Scope and Scale of Postharvest Loss and Waste

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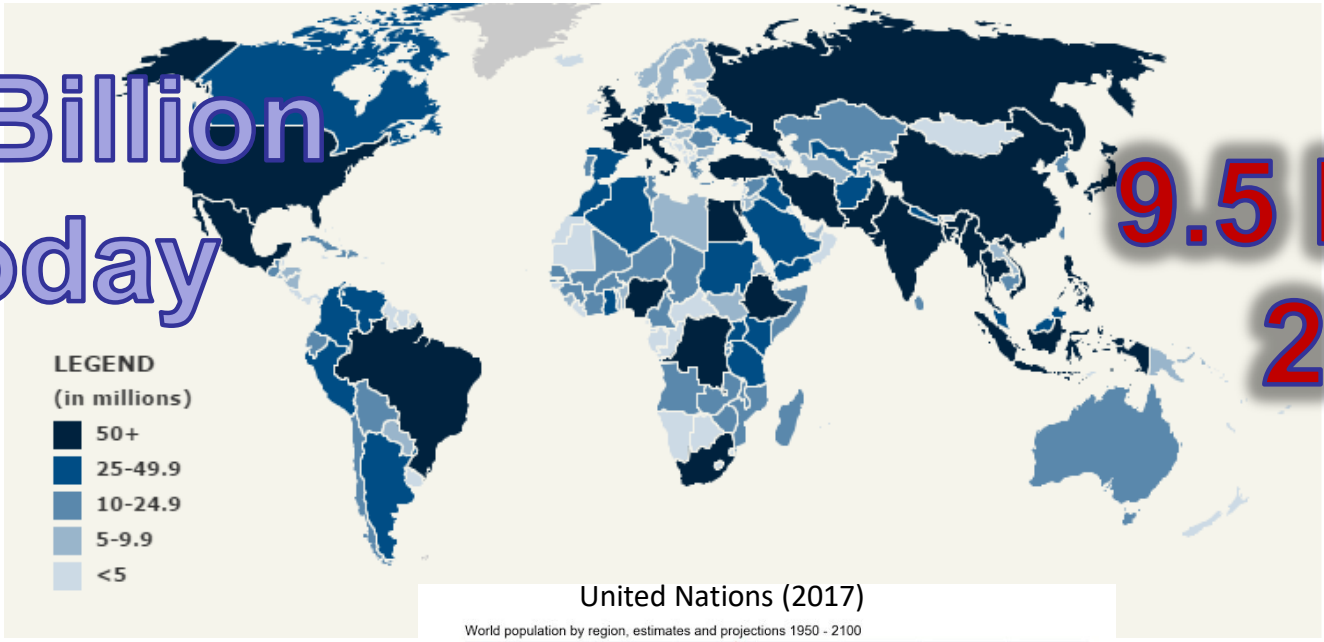
ADM Institute for the Prevention of Postharvest Loss

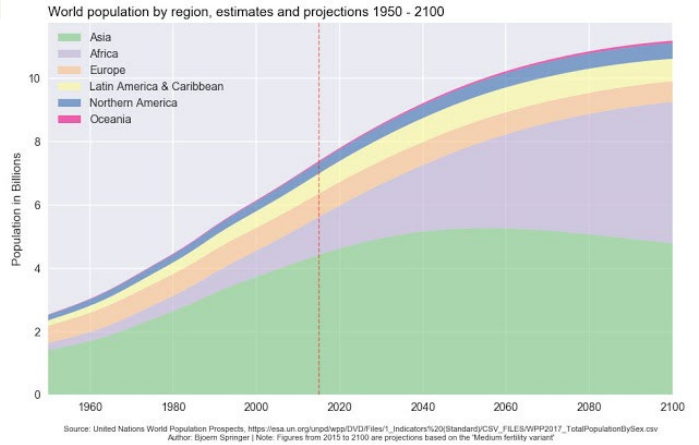
Food Insecurity and Hunger

7.5 Billion Today



9.5 Billion 2050

United Nations (2017)



