

The Target – Measure – Action Framework for Reducing Food Loss and Waste towards a Sustainable Food System in APEC Region

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Food waste is challenging globally

- One third of produced food is being wasted from farm to folk annually



1.3
billion tonnes

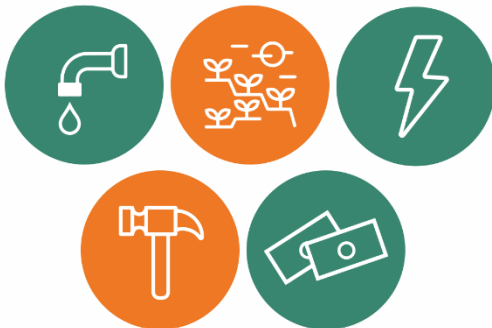
of wasted food annually



\$1
trillion

on food wasted annually

- A waste of resources including water, cultivated land, energy, labor and capital



- In APEC region, 717 million tons of food was lost and wasted in 2013



1

billion hungry people worldwide



Providing meals for

870

million hungry people

If only one quarter of the food wasted was saved, it would feed about 870 million hungry people across the world.

SDG Target 12.3



By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses



Three-step pathway for reducing FLW

CHAMPIONS  12.3

Target
Measure
Act 

- The framework is first proposed by Champion 12.3 in the SDG Target 12.3 on FLW: 2016 Progress Report. WRAP advocates the framework for the UK.
- “Targets set ambition and ambition motivates action”
- Measure: “What gets measured, gets managed”
- Action: “What ultimately matters is action”

Progress of APEC Region according to the Framework



We waste too much food

- A Global Perspective, a **Regional Perspective** or an Economy-wide Perspective ?
- APEC region is one of the first regions having an official agreement on reducing FLW under food security umbrella, aim to enhance the Millennium Development Goal (MDG) – Hunger Goal.

TARGET

"Compared to what?"

- Winston Churchill, when once asked,
"How's your wife?"

Safeguard APEC food security

Reducing Food Losses and Waste (FLW) has been repeatedly underscored as one of the primary tasks to safeguarding APEC Food security in relevant APEC fora and Leader's meetings.

2010

**Niigata
Declaration on
APEC Food
Security**

2014

**APEC Food
Security
Roadmap
Towards 2020**

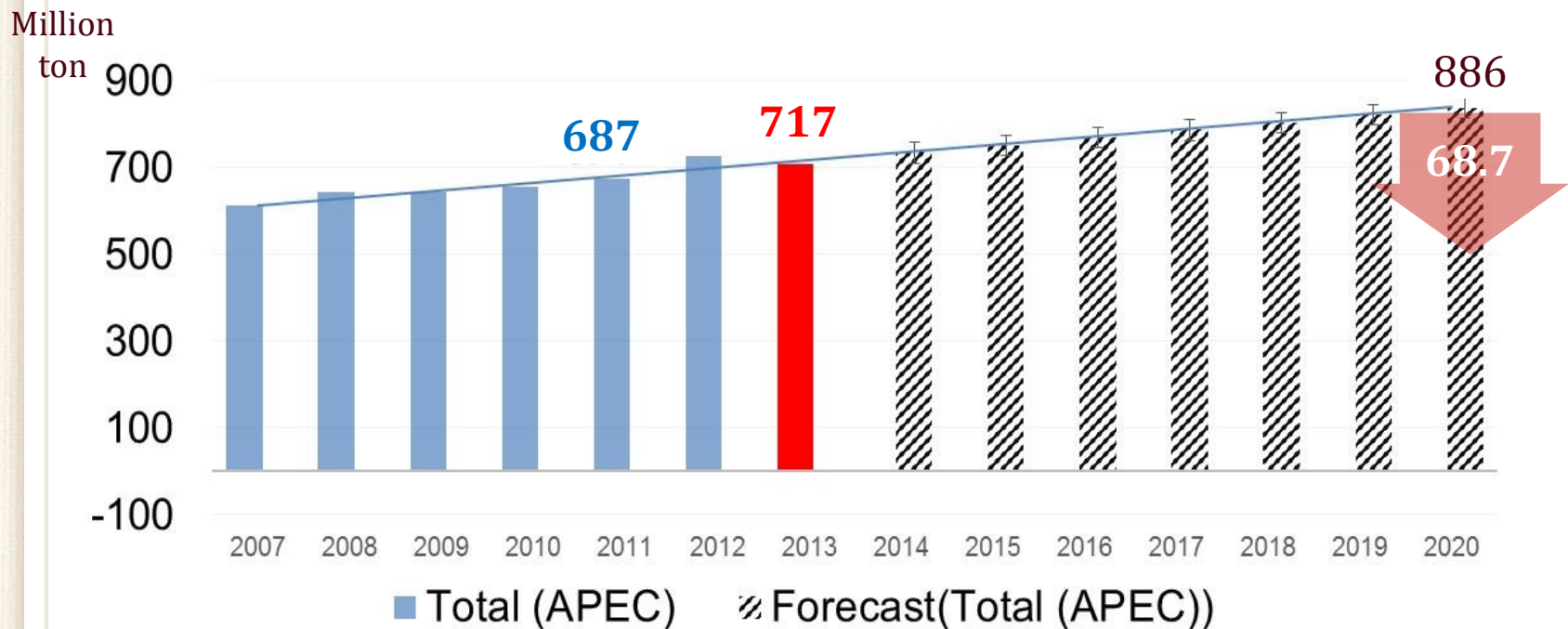
2012

**Economic Leader's
Declaration & Kazan
Food Security
Declaration**

APEC economies committed in the **APEC Food Security Roadmap Towards 2020** to “strive to reduce food loss and waste by **10%** compared with the 2011-2012 levels by 2020 in the Asia-Pacific region, [and to] aim to advance beyond the Millennium Development Goals (MDGs) 2015 hunger goals,” noting that **the 10% specified in that goal is an average level for all economies**, and noting further that **specific indicators** can be developed based on each economy’s respective situation.

APEC Target for FLW Reduction

Food Security Roadmap (2014): “APEC economies will strive to reduce food loss and waste by 10% compared with the 2011-2012 levels by 2020 in the Asia-Pacific economies...”



Source: “APEC Food Security Roadmap Towards 2020”, Third Senior Officials’ Meeting, Beijing, China, 2014; and our estimation.

