



สวทช  
NSTDA

MTEC  
a member of NSTDA

Thai Sustainable Development perspective on Food Loss and Waste

ความก้าวหน้าของงานวิจัย SDG :  
ตัวชี้วัด 12.3.1 Food Loss and Waste

จิตติ มังคละศิริ

ศูนย์เทคโนโลยีโลหะและวัสดุแห่งชาติ

สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ

30 มิถุนายน 2560

## ประเด็นแลกเปลี่ยน

- SDG > SDG 12 > SDG 12.3
  - ความสัมพันธ์ของ SDG 12.3 และภาพรวมของการจัด
  - คำจำกัดความ
  - ตัวเลขที่น่าสนใจ
- ความก้าวหน้าของการดำเนินงานด้าน SDG 12.3
- ปัญหาที่พบในการจัดทำ



**SUSTAINABLE DEVELOPMENT GOALS**  
17 GOALS TO TRANSFORM OUR WORLD

1

- On 25 September 2015, the 193 countries of the UN General Assembly adopted the 2030 Development Agenda titled *Transforming our world: the 2030 Agenda for Sustainable Development*.
- The 17 Sustainable Development Goals and 169 targets which we are announcing today demonstrate the scale and ambition of this new universal Agenda. They seek to build on the Millennium Development Goals and complete what they did not achieve. They seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls. They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental.
- The Goals and targets will stimulate action over the next 15 years in areas of critical importance for humanity and the planet.

"Thai Sustainable Development Perspective on 'Food Loss and Waste'"

# SDGs grouping

## People

- 1 NO POVERTY** End poverty in all its forms everywhere.
- 2 ZERO HUNGER** End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- 3 GOOD HEALTH AND WELL-BEING** Ensure healthy lives and promote well-being for all at all ages.
- 4 QUALITY EDUCATION** Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- 5 GENDER EQUALITY** Achieve gender equality and empower all women and girls.
- 6 CLEAN WATER AND SANITATION** Ensure availability and sustainable management of water and sanitation for all.

## Prosperity

- 7 AFFORDABLE AND CLEAN ENERGY** Ensure access to affordable, reliable, sustainable and modern energy for all.
- 8 DECENT WORK AND ECONOMIC GROWTH** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE** Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
- 10 REDUCED INEQUALITIES** Reduce inequality within and among countries.

## Planet

- 11 SUSTAINABLE CITIES AND COMMUNITIES** Make cities and human settlements inclusive, safe, resilient and sustainable.
- 12 RESPONSIBLE CONSUMPTION AND PRODUCTION** Ensure sustainable consumption and production patterns.
- 13 CLIMATE ACTION** Take urgent action to combat climate change and its impacts.
- 14 LIFE BELOW WATER** Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- 15 LIFE ON LAND** Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

