SWEDISH LIFE CYCLE CENTER

Webinar - The research behind WWF's plant-based consumer guide

Presenter: Hanna Karlsson Potter, researcher at Swedish University of Agricultural Sciences

2021-09-23

Information and guidelines

MUTE YOUR MICROPHONE

QUESTIONS AFTER THE PRESENTATIONS

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RECORDING WILL BE AVAILABLE ON YOUTUBE

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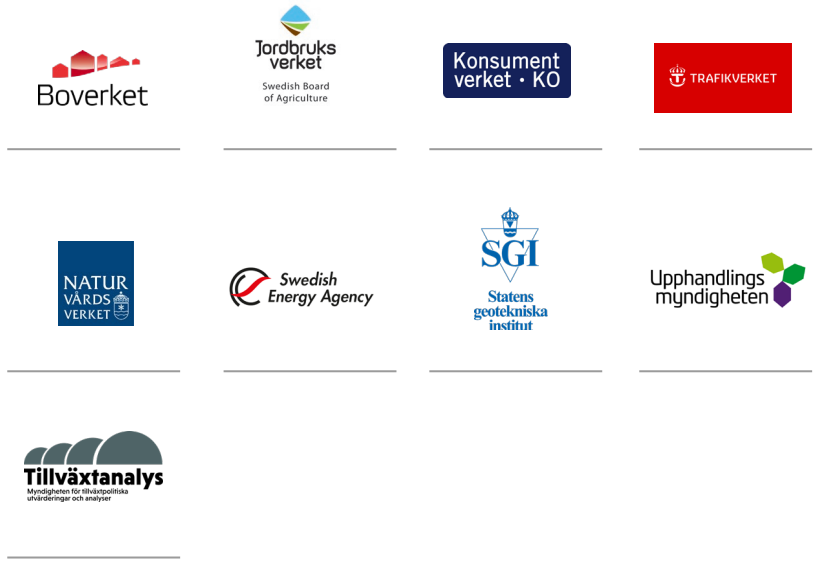
We aim for credible & applied life cycle thinking globally!