The Multi-Year Project “Strengthening Public-Private Partnership to Reduce Food Losses in the Supply Chain”

Purposes

- Identify **key issues** on reducing food losses and waste
- Seek **best practices** in **private and public sectors**
- Find **practical solutions** and enhance **capacity-building**

Work Plan (2013-2018)

2013

- Preparation, Research, and Identification

2014/16

- Investigation of Food Losses and Waste

2017/18

- Actions and Inter-linkages

Overview: 3 Pillars Approach

Food Loss & Waste Assessment

- ✓ 2014 on FAO methodology
- ✓ 2015 on refinement baseline
- ✓ 2016 on macro-level driver
- ✓ 2017 on industry-level

Toolkits, Best Practices in PPP

- ✓ 2013~4 on cereal, V&F crops
- ✓ 2015 on fishery and livestock
- ✓ 2016 on retail/consumer waste
- ✓ 2017 on policies and PPP

Capacity Building Seminars/ Expert Consultation/ Survey

- ✓ 2013 on cereal crops
- ✓ 2014 on fruit and vegetables
- ✓ 2015 on fishery and livestock
- ✓ 2016 on retail/consumer waste
- ✓ 2017 on reduction policies
- ✓ 2018 HLPD on Enhancing PPP on Reducing FLW

APEC Surveys on FLW Reduction Policy

- ▶ Respondents: **16 Member Economies (MEs)**
- ▶ **6 Advanced MEs:**
 - ▶ Focus on food waste recovery and recycling
 - ▶ 10% target attainable
- ▶ **10 Developing MEs:**
 - ▶ Focus on food loss occurring in production
 - ▶ Less confident on reaching the 10% target
 - Consumer awareness
 - Insufficient funding
 - Lack of clear objective & reliable data systems

APEC Survey on Feasible Solutions for FLW Reduction

👉 Stock-take targets, policies and strategies for FLW

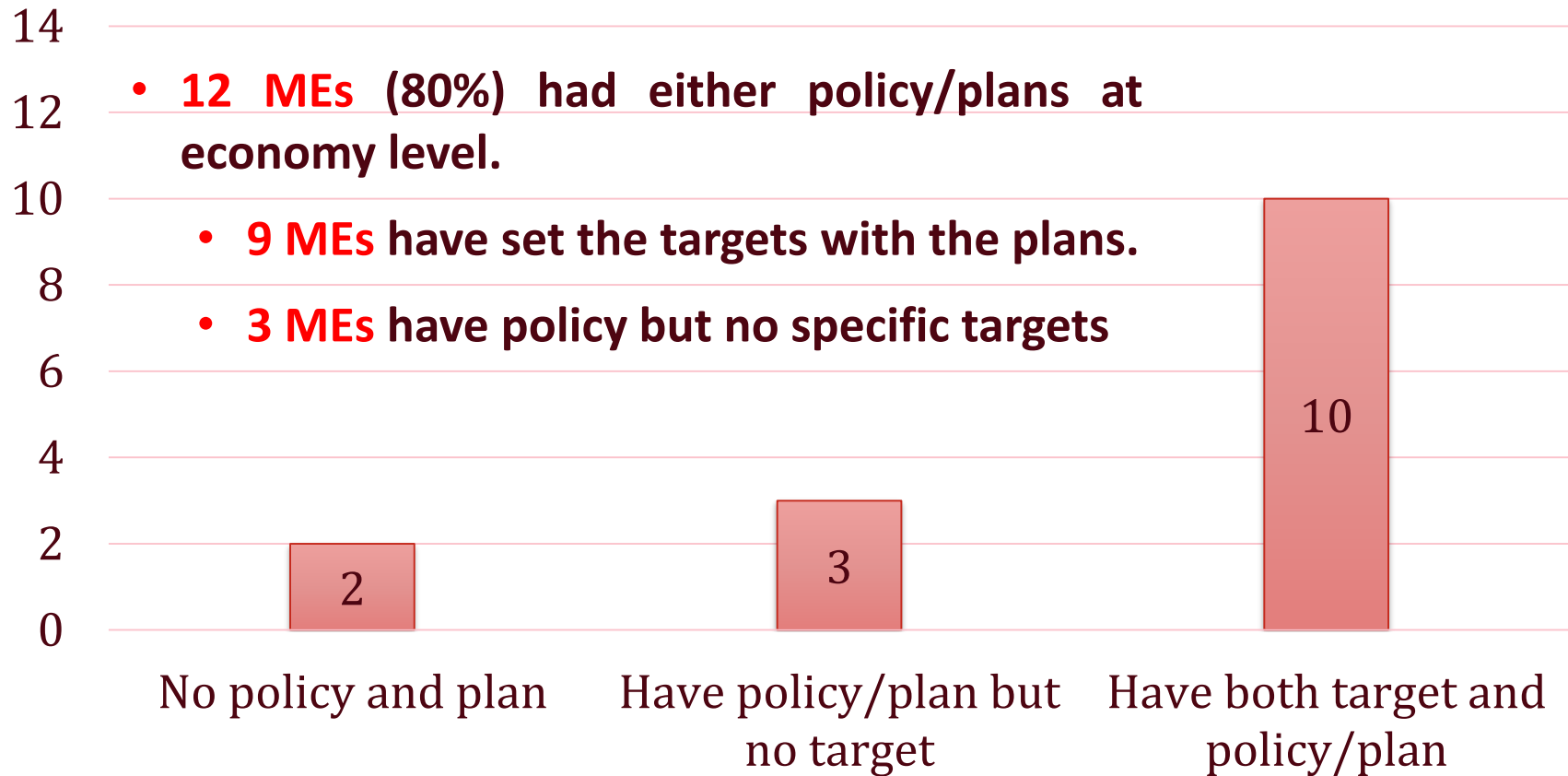
👉 Gather information of FLW quantification and verify them

OBJECTIVES

👉 Identify diversion potential, costs, and benefits of reduced FLW

👉 Investigate PPP barriers and recommendations.

1. Policy Targets and Strategies for FLW Reduction



MEASURE

"What gets measure gets managed"
- Peter Drucker -

The issue of FLW can best be addressed from three perspectives: “a **systemic perspective**; a **sustainability perspective**, including the environmental, social and economic dimensions of sustainability; and a **food security and nutrition perspective**, looking at how food losses and waste relate to the various dimensions of food security and nutrition.”
(HLPE, 2014)

Food Recovery Hierarchy

Most Preferred

Source Reduction
Reduce the volume of surplus food generated

Feed Hungry People
Donate extra food to food banks, soup kitchens and shelters

Feed Animals
Divert food scraps to animal feed

Industrial Uses
Provide waste oils for rendering and fuel conversion and food scraps for digestion to recover energy

