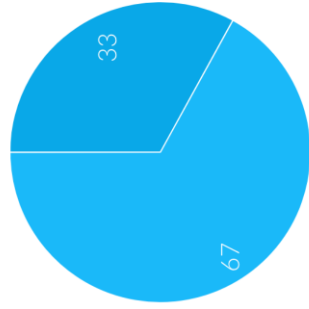


The Big Picture

The US Department of Agriculture expanded the definition of food waste from post-harvest loss to any loss in edible food mass across the entire food chain. This is significant as much of the waste happens even before the food reaches our plate. So, how much food do we waste, really?

- Around one-third of the world's food is lost to waste or 1.3 billion tons per year.
- In micro terms, roughly 1,000 tons of food is wasted every minute.
- It is estimated that up to 50% of food is lost at the production stage alone.
- In real terms, that's about 1.6 billion tons of raw food products never turned to consumable food to feed the hungry.
- All this wastage in the face of over 8 million people worldwide suffering from hunger and malnutrition.
- Saving even just a fourth of the total global food waste volume can feed all the world's hungry.

How Much Food We Waste



● Food Wasted ● Food Consumed

Source: TheWorldCounts.com

Created by CompareCamp.com

RESEARCH ARTICLE | JULY 18 2018

Current global food production is sufficient to meet human nutritional needs in 2050 provided there is radical societal adaptation

Collections: Forum: [New Pathways to Sustainability in Agroecological Systems](#), [Knowledge Domain: Sustainability Transitions](#)

M. Berners-Lee, C. Kennedy, R. Watson, C. N. Hewitt

Domain Editor-in-Chief: Anne Pi. Koparcsinski, Ph.D.

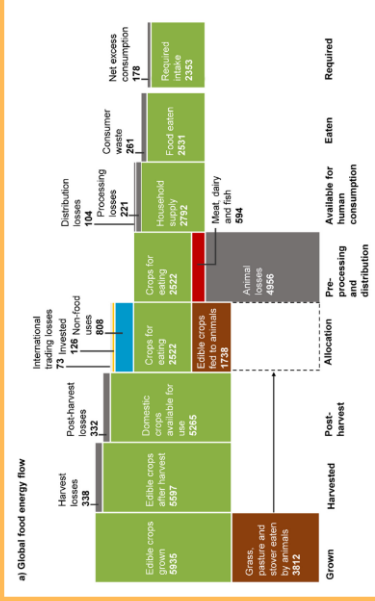
Associate Editor: Kim A. Locke, Christian J. Peters, Ph.D.

Elements: *Science of the Anthropocene* (2018) 6: 52.

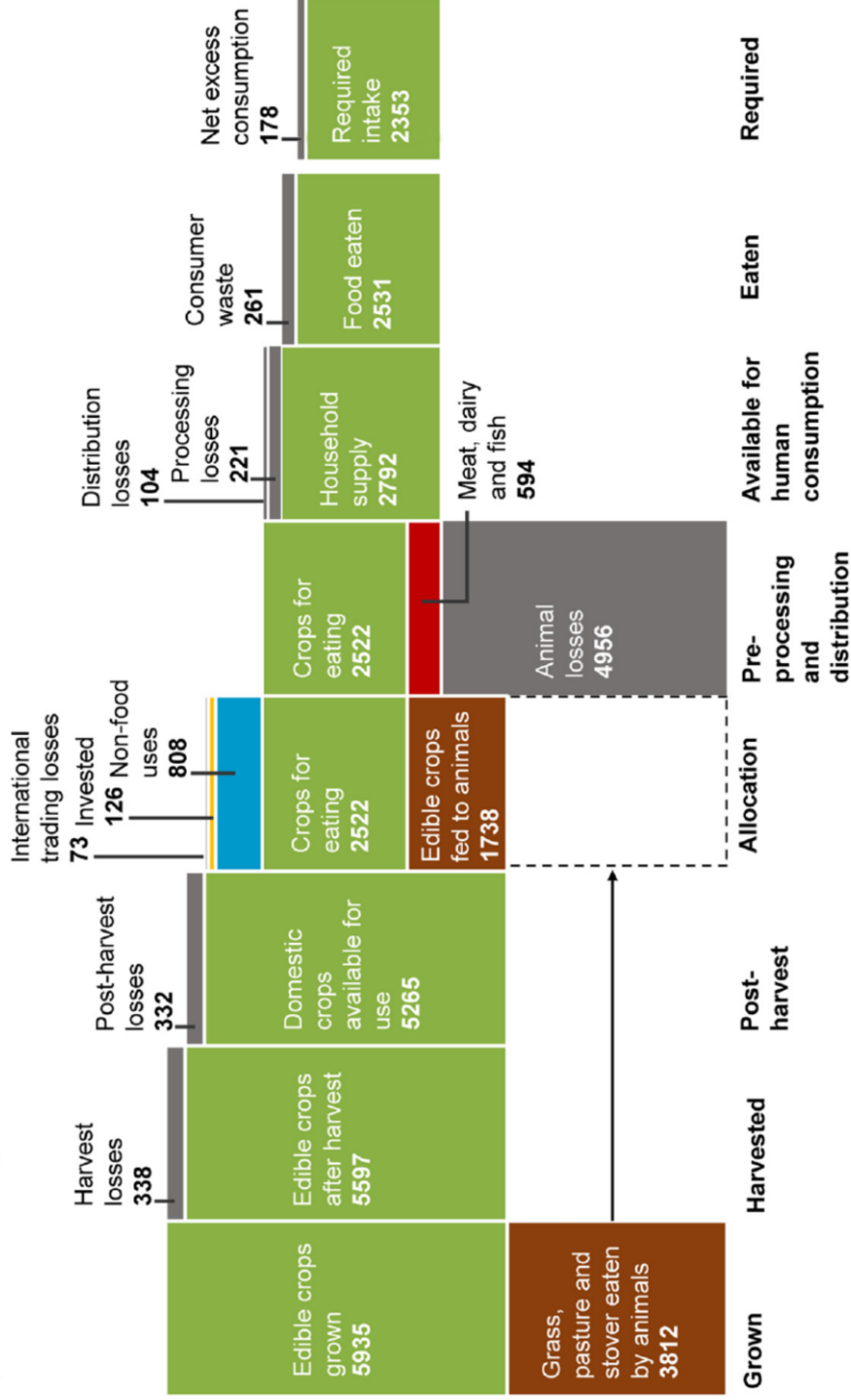
<https://doi.org/10.1025/elementa.30> [Article history](#)

