REDUCING FOOD LOSSES AND WASTE FOR STRENGTHENING FOOD SECURITY

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I. Introduction

II. FLW Situation

III. Efforts to Reduce FLW
“Food loss” refers to food that spills, spoils, incurs an abnormal reduction in quality such as bruising or wilting, or otherwise gets lost before it reaches the consumer. Food loss is the unintended result of an agricultural process or technical limitation in storage, infrastructure, packaging, or marketing.

“Food waste” refers to food that is of good quality and fit for human consumption but that does not get consumed because it is discarded—either before or after it spoils. Food waste is the result of negligence or a conscious decision to throw food away.
II. FLW Situation

GLOBAL FOOD LOSS AND FOOD WASTE

1/3 Global Food Production gets lost and wasted

- 1.3 billion ton per year
- 24% of Calorie: 614 kCal/capita/day

24-30% on production stage

30-35% on consumption stage

20% on post harvest stage

www.fao.org
SHARE OF TOTAL FOOD LOSS AND WASTE

PRODUCTION
- Developed Countries 14%
- Developing Countries 10%

HANDLING AND STORAGE
- Developed Countries 24%
- Developing Countries 9%

PROCESSING AND PACKAGING
- Developed Countries 4%
- Developing Countries 2%

DISTRIBUTION AND MARKET
- Developed Countries 7%
- Developing Countries 5%

CONSUMPTION
- Developed Countries 35%
- Developing Countries 28%

WRI Analysis based on FAO 2011 Global Food Losses and Waste: extent, causes and prevention
Food Loss and Waste

Largest food wasters (per person per year)
- **Saudi Arabia**: 427kg
- **Indonesia**: 300kg
- **US**: 277kg
- **UAE**: 196kg

In **rich countries**, consumers waste most food.

In **developing countries**, food losses occur before reaching the consumer.

**Top 3 / Lowest 3 Performers**
in reducing food loss & waste

**TOP PERFORMERS**
1. France
2. Australia
3. South Africa

**LOWEST PERFORMERS**
23. United Arab Emirates
24. Indonesia
25. Saudi Arabia
A. Loss of Commodity in Indonesia

Loss for paddy/rice

Source: BPS

- Loss due to under performed milling unit
- Drying (physical loss)
- Rice loss
- Post harvest loss
- Harvesting and threshing

<table>
<thead>
<tr>
<th>Year</th>
<th>Loss due to under performed milling unit</th>
<th>Drying (physical loss)</th>
<th>Rice loss</th>
<th>Post harvest loss</th>
<th>Harvesting and threshing</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS 1987/1988</td>
<td>3.10</td>
<td>2.01</td>
<td>0.45</td>
<td>2.08</td>
<td>14.32</td>
</tr>
<tr>
<td>BPS 1995/1996</td>
<td>2.04</td>
<td>2.17</td>
<td>0.26</td>
<td>1.59</td>
<td>14.32</td>
</tr>
<tr>
<td>BPS/Deptan 2005-2007</td>
<td>3.25</td>
<td>3.27</td>
<td>0.93</td>
<td>1.99</td>
<td>2.98</td>
</tr>
<tr>
<td>BPS/Kementan 2012</td>
<td>1.38</td>
<td>6.09</td>
<td>1.36</td>
<td>1.36</td>
<td>1.36</td>
</tr>
</tbody>
</table>

Source: BPS
POSTHARVEST LOSSES FOR TOMATO AND CHILLI (%)

<table>
<thead>
<tr>
<th></th>
<th>Harvesting</th>
<th>Post Harvest</th>
<th>Whole shale/Distribution Center</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato</td>
<td>5</td>
<td>10</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Chili</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>
Estimation of Consumer’s Rice Waste at Various Restaurants in Bogor City

- Rice waste from sundanese restaurant was the highest with an average of 4.7 g/capita/day of rice equivalent.
- Rice waste from javanese restaurant and warung tenda were equal to 3.6 g/capita/day and 4.2 g/capita/day of rice equivalent.
- The lowest was the waste from padang restaurant with the average of 2.5 g/capita/day of rice equivalent.