## Peace

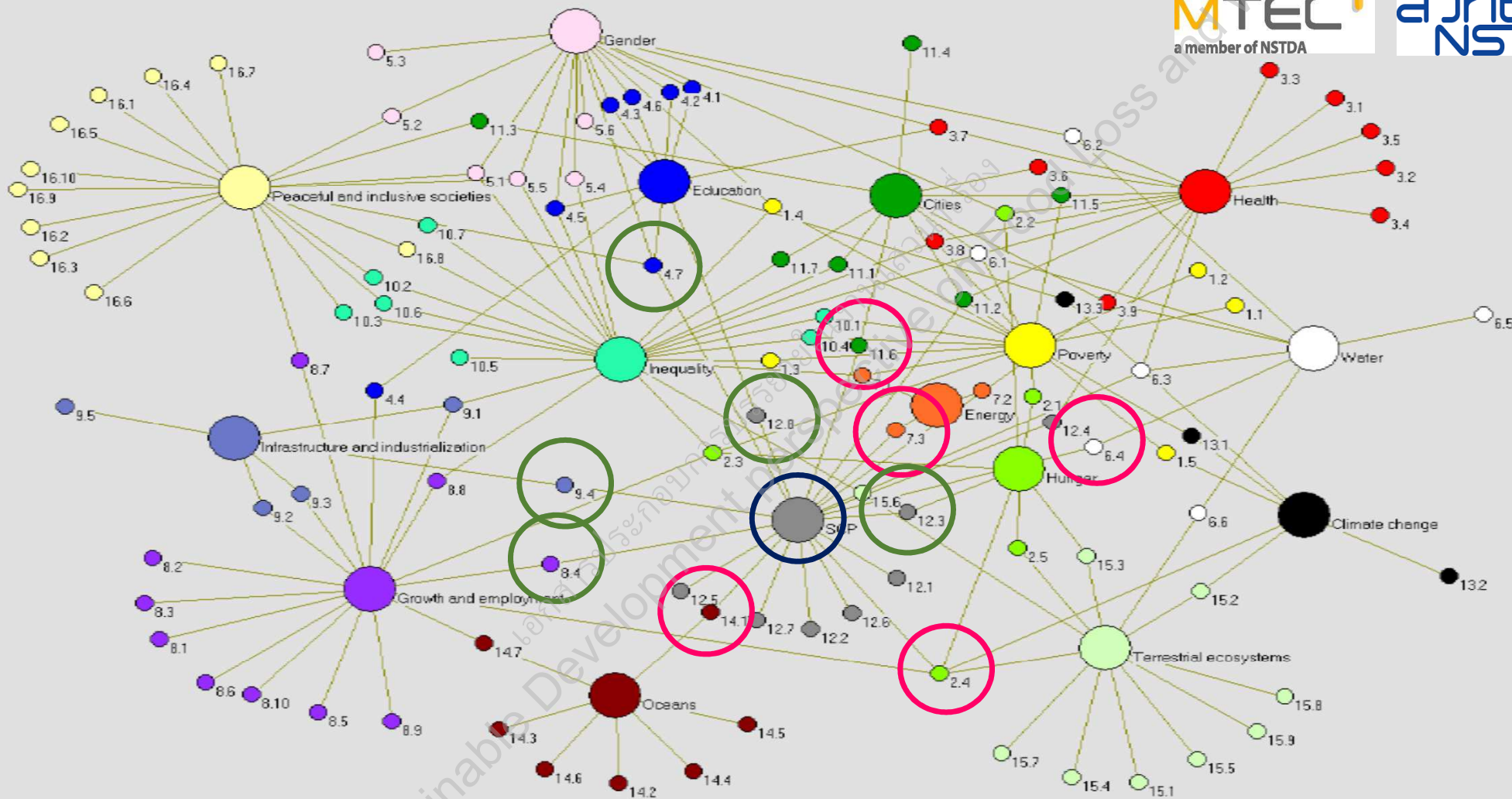
- 16 PEACE AND JUSTICE** Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

## Partnership

- 17 PARTNERSHIPS FOR THE GOALS** Strengthen the means of implementation and revitalise the global partnership for sustainable development.

**17 Goals**  
**169 Targets**  
**230 (241) Indicators**

**Business and the United Nations**  
**Working Together Towards the Sustainable Development Goals: A Framework for Action**



The SDGs as a network of targets

Towards integration at last?  
The sustainable development goals as a network of targets. David Le blanc



Target 12.3 by 2030 halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains, including post-harvest losses.

เป้าประสงค์ที่ 12.3 ลดขยะเศษอาหารของโลกลงครึ่งหนึ่งในระดับค้าปลีกและผู้บริโภค และลดการสูญเสียอาหารจากกระบวนการผลิตและห่วงโซ่อุปทาน รวมถึงการสูญเสียหลังการเก็บเกี่ยว ภายในปี 2573



ดร.จิตติ มังคละศิริ  
พรนลัท สิงห์รัตนพันธุ์  
เบญจมาภรณ์ ถนอมนิ่ม

# DEFINITION

## Consider

- Human consumption

## Not Consider

- Animal feed
- Production for energy
- Inedible parts of food

“Food losses” refer to the decrease in edible food mass throughout the part of the supply chain that specifically leads to edible food for human consumption. - Food losses take place at production, post-harvest and processing stages in the food supply chain.