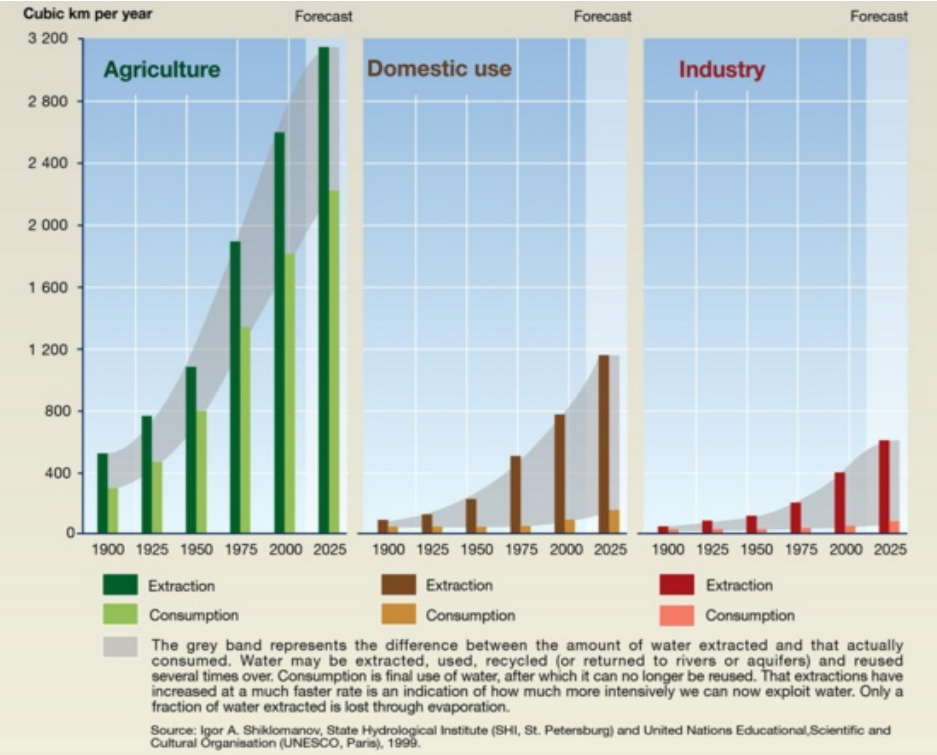
- Most of the population increase in developing countries
- At present **840 Million** suffering from hunger

FOOD PRODUCTION WILL NEED TO BE INCREASED BY 70% BY 2050

Photo Source: http://www.prb.org/publications/datasheets/2013/2013-world-population-data-sheet/world-map.aspx#map/world/population/2013

How to Increase Food Availability?

- Increase land area under agricultural production
- Improve agricultural efficiency
- Use high yielding crop varieties or GMO Crops



Challenges

- Limited land and water resources
- Rapid Urbanization
- Use of land to produce non-food crops
- Climate Change

Postharvest Loss and Waste

GLOBALLY ONE THIRD OF THE FOOD IS LOST OR WASTED EVERY YEAR = 1.3 BILLION TONS PER YEAR

1.3 BILLION TONS > CAN FEED 37 MILLION PEOPLE FOR LIFETIME

Type of Losses

- Weight loss
- Quality Deterioration
- Nutritional Loss
- Seed viability loss

Aspergillus's mold on rice seed

198 million h*ectares is used to produce food that is lost or wasted each year. (About the area of Mexico)*

