



# FOOD LOSS AND WASTE IN THE WHEAT VALUE CHAINS OF EGYPT, JORDAN AND MOROCCO:

IMPLICATIONS FOR FOOD AND ENERGY SECURITY, NATURAL RESOURCE CONSERVATION, AND GREENHOUSE GAS EMISSIONS

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VIRTUAL PRESENTATION AT THE INTERNATIONAL WORKSHOP ON FOOD LOSS AND WASTE PREVENTION TARGETING MEDITERRANEAN COUNTRIES ,

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# I MOTIVATION

- Strategies for food & nutrition security

- 1) ↑ Productivity;
- 2) ↑ Area expansion;
- 3) Biofortification; 4) ↑ Consumption efficiency; 5) ↑ Dietary diversity;
- 6) ↓ **FOOD LOSS and WASTAGE (FLW).**

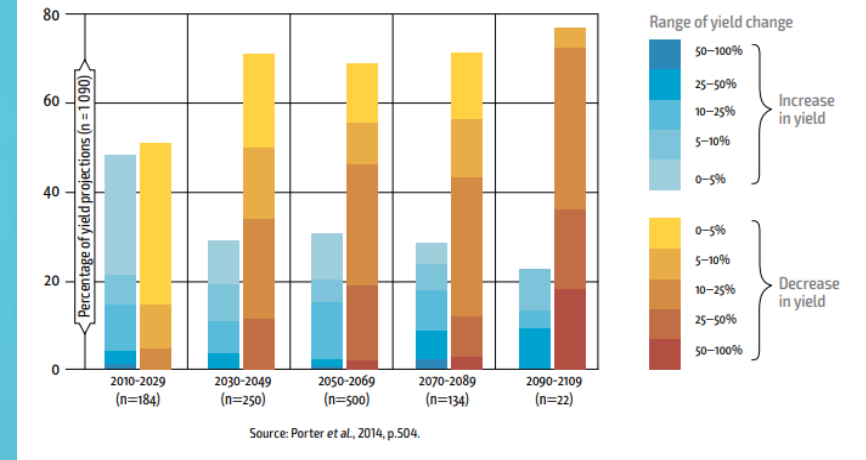
- All important, but 1 – 5 insufficient; some infeasible(?);

- FLW – not given due attention

- A sixth to a third of human food production

- Reducing FLW great potential

- FLW: Socio-economic, resource & environmental implications
- Preventable waste – ethically wrong !



Global warming expected to decrease productivity substantially



## II. OBJECTIVE OF THE STUDY

- **Objective:**

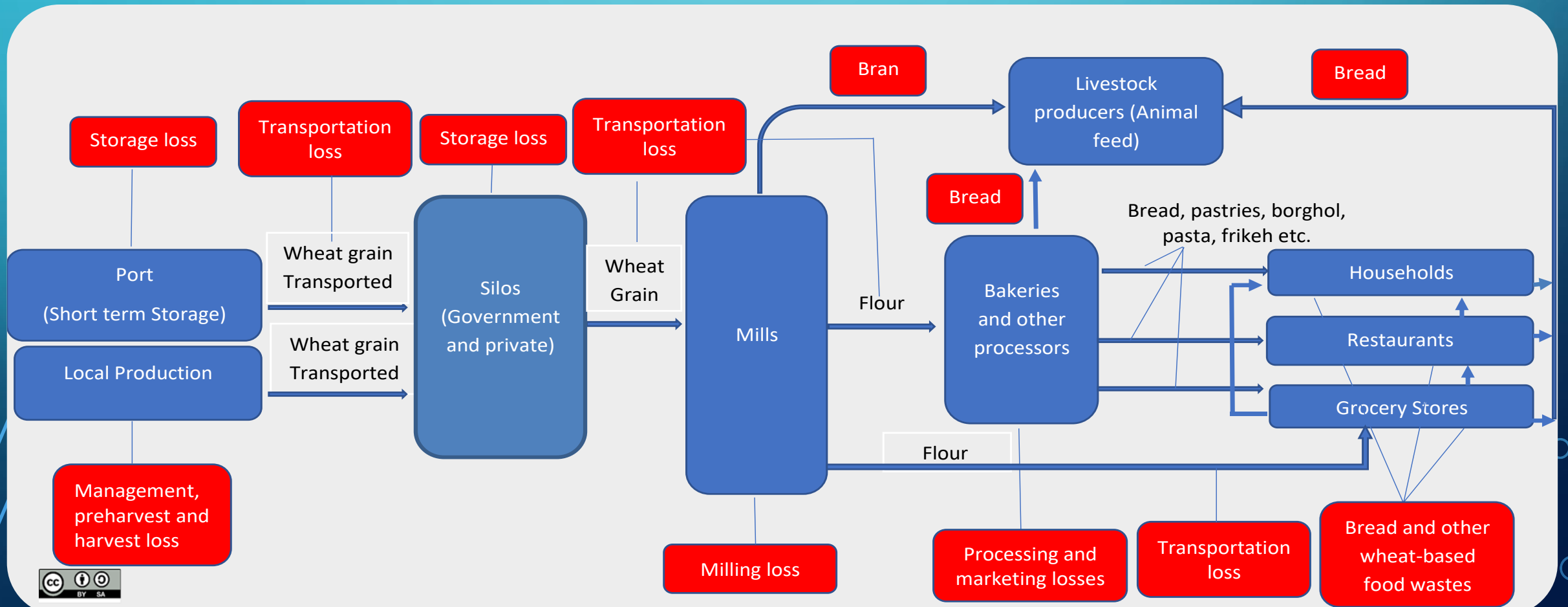
- Provide credible estimates of FLW at each node of the wheat value chains - from farm to fork.