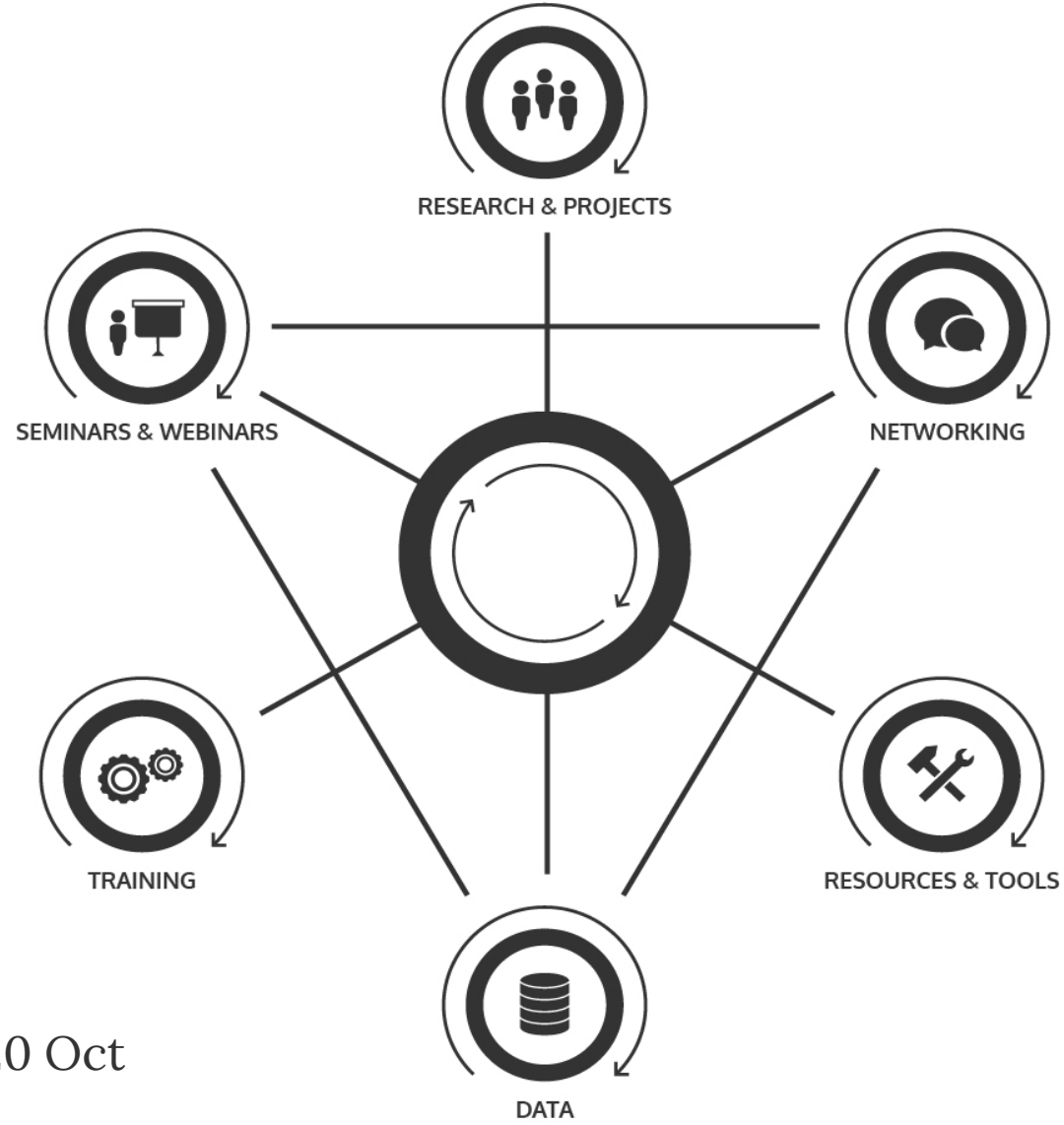
A partner driven center

16 partners and 9 government agencies in collaboration

Information meeting

7 October 9:00-10:30

Online



Two day course
Network conference, 20 Oct

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2021-09-23


SLU
SCIENCE AND EDUCATION FOR SUSTAINABLE LIFE

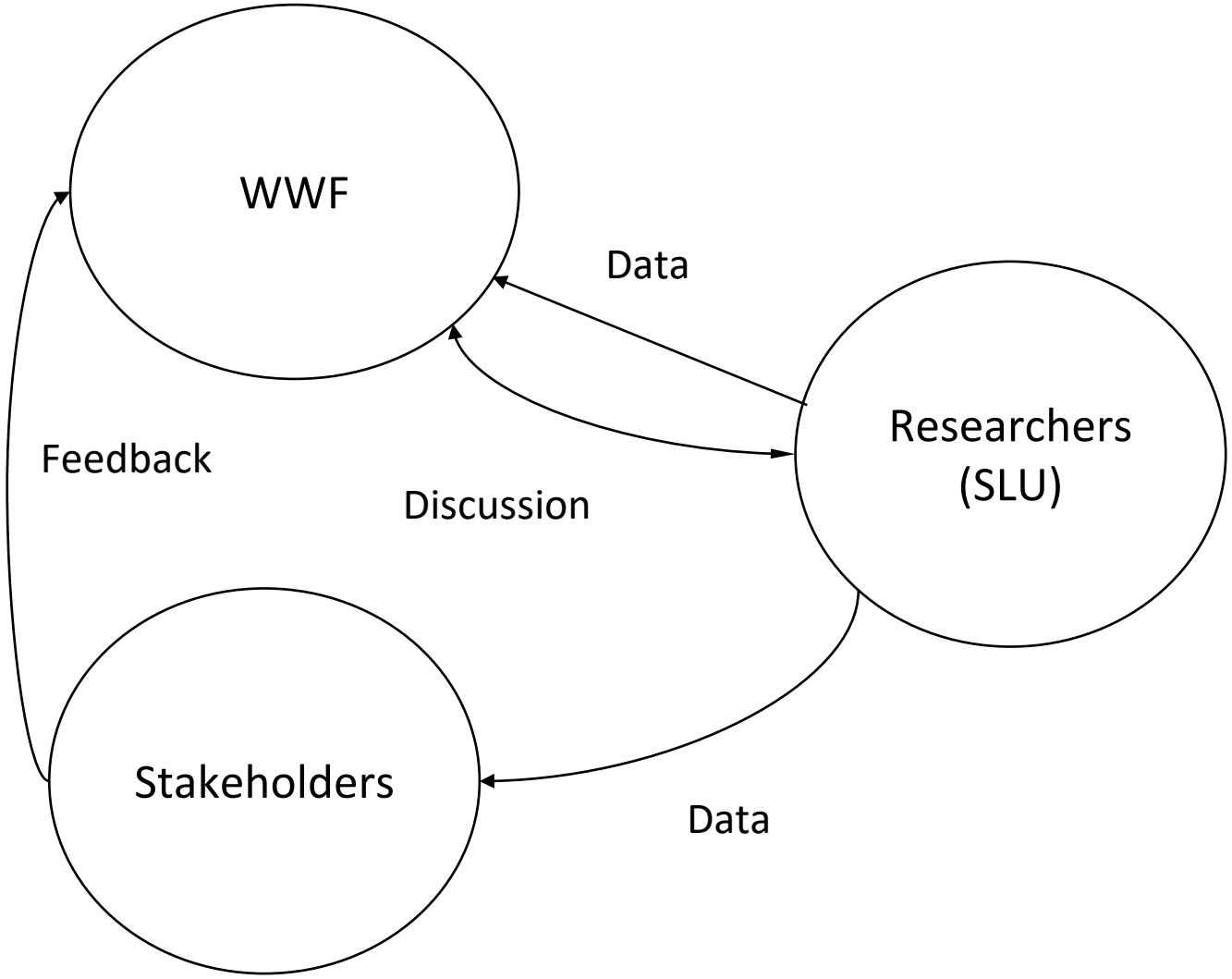
The research behind WWF´s consumer guide for plant-based foods