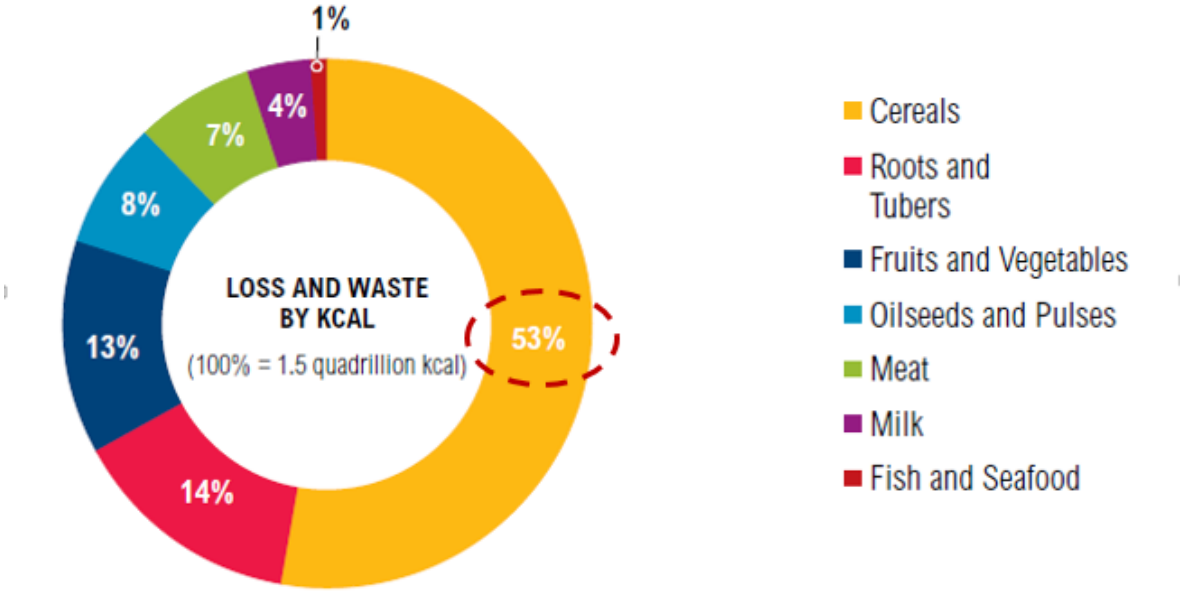
Source: Lipinski et al 2013. Reducing Food Loss and Waste. World Resource Institute

Impact of Postharvest Loss & Waste

Reduce food availability and food quality -> Food Insecurity	Less Income -> Poor Livelihood	Waste of resources and produce emissions -> Burden the ecosystem
1 in 9 People Don't have Sufficient Food	**$ 4 Billion** Annual Grain loss in sub-Saharan Africa (SSA)	**3.3 Gtonnes** CO_2 Emissions due to Food Loss/waste

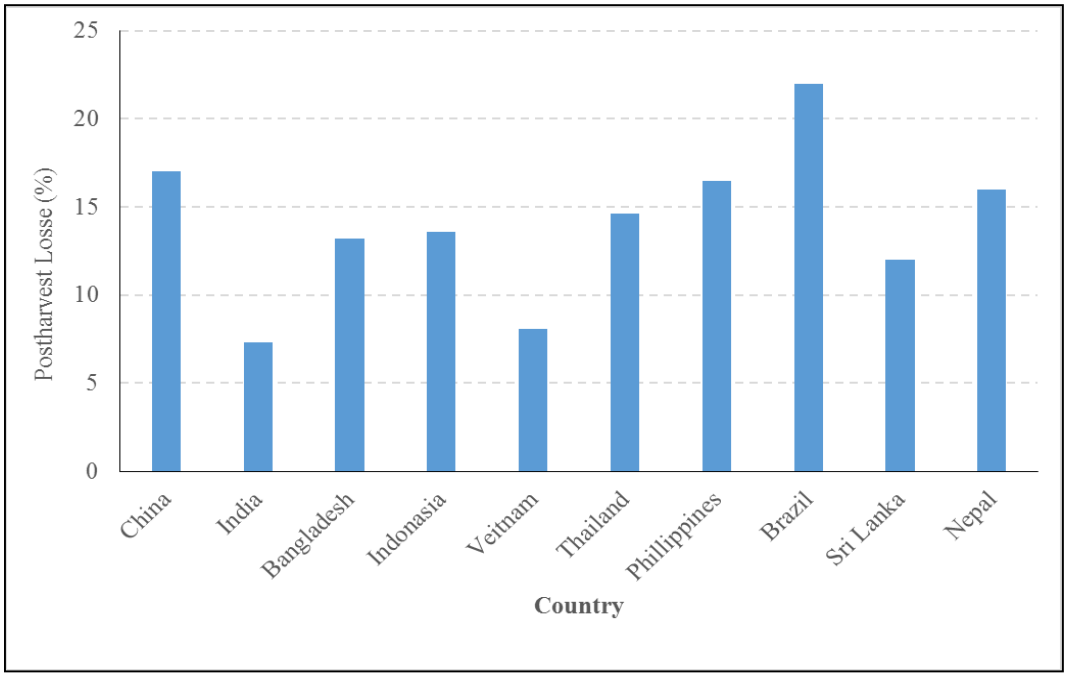
MAY BE EASIER TO PREVENT FOOD LOSS THAN TO PRODUCE MORE FOOD

Postharvest Losses in Cereals



Food Security Issue:
Based on caloric content, cereals comprise the largest share of global food loss and waste –53 %