Split-Screen Views PDF Share Tools

We present a quantitative analysis of global and regional food supply to reveal the flows of calories, protein and the micro-nutrients vitamin A, iron and zinc, from production through to human consumption and other end points. We quantify the extent to which reductions in the amount of human-edible crops fed to animals and, less importantly, reductions in waste, could increase food supply. The current production of crops is sufficient to provide enough food for the projected global population of 9.7 billion in 2050, although very significant changes to the socio-economic conditions of many (ensuring access to the global food supply) and radical changes to the dietary choices of most (replacing most meat and dairy with plant-based alternatives, and greater acceptance of human-edible crops currently fed to animals, especially maize, as directly-consumed human food) would be required. Under all scenarios, the scope for biofuel production is limited. Our analysis



a) Global food energy flow



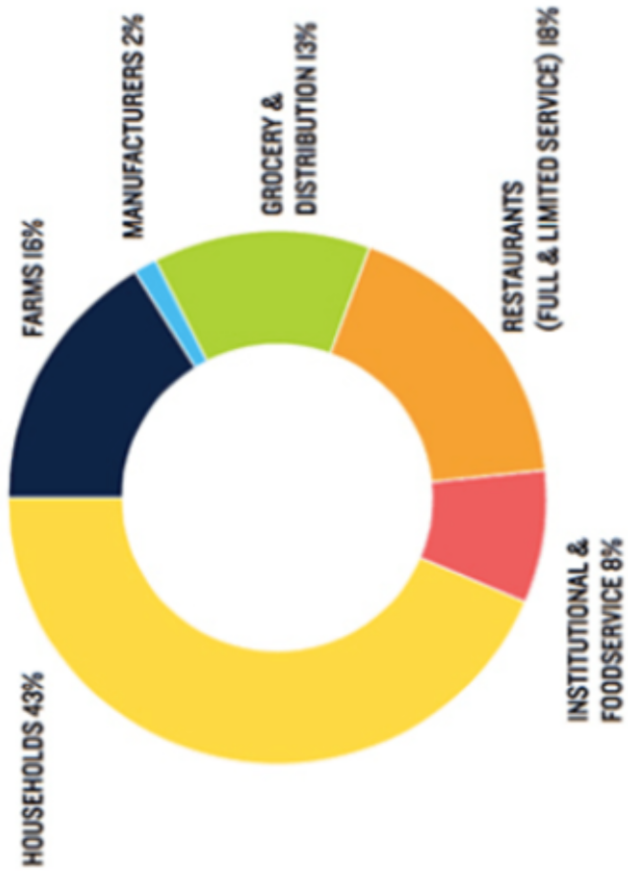
Where Food Waste Happens

By country

Food waste in developed countries and developing countries vary significantly not only in real numbers but where waste happens.

- The regions that waste food most in order of volume are North America & Australia/New Zealand, Europe/Russia, and East Asia.
- Much of the food waste in developed countries occur at the consumer level.
- In comparison, developing countries lose food at the production stage due to inefficient or inadequate facilities, logistics, and agricultural management.
- In economic terms, developed countries waste about \$680 billion in food waste per year compared with \$310 billion in developing countries.

FIGURE 1: BREAKDOWN OF FOOD WASTE GENERATION BY SUPPLY CHAIN STAGE, AS ESTIMATED BY REFD FOR 2015⁴³

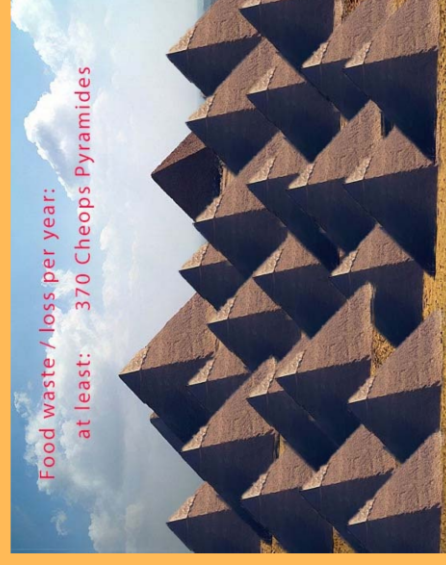


<https://aph.fs.quoracdn.net/main-qimg-0193d99679728077c31d5400a7c9e3f0>

Let's do a calculation with the today's numbers: say: 1m³ of water approx. weights 1 ton

Today we are up to about 960'000'000 tons of food waste. witch would be an equivalent in m³ for water.

