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Reimagining our food systems to sustain our future

Towards a Circular Food Economy: Addressing Water Footprint in Food Loss and Waste

Seta Tutundjian

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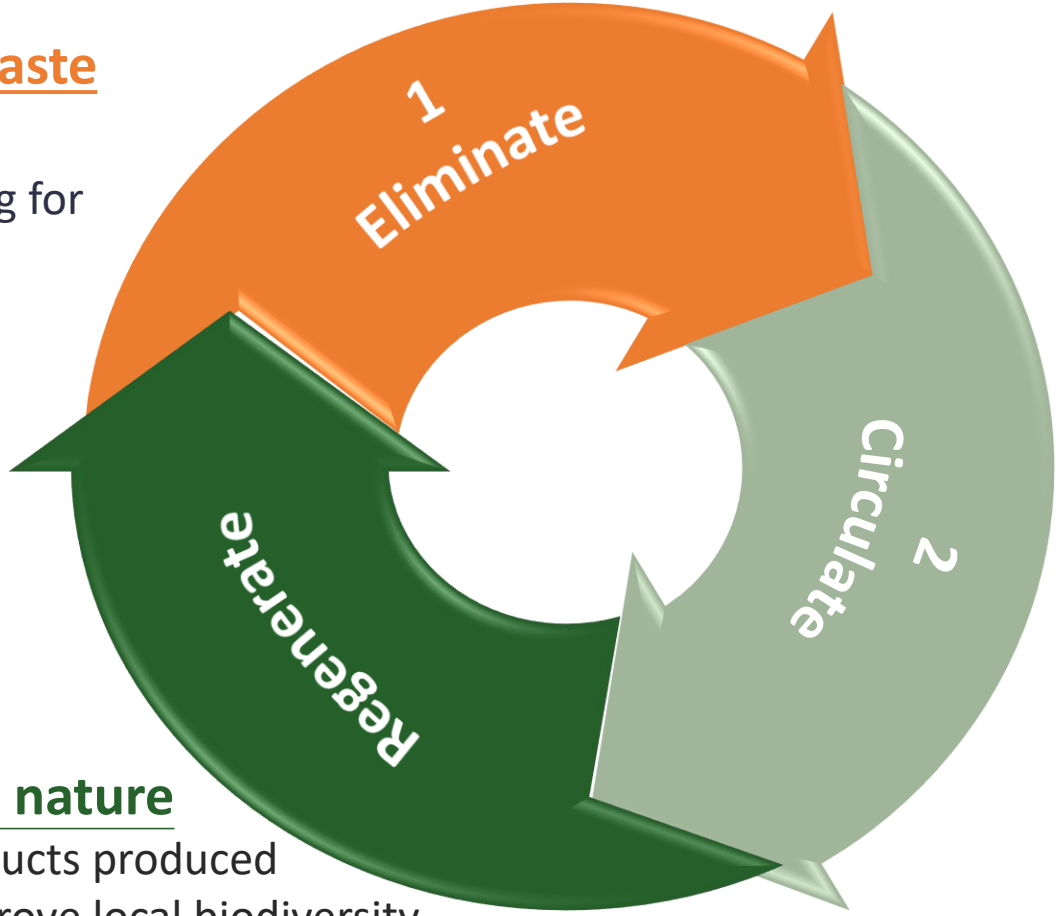
CIRCULAR ECONOMY

1. **Eliminate waste and pollution**
through designing for circularity.



2. **Circulate materials and products**
keeping them in use and prolonging their value.

3. **Regenerate nature**
by sourcing products produced in ways that improve local biodiversity, air and water quality.

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Circular Food Economy

Circular Food Economy has
4 dimensions:

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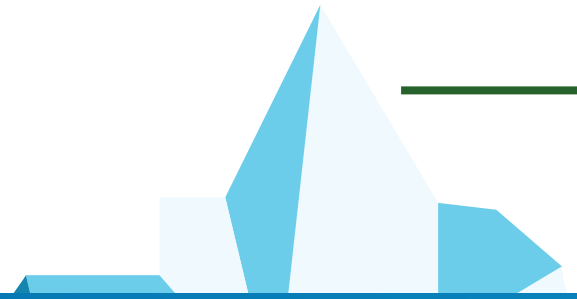
Cost of Food Loss and Waste



Cost of disposal and management of FLW

True cost of wasted materials is around ten times the cost of disposal

Lost materials (fertilizers, pesticides, anibiotics) and the caused pollution

Lost water used for irrigation, processing, cleaning, preparing food.