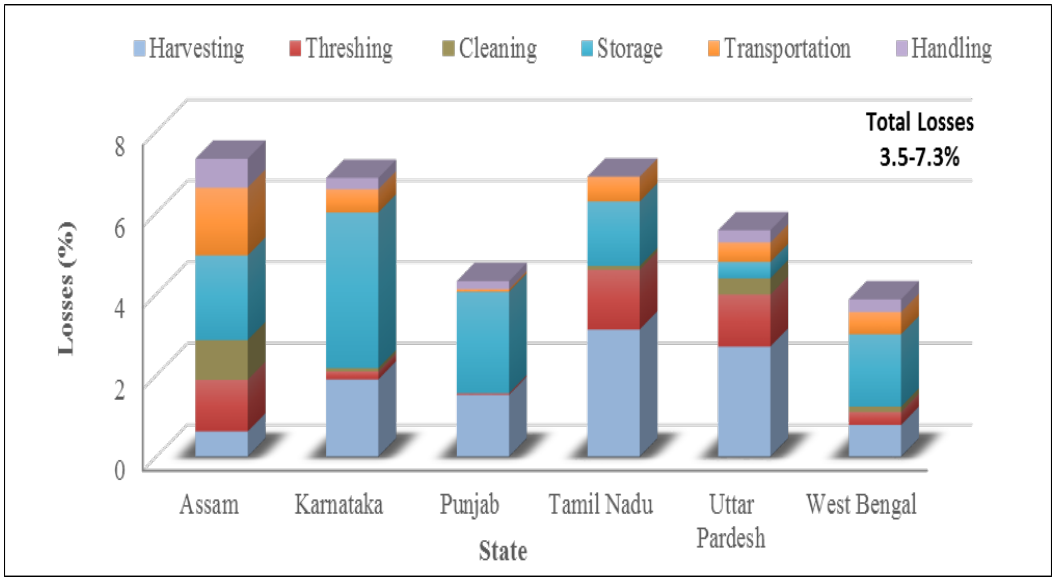
Postharvest Losses in Rice: International Variation



Most of these losses occur during storage.

Postharvest Losses in Rice: Intra-National Variation and Process Variation

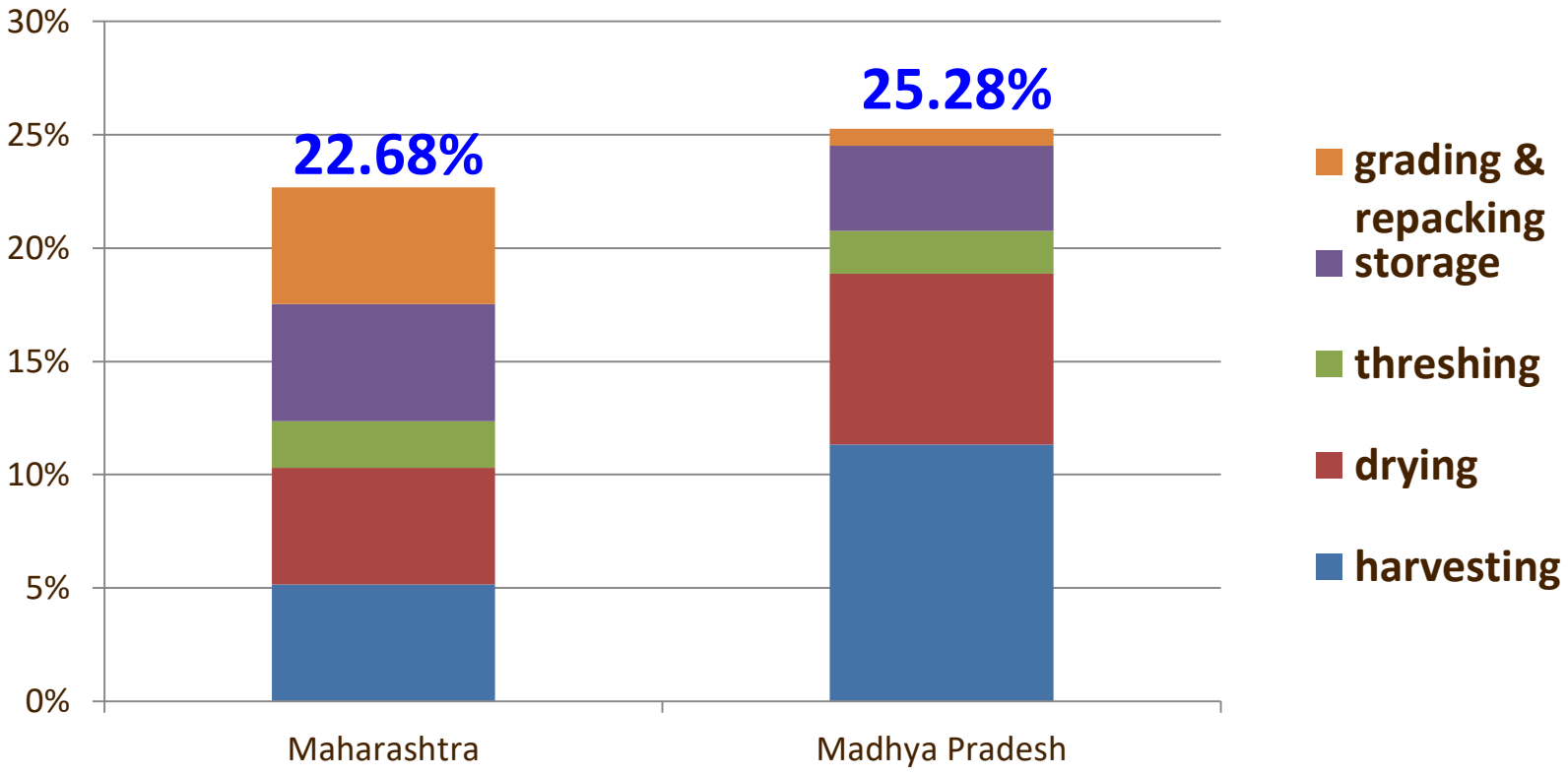
Estimated postharvest loss of rice in India