This wasted amount of food until today is at least equivalent to the volume of 370 Cheops-Pyramids!



everything is linked

WHY ?

Water use 40%
Energy use 30%
Fertilizer use 30%

Fertilizer industry ... emits 1.5 Gt CO₂ annually
It's effects are 2 times the ones of CO₂ ... only that one plant
During the past 40 years ... 30% of N₂O emissions

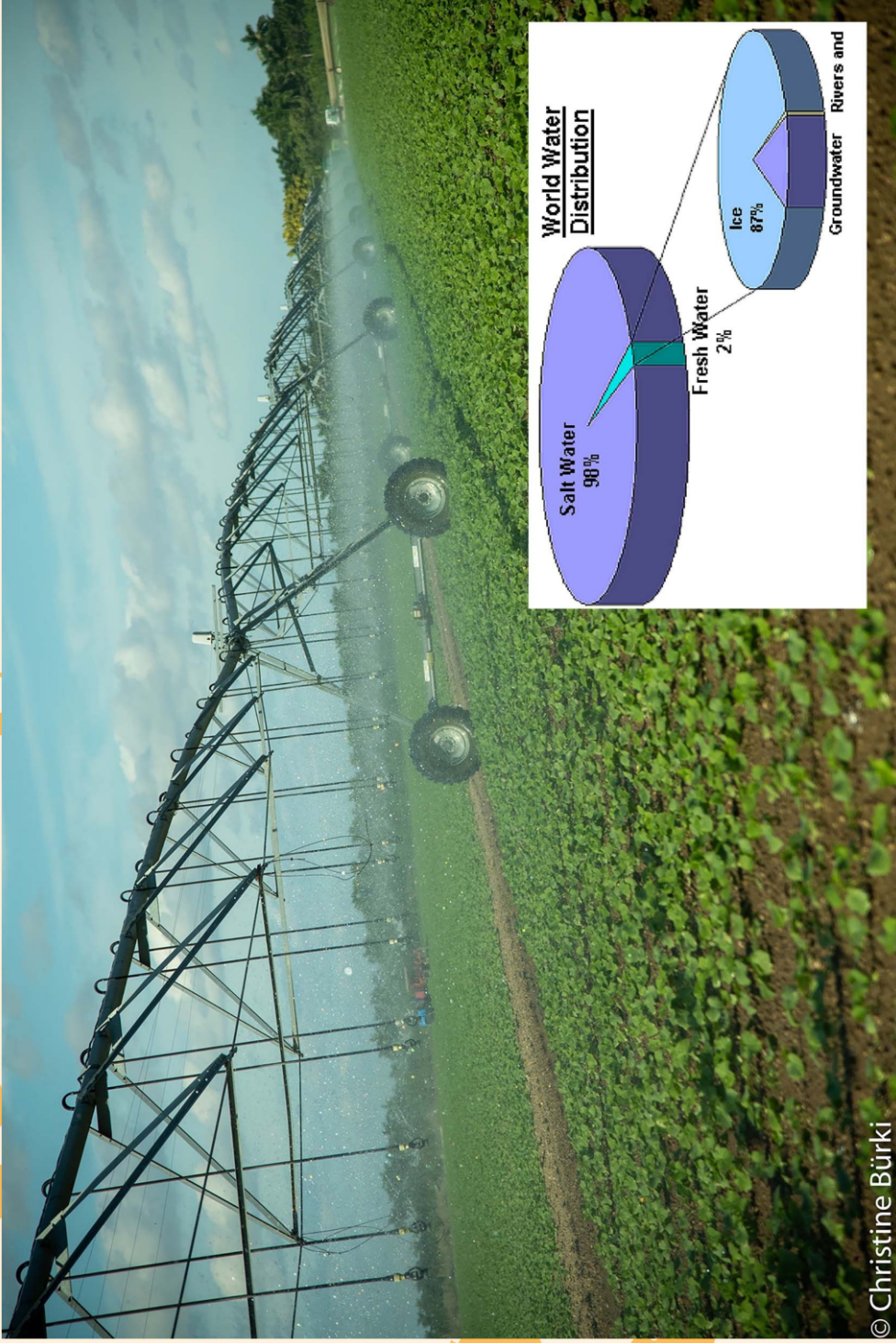
transportation

Landfills are a huge climate issue:
--> Transporting emitting CO₂

But much more important
the landfill itself:
--> emitting CH₄, Methane
which is having a 25x bigger
impact on climate change-issues
than CO₂



© ChrisBurkiPhotography



Fertilizer industry:
since years it has been known, that N_2O (Nitrous oxide) is a very „effective“ gas to promote climate change. It's effects are 298x the ones of CO_2 --> only that no plant is absorbing it from the air...