Lost energy used for pumping water, irrigation, processing, cleaning, preparing food.

Lost labor from farm to fork.

Other costs

Food Loss and Waste is a Global Problem

40%
food is lost or wasted annually*

1/4
freshwater consumed by agriculture

28%
cultivated land
(farmland size of China)

10%
global GHG emissions
(3rd emitter)

economic costs of FLW ≈ US$ 1 trillion/yr **environmental costs** ≈ US$ 700 billion/yr **social costs** ≈ US$ 900 billion/yr

If we reduced food loss and waste by 50% by 2050 we can avoid 88.50 gigatons of CO_2 equivalent emissions.

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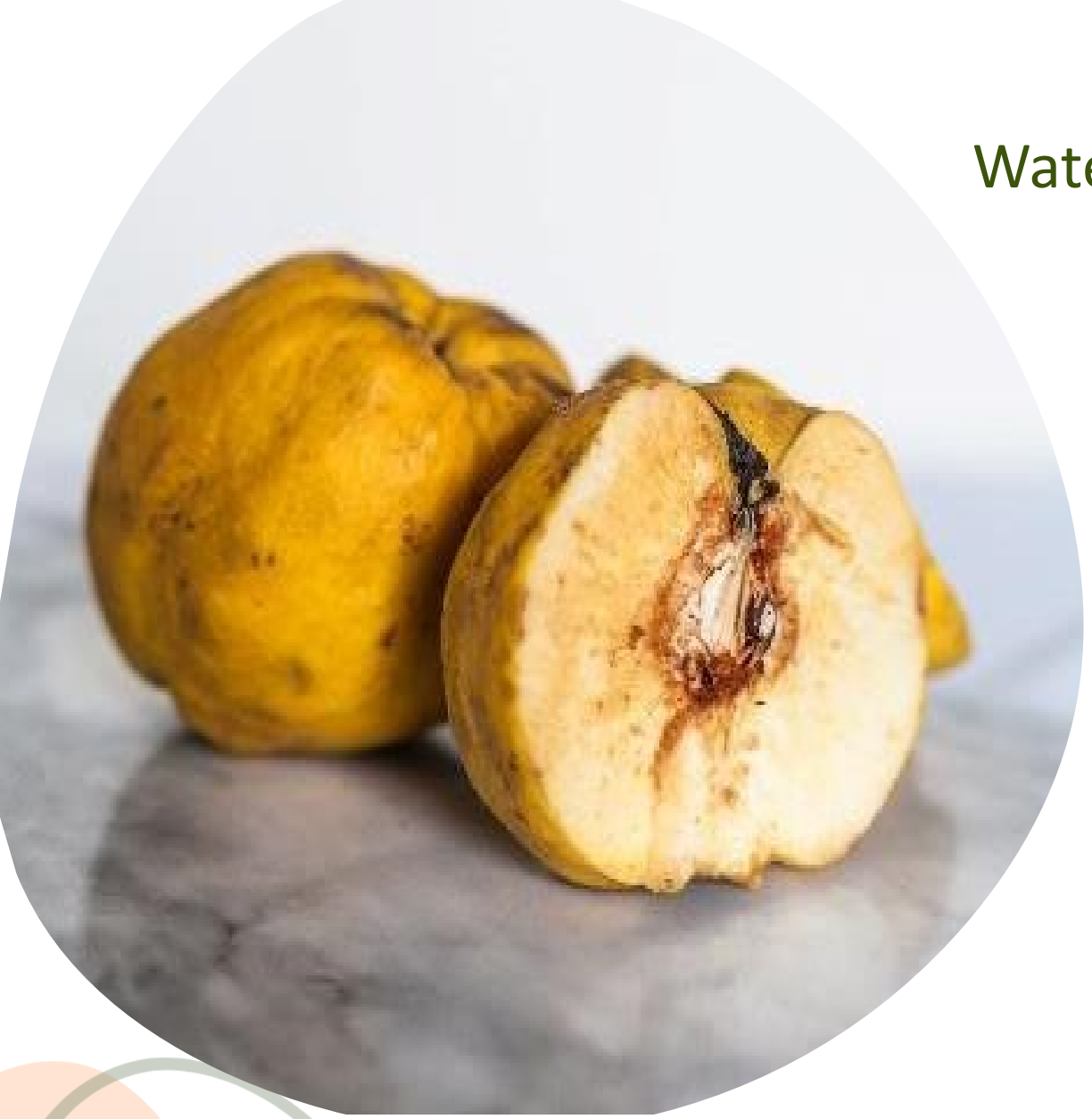
*Sources: Driven to Waste: The Global Impact of Food Loss & Waste on Farms. WWF. 2022; Project Drawdown