- Maximum losses were observed during harvesting and storage stages

Data Source: Kannan et al (2014) Assessment of Pre and Postharvest Losses of Important Crops in India

Postharvest Losses in Black Gram: Variations Between States in India



Outlook

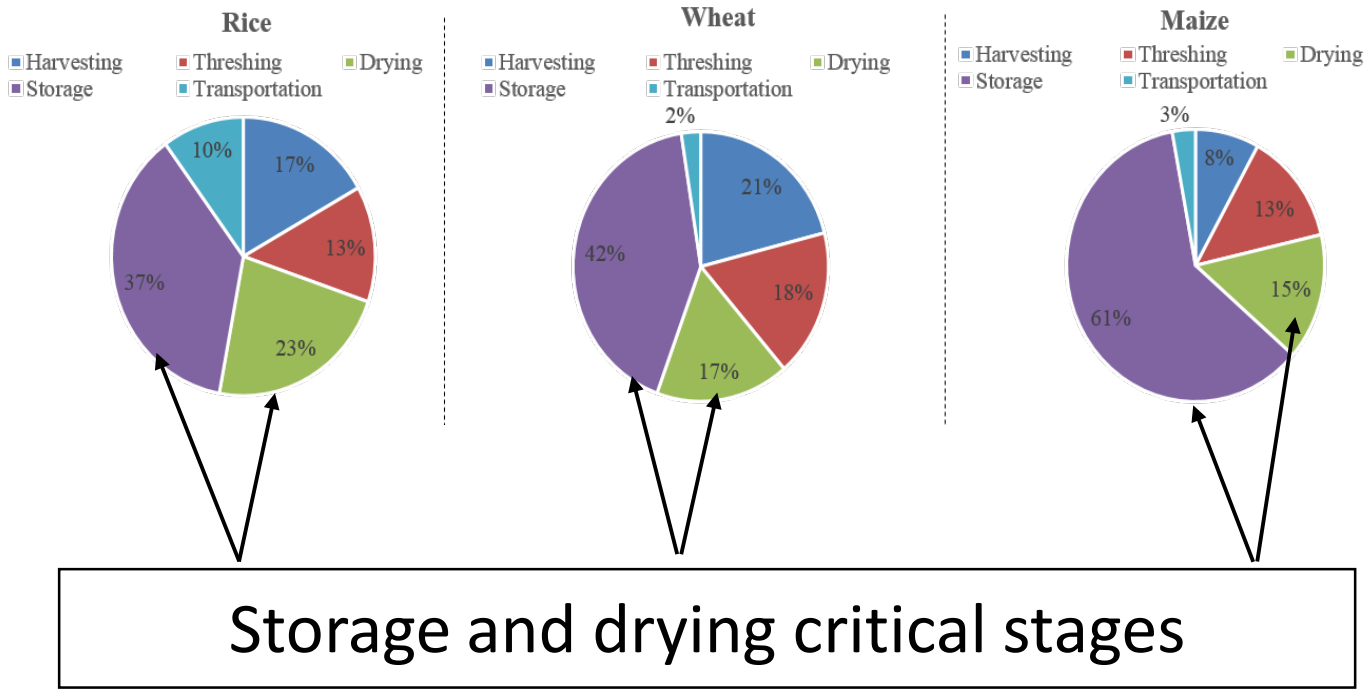
Between the farm and the table lies the rot and a racket