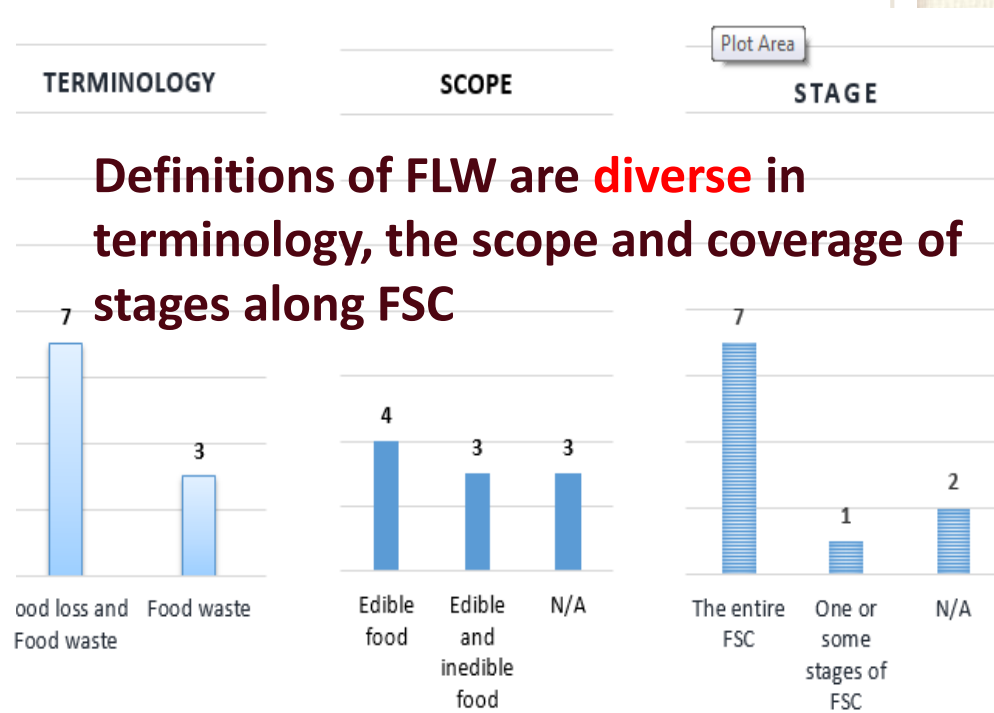
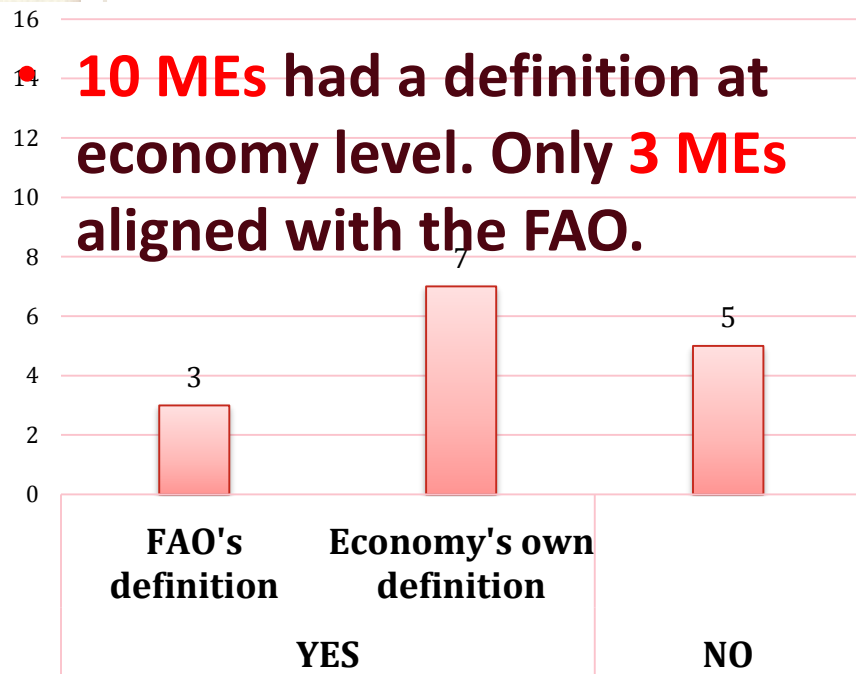
Composting
Create a nutrient-rich soil amendment

**Incineration/
Landfill**
Last resort to disposal

Least Preferred

2. Quantification of FLW in APEC MEs

2.1 Definition of FLW

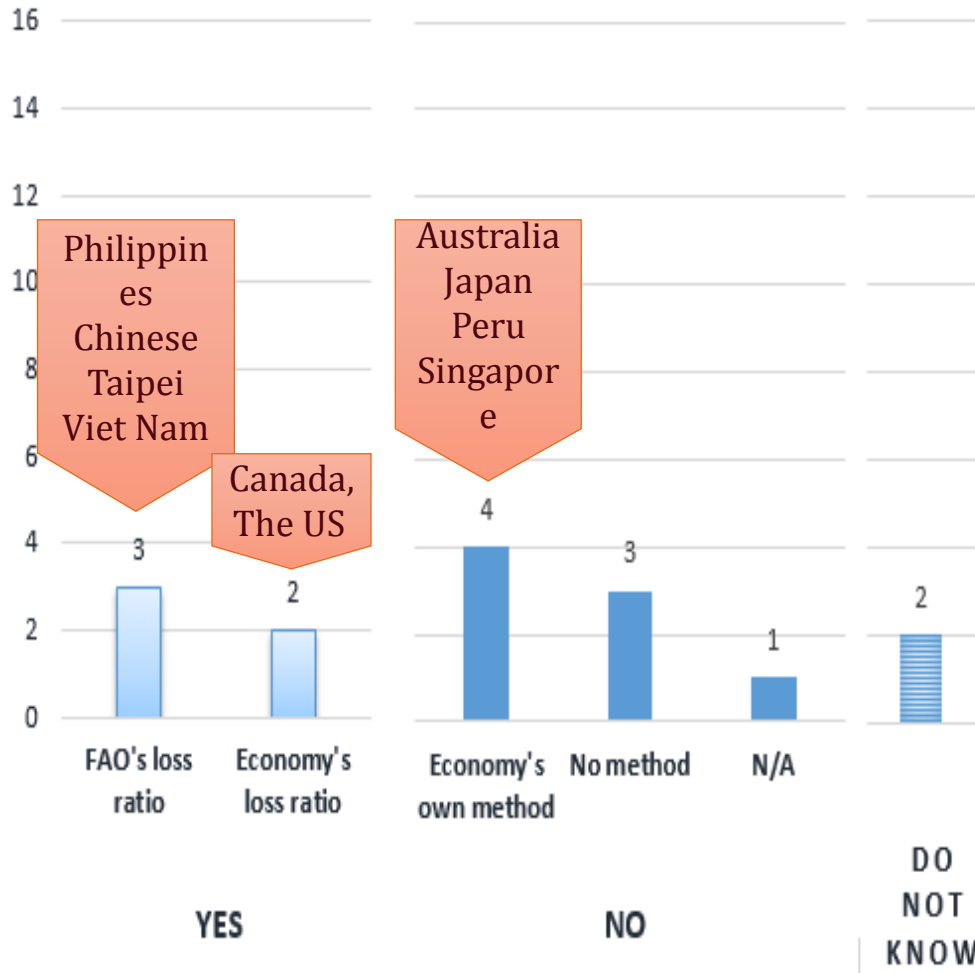


Source: APEC Survey on Feasible Solution for FLW Reduction

2.2 Quantifying method



Does your economy adopt the Mass Flow Method suggested by FAO (2011) to quantify FLW?



• US:

- based mainly on inference.
- develops supply and use balance sheets for over 200 individual commodities.