“Food waste” relates to retailers and consumers behavior (final consumption). (Parfitt et al., 2010)

“Food loss” from production and post harvest up to retail

“Food waste” retail, household and other public consumption



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United Nations



# Definition Food loss and waste



## **Please briefly describe the process of developing the methodology for the indicator**

F.A.O. collects and/or imputes agricultural food losses and waste data in the framework of the Food Balance Sheets compilation. A new more statistically sound methodology for imputation of loss has been developed in 2016 and is being tested and refined. The new imputation model will generate annual loss imputations for each food commodity for all countries, for a number of relevant years, at the primary level of the supply-utilization account. The losses per commodity are aggregated by country using price-weighted quantities for every relevant year. A fixed-base volume index is calculated for each country for a given base period.

The country indices can be aggregated by geo-economic or other regional groupings using appropriate weights (i.e. price-weighted production quantities to reflect the countries' shares in the region). The same procedure can produce a global index.

The indicator's coverage is determined by the coverage of the Food Balance Sheets. The represented segments of the Food Supply Chain range from on-farm postharvest losses to losses and waste up to and not including the retail sector. Waste in the last segments of the chain, i.e. at retail and household levels are therefore not included in the indicator.

A different indicator and imputation method are needed to monitor Food waste at the retail and household levels.





# SDG 12.3 Mapping

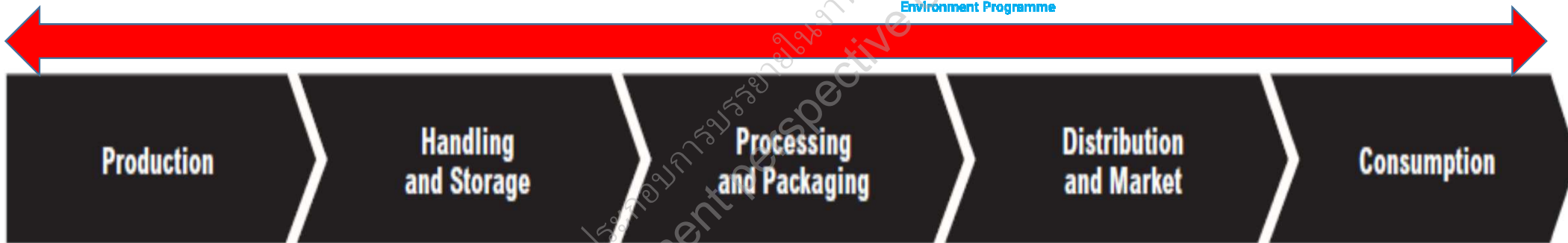
Target SDG4.7:  
Learning to live together sustainably



