Resource Implications of Reducing Edible Food Waste

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Introduction

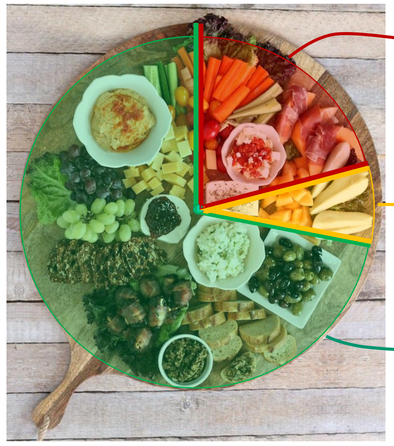
Food production consumes a significant share of global resources. With increasing global population, food and water scarcity and climate change, there is a need to be efficient with resources. The amount of resources that could be saved by reducing the edible food waste was explored.

Embodied CO_2e footprint:
12,150 MtCO_2e
32.1% of global CO_2e

Embodied Water Footprint:
1,846km^3 (trillion L)
70% of global water use

To produce:
$2,758bn
3.8% of global GDP

The resources in the 5,883Mt of produced food



Edible food waste:
21%
1,243Mt

Non-edible food waste:
6%
343Mt

Consumed:
73%
4296Mt

Embodied CO_2e Footprint:
- 2,567 MtCO_2e
- 6.8% of global CO_2e

Embodied Water Footprint:
- 390.1 trillion L
- 14.8% of global water use

Cost to produce:
- $582.8bn
- 0.8% of global GDP

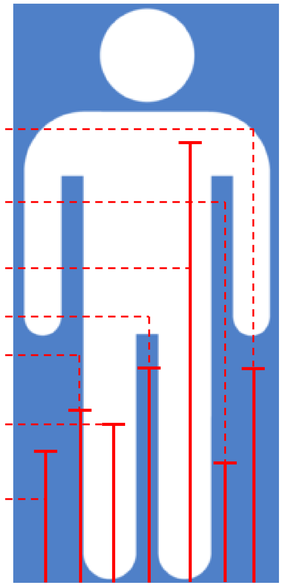
Resources and Waste

Significant amounts of edible food is wasted. This represents a waste of resources used to produce, process and transport food to the point of consumption. Edible food wastes for each food type by region were calculated.

Food type	Edible Waste [Mt]	Edible Waste per capita [kg/cap]
Cereals	309.6	47.0
Starchy Roots	244.9	36.6
Oilcrops & Pulses	41.6	6.5
Fruits	194.1	29
Meat	55.5	8.3
Fish & Seafood	9.2	1.5
Milk & Eggs	106.3	15.9
Vegetables	281.9	42.9

Food type	Edible Waste [Mt]	Edible Waste per capita [kg/cap]	Calories wasted per capita per day [kcal/cap/day]
Industrialized Asia	354.0	234.8	746
South & South-east Asia	267.7	122.0	414
North America & Oceania	99.3	271.5	1520
Europe	190.5	259.8	748
Sub-Saharan Africa	118.7	153.3	545
North Africa, West & Central Asia	90.1	197.9	594
Latin America	117.6	205.8	453
Global		187.5	

Wasted calories proportion of RDA 2000kcal/day

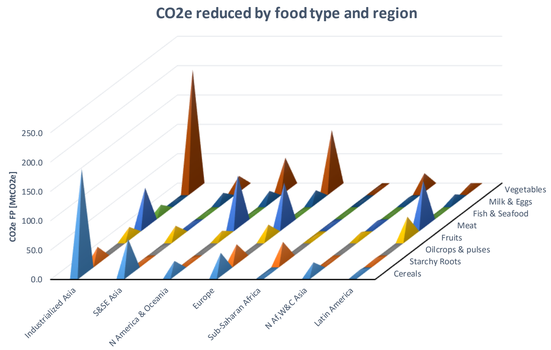


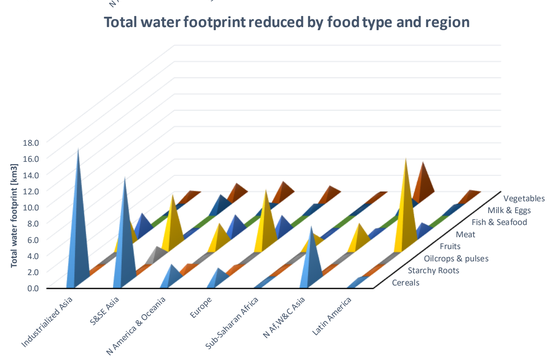
Modelling Tool

A modelling tool was developed to calculate the reductions in greenhouse gas emissions, water footprint, and economic cost depending on the scale of reducing edible food waste disposal according to food type in different regions.

	Industrialized Asia	S&SE Asia	N America & Oceania	Europe	Sub-Saharan Africa	N Af,W&C Asia	Latin America	Global
Edible waste reduction factor								
Cereals	70%	30%	70%	60%	10%	50%	20%	
Starchy Roots	40%	10%	40%	60%	70%	10%	30%	
Oilcrops & pulses	10%	50%	70%	30%	60%	30%	40%	
Fruits	30%	30%	50%	50%	30%	40%	70%	
Meat	50%	10%	80%	70%	10%	20%	70%	
Fish & Seafood	60%	30%	50%	40%	20%	10%	30%	
Milk & Eggs	20%	40%	80%	70%	20%	50%	70%	
Vegetables	50%	20%	60%	60%	30%	40%	40%	
Edible Waste per capita [kg/cap]								
Cereals	62.39	42.64	61.73	54.27	20.16	55.49	33.85	46.99
Starchy Roots	37.76	14.90	36.99	67.66	87.45	8.66	30.56	36.63
Oilcrops & pulses	2.59	9.20	12.46	4.44	7.58	4.29	5.70	6.51
Fruits	21.03	19.27	40.46	42.54	21.87	33.66	68.41	28.98
Meat	10.34	2.56	27.27	14.46	3.22	5.48	14.17	8.31
Fish & Seafood	2.81	1.01	2.01	1.51	0.71	0.40	1.29	1.48
Milk & Eggs	5.62	12.41	49.64	30.54	5.48	19.93	26.46	15.86
Vegetables	86.06	20.42	46.46	47.06	10.65	68.98	27.02	42.59
Total	234.75	122.00	271.46	259.84	153.48	197.89	205.75	187.53

Example scenario of reduction and savings based on edible waste per capita.





Reduce Edible Waste

The model indicated that a 50% reduction in global edible food waste would reduce the resources consumed for food production by 11.22%.

Reduction of Edible Food Waste
20%
50%
70%
100%

- 1,284MtCO_2e
- 3.4% of global CO_2e
- 195.1trillion L of water
- 7.9% of global water use
- $291.4bn
- 0.42% of global GDP

Emission from

1.3 X Dead Sea
26 X Loch Ness

GDP of

Conclusion

The significance of the resource savings possible in the global context highlights the need to reduce edible food waste. This can aid sustainable development, resource scarcity and mitigate climate change.

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