Water is used throughout the food system.

WASTING FOOD

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WASTING WATER

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“Water Footprint”

- Water footprint is a ***measure of the amount of water consumed*** (directly or indirectly) and ***polluted*** during the production cycle.
- Water footprints can be divided into:
  - **Blue water footprint** - the use of surface or groundwater sources.
  - **Green water footprint** - the use of rainwater and soil moisture.
  - **Grey water** footprint is freshwater needed to assimilate pollutants.
- Water footprints have a **local or regional** impact on water availability and quality.
- The global standard was developed by the Water Footprint Network (WFN).

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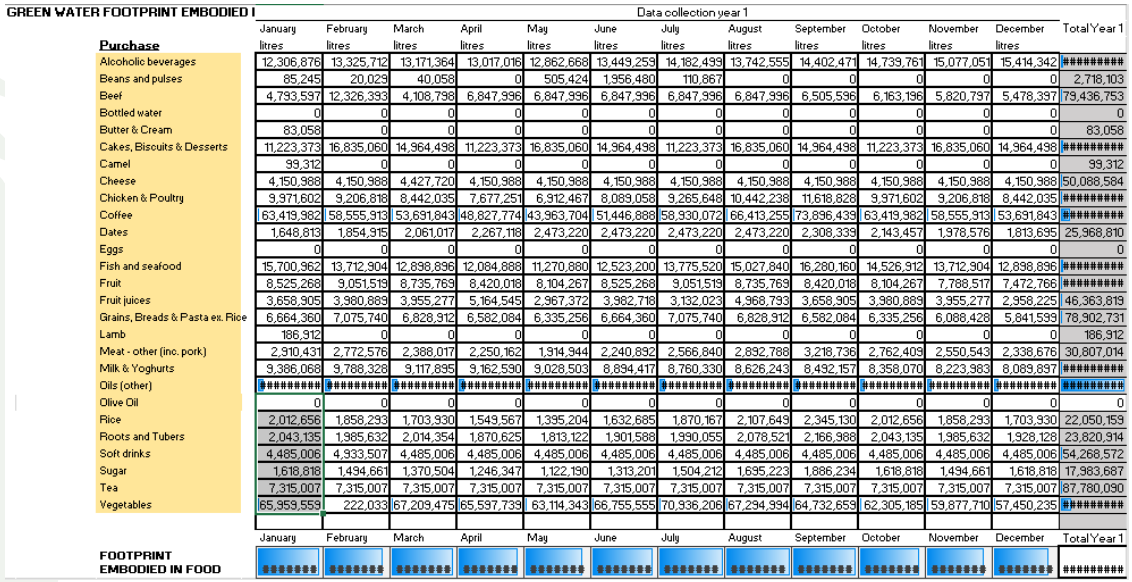
Why is measuring the water footprint of food and wasted food important?

- The ***geography of production affects the water footprint*** as it affects the carbon footprint.
- ***High-water foods*** and ***food produced in arid regions*** have higher "water footprints" when wasted.
- The type and ***origin of food***, plus the ***stage of the supply chain where the loss or waste occurs***, can affect the amount of water used in the production and processing of the food.

Calculating Food Water Footprint for UAE

- Excel-based tool to calculate the Blue and Green Water Footprint for locally produced food, imported food, wasted food, redistributed food.
- Guidance document with step-by-step instructions on how to use the tool.
- Instruction short-video on how to use the tool.