As of January 1, 2019 4,135.224 tonnes of ‘damaged’ grain in FCI godowns in India

Bihar accounts for 3,567.65 tonnes (86%)
Punjab, with about 324.39 tonnes and a history of storage issues, comes second among the states.

Postharvest Losses: Bangladesh

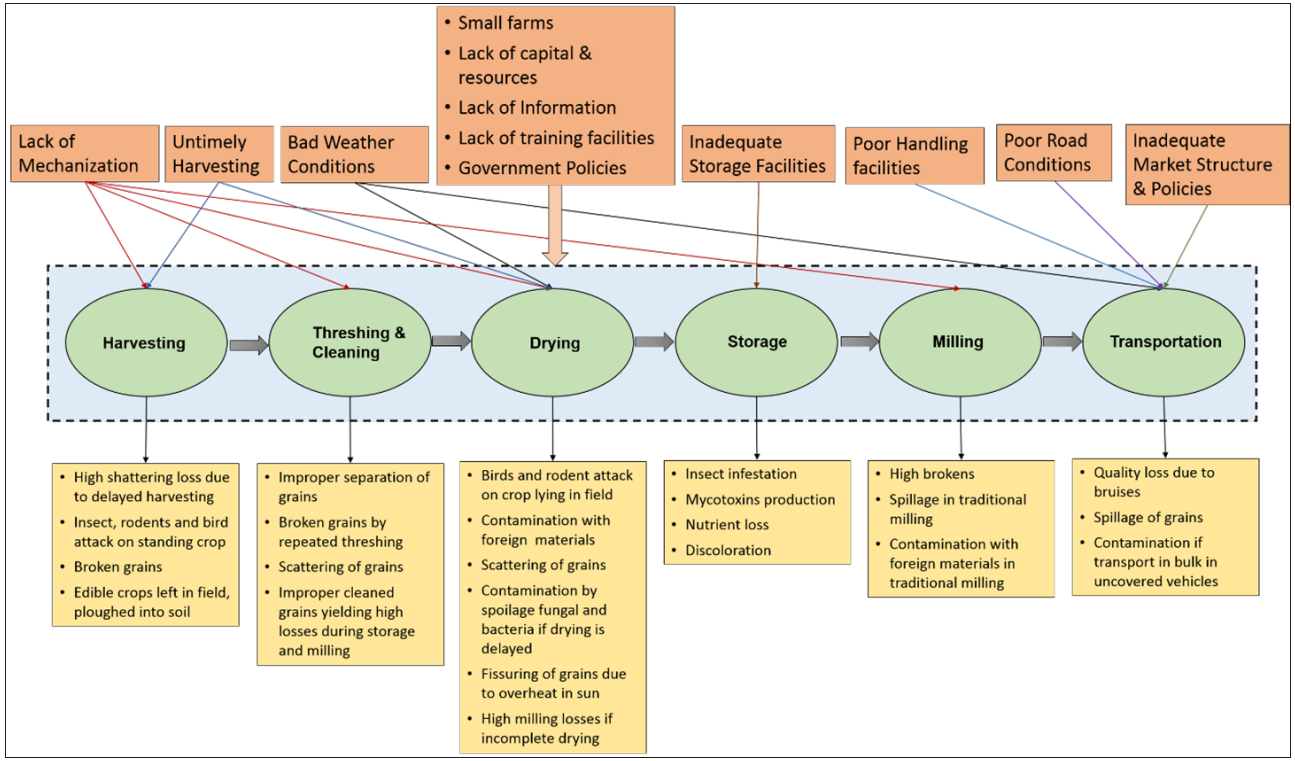
Grain Losses in Food Supply Chain in Bangladesh