United Nations  
Educational, Scientific and  
Cultural Organization

Integrated indicator

Target 12.3:  
Food Loss & Waste



Food and Agriculture  
Organization of the  
United Nations

Target 2.4:  
Sustainable food production



กรมโรงงานอุตสาหกรรม  
DEPARTMENT OF INDUSTRIAL WORKS

Target 9.4:  
Sustainable industry



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION



กรมควบคุมมลพิษ  
POLLUTION CONTROL DEPARTMENT

Target 11.6 :  
Clean cities

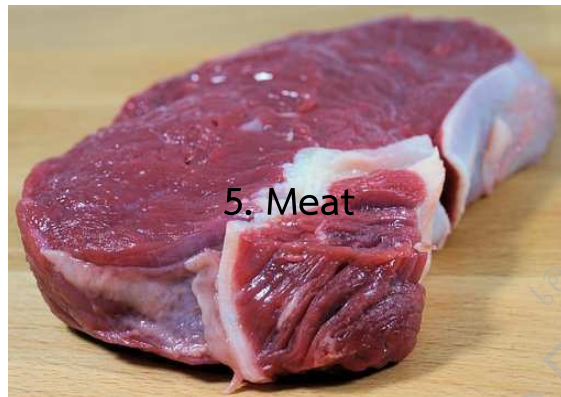


FOR A BETTER URBAN FUTURE

## Tier Classification for Global SDG Indicators (21 December 2016)

Targets	Indicators	Possible Custodian Agency(ies)	Initial Proposed Tier (by Secretariat)	Updated Tier Classification (by IAEG-SDG Members)
12.1	SCP action plan	UNEP	n.a.	Tier III
12.2.1	Material Footprint	UNEP	Tier II	Tier III
12.2.2	DMC	UNEP	Tier II	Tier II
12.3	Food loss/waste	FAO, UNEP	Tier III	Tier III
12.4.1	environmental agreements	UNEP	Tier I	Tier I
12.4.2	Treated HW	UNSD, UNEP	Tier II	Tier III
12.5	recycling rate	UNSD, UNEP	Tier III	Tier III
12.6	sustainability reports	UNEP, UNCTAD	Tier III	Tier III
12.7	sustainable public procurement	UNEP	Tier III	Tier III
12.8	SCP in education	UNESCO	Tier III	Tier III
12.a	SCP support in technology	UNEP, UNESCO, World Bank, OECD-to confirm	Tier III	Tier III
12.b	Sustainable tourism	UNWTO	Tier III	Tier III
12.c	fossil-fuel subsidies	UNEP	Tier III	Tier III

# COMMODITY GROUPS according to FAOSTAT's Food Balance Sheet



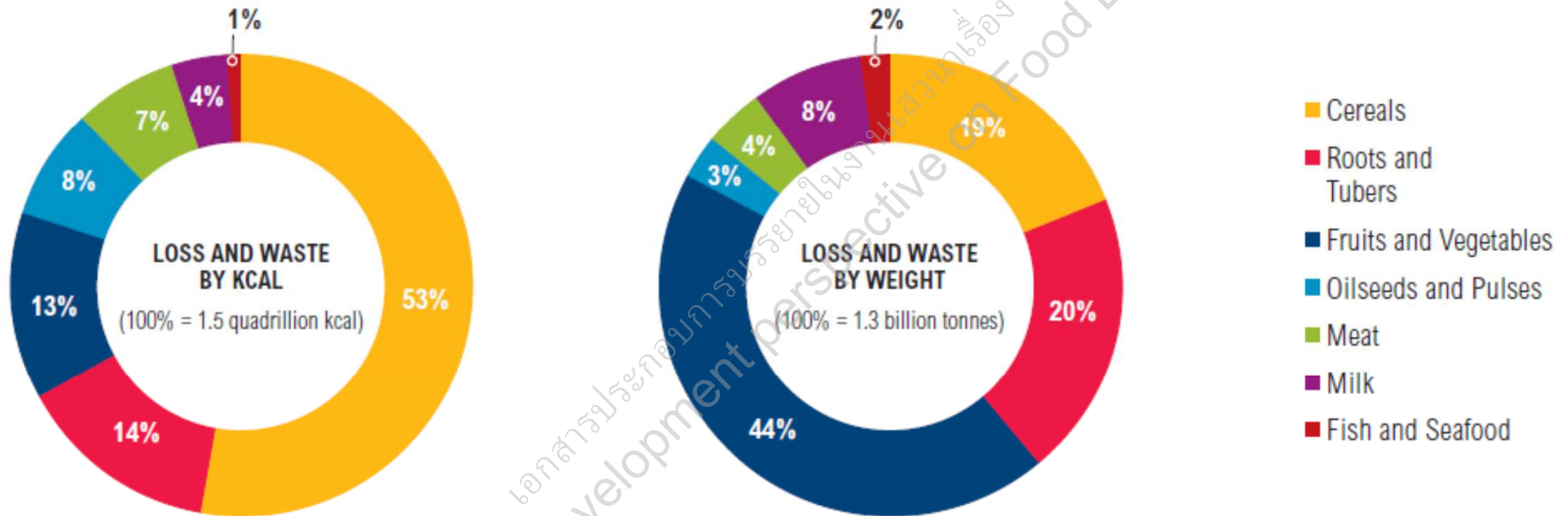
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“Thai Sustainable Development and Waste”