Hanna Karlsson Potter, Department of Energy and Technology, SLU

Content

1. Background
2. Environmental assessment categories
3. Data collection
4. Some results
5. Reflections from me and from WWF

Our role in the development of the guide



Why a consumer guide for plant-based products?
And for whom?

Aim and target group

Aim

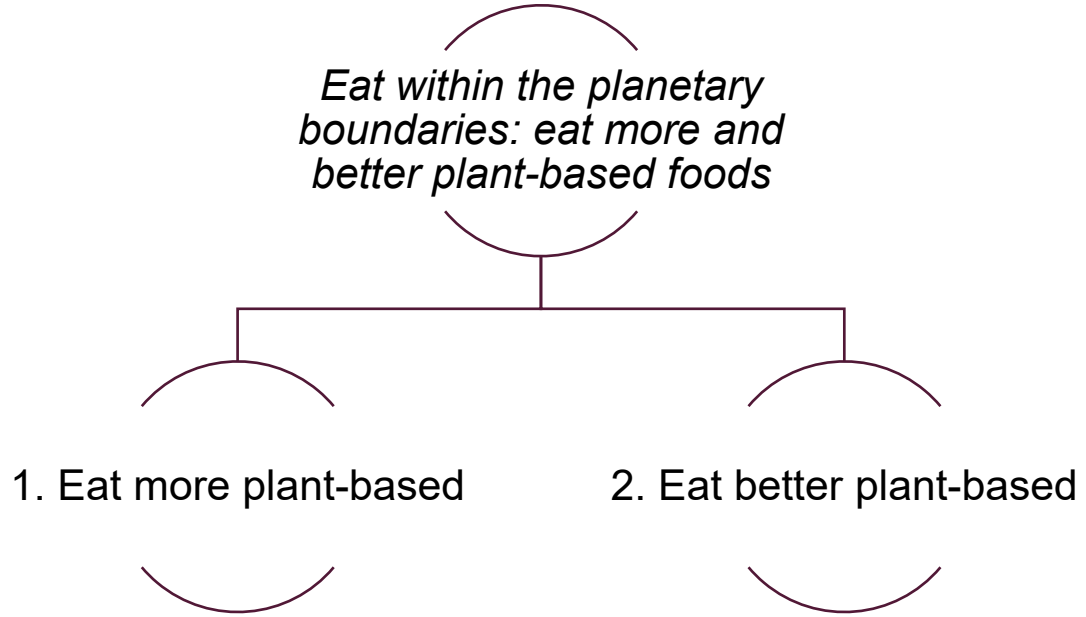
- **Aim:** To contribute to sustainable food habits and consumption within the planetary boundaries by 2030.
- **The guide aims to:**
  - Encourage a more plant-based diet and make it easier to make better choices.
  - Fill knowledge gasps and provide new information to enable a more sustainable production and consumption of plant-based foods.
  - Address sustainability challenges with consumption of plant-based foods.

Target group:

Environmentally aware consumers and people that work with food, that want to prepare more plant-based meals and what to make better and more informed choices on plant-based foods.