Storage and drying critical stages

Data Source: Bala et al (2010) Post Harvest Loss and Technical Efficiency of Rice, Wheat and Maize Production System: Assessment and Measures for Strengthening Food Security

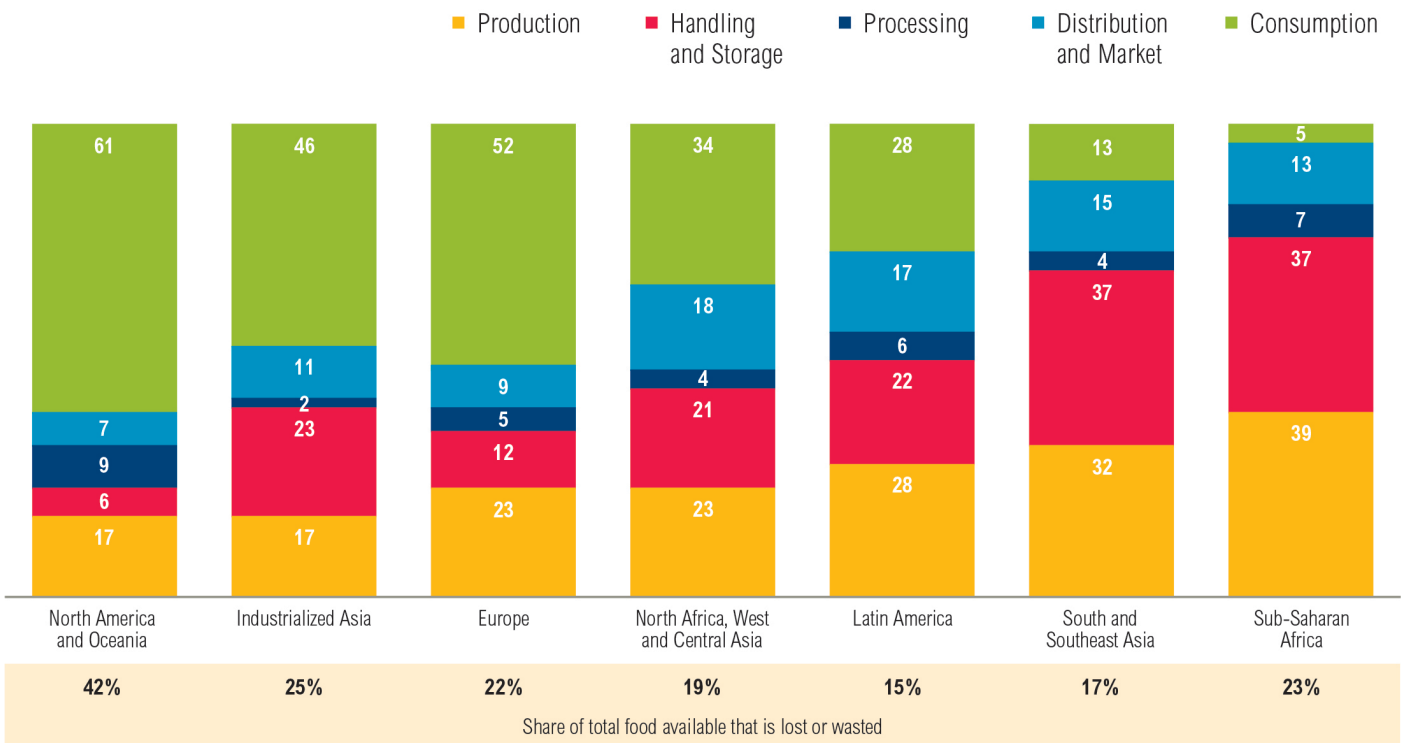
Factors and Causes of Losses



Ref: Kalita and Kumar (2015) ***eFOOD-Lab_International*****, 4: 24-26**

Global Postharvest Loss Status

Highly developed → **Less developed**



Wastes → **Losses**

Retail and Consumer Food Loss and Waste (FLW) in the USA

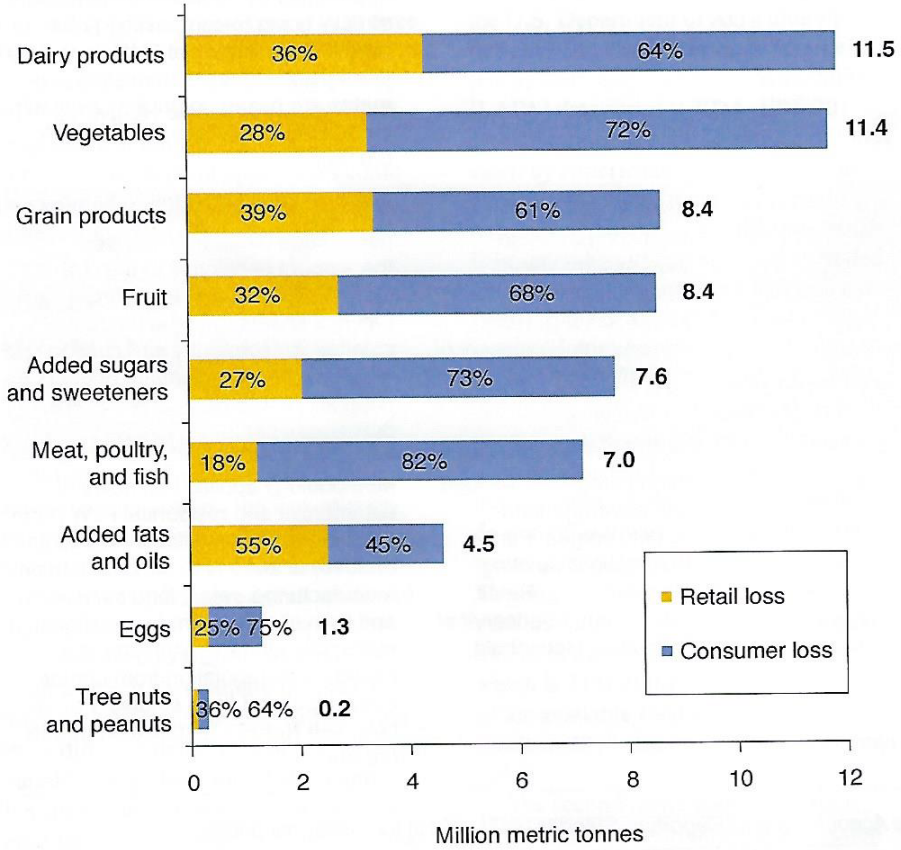


Figure 1. Retail and consumer food loss in the United States, by food group. Consumer loss includes loss in the home and in away-from-home locations; includes cooking losses and uneaten food. Numbers within bars represent percent of retail vs. consumer losses for each food group. Numbers at end of bars represent million metric tonnes of losses for food groups. Source: Buzby, Wells, and Hyman (2014).

Economic value of FLW in the USA

Total = $161.6 billion

Retail FLW = $46.7 billion

Consumer level FLW = 114.9 billion

Energy Embedded in FLW in the USA

Total Energy = 2.1×10^{18} joules

- It is equivalent to energy loss of 25% of total energy consumption in the entire farm-to-fork food system
- It is equivalent of 2% of all-purpose energy use in the entire country

To put into perspective.. (CAST Issue Paper No. 62, September 2018)

To put the amount of resources embedded in FLW into perspective, the 16 million ha of land associated with the retail- and consumer-level FLW is approximately half of the total area of the U.S. National Park System, or roughly the total land area of Maryland, Delaware, Pennsylvania, New Jersey, and Rhode Island combined. The 3.9 million tonnes of fertilizer nutrients embedded in FLW at retail and consumer levels is 150% of the total annual fertilizer use in sub-Saharan Africa; and the 17 billion m^3 of irrigation water lost in FLW is equivalent to the area of the city of Philadelphia covered by 50 m of water. Using a different metric—for a typical family of four, there would be 0.2 ha of land, 50 kg of fertilizer, and 225,000 liters of irrigation water associated with food loss.


"If we are mindful and intentionally think of not wasting food, we will have a positive impact on the environment.
-Prasanta Kalita, Professor
College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana-Champaign
foodtank
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