- **Rationale:**

- For advocacy and policy making
- For setting priorities of interventions

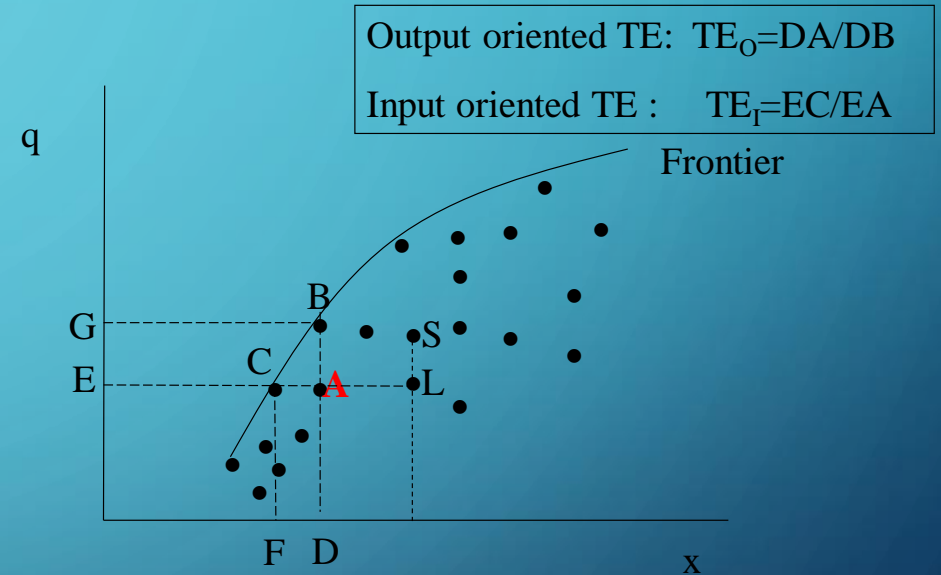
### III. MATERIALS AND METHODS

- Life cycle of food approach – to describe and characterize FLW;
- Developed measurement protocols at each node (Khader et al., 2019)



# ...MATERIALS AND METHODS CONT'D

- Physical measurements
- Interviews
- Stochastic frontier production function
- Volumetric weighing for aggregation.