• Japan

- mandatory regular repost system since 2007, in accordance with Food Recycling Law.

• Peru

- projects focusing on quantifying different agricultural products;
- different methods to fit the products at best.

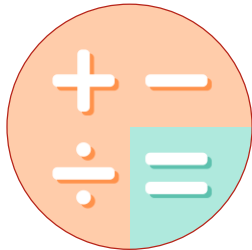
A Food Loss and Waste Quantification Handbook for APEC Economies

(Version 3.0)

Agricultural Technical Cooperation Working Group (ATCWG)
Policy Partnership on Food Security (PPFS)

February, 2019

A Food Loss and Waste Quantification Handbook for APEC Economies



Developing a
systematic yet flexible
quantification method
to estimate FLW at the
ME and sectoral levels



Introducing how to
report FLW
quantification results
for **self-improvement**



Recommendations for
sectors to start
quantifying FLW





Tuna eyeballs - Japan

- There is a highly diverse nature of APEC economies. The edible and inedible part of foods depend on culture and norm of each MEs.
- We encourage MEs define the scope of FLW by themselves and quantify FLW for **self-improvement**.

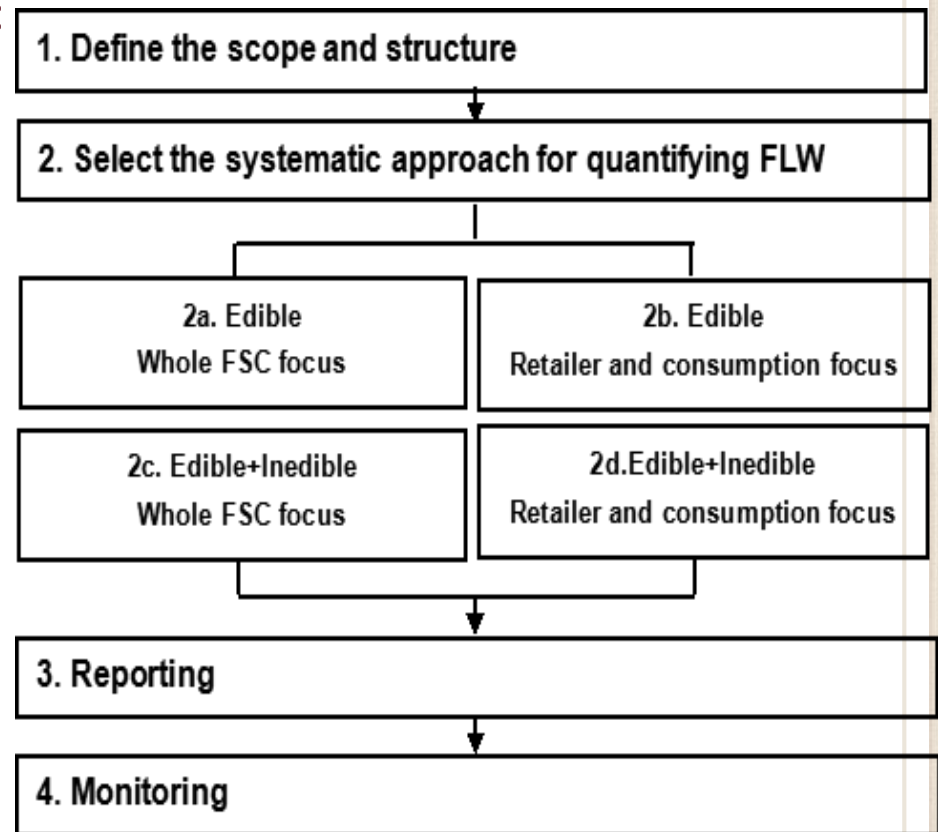


The Handbook - Chapter 3 – General approach for quantifying FLW at the economy level

- We adopt FAO quantification methodology for quantifying because of the following reasons:
 - It has a clear and well-defined estimation procedure.
 - It is also cost-effective methodology especially for those who do not have direct access to FLW data.

*What's measured
Improves
-Peter F. Drucker-*

Steps for quantifying FLW at economy level



The Handbook - Chapter 4 – Case study of FLW quantification at sectoral level

Losses in the value chain of rice in APEC economies

Thailand: In the expert consultation on July 2015 in Taipei, data as below



(Source: Dr. Sarun Wattanutchariya)

The Philippines:

- An assessment by PhilMech published in 2012 reflected that paddy/rice losses in the postharvest stage accounts for **16.47%** of the total production, of which, **5.52%** is lost in the milling process. The main causes arise during harvesting, drying and threshing.

Figure 4.1 Losses and Waste along the value chain of Rice in Thailand

Losses in the value chain of fisheries products

Fisheries generate large quantities of by-products which are not suitable for human consumption, e.g. bones and shells, but if further processed they may have high economic value.



Quantification of Fisheries By-products in Korea Study (Cho, 2015)
unit: 1,000 ton

Categories	Production	Edible Supply	Non-edible (%)	By-products
Total	2,276.6	3,069	38.66	1,186
Fish	1383.3	1,850	39.16	724.6
Shellfish	893.3	1,218	37.91	461.9

Losses in the Livestock Sector in USA

- Buzby et al., 2014 uses data from ERS's Loss-Adjusted Food Availability (LAFA) data series which is ERS's data series, adjusted for spoilage, plate waste and other food losses.
- LAFA is from Food Availability data which is similar to Food Balance Sheet

FLW at the retailer and consumer level in the U.S. in 2010

Top three food groups in terms of amount

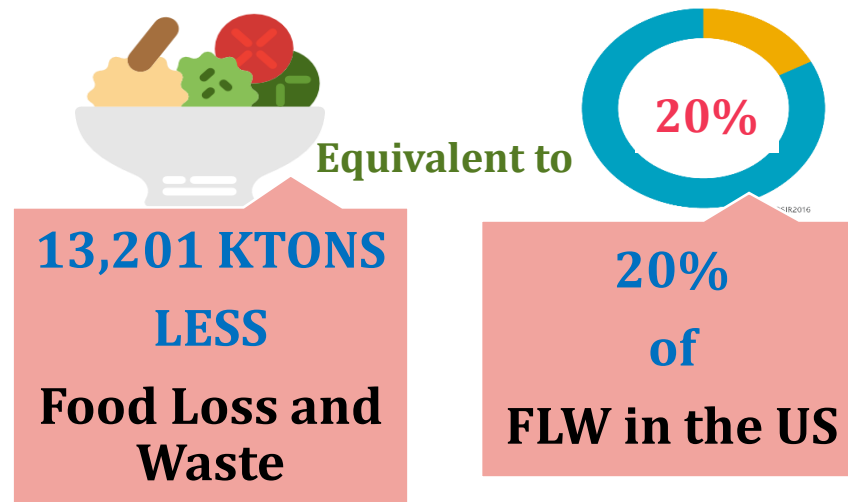
1	Dairy Products	25 billion pounds	19%
2	Vegetables	25 billion pounds	19%
3	Grain Products	18.5 billion pounds	14%

Top three food groups in terms of value

1	Meat, poultry, and fish	\$48 billion	30%
2	Vegetables	\$30 billion	19%
3	Dairy Products	\$27 billion	17%

Sustainable indicators for extended FLW measurement: ReFED

- ReFED, *A Roadmap to Reduce U.S. Food Waste by 20 Percent* (2016), http://www.refed.com/downloads/ReFED_Report_2016.pdf
- By implementing 27 reduction solutions, the U.S can potentially reduce 20% of food waste, which equivalent to:



Sustainable indicators for extended FLW measurement: ReFED



**1,642 B GALS
LESS
Water**



**15,165
MORE
Job**



**17,885 KTONS
LESS
GHGs**



**1,829 MILLION
MORE
Meal**

Climate change (climate system) has complex interactions with our **food system** and adds a further challenge to our food security policy.