During the past 40yrs ---> + 30% of N_2O emissions

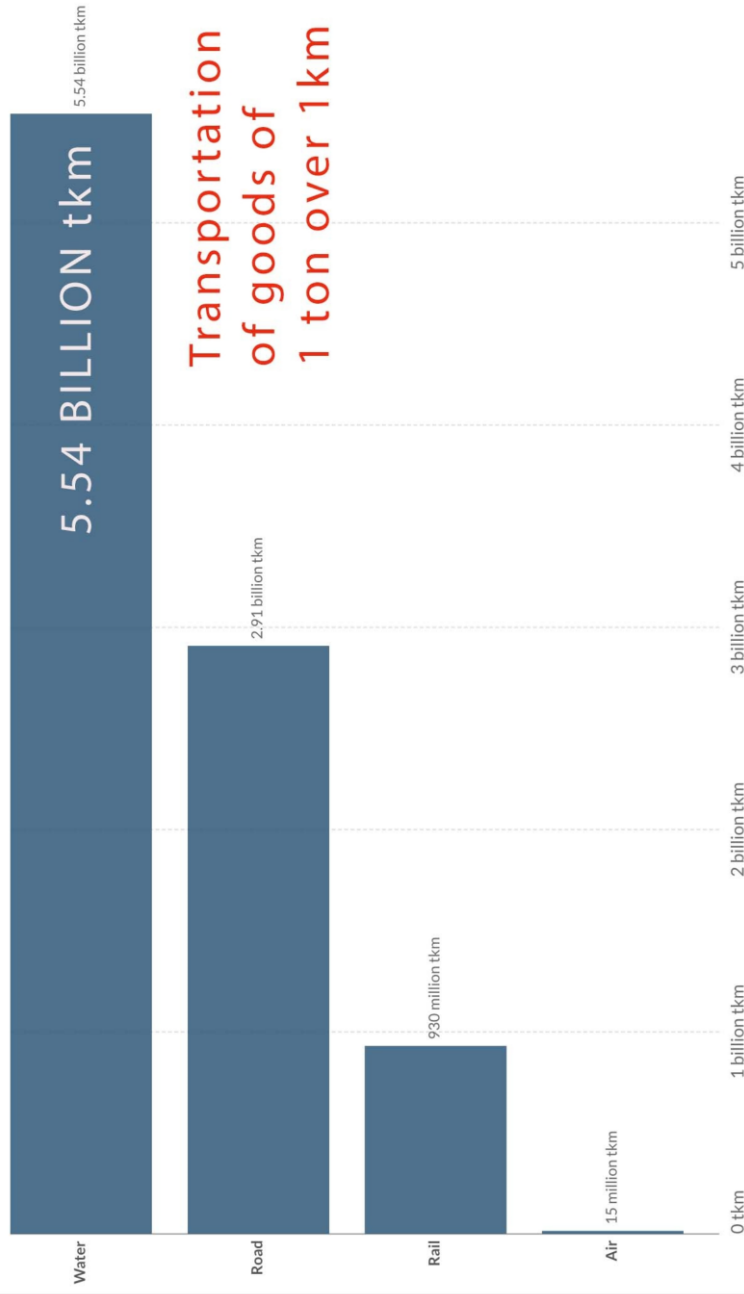




Global food miles by transport method

Food miles are measured in tonne-kilometers per year. A tonne-kilometer is a unit of measure of freight transport which represents the transport of one tonne of goods over a distance of one kilometre.

Our World
in Data



Source: Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*.