The GUIDE

- Message: *Eat within the planetary boundaries: eat more and better plant-based foods.*
- Much should be green, and little red to communicate that the overall message is to eat more plant-based.



- GREEN = Eat preferably
- GREEN = Eat gladly ☺
- YELLOW = Eat sometimes
- Orange = Be careful

Food groups and functional unit

- Based on earlier studies (collection of material 1 year post-doc)
- Life cycle perspective of 1 kg ready-to eat product. System boundaries up to retailer.
- Product groups:
  - (Plant-based dairy)
  - Protein foods
  - Nuts and seeds
  - Carbohydrate sources
  - Vegetables and mushrooms
  - Fruits and berries

Food products

90 food products

Table 2
Products[a] included in data collection, divided into product groups.

Protein sources	Carbohydrate sources	Plant-based drinks/cream	Fruit and berries	Vegetables and mushrooms
	Cereals		Fruit	Vegetables
Green peas	Barley	Almond drink	Apples	Artichoke
Yellow peas	Maize	Coconut drink	Bananas	Asparagus
Dry beans	Millet	Soy drink	Cherries	Avocado
Faba beans	Oats	Oat drink	Dates	Broccoli
Canned beans (including lentils)	Pasta	Oat cream	Grapefruit and pomelo	Cabbage
Chick peas	Quinoa	Coconut milk	Grapes	Capsicums/ peppers
Dry lentils	Rice		Guava and mango	Cauliflower
Soybeans	Rye		Kiwi	Celery
Ready-made products	Sorghum		Lemons and limes	Cucumber
Mixed without animal products[b]	Wheat		Melons	Eggplant
Pea-protein products	Root vegetables		Oranges	Garlic
Quorn	Beetroot		Papayas	Ginger
Soy-based	Carrots		Peaches	Lettuce
Tofu and tempeh	Potatoes		Pears	Green beans
Nuts and seeds	Swedes		Pineapples	Mushrooms
Almonds	Sweet potato		Plums and sloes	Olives
Cashew nuts	Jerusalem artichoke		Tangerines, mandarins *etc.*	Onion
Chestnuts	Parsnips		Watermelon	Pumpkins and squash
Coconut (grated)			Berries	Spinach
Hazelnuts			Cranberries	Tomatoes
Walnuts			Blueberries	
Pistachios			Raspberries and other berries	
Peanuts			Strawberries	
Sesame seeds				
Sunflower seeds				

[a] All products for which data were collected, WWF-Sweden will decide which products to include in the Vego-guide.
[b] Including *e.g.*, falafel.