# FOOD LOSS AND WASTE

Figure 1 | Share of Global Food Loss and Waste By Commodity, 2009



Source: WRI analysis based on FAO. 2011. *Global food losses and food waste—extent, causes and prevention*. Rome: UN FAO.



## REDUCING FOOD LOSS AND WASTE

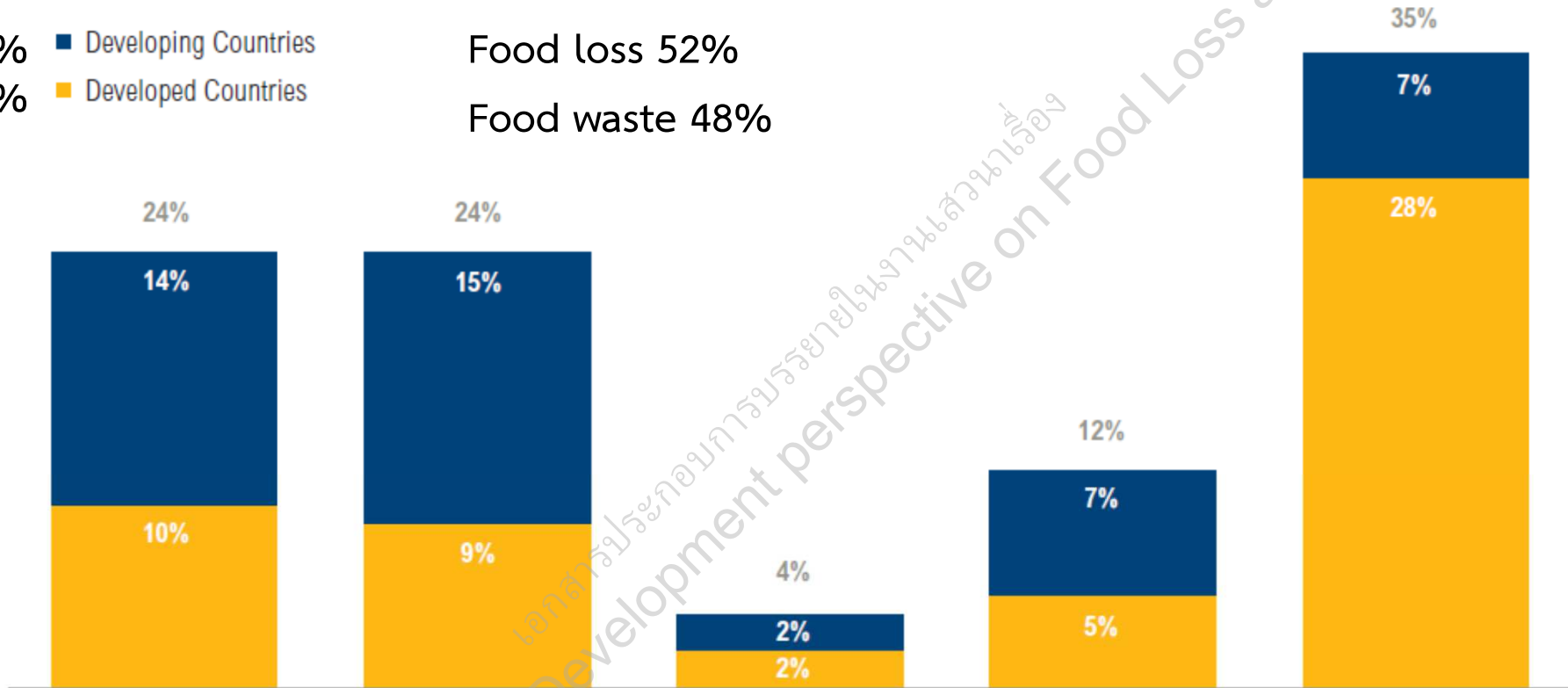
BRIAN LIPINSKI, CRAIG HANSON, JAMES LOMAX, LISA KITINOJA, RICHARD WAITE AND TIM SEARCHINGER