GREEN WATER FOOTPRINT EMBODIED I — Data collection year 1

Purchase	January litres	February litres	March litres	April litres	May litres	June litres	July litres	August litres	September litres	October litres	November litres	December litres	Total Year 1
Alcoholic beverages	12,306,876	13,325,712	13,171,364	13,017,016	12,862,668	13,449,259	14,182,499	13,742,555	14,402,471	14,739,761	15,077,051	15,414,342	#########
Beans and pulses	85,245	20,029	40,058	0	505,424	1,356,480	110,867	0	0	0	0	0	2,718,103
Beef	4,793,597	12,326,393	4,108,798	6,847,996	6,847,996	6,847,996	6,847,996	6,847,996	6,505,596	6,163,196	5,820,797	5,478,397	79,436,753
Bottled water	0	0	0	0	0	0	0	0	0	0	0	0	0
Butter & Cream	83,058	0	0	0	0	0	0	0	0	0	0	0	83,058
Cakes, Biscuits & Desserts	11,223,373	16,835,060	14,964,498	11,223,373	16,835,060	14,964,498	11,223,373	16,835,060	14,964,498	11,223,373	16,835,060	14,964,498	#########
Camel	99,312	0	0	0	0	0	0	0	0	0	0	0	99,312
Cheese	4,150,988	4,150,988	4,427,720	4,150,988	4,150,988	4,150,988	4,150,988	4,150,988	4,150,988	4,150,988	4,150,988	4,150,988	50,088,584
Chicken & Poultry	9,971,602	9,206,818	8,442,035	7,677,251	6,912,467	8,089,058	9,265,648	10,442,238	11,618,828	9,971,602	9,206,818	8,442,035	#########
Coffee	63,419,982	58,555,913	53,691,843	48,827,774	43,963,704	51,446,888	58,930,072	66,413,255	73,896,439	63,419,982	58,555,913	53,691,843	#########
Dates	1,648,813	1,854,915	2,061,017	2,267,118	2,473,220	2,473,220	2,473,220	2,473,220	2,308,339	2,143,457	1,978,576	1,813,695	25,968,810
Eggs	0	0	0	0	0	0	0	0	0	0	0	0	0
Fish and seafood	15,700,962	13,712,904	12,898,896	12,084,888	11,270,880	12,523,200	13,775,520	15,027,840	16,280,160	14,526,912	13,712,904	12,898,896	#########
Fruit	8,525,268	9,051,519	8,735,769	8,420,018	8,104,267	8,525,268	9,051,519	8,735,769	8,420,018	8,104,267	7,788,517	7,472,766	#########
Fruit juices	3,658,905	3,980,889	3,955,277	5,164,545	2,967,372	3,982,718	3,132,023	4,968,793	3,658,905	3,380,889	3,955,277	2,958,225	46,363,819
Grains, Breads & Pasta ex. Rice	6,664,360	7,075,740	6,828,912	6,582,084	6,335,256	6,664,360	7,075,740	6,828,912	6,582,084	6,335,256	6,088,428	5,841,599	78,902,731
Lamb	186,912	0	0	0	0	0	0	0	0	0	0	0	186,912
Meat - other (inc. pork)	2,910,431	2,772,576	2,388,017	2,250,162	1,914,944	2,240,892	2,566,840	2,892,788	3,218,736	2,762,409	2,550,543	2,338,676	30,807,014
Milk & Yoghurts	9,386,068	9,788,328	9,117,895	9,162,590	9,028,503	8,894,417	8,760,330	8,626,243	8,492,157	8,358,070	8,223,983	8,089,897	#########
Oils (other)	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########	#########
Olive Oil	0	0	0	0	0	0	0	0	0	0	0	0	0
Rice	2,012,656	1,858,293	1,703,930	1,549,567	1,395,204	1,632,685	1,870,167	2,107,649	2,345,130	2,012,656	1,858,293	1,703,930	22,050,159
Roots and Tubers	2,043,135	1,985,632	2,014,354	1,870,625	1,813,122	1,901,588	1,990,055	2,078,521	2,166,988	2,043,135	1,985,632	1,928,128	23,820,914
Soft drinks	4,485,006	4,933,507	4,485,006	4,485,006	4,485,006	4,485,006	4,485,006	4,485,006	4,485,006	4,485,006	4,485,006	4,485,006	54,268,572
Sugar	1,618,818	1,494,661	1,370,504	1,246,347	1,122,190	1,313,201	1,504,212	1,695,223	1,886,234	1,618,818	1,494,661	1,618,818	17,983,687
Tea	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	7,315,007	87,780,090
Vegetables	65,959,559	222,033	67,209,475	65,537,739	63,114,343	66,755,555	70,936,206	67,294,994	64,732,659	62,305,185	59,877,710	57,450,235	#########