Reducing food loss and waste (FLW) can be seen as an **“adaptation” option** for reducing food security risks from climate change, as well as a **“mitigation” option** by reducing greenhouse gases (GHG) emissions.

- **A sectoral approach** to go after GHG emissions is to have meat, dairy, and rice sectors embark on initiatives to reduce FLW from farm to plate.
- Another approach to go after GHG reductions is to get the reduction of FLW incorporated into national climate strategies, particularly in an economy's **nationally determined contribution (NDC)** to the Paris Agreement on climate change.
- GHGs Emission Reduction Act

ACTION

"What ultimately matters is action."

- Champion 12.3 -

APEC Project Implementation Related to Reducing FLW

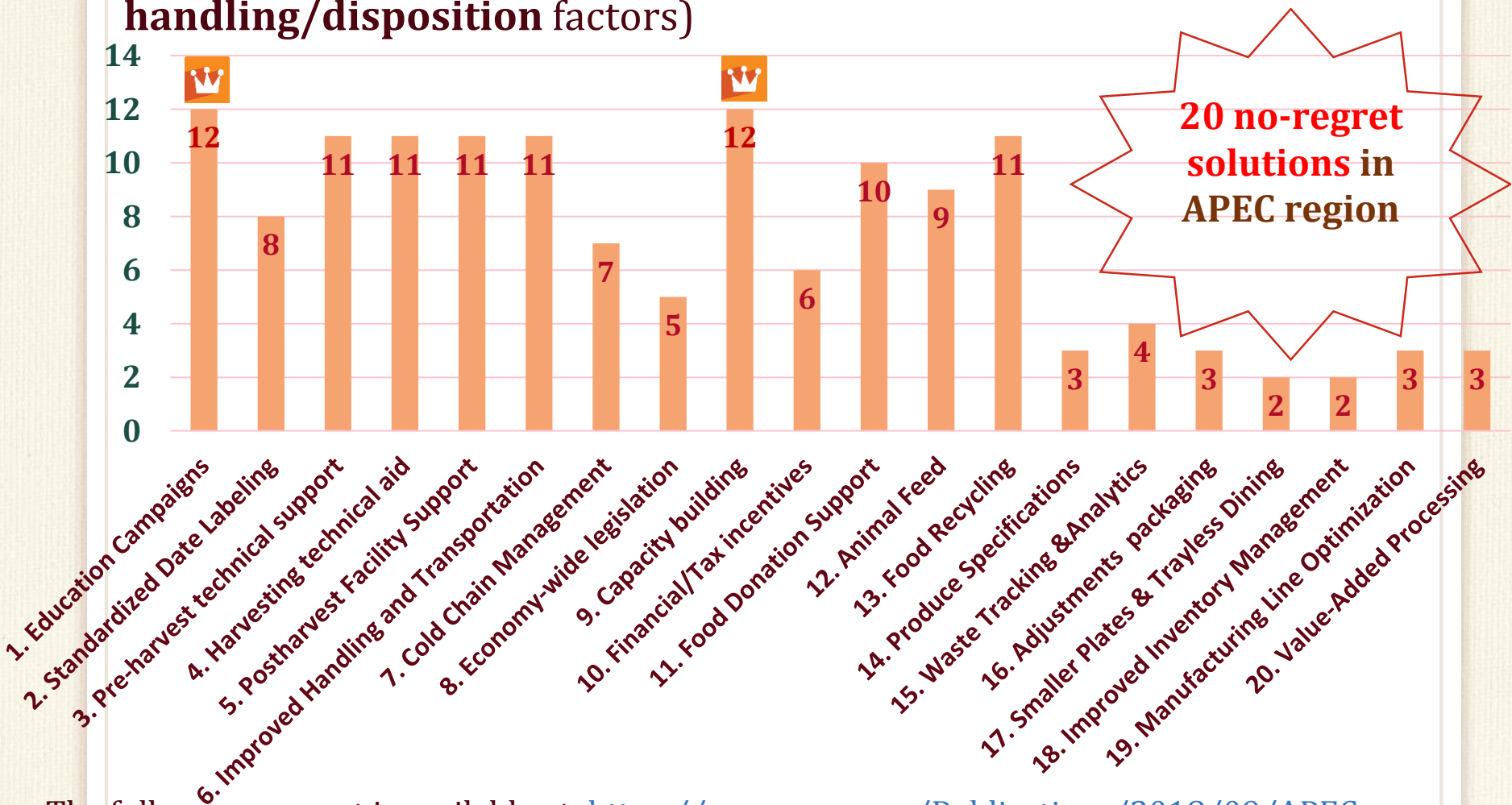
- Since 2013, there have been several projects and multi-year projects aim at reducing FLW
- The projects and capacity building focus on:
 - 1) Improve the efficiency of the food supply chain including **enhance agricultural productivity** and **improve logistics** such as cold chain.
 - 2) Food security – food safety (e.g. Reduce Mycotoxin in grain by China)

APEC Project Implementation Related to Reducing FLW

- 3) **A complete study on FLW issues** in several food categories, retail and consumer levels. E.g. *Strengthening Public – Private Partnership to Reduce FLW along the supply chain.* (Chinese Taipei)
- 4) **Food security and climate change nexus** is the new topic in 2017, e.g. *Strengthening APEC Cooperation on Food Security and Climate Change* by the U.S.
- 5) *Reducing Food Waste by Using Information and Communications Technology (ICT) and Innovative Technologies* (2019, Japan)

A Set of Feasible Solutions to Reduce FLW

- Most APEC MEs have been conducting various solutions on reducing FLW in both governmental entities and businesses.
- **Three main challenges** (economic, technological and handling/disposition factors)



The full survey report is available at: <https://www.apec.org/Publications/2018/09/APEC-Survey-Report-on-Feasible-Solutions-for-Food-Loss-and-Waste-Reduction>

Public-private Partnership on FLW Reduction



What types of PPP have been applied in your economy?

- **Public financial support** is the most popular type of PPP
- Joint ventures PPP is more prevalent in developing MEs.



What areas of reducing FLW that PPPs have been applied in your economy?