46% ■ Developing Countries  
54% ■ Developed Countries

Food loss 52%  
Food waste 48%



Note: Number may not sum to 100 due to rounding.

Source: WRI analysis based on FAO. 2011. *Global food losses and food waste—extent, causes and prevention*. Rome: UN FAO.



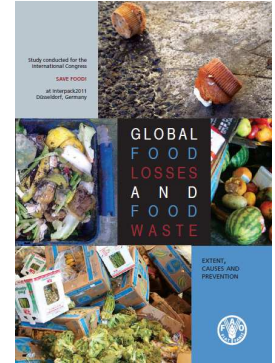
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# WEIGHT PERCENTAGE OF FOOD LOSSES AND WASTE

(IN PERCENTAGE OF WHAT ENTERS EACH STEP), FAO (2011)

Estimated/assumed waste percentages for each commodity group in each step of the FSC for

**South & Southeast Asia.**



	Agricultural Production	Postharvest handling and storage	Processing and packaging	Distribution	Consumption	SUM
Cereals	6	7	3.5	2	3	21.5
Roots and Tubers	6	19	10	11	3	49
Oilseeds and Pulses	7	12	8	2	1	30
Fruit and Vegetable	15	9	25	10	7	66
Meat	5.1	0.3	5	7	4	21.4
Fish and Seafood	8.2	6	9	15	2	40.2
Milk	3.5	9	2	10	1	25.5



Food and Agriculture Organization of the United Nations

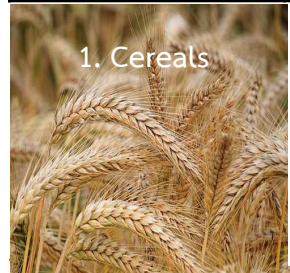
Food loss

Food waste

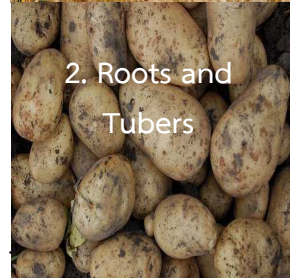


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COMMODITY GROUPS	Product				
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Product	Production	%	Export	import
Sugarcane	103,697,005	78.1	32,592,701	425
Rice (milled)	24,263,103	18.3	10,969,000	6,967
Maize	4,730,000	3.6	631,497	28,658
Sorghum	46,000	0.0		140



Product	Production	%	Export	import
Cassava	30,022,000	99.5	29,238,357	1,568,064
Potato	99,715	0.3		
Sweet potato	24,271	0.1	172	53350
Yam bean/Jicama	14,796	0.0		



Product	Production	%	Export	import
Oil palm	12,473,000	92.0	2,238,500	800,256
Coconut	1,000,000	7.4	88,500	894,866
Soybean	57,626	0.4	11,595	1,898,295
Sesame seed	28,800	0.2	5,749	14,073
Cottonseed	867	0.0	6	322,280

Unit: Tonne

Commodity grouped according to FAOSTAT's Food Balance Sheet

Ref.1. FAO : <http://www.fao.org/crop/statistics/en/>

2. Office of Agricultural Economics : [www.oae.go.th](http://www.oae.go.th)

3. กรมศุลกากร [www.customs.go.th](http://www.customs.go.th)