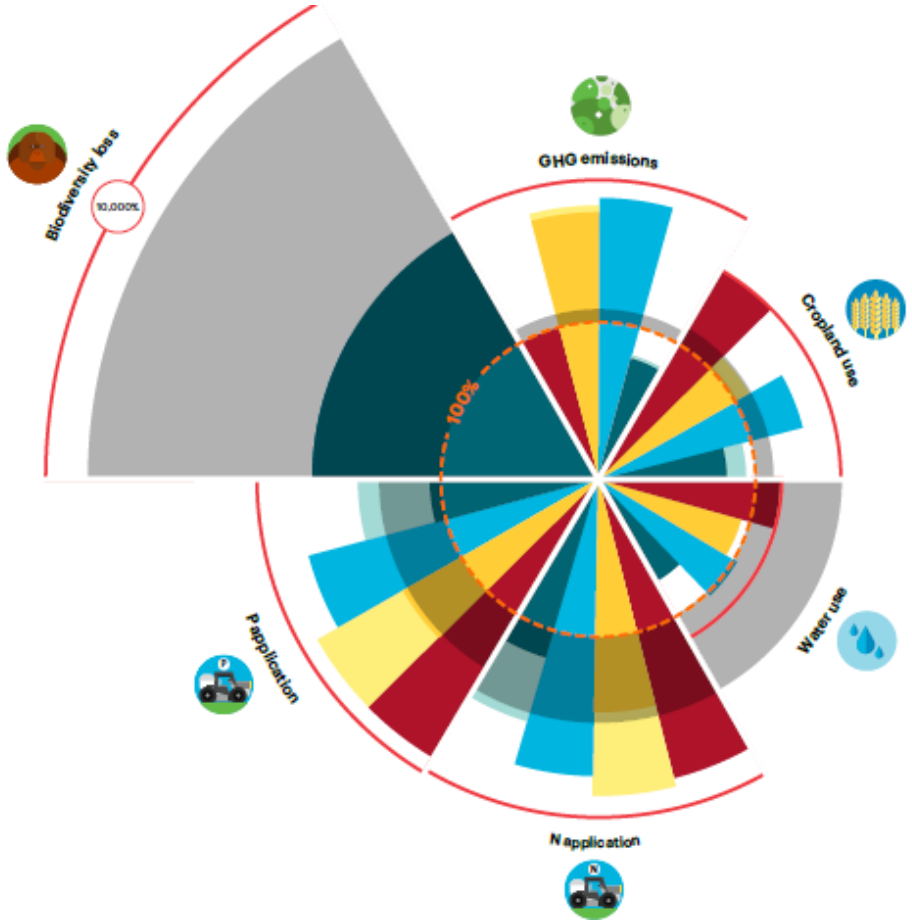
Selection of environmental criteria

	Environmental indicators									Resources			
	Climate change * /Global warming**	Biosphere integrity*	Novel entities*/ Eco/human toxicity**	Stratospheric ozone depletion*,**	Trop. ozone formation	Atmospheric aerosol loading*/Part. Matter**	Ocean acidification*/ Terr. acidification**	Biogeochemical flows*/ Eutrophication**	Ionizing radiation	Land system change*/ Land use**	Fresh water use* / Water use**	Fossil resources**	Mineral resources**
Relevance for production of plant-based foods	+	++	++	?	+	?	0	+	0	++	++	+	?
Importance to users	++	+	++	0	0	0	0	+	0	+	++	+	0
Availability of scientifically accepted methods	++	+	+	?	0	++	++	+	?	+	+	++	+
Availability of data	++	+	0	?	0	?	+	+	+	++	++	+	0
Total score	7+	5+	5+	0+	1+	2+	3+	4+	1+	6+	7+	5+	1+

What is assessed?

- Climate impact
- Biodiversity
- Pesticide use
- Water use

Boundaries for the food system



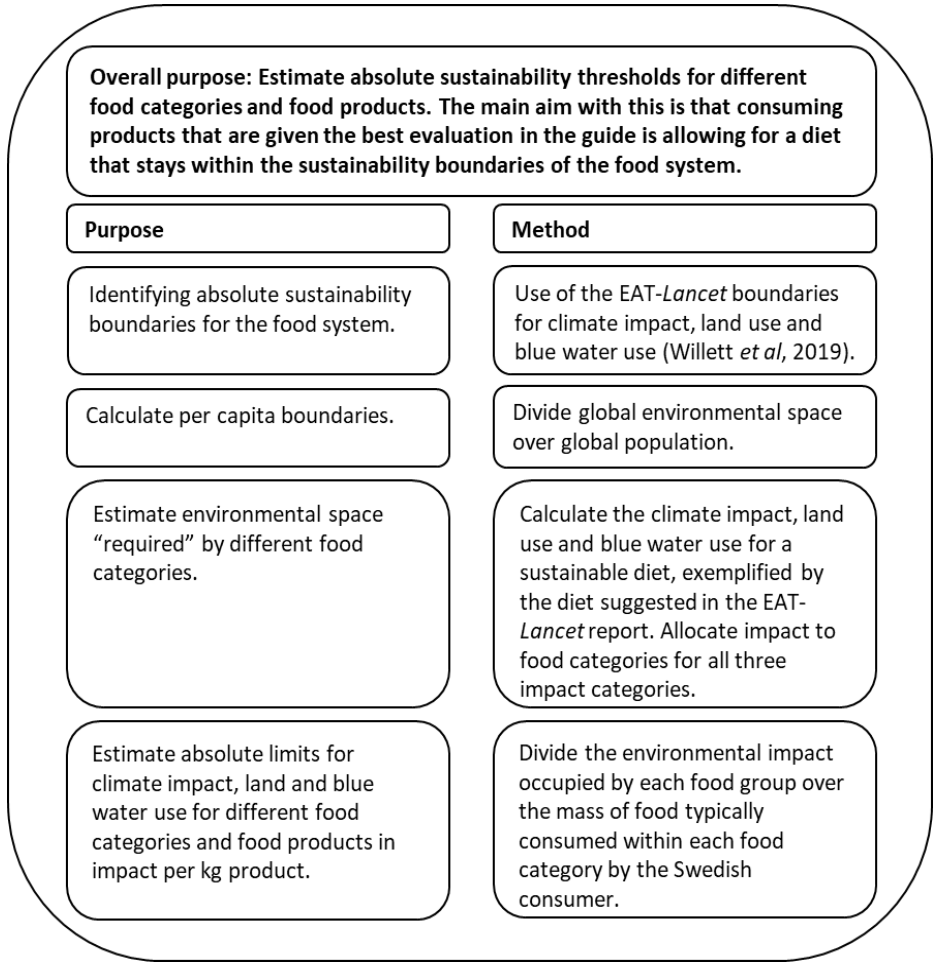
The EAT Lancet Commission

Can you use the guide to ”stay within the planetary boundaries”