- PPP has covered the most in **food waste recycling** with 12 APEC MEs.
 - Advanced: 7 out of 8 PPP in food waste recycling
 - Developing:
Agricultural enhancement and food waste recycling slightly above others



*What areas **have been affected** by the current PPP?*

- Advanced ME:
Most affected in **Food donation and recycling.**
- Developing ME:
Most affected in **Food donation** and **agricultural facility**



*What **areas** of FLW reduction should PPP focus on?*

- Both advanced and developing MEs agreed that **reduction campaign and food waste recycling** should be conducted with dominant advocates.
- Developing MEs strongly recommend **agricultural facility and cold chain improvement** for further PPP applications.

Summary Report of Activities, Findings and Recommendations from the APEC HLPD 2018

- Hold **regional seminars and workshops**, liaise with other relevant APEC sub-fora and international organizations
- Systematically **measure FLW** in their food systems, while also recognizing the importance of initiating active efforts to reduce FLW even **without final estimates**.
- Collaborate with the **private sector and civil society** to investigate improvements, including low-cost steps that can be **implemented quickly**
- Collaborate with the private sector and civil society to implement **feasible solutions to reduce FLW**
- Policy supporting **donation activities (e.g. liability protection, tax incentives)** is a low-cost solution which should be considered to implement quickly.

Information Platform: APEC-FLOWS

<http://apec-flows.ntu.edu.tw/>

Purpose

- Serve as a repository of information on APEC strategic plans on FLW reduction
- Connect stakeholders to share information and best practices and build business connection
- Capacity building information platform
- Dissemination and on-line education

APEC-FLOWS
ASIA PACIFIC REGION FOOD LOSSES AND WASTE SYSTEM

Reducing food losses and waste is an urgent issue around the world and in Asia Pacific Region. Although the assessment of global losses along the food chain is fraught with considerable uncertainties, there is no doubt that these losses are substantial. The Food and Agriculture Organization of the United Nations (FAO) estimates that roughly one third of food produced for human nutrition gets lost or wasted globally. This amounts to approximately 1.3 billion tons per year.

This APEC project aims to find the roadmap to reduce post-harvest losses in all stages of the food supply chain in the APEC region by strengthening PPPs. Taking into account the major challenges that lie ahead in increasing access to food and the need for strong cooperation to address food security, this study will try to balance between the need to raise the competitive ness of the supply chain and capacity building of smallholders and farmers to meet the institutional and technological requirement of the supply chain.

The overall goal can be achieved through the following three objectives:

- 1 FOOD SECURITY**
To identify key issues on reducing post-harvest losses and costs along the entire food supply chain and enhancing food safety and quality in the APEC region.
- 2 BALANCE**
To seek best practices in private and public sectors on reducing post-harvest losses and costs, to enhance the role of public-private partnerships (PPP) using the entire food supply chain, to enhance policy coordination among APEC economies, and to establish a milestone for APEC food security pact.
- 3 DATA BASE**
To search and identify practical solutions, to enhance capacity building on reducing food losses and costs, as well as improving food safety and quality, to establish a reliable and updated on reducing food losses, and to develop a consolidated methodology of APEC food losses assessment. This contributing to mitigating food security in the APEC region.

Funded by the APEC Multi-Year Project entitled, "MICE 02 2013A - Strengthening Public-Private Partnership to Reduce Food Losses in the Supply Chain, the APEC Information Platform on Post-Harvest Loss and Waste System (APEC-FLOWS) is an information platform to support the capacity building needs of APEC member economies on reducing food losses and waste in all stages of the food supply chain.

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APEC-FLOWS
NEWS ASSESSMENT TOOLS/ITS RESOURCES CONTACT
News Assessment & Methodology Data Reports
Research Reports Database Statistics Policy Literature
Workshop Reports Post-Reports

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Setting an APEC Action Agenda for FLW Reduction

Reference: WRI (2019), *Reducing Food Loss and Waste: Setting a Global Action Agenda*.

Target

- Set APEC goal aligned with SDG 12.3
- Member economies are encouraged to set their own FLW reduction target based on their own situation for self-improvement.

Measure

- Apply quantification method proposed by the handbook
- Measure in a consistent way for target tracking progress in their own economies
- Add sustainability indicators into measurement (Paris Agreement)

Action

- APEC government and companies should accelerate and scale up the feasible solutions
- Actions should be taken as soon as possible, initiating active efforts to reduce FLW even without final estimates

What APEC have done ? (1/3)






Production

Handling & Storage

Processing & Packaging

Distribution & Market

Consumption

Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"
 <p>Crop farmers</p>	<ul style="list-style-type: none"> Improve harvesting practices (e.g., ensure product is harvested at the right maturity and use appropriate harvesting equipment to maximize yield while minimizing crop damage).(meeting/toolkits) Improve skills or use tools to better schedule harvesting (including accessing better data on weather).(meeting/toolkit) Engage customers to explore changes in quality specifications to enable more of what is harvested to be sold.(toolkits) Identify financially viable alternative markets or use for crops otherwise left in the field (e.g., value-added processing, donation, secondary surplus markets).(toolkits) 	 <p>Primary producers</p>	<ul style="list-style-type: none"> Crop farmers: Improve training in best practices (e.g., handling to reduce damage, drying, fumigation treatments, and on- farm processing). Establish aggregation centers that provide adequate storage and preservation options, such as cooling chambers.(toolkits/meeting) Fishers: Improve temperature management, handling, and preservation techniques (e.g., fenced-off landing beaches or drying racks to improve the quality of fish and to minimize losses).(meeting/toolkits) 	 <p>Processors and manufactures</p>	<p>Operations-related:</p> <ul style="list-style-type: none"> Improve training of staff to reduce technical malfunctions and errors during processing.(toolkits) Reengineer production processes and product design to reduce waste during product line changeovers.(meeting) Introduce software and related information and communications technologies to optimize operations (e.g., to identify waste, track temperature and ensure freshness, assess ripeness, better balance demand and supply forecasts, accelerate delivery of food).(meeting) 	 <p>Wholesalers</p>	<ul style="list-style-type: none"> Build capacity for better handling and storage practices to reduce mistakes that result in food loss.(toolkits/meeting) Expand cold storage systems during wholesale and logistics to protect products vulnerable to heat damage.(toolkits/meeting) Find food rescue partners or establish online marketplaces that facilitate sale or donation of rejected shipments or short-life products.(meeting/toolkits) Use backhauling (or other logistics solutions) to enable return of reusable storage containers or rescue of surplus food for people in need.(meeting) 	 <p>Households</p>	<ul style="list-style-type: none"> Buy only what you expect to eat: check refrigerator and cupboards before shopping, use a shopping list, and plan meals in advance.(meeting) Know the difference between “use by” (which is about food safety) and “best before” (which is about quality; food is still safe to eat after this date).(meeting)

What APEC have done ? (2/3)