COMMODITY GROUPS	Product				
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Product	Production	%	Export	import
Pineapple	1,917,000	41	668,728	15
Longan	995,000	21	565,559	171
Durian	632,000	14	423,023	2,165
Rambutan	322,000	7	12,123	59
Mangosteen	289,000	6	195,838	277
baby corn	268,961	6	34,434	29
Tomato	119,049	3	1,007	195
Garlic	72,109	2		
Shallot	37,756	1		241



Product	Production	%	Export	import
Broiler ไก่เนื้อ	1,657,994	58.3	399,016	8,049
Swine สุนัข	1,046,000	36.8	16,207	1,023
Cattle โคเนื้อ	140,360	4.9	7926	17343



Product	Production	%	Export	import
White leg shrimp	310,700	38	63,177	3,545
Nile tilapia	217,600	26		
Indo-Pacific mackerel	145,300	18	22	195
Catfish	128,800	16	453	533
Giant freshwater prawn	19,400	2	2,062	149



Product	Production	Export	import
Milk	1,111,481	213,371	131,480
Yogurt		202	31
cheese		32	1,817

"Thai Sustainable Development Report 2022"

## ความก้าวหน้าของการทำงาน SDG 12.3

- สำนักงาน นโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม (สผ.) เป็นผู้รับผิดชอบเป้าหมายการพัฒนาที่ยั่งยืนที่ 12 ประเทศไทย มีการประชุมจัดขึ้นตามระยะเวลาที่กำหนด
- สำนักงานเศรษฐกิจการเกษตรและกรมควบคุมมลพิษ เป็นหน่วยงานภาครัฐที่ถือข้อมูลที่เกี่ยวข้องกับ SDG 12.3 แต่ยังคงไม่ครบถ้วนตามระเบียบการทำงานเนื่องด้วยมีรายละเอียดอีกมาก
- มีการสนับสนุนงานวิจัยจากภาครัฐเพื่อช่วยในการจัดทำเป้าประสงค์
- มีประสานงานระหว่างหน่วยงานระหว่างประเทศ และหน่วยงานภายในประเทศ



## ปัญหาที่พบในการจัดทำ

- ระเบียบวิธีการทำงานอยู่ระหว่างการจัดทำขั้นสุดท้าย นอกจากนี้ ประเทศไทยยังขาดข้อมูลที่สมบูรณ์ของ Allocation factor, Conversion factor และ Waste percentage ในแต่ละ Food Supply Chain
- นโยบายของการจัดทำ อาทิ หน่วยงานที่มีอำนาจหน้าที่ หรือ หน่วยงานที่ถือข้อมูล
- ทรัพยากรที่จำเป็น อาทิ บุคลากร หรือ การจัดเก็บข้อมูลที่เป็นระบบอย่างมีประสิทธิภาพ (Big data)
- การทำงานอย่างบูรณาการของทุกภาคส่วน
- คนส่วนมากให้ความสำคัญกับช่วงการผลิต ซึ่งคิดเป็นประมาณ 4%
- แนวทางการจัดการที่เหมาะสมต้องคิดให้ครบ Life Cycle Thinking