- GREEN = Eat preferably
- GREEN = Eat gladly ☺
- YELLOW = Eat sometimes
- Orange = Be careful

Boundaries for different food groups

- Boundaries for climate impact, land use and fresh water use are from EAT Lancet.
- The *environmental space* for each category was divided over the different food groups based on the environmental impact of the different food groups in a sustainable diet.
- The boundary for 1 kg food was calculated by dividing the *environmental space* of each food group on the amount of food we eat within this food group



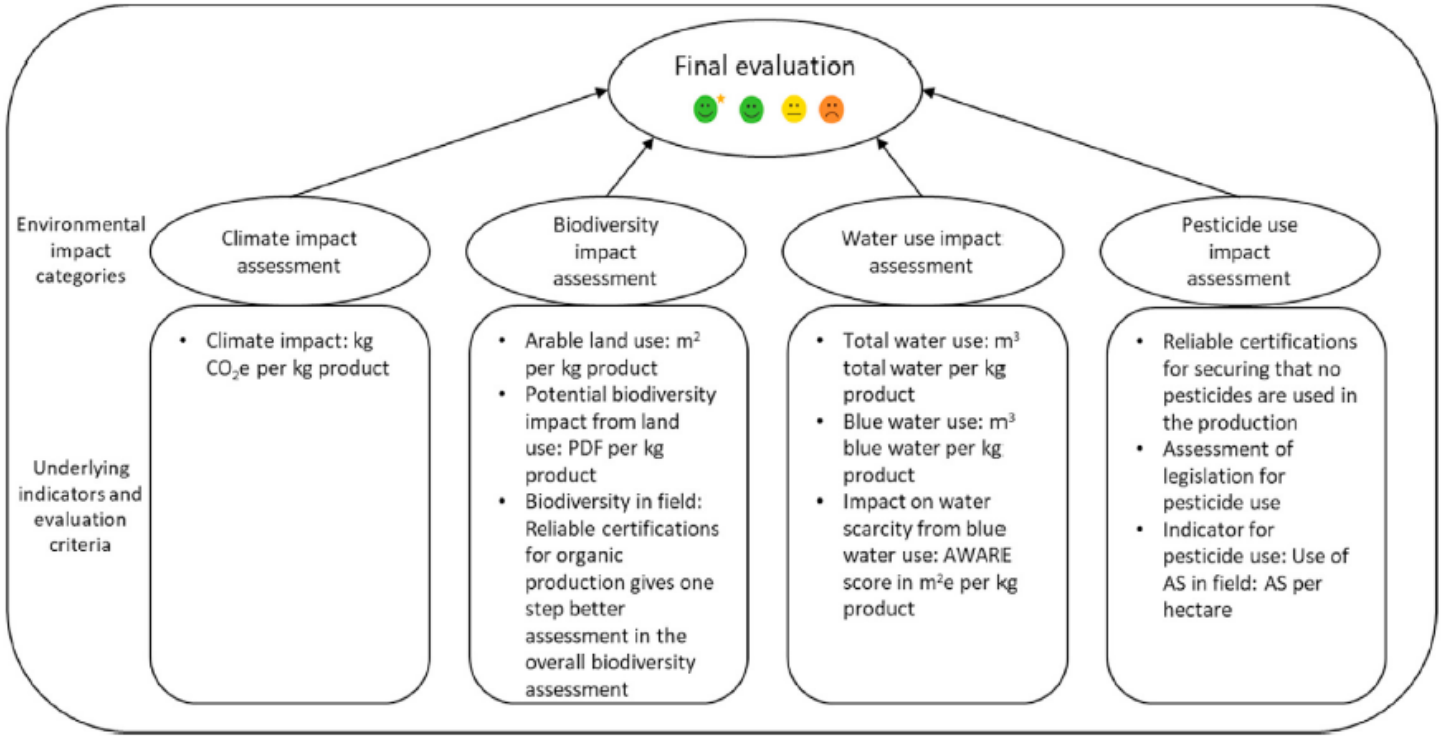
Criteria and boundaries

- Life cycle perspective of 1 kg edible product, including transport and packaging.
- Different food groups get different boundaries dependent on how much resources products in their product group generally requires.
- This boundaries enables visualization of the best products within each category.
- Shows that the products have different roles within a full diet.