Production

Handling & Storage








Processing & Packaging

Distribution & Market

Consumption

Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"
 Fishers	<ul style="list-style-type: none"> Use fishing gear designed for target species to reduce bycatch. (toolkits) 	 Packing houses	<ul style="list-style-type: none"> Adopt best practices to provide the clean, cool, and/or dry conditions required to reduce postharvest losses. (meeting/toolkits) 	 Processors and manufacturers	<p>Customer-related:</p> <ul style="list-style-type: none"> Use product sizes and packaging that reduce waste by consumers (e.g., accommodate desire for smaller or customizable portions). (toolkit/meeting) Standardize date labels (e.g., eliminate "sell by" and use only "use by" for perishable items and "best before" for others) to reduce consumer confusion. (meeting) Develop new food products or secondary uses (e.g., animal feed) from what cannot be marketed (e.g., spent grains, fruit trimmings, vegetable peels). (toolkits) Seek donation of excess food that is still safe to consume (e.g., revise vendor agreements with retailers to allow for donation instead of mandatory destruction). (toolkits/meeting) 	 Retailers (formal)	<p>Operations-related:</p> <ul style="list-style-type: none"> Optimize inventory management systems (and increase flexibility in supplier contracts) to better match forecasting and ordering. (meeting/g/toolkits) <p>Consumer-related:</p> <ul style="list-style-type: none"> Enable consumers to purchase smaller or customized portions (e.g., through bulk bins or staffed seafood and meat counters). (meeting/g/toolkits) Adjust promotions to avoid excessive purchase of additional items (e.g., offer half off or mix-and-match deals rather than two-for-one offers). (meeting) 	 Restaurants	<ul style="list-style-type: none"> Shift away from preparation methods such as batch cooking, casserole trays, and buffets to reduce overproduction and repurpose excess food (e.g., offer customers "doggy bags," safely incorporate unused items into other dishes, sell excess food at a discount, donate unsold food). (meeting) Revisit inventory management and purchasing practices (as well as menus) to better fit needs based on historical trends and waste data. (meeting) Use scales in the kitchen to weigh food (and estimate the financial cost of food disposed, thus creating a financial signal to waste less). (toolkits) Consider whether portions served exceed what can be eaten, and rethink promotions that encourage overpurchasing by customers. (toolkits)
 Ranchers and animal farmers	<ul style="list-style-type: none"> Implement best practices in animal welfare to avoid stress and injuries that can reduce the shelf life of meat from animals. (toolkits) 	 Storage providers	<ul style="list-style-type: none"> Adopt low-cost storage and handling technologies (e.g., hermetic grain storage bags, plastic or metal silos, plastic crates) that prevent spoilage and increase shelf life. (toolkits) 						

What APEC have done ? (3/3)

Production		Handling & Storage		Processing & Packaging		Distribution & Market		Consumption	
Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"
		 Transportat ion and logistics providers	<ul style="list-style-type: none"> • Improve handling practices during loading and unloading.(tool kits/meeting) • Introduce (or expand) energy-efficient, clean, low-carbon cold chains from farm to wholesalers.(toolkits/meeting) • Create access to alternative markets for product that cannot be marketed.(tool kits) 	 Slaughter houses	<ul style="list-style-type: none"> • Ensure proper temperature management conditions are maintained.(tool kits) • Fully leverage potential for using animal by-products to safely manufacture other products (e.g., animal feed supplements).(toolkits/meeting) 	 Retailers (informal)	<ul style="list-style-type: none"> • Use practices that minimize damage such as handling produce gently, stacking properly (e.g., to avoid bruising delicate produce), marking cases to track inventory, and rotating stock following a “first-in-first-out” method.(meeting) 	 Hotels	<ul style="list-style-type: none"> • Reduce overproduction by producing smaller quantities of items consistently left on the plate.(toolkits) • Repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it).(toolkits/meeting) • Communicate to guests about food waste and encourage them to take only as much as they need.(toolkits)
				 Packaging providers	<ul style="list-style-type: none"> • Invent and mainstream packaging options or coatings (e.g., resins used on pouches or on foods) that(toolkits/meeting) • extend a product’s shelf life.(meeting) • Adjust packaging so it is easier for consumers to empty all the contents.(toolkits/meeting) 			 Caterin g/good service	<ul style="list-style-type: none"> • Repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it).(meeting/toolkit s) • Use scales in the kitchen to weigh food and track items most commonly wasted (and estimate the financial cost of food disposed, thus creating a financial signal to waste less).(toolkits)
								 Public and Private institutions (e.g., schools, hospitals, government, canteens).	<ul style="list-style-type: none"> • Reduce the amount overproduced (e.g., by producing smaller quantities of items that are consistently underconsumed), and repurpose excess food (e.g., by safely incorporating unused items into other dishes, or by donating it).(meeting)

What APEC should do in future ? (1/2)










Production

Handling & Storage

Processing & Packaging

Distribution & Market

Consumption

Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"
 Crop farmers	<ul style="list-style-type: none"> Engage customers (e.g., wholesalers, retailers) to communicate implications of order changes. 	 Primary producers	<ul style="list-style-type: none"> Ranchers and animal farmers: Improve handling and preservation options (e.g., establish milk collection centers with cooling tanks). Improve conditions during transportation of food-producing animals from farm to markets. 	 Slaughter houses	<ul style="list-style-type: none"> Follow best practices in cleaning and sanitation to reduce losses due to contamination. Identify and address management practices that lead to avoidable losses (e.g., using remote video auditing to assess whether best practices are being implemented). 	 Wholesalers	<ul style="list-style-type: none"> Invest in technologies to track temperature and ensure freshness, streamline routing, track movement of goods in and out of warehouses, and monitor food loss and waste. 	 Households	<ul style="list-style-type: none"> Freeze or preserve food before it spoils, and find out how to best store different foods so they stay fresh and safe longer. Find creative ways to use leftover ingredients and products past their peak quality (e.g., in soups, sauces, smoothies), as well as to cook the parts you may not normally eat (e.g., stems, cores). Organize the kitchen and refrigerator so that items do not get lost and spoil.
						 Retailers (formal)	<ul style="list-style-type: none"> Operations-related: <ul style="list-style-type: none"> Improve training of staff in temperature management, product handling, and stock rotation. Review cosmetic specifications and accept a wider diversity of produce. Consumer-related: <ul style="list-style-type: none"> Redesign in-store merchandising to avoid excessive handling of products by consumers (e.g., sort by stage of maturity), and to achieve the desired appearance of abundance but with less damage and excess product (e.g., through smaller bins and bowls). 		
 Fishers	<ul style="list-style-type: none"> Identify (or create) markets for unavoidable bycatch (e.g., animal feed or processed products). 	 Packing houses	<ul style="list-style-type: none"> Reexamine handling and storage practices to reduce damage (e.g., use liners in wood and basket containers, reduce the size of sacks or crates to minimize product damage). Build near-farm facilities to convert unmarketable crops and by-products into value-added products. 					 Hotels	<ul style="list-style-type: none"> Rethink the buffet (e.g., shift certain items to à la carte near end of meal times, reduce the size of dishes used in buffets).