FOOTPRINT EMBODIED IN FOOD	January	February	March	April	May	June	July	August	September	October	November	December	Total Year 1
	########	########	########	########	########	########	########	########	########	########	########	########	#########

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Users Can

- Quantify/ compare uses of freshwater resources and the environmental effects of different scenarios.
- Identify hotspots and trade-offs.
- Connect FLW reductions with water use efficiency.
- Align strategies with global and national climate change mitigation and water security goals.
- Set targets and indicators.
- Calculate and communicate environmental benefits of FLW reductions.

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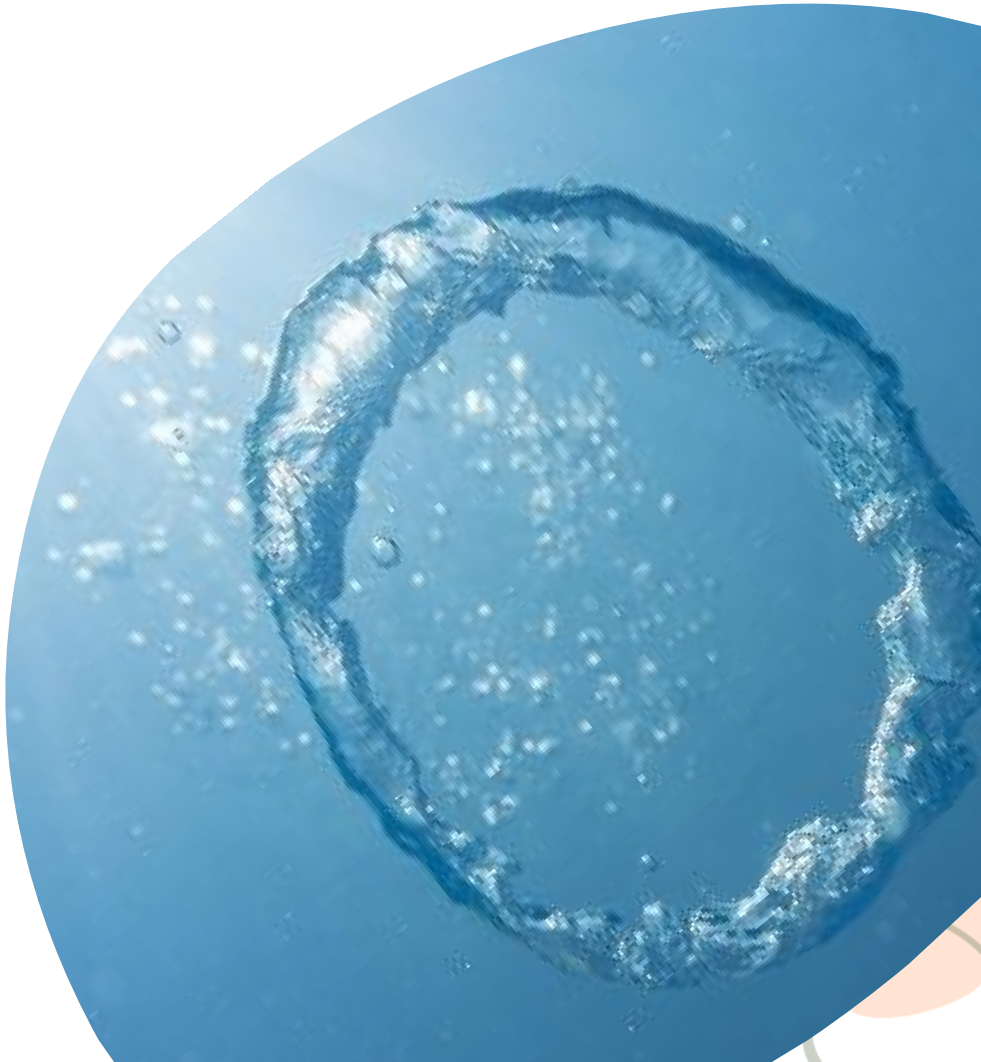
Benefits

- Measuring the water footprint is part of the environmental impact assessment of the agrifood sector.