CHART

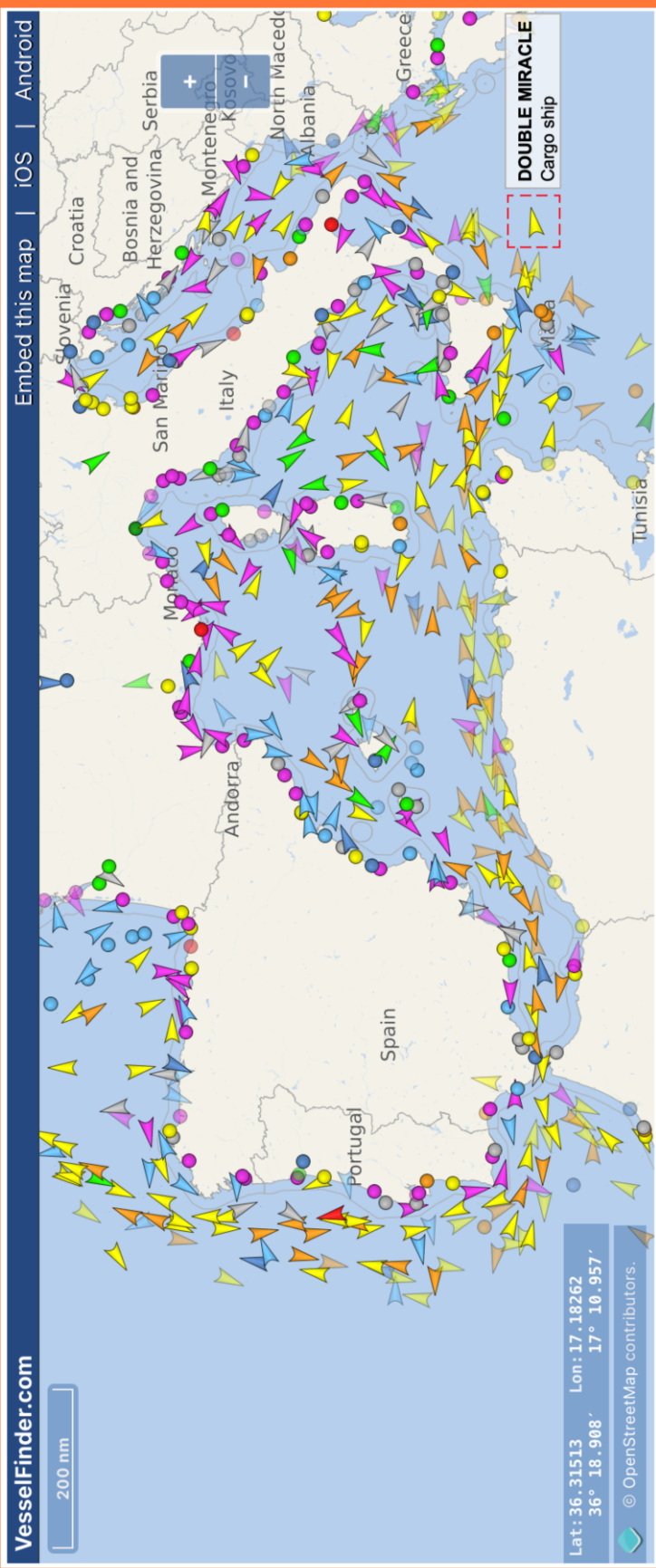
TABLE

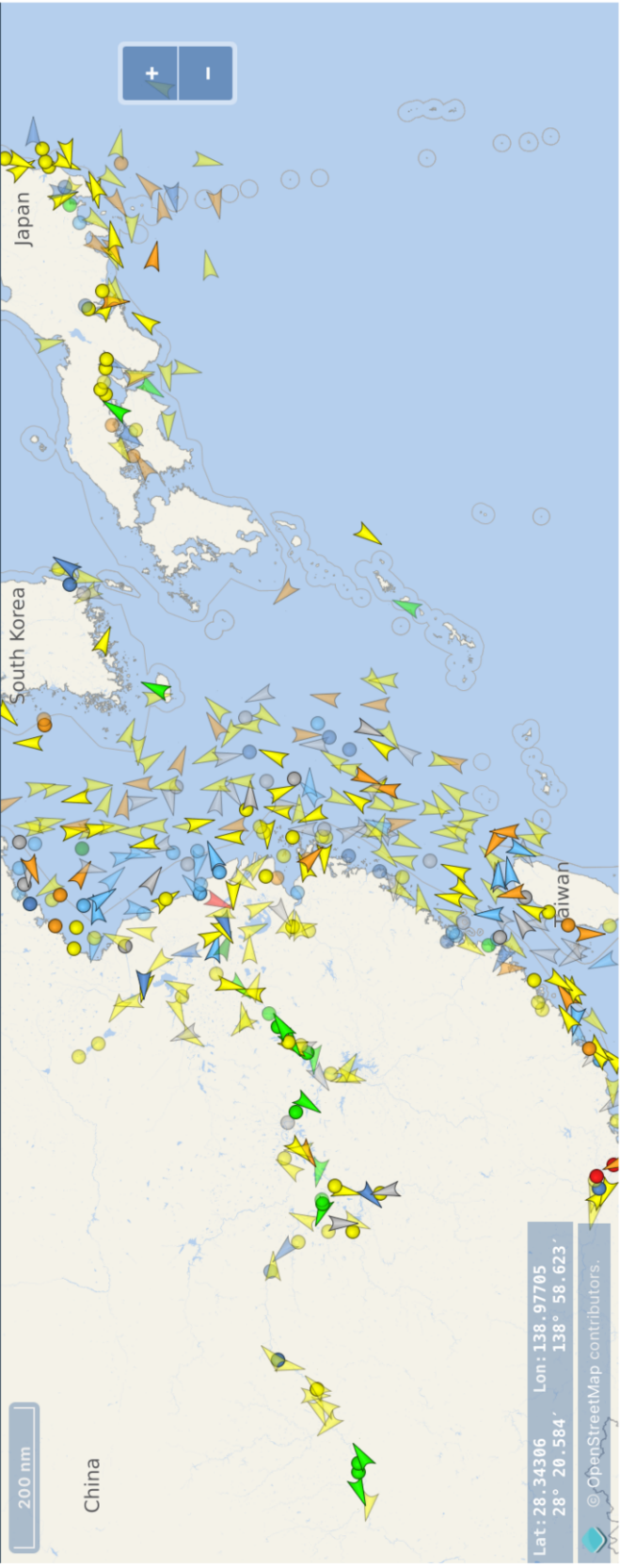
SOURCES

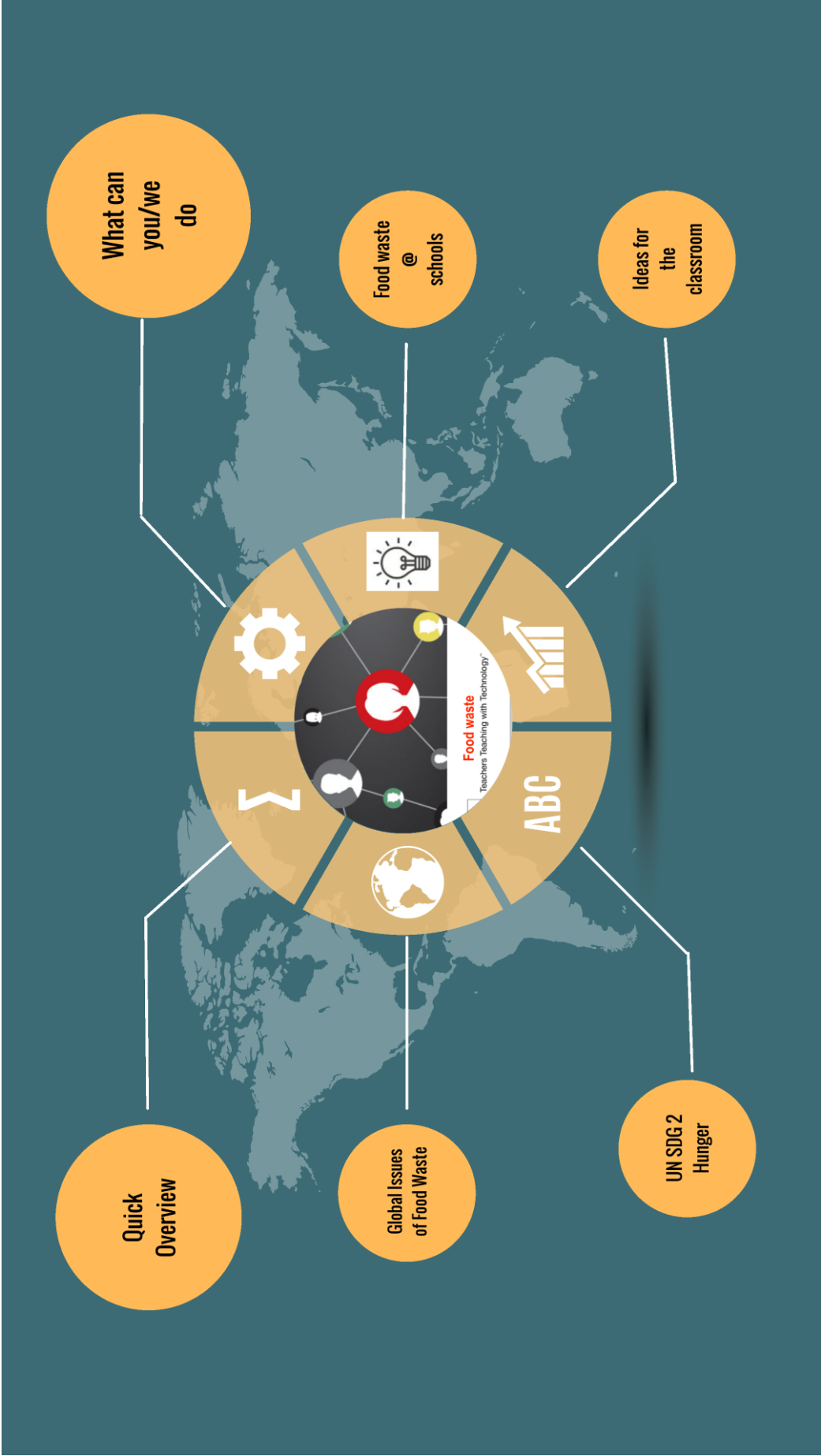
DOWNLOAD



CC BY







2 ZERO HUNGER

SDG no 02: Zero Hunger

End hunger, achieve food security and improved nutrition and promote sustainable agriculture