What APEC should do in future ? (2/2)








Production

Handling & Storage






Processing & Packaging

Distribution & Market

Consumption





Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"	Actor	Key "to do"
 Ranchers and animal farmers	• Build capacity in practices to reduce losses (e.g., reduce milk spills, minimize contamination).	 Storage providers	<ul style="list-style-type: none"> • Use storage containers that protect against temperature variations, humidity and precipitation, and insect and rodent infestation. • Work with intended users and community experts to design and produce locally relevant storage solutions. 	 Packaging providers	<ul style="list-style-type: none"> • Offer packaging that is resealable to allow for incremental consumption and to extend how long the remainder of a product stays suitable for consumption. • Provide commercial customers with a greater variety of packaging sizes to help shoppers purchase the amount appropriate for their needs. 	 Retailers (informal)	<ul style="list-style-type: none"> • Educate consumers about better food management (e.g., proper storage, meal planning, understanding date labels, safe food handling, cooking tips). • Participate in groups or associations of informal operators to access guidance and training in best practices in food handling and storage. • Take advantage of municipal support to access clean water, storage areas, equipment that improves food safety, and training in how to reduce food contamination. • Ensure displays allow air to be circulated and temperature conditions to be appropriate for product to remain fresh (e.g., high-ethylene producers should be kept away from ethylene-sensitive commodities). • Avoid sprinkling unclean water on products (to minimize wilting and shriveling) as such practices result in unsafe foods shunned by buyers. 	 Households	<ul style="list-style-type: none"> • Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets). • Reduce the amount overproduced (e.g., by producing smaller quantities of items that are consistently underconsumed). • Evaluate contractual obligations between clients and suppliers that generate waste and overproduction (e.g., contracts that stipulate that all hot dishes must be available for the full-service period).
		 Transportation and logistics providers	<ul style="list-style-type: none"> • Use technology innovations to improve the flow of information (e.g., about road and traffic conditions, as well as timing of pickup and delivery) to optimize movement of food. • Introduce (or expand) energy-efficient, clean, low-carbon cold chains from farm to wholesalers. • Create access to alternative markets for product that cannot be marketed. 					 Public and private institutions (e.g., schools, hospitals, government canteens)	<ul style="list-style-type: none"> • Engage staff on food waste reduction (e.g., explain why reduction is important, give tips on waste reduction, and reward staff who deliver against targets). • Introduce techniques to minimize people taking overly large portions (e.g., trayless dining, flexible portion sizes, pay-by-weight pricing system, smaller plates). • Revisit inventory management and

What APEC have done ?

Cross-cutting	
Actor	Key “to do”
 <p>Policymakers</p>	<ul style="list-style-type: none"> • Embed into agricultural extension services (and in farmer subsidy programs) food loss reduction awareness, technical assistance, and financial aid. (meeting) • Develop, facilitate, promote, and/or improve climate-smart infrastructure (e.g., roads, electricity, irrigation, community storage) and access to it, especially for smallholder farmers who live far from markets. (meeting) • Remove barriers to food redistribution via policies (e.g., liability limitations, tax breaks) that make it easier for food suppliers to donate safe (but unsold) food to charities or to those in need. (meeting) • Support polices to standardize food date labeling practices to reduce confusion about product safety and quality, and improve consumer understanding of the meaning of date labels. (meeting)
 <p>Financiers</p>	<ul style="list-style-type: none"> • Increase development cooperation between high-income and low-income economies targeting FLW. (meeting/project)
 <p>Innovators and intermediaries (e.g., brokers, consolidators, digital solution developers).</p>	<ul style="list-style-type: none"> • For unmarketable crops, improve flow of information to find alternative buyers, promote financially viable alternative markets, or develop new outlets (e.g., as processed foods, industrial products, animal feed). (toolkits) • Leverage technology and digital solutions to rethink and better coordinate key processes between suppliers and customers in a more organized and informed way. (toolkits)
 <p>Researchers</p>	<ul style="list-style-type: none"> • Research new and innovative technologies to preserve food quality and extend shelf life. (toolkits) • Develop innovative products from perishable food commodities, such as fruits and vegetables, and research innovative food technologies and practices used to promote whole food utilization. (toolkits) • Undertake research to fill data gaps and standardize reporting of FLW data in order to better compare results, create benchmarks, and provide clearer direction for stakeholders. (project) • Develop sector-specific guidance that provides the motivation and technical information for businesses to take action (e.g., promote industry roadmaps for FLW reduction). (project)
 <p>Civil Society</p>	<ul style="list-style-type: none"> • Raise awareness and shift social norms so that FLW is considered “unacceptable” for all, including higher- income consumers. (project) • Encourage public and private sector leaders to pursue the Target-Measure-Act strategy. (project) • Act as a channel for the sharing and reporting of food waste data and progress. (project)

What APEC should do in future ?

Cross-cutting

Actor	Key “to do”
 <p data-bbox="77 406 280 449">Policymakers</p>	<ul data-bbox="357 228 1767 621" style="list-style-type: none"> • Increase investment in agricultural research related to postharvest loss and provide incentives for the adoption of postharvest technologies (e.g., zero-rates tax on imported postharvest technologies, incentives for local manufacturers of postharvest technologies, subsidies for postharvest technologies). • Implement policies to prevent unfair trading practices (e.g., last-minute order cancellations, unilateral or retroactive changes to contracts). • Include food waste in school curricula and include food waste-reduction training in public procurement programs. • Provide municipal support for informal retailers to access clean water, storage areas, equipment that improves food safety, and training in how to reduce food contamination. • Make measurement of FLW by companies mandatory.
 <p data-bbox="106 756 251 792">Financiers</p>	<ul data-bbox="357 649 1883 899" style="list-style-type: none"> • Increase the number of philanthropic institutions funding FLW prevention activities. • Create financing instruments and product lines (e.g., funds, bonds, loans) dedicated to reducing FLW. • Increase start-up financing for new technologies and business models that would reduce FLW, as well as financing to scale up proven technologies and models. • Introduce “pay-as-you-go” programs to make technologies affordable for smaller operations (e.g., for solar-powered refrigeration units and mobile processing).
 <p data-bbox="57 992 299 1149">Innovators and intermediaries (e.g., brokers, consolidators, digital solution developers).</p>	<ul data-bbox="357 921 1864 1178" style="list-style-type: none"> • Develop and improve availability of processing and preservation facilities (including aggregation centers and mobile low-carbon options). • Develop alternative outlets during peak season through organizing export opportunities to markets with other seasonalities. • Apply innovations to reduce delays during the point of exit and entry, which extends to increase the shelf life of perishable products.
 <p data-bbox="96 1306 260 1342">Researchers</p>	<ul data-bbox="357 1199 1758 1278" style="list-style-type: none"> • Assess impact of interventions to improve evidence base of what works and the return on investment.

Thank You
Comments Welcome