**SUSTAINABLE DEVELOPMENT GOALS**  
17 GOALS TO TRANSFORM OUR WORLD

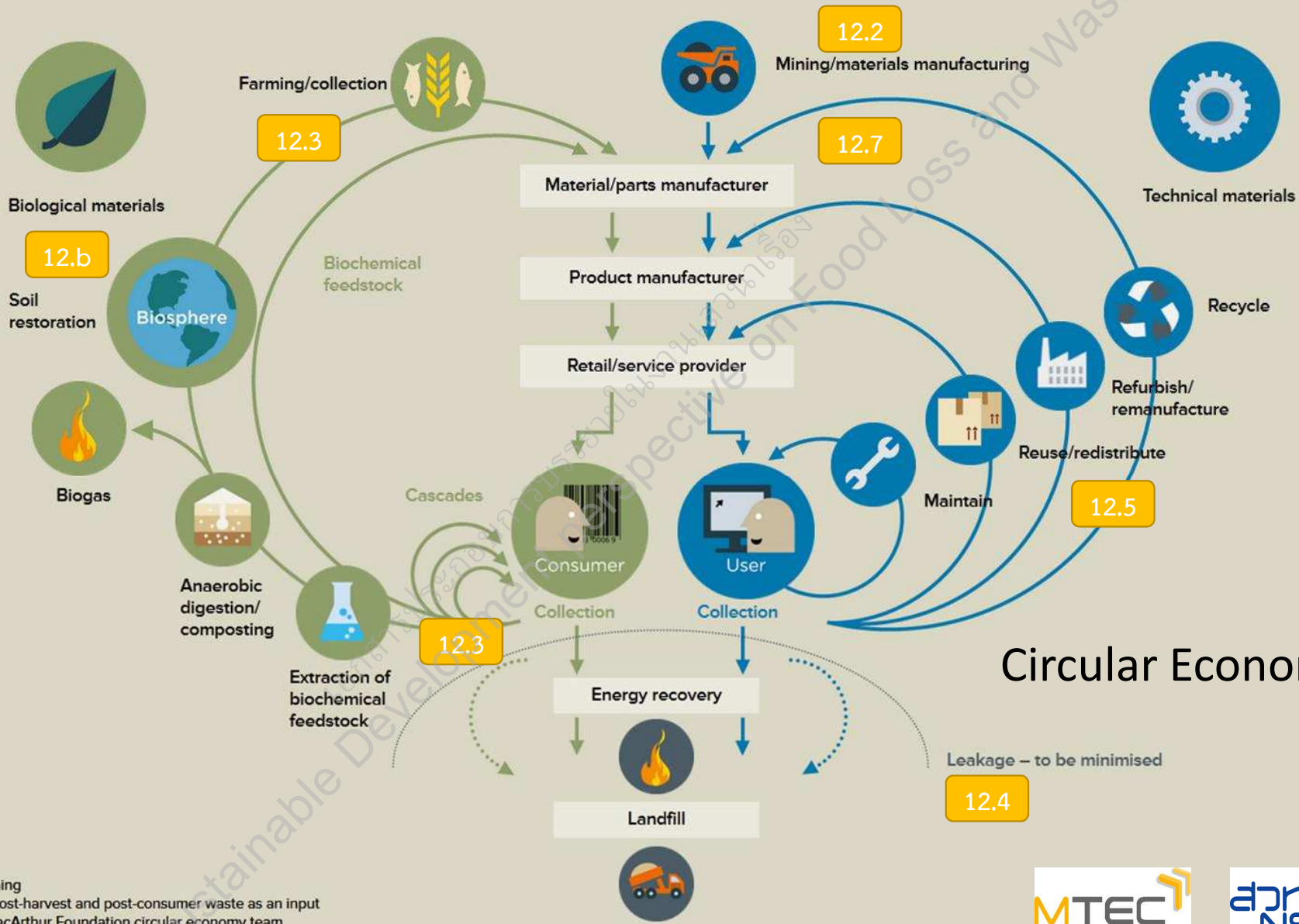


PILOT PROJECTS FOR IMPLEMENTING LIFE CYCLE THINKING IN ASIA AND THE PACIFIC

# Food waste and food packaging monitoring application via life cycle concept

The Resource Efficiency through Application of Life cycle thinking (REAL) project is a new global project in UN Environment's Economy Division, which is financially supported by the European Commission.





# Circular Economy ?

1 Hunting and fishing  
 2 Can take both post-harvest and post-consumer waste as an input  
 SOURCE: Ellen MacArthur Foundation circular economy team



"Thai Sustainable Development Strategy Perspective on Food Loss and Waste"



# ขอบคุณครับ

“Thai Sustainable Development perspective on Food Loss and Waste”  
เอกสารประกอบการบรรยายในงานเสวนาเรื่อง