1. **Meat of animals: Sheep**

2. **Meat of animals: Pig**

3. **Meat of animals: Cow**

4. **Meat of animals: Chicken**

5. **Meat of animals: Turkey**

6. **Meat of animals: Lamb**

7. **Meat of animals: Beef**

8. **Meat of animals: Pork**

9. **Meat of animals: Poultry**

10. **Meat of animals: Seafood**

11. **Meat of animals: Eggs**

12. **Meat of animals: Dairy**

13. **Meat of animals: Honey**

14. **Meat of animals: Fish**

15. **Meat of animals: Shellfish**

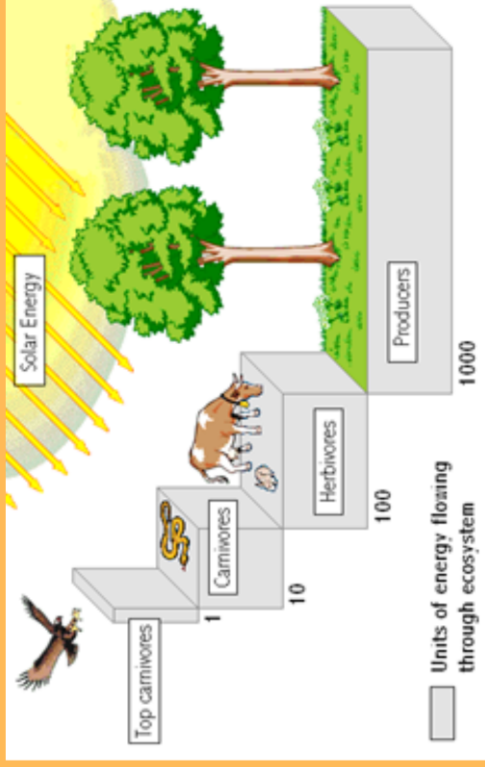
16. **Meat of animals: Insects**

17. **Meat of animals: Other**

18. **Meat of animals: Unlabeled**

19. **Meat of animals: Unknown**

20. **Meat of animals: Miscellaneous**





Teachers Teaching with Technology™



Christine Buerki

Education for a Sustainable Development

Complementary Material and Hints for the UN SDG no 02

www.t3europe.eu

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reflect

it matters what we eat

it matters from which places comes where it was produced and how it was produced

--> therefore: buy local
buy non treated food!
buy seasonal food
buy food which originates from your country

re-think your meat-consumption !

It matters that we don't support food speculation!

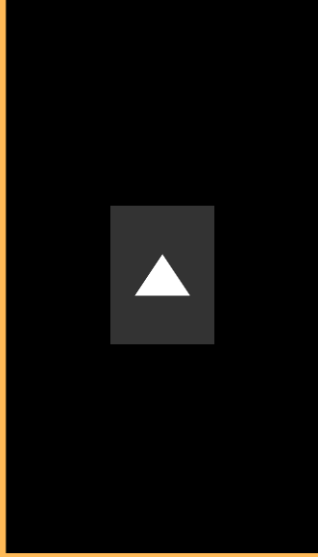
It matters that we eat up what we buy.

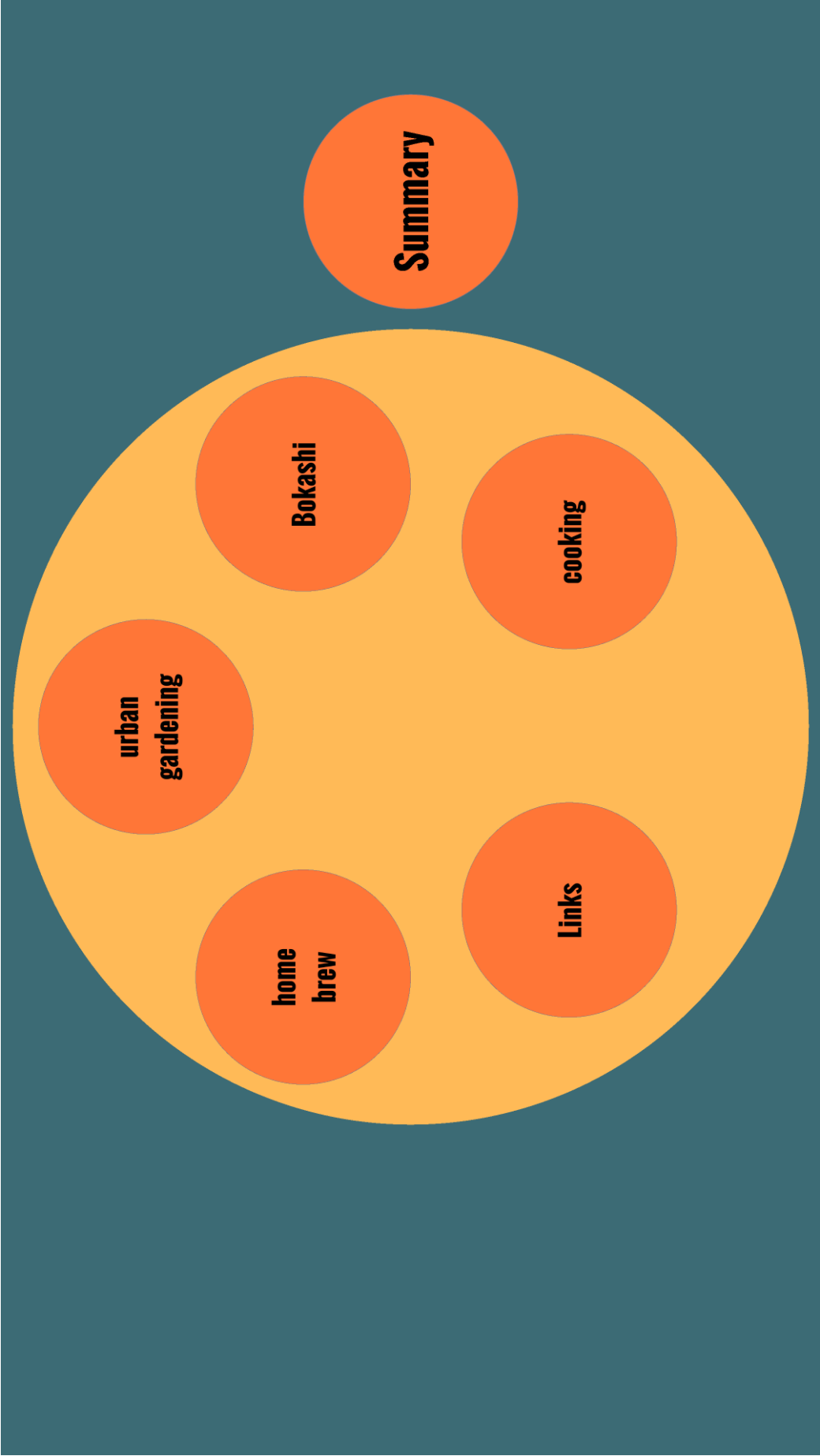
Up taking less calories is healthier anyhow!