# III. Results (summary)

Percentage Loss at Each Node	Percentage Loss per unit amount of wheat entering the node (%)					
	Egypt		Jordan		Morocco	
	Average	Rank	Average	Rank	Average	Rank
Farm management-related loss (%)	8.22%	2	10.15%	3	30.13%	1
Pre-harvest loss (%)	0.85%	7	0.42%	8	0.05%	8
Harvest loss (%)	9.26%	1	9.10%	4	2.82%	4
Transportation loss (%)	0.26%	8	0.58%	7	0.19%	7
Storage loss (%)	4.20%	4	6.37%	5	14.1%	2
Processing loss (%)	1.83%	6	12.92%	2	1.86%	6
Marketing loss (%)	4.76%	3	3.34%	6	1.8%	5
Total consumption loss (%)	2.91%	5	24.73%	1	12.59%	3
- At households, at restaurants (%)	1.91%, 7.65%		31.22%, 3.02%		10.42%, 2.17%	
	Loss as percentage of total national wheat supply (%)					
Farm management-related loss (%)	3.63%	4	0.76%	5	17.47%	1
Pre-harvest loss (%)	0.36%	7	0.03%	8	0.03%	8
Harvest loss (%)	3.93%	3	0.59%	6	1.63%	4
Transportation loss (%)	0.25%	8	0.58%	7	0.19%	7
Storage loss (%)	4.00%	2	6.29%	3	8.70%	3
Processing loss (%)	1.67%	6	11.96%	2	1.28%	6
Marketing loss (%)	4.27%	1	2.69%	4	1.6%	5
Total consumption loss (%)	2.50%	5	19.29%	1	11.03%	2
- At households, at restaurants (%)	2.06%, 0.44%		14.85%, 4.44%		9.16%, 1.87%	
Total loss as % of total supply	20.62%		41.43%		41.93%	
Total wheat lost (million tons, million US\$)	4.436, \$1,109		0.377, \$94		4.692, \$1,173	

# IV. SOCIO-ECONOMIC & ENVIRONMENTAL IMPLICATIONS

- Wheat lost or wasted in Egypt and Morocco could have:
  - Fed 21 and 34 million people (55 million in total)
  - Saved \$1.1 and \$1.2 billion much needed foreign currency (\$3.3 billion in total)
  - Saved 3.1 and 1.8 billion m<sup>3</sup> of water (4.9 billion m<sup>3</sup> in total)
  - Freed 1.03 and 0.6 million ha of land (1.63 million ha in total)
  - Saved 59.9 and 74.7 million GJ of energy (134.6 million GJ in total)
  - Prevented emission of 8.5 and 19.3 million kg of methane (27.8million kg in total)
- Egypt: bold measure to overhaul & reorient the subsidy system;
  - Effective in reducing food waste;
  - Food and nutrition security, saved government budget, ...(?)



# V. CONCLUSIONS & RECOMMENDATIONS

**Conclusion:** FLW- very high and has huge implications

- It is imperative to reduce it.

## **Recommendations**

### **1. Creating awareness among the society**

- Magnitude of loss; moral and resource use implications;
- Providing options for smaller package sizes (bundle) of bread;

### **2. Replacing flour subsidies with bread subsidies**

- Vouchers to the needy and selling bread at cost (example from Egypt)

### **3. High priority for research investment to reduce food loss**

- Improved grain storage facilities.
- Better inventory and stock management methods in groceries.

# VI. ACKNOWLEDGEMENTS

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## Where in the value chain are we losing the most food? The case of wheat in Jordan

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### Abstract

Efforts to increase global food supply through increased productivity and intensification of agriculture have led to a growing concern about the sustainability of the current food production system. The literature on measurement of food losses and wastage and techniques to reduce food losses and wastage at each node along the food value chain is limited. The “life cycle of food” approach, along with standard protocols developed by the World Resources Institute (WRI) were used for physical measurements and estimates of food losses and wastage. It was estimated that 34% of the total wheat supply in Jordan (both from local production and imports) is lost or wasted, which is also associated with high levels of losses in nutrients. These losses are more important in Jordan where, at a level of 12.95%, wastage during consumption is reported that 67% of the household food waste was fed to animals. This means that for every 1 US\$ spent on bread that is fed to animals instead of consumed by humans, 0.17 US\$ is lost in protein and energy for every 1 US\$ spent on bread that is fed to animals instead of consumed by humans.



sustainability



### Article

## Food Losses and Wastage along the Wheat Value Chain in Egypt and Their Implications on Food and Energy Security, Natural Resources, and the Environment

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**Abstract:** Pushing yield frontiers of cereals and legumes is becoming increasingly difficult, especially in drylands. This paper argues and provides empirical evidence that food loss and wastage constitute a sizeable proportion of the total wheat supply in Egypt. By following the life cycle of food and using standard measurement protocols, we estimated the levels of food loss and wastage along the wheat value chain in Egypt and their socioeconomic, biophysical, and environmental implications. About 4.4 million tons (20.62% of total wheat supply from domestic production and imports in 2017/2018) is estimated to be lost or wasted in Egypt which is also associated with the wastage of about







# THANK YOU



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