Challenges

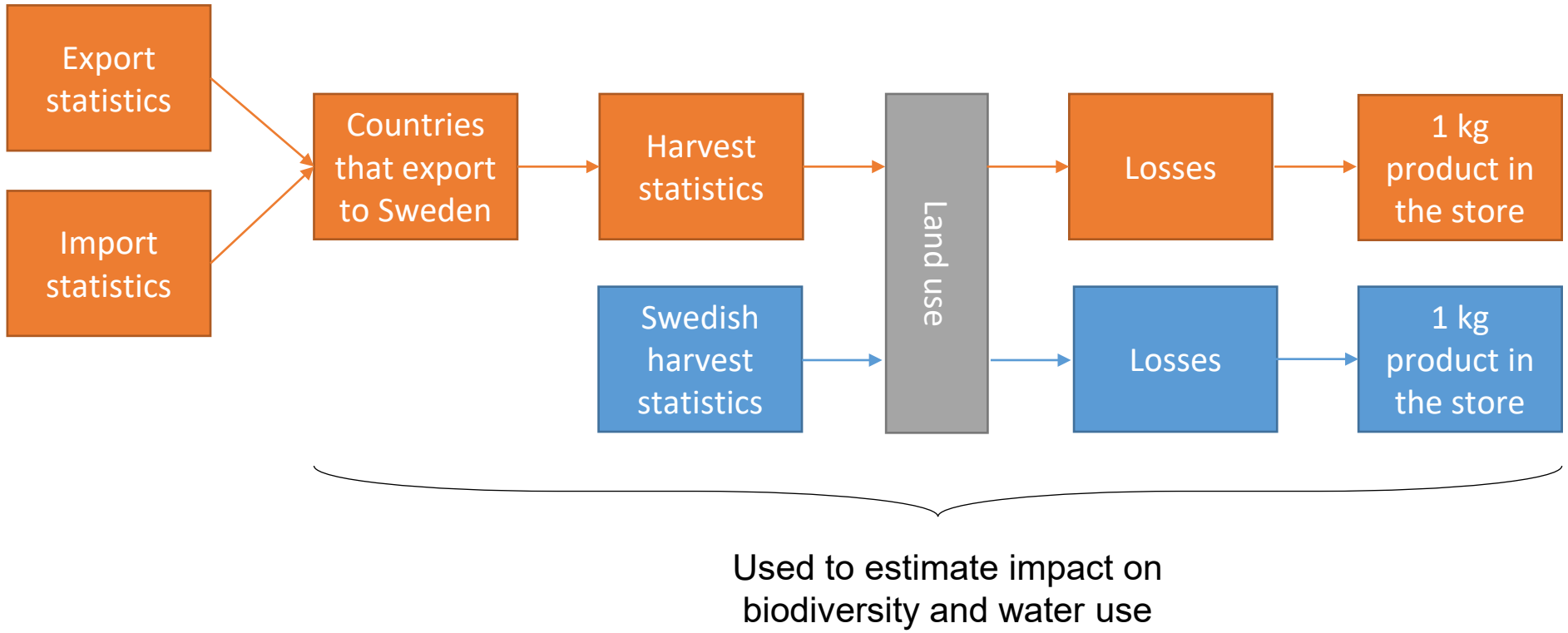
- Difficult to group some products (for example nuts and root vegetables)
- Difficult to communicate

