. Unpublished terminal report. DA-PHilMech, Science City of Muñoz, Nueva Ecija, Phils.

Measurement

SUMMARY OF CORN POSTPRODUCTION LOSSES

Table 7. On-farm white corn postproduction losses, August to October 2019

POSTPRODUCTION OPERATION	MEAN LOSS (%)
Manual Harvesting	2.94
Piling	0.01
Mechanical Shelling	0.76
Sundrying	3.31*
TOTAL	**7.02**

*3.28 due to over drying

Note: Loss measurement conducted in one season only (2019) due to pandemic

Source Salvador, A.R., M.M. Dulay and C.M.S. Palma. 2021. On-Farm Postproduction Loss Assessment of White Corn. Unpublished terminal report. DA-PHilMech, Science City of Muñoz, Nueva Ecija, Phils.

Actions

- With the above presented level of PH losses across the Philippine staple and food commodities, policies, programs, projects and interventions are already being implemented at the R4D level, extension and commercialization level under the Food security thematic program; This includes the **Rice Competitiveness Enhancement Fund Program, the Coconut Farmers Industry Development Program, and the upcoming Corn Competitiveness Enhancement Fund (CCEF), the livestock, Salt, and Sugarcane;**

- At the food waste level, which starts from the retail markets up the consumer level, the information under Philippine conditions is still scarce, and therefore should be handled by the appropriate agencies of the government (i.e. FNRI, PSA, DOH, etc.) to map out the complete picture of FLW of the Philippines;

Policies and Recommendations

- Continuous and sustained active participation of the Philippines in this APEC regional and international levels of initiatives and programs as it would promote not only the significant role of the economy, local awareness in this global concern but more importantly harness the potential of promoting and creating a market of our local food products and by-products to support and sustain our local farmers and industries;
- Adopt some of the corporate social responsibility (CSR) models like the ones implemented by Peru in their Food Rescue Program that successfully served a critical mass of their marginal population;

Policies and Recommendations

- Such a model can be replicated under the “Kadiwa” program that is fully supported and recognized by the Office of the President which can be used to leverage for financial and policy support;
- We can capitalize on this program to pilot at least one project in, say one in each major island (Luzon, Visayas, Mindanao models) to capture the diversity of population, culture, geographic challenges, natural endowment, political biases, and other factors that can be considered as drivers/barriers of the success/failure of implementing such program;
- This initiative should be well-described under the Food Sufficiency and Security campaign of the domestic government where the Department of Agriculture plays a major role;

Asia-Pacific
Economic Cooperation

Thank you!