--> less is more - as usual!

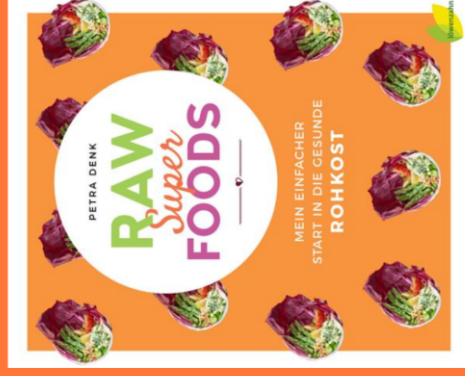
Education matters

Avoidable household food waste in the U.K. has dropped 21 percent since the Love Food Hate Waste program began in 2007.

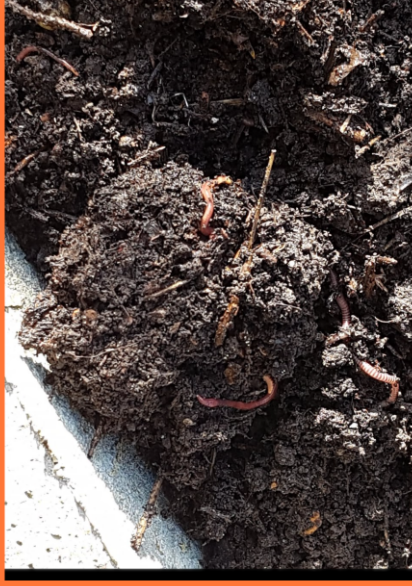




share with your students how to make healthy snacks by their own... and install a snack-share-table....



in combination with the urban gardening: teach them how to set up a Bokashi and why this matters



urban gardening @ schools



Source: <https://www.populationeducation.org/>

- use planting kits on the school campus → reduce the number of plants that are thrown away
- use the soil bag → for those that are building and place containers out of hand
- collaborate with the neighborhood → they can be the ones to gather after hours of collaboration with people in the neighborhood

<https://populationeducation.org/benefits-building-urban-garden-your-school/>

ideas of how to proceed:

- use parking-lots on the school campus --> restore those surfaces, in any case bad for the environment and renaturate it to install a school garden
- use the roof-top - if you have a flat roof building and place containers out of wood
- collaborate with the neighborhood: may be in the vicinity you will find people, not anymore able to care for their own garden: offer them a collaboration with your students. They can learn from such experienced people a lot



TOAST
HERE'S TO CHANGE

HOMEBREW RECIPE
Pale Ale

What you'll need...

For the mash		For the boil		To ferment	
Pale Malt	3.5kg	German Hallertau	5g	Cascade hops	60g
Dry crumbed bread	1.5kg	Tradition hops	37g	Bramling Cross hops	35g
CaraiMalt	150g	Cascade hops	20g	Sarale US05	11.5g
Munich malt	150g	Centennial hops	25g	rehydrated yeast	
		Bramling hops	1.9g		
		Protafloc			

Beer Style: Pale Ale | Original Gravity: 1.048 | Yield: 25l

Links:

Overview:

<https://online.ucpress.edu/elementa/article/doi/10.1525/elementa.310/1.12838/Current-global-food-production-is-sufficient-to>

big data:

[http://www.research.lancs.ac.uk/portal/en/datasets/current-global-food-production-is-sufficient-to-meet-human-needs-in-2050-provided-there-is-radical-societal-adaptation\(0e68ef70-2998-4cd0-9c86-e4137e2f6dbd\).html](http://www.research.lancs.ac.uk/portal/en/datasets/current-global-food-production-is-sufficient-to-meet-human-needs-in-2050-provided-there-is-radical-societal-adaptation(0e68ef70-2998-4cd0-9c86-e4137e2f6dbd).html)

Fertilizer - Haber-Bosch

https://www.scienceinschool.org/article/2014/ethical_chemistry/

Fertilizer - Haber-Bosch

Lab:

<https://flexbooks.ck12.org/cbook/ck-12-chemistry-flexbook-2.0/section/19.7/primary/lesson/effect-of-concentration-chem/>

Ethics:

https://www.scienceinschool.org/article/2014/ethical_chemistry/

Food waste Schools:

<https://www.usda.gov/foodlossandwaste/schools>
<https://ensia.com/features/school-food-waste-solutions/>
<http://www.reducefoodwaste.eu/unterrichtsmaterialien.html>

Urban gardening:

<https://populationeducation.org/benefits-building-urban-garden-your-school/>

Galileo: an amazing school garden: https://www.youtube.com/watch?v=e998Eh4_1pV0

Bokashi:

<https://materialscycle.wordpress.com/2017/03/08/a-successful-guide-of-bokashi-composting/>

collecting microbes: <https://www.ctahr.hawaii.edu/oc/freepubs/pdf/BIO-9.pdf>