- Governments and policy makers can calculate the water footprint of locally produced food and the water footprint of imported food separately. Plus, the water footprint of food wasted or redistributed for a city, region or country.



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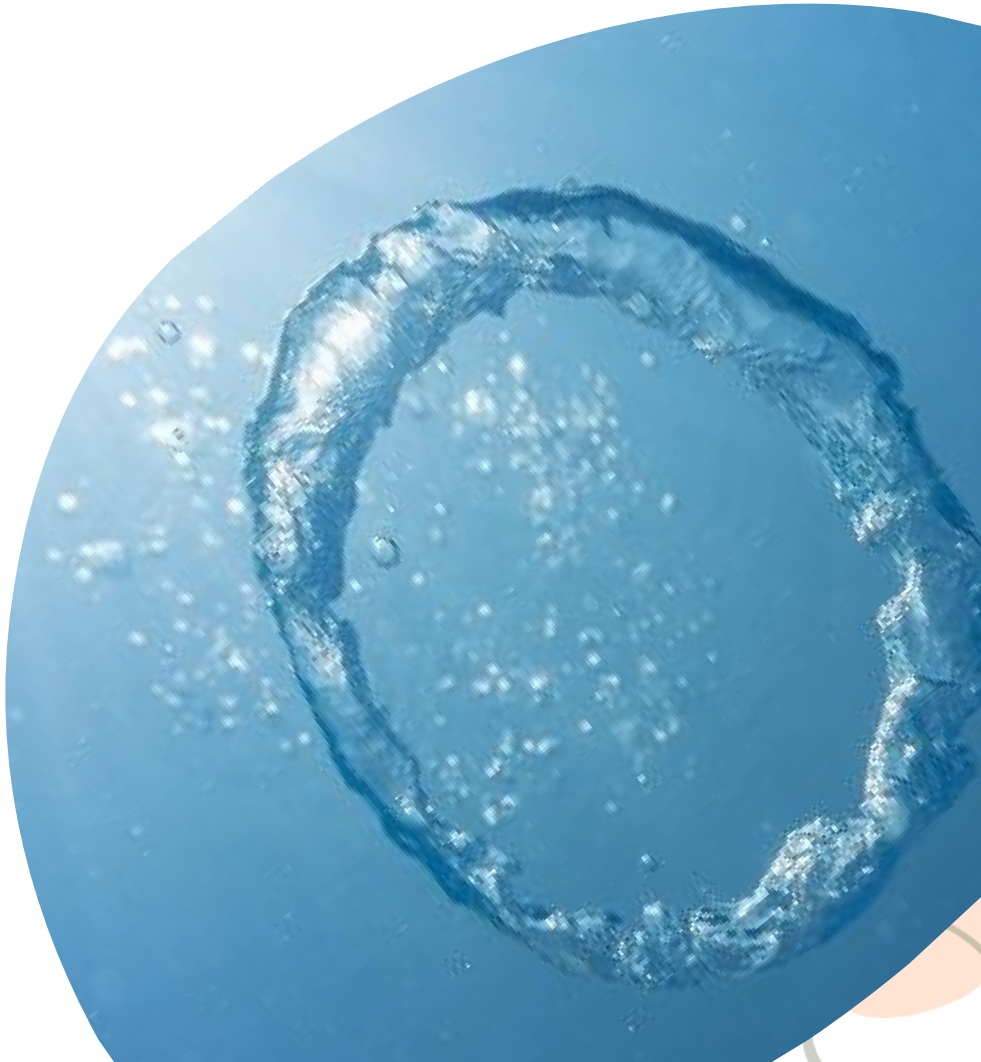
Benefits

- Companies across the supply chain can calculate the water footprint of the food they used, wasted or redistributed allowing them to track how their FLW initiatives impact their footprint.

- Academics/consultants could use this tool to calculate the water footprint of various scenarios and generate policies.



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What Data is required to run the model optimally?

- Country/city Level:
  - Itemized list of all locally produced food per commodity during a year in kilograms or tons.
  - Itemized list of all imported food per commodity and the source of the commodity during a year in kilograms or tons.
  - Volumes of redistributed food within the country during the year in kilograms or tons.
  - Volumes of food waste within the country during a year in kilograms or tons OR the % figure of food waste.

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