Anriany and Martianto, 2013
Estimation of Consumer’s Rice Waste at Various Restaurants in Bogor City

Waste based on Age

Waste based on gender
Quantifying and analysing food waste generated by Indonesian undergraduate students

- produced 47.05 g of avoidable food waste per person each month (564.62 g each year).
- eating out frequency and gender were proven to be predictors of food waste occurrence.
Estimation of Household Rice Waste in Industrial Settlement (Case study desa Banjarkemantren, Sidoarjo)

- Rice waste per household was 108 g/month equal to 1.296 g/year
- Main actor for household rice waste was children: too big portion; time constraint during breakfast; no space after consuming milk; least preference over a tastier side dishes
- Other actors were parents: time constraint during breakfast

Nafiroh and Fuad, 2019
### III. Efforts to Reduce Food Loss and Waste

#### POSSIBLE APPROACHES FOR REDUCING FOOD LOSS AND WASTE

<table>
<thead>
<tr>
<th>PRODUCTION</th>
<th>HANDLING AND STORAGE</th>
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<th>DISTRIBUTION AND MARKET</th>
<th>CONSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate donation of unmarketable crops</td>
<td>Improve access to low-cost handling and storage technologies</td>
<td>Re-engineer manufacturing process</td>
<td>Facilitate increased donation of unsold goods</td>
<td>Facilitate increased donation of unsold goods from restaurants and caterers</td>
</tr>
<tr>
<td>Improve availability of agricultural extension services</td>
<td>Improve ethylene and microbial management of food in storage</td>
<td>Improve supply chain management</td>
<td>Change food date labelling practices</td>
<td>Conduct consumer education campaigns</td>
</tr>
<tr>
<td>Improve market access</td>
<td>Introduce low-carbon refrigeration</td>
<td>Improve packaging to keep food fresher for longer</td>
<td>Change in-store promotions</td>
<td>Reduce portion sizes</td>
</tr>
<tr>
<td>Improve harvesting techniques</td>
<td>Improve infrastructure</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Lipinski, B. et al. 2013
PADDY LOSSES REDUCTION

Technology for paddy loss reduction
Losses decrease 20,92% --> 11-13%

- Mechanization: the use of combine harvester (9,49% → 2,5%)
- Flatbed dryer (2,98 → 2,3%)
- Revitalization on small RMU → yields from 58% → 60%
MAIZE LOSS REDUCTION

Combine harvester:
• Cutting
• Threshing
• Separation and Cleaning
• Chopping the stalks

Reduced losses from 8.95% to 2.5-2.79%

Source: ICAPRD, 2019
Reducing Chili Loss

Pilot Project from ASEAN Study Case: Magelang

**Losses > 20%**
- Existing

**Losses < 15%**
- Shorter Supply Chain

**Losses < 10%**
- Technology Intervention

Packaging Recommendation

- Used cigarettes plastic sacks as harvested chilli packaging (farmers level)
- Plastic create for distribution from farmers to collectors
- Used cardboard/unperforated/thin cardboard for transportation (intercity/inter-island)
- Perforated cardboard for transportation from collectors to trader (intercity)

www.pertanian.go.id
Existing transportation method

Refrigerated transportation (intercity)

Transportation Recommendation

Ozone treatment

Technology for Desinfection
REDUCING POSTHARVEST LOSSES OF SHALLOT

IMPROVED STORAGE TECHNOLOGY

*Instore Dryer ➔ Losses 15 %*

*Controlled Atmosphere Storage (CAS) ➔ Losses <10%*

Funded By AFACI and MOA

Source: ICAPRD, 2019
DEVELOPMENT COMMUNITY FOOD BUSINESS (PUPM)/INDONESIAN FARMERS’ STORE (TTI)

COMMUNITY FOOD BUSIINESS (RICE) (LUPM)

Farmer Group engaged in the production / food business, to ensure the supply of basic staple food to the Indonesian Farmers’ Store (TTI)

SUPPLYING

INDONESIAN FARMERS’ STORE (TTI)

Stores / stalls as Gapoktan partners in channeling staple food and direct marketing to the community

LOCATIONS:
Consumer areas, mainly the barometer of price fluctuations and basic food supply and strategic. Target 2019 = 5,000 TTIs

Target 2018:
- Farmer Group 2016: 250 Groups
- Farmer Group 2017: 406 Groups
- Establishment of 2018: 500 Farmer Groups
- Socialization and campaign
- Reducing portion size to minimize waste during consumption and processing
Reduce Organic Waste for Safe Environment

The Jakarta Regional Environmental Management Agency in 2011 had released the quantity of garbage production reaches 7,500 tons/day. More than 54 percent or 4,050 tons is food waste.

The pilot project of Agency for Applicable Technology (BPPT) in 2018: developing waste processing at Bantargebang “The integrated waste management place” in Bekasi City (34.7 kilometers from Jakarta) with the technology of producing electricity → “Batman” (best available technology meet actual need)

Target: waste processing capacity reaches 100 tons per day and will generate electricity 700 kilowatt hours
NGO DEALING WITH FOOD LOSS AND WASTE
Thank you
References

• The Economist Intelligence Unit (EIU) and Barilla Center for Food and Nutrition. 2018. Fixing Food 2018, Best Practices Towards The Sustainable Development Goals. EIU.