Environmental impact categories



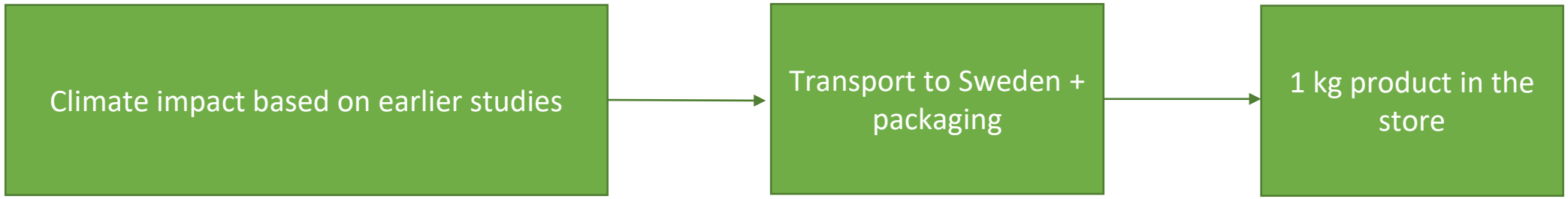
Data collection

Method: Selection of countries



Climate impact

- Climate impact in CO2e per kg product including transport and packaging



Biodiversity

- Land use, since land use for agriculture is one of the most important drivers for biodiversity loss.
- Indicator for biodiversity loss (Potential Disappeared Fraction (PDF) – indicator for species loss / extinction rate *Chaudhary et al. (2018)*)
- Cropping systems that benefit biodiversity, verified through reliable certification such as organic.

Data?

- Based on import statistics (where are the products coming from) and harvest statistics.

Pesticide use

- Certification (organic) is used as a guarantee that no pesticides are used
- Legislation- where EU legislation is assumed to be more strict than other legislation
- Dose per hectare (AS/ha) in the production is used as an indicator for potentially high eco-tox

Data?

- Origin, certification and pesticide use statistics when available (EU and Sweden)

Water

Method:

- Total water use (Blue, green and grey water) used as an indicator for resource use.
- Blue water use, indicator of irrigation waster use.
- Water Footprint Scarcity (AWARE) *Boulay et al., (2018)*

Data?

- *Mekonnen and Hoekstra (2010; 2011) (Water footprint network) and* statistics on import.

Results-boundaries

Table S3. Thresholds applied for all underlying indicators for the four environmental impact categories included (climate impact, biodiversity impact, water use, and pesticide use)

	Protein sources	Carbohydrate sources	Plant-based drinks/cream	Fruit and vegetables
Climate impact (kg CO_2e/kg)				
Green star	<2.9	<0.7	<0.9	<0.8
Green	<4.0	<1.4	<1.8	<1.6
Yellow	<14.0	<2.8	<3.6	<3.2
Orange	>14.0	>2.8	>3.6	>3.2
Biodiversity impact[a] (Land use (LU): m²/kg; biodiversity impact (biod.: PDF/kg)				
Green star	Land use: <5.0 Biod.: <1.3E-12	Land use: <1.7 Biod.: <4.6E-12	Land use: <1.7 Biod.: <4.6E-13	Land use: <0.9 Biod.: <2.4E-13
Green	Land use: <5.0 Biod.: <1.3E-12	Land use: <3.4 Biod.: <4.6E-12	Land use: <3.4 Biod.: <4.6E-13	Land use: <1.8 Biod.: <2.4E-13
Yellow	Land use: >5.0 Biod.: <3.6E-12	Land use: >3.4 Biod.: <1.2E-12	Land use: >3.4 Biod.: <1.2E-12	Land use: >1.8 Biod.: <6.4E-13
Orange	Biod.: >3.6E-12	Biod.: >1.2E-12	Biod:: >1.2E-12	Biod.: >6.4E-13
Water use (Total: m³/kg; Blue: m³/kg; AWARE: m³e/kg)				
Green star	-	-	-	-
Green	Total: <3.2 Blue: <0.20 AWARE: <3.0	Total: <1.6 Blue: <0.10 AWARE: <1.5	Total: <0.5 Blue: <0.03 AWARE: <0.5	Total: <3.2 Blue: <0.20 AWARE: <3.0
Yellow	Total: >3.2 Blue: >0.20 AWARE: >3.0	Total: >1.6 Blue: >0.10 AWARE: >1.5	Total: >0.5 Blue: >0.03 AWARE: >0.5	Total: >3.2 Blue: >0.2 AWARE: >3.0
Orange	AWARE: >25.0	AWARE: >12.5	AWARE: >3.8	AWARE: >25.0
Pesticide use				
Green star	Cert: Organic Legislation: Any	Cert: Organic Legislation: Any	Cert: Organic Legislation: Any	Cert: Organic Legislation: Any
Green	-	-	-	-
Yellow	Cert: No Legislation: EU AS: < 2.5kg AS/ha	Cert: No Legislation: EU AS: < 2.5kg AS/ha	Cert: No Legislation: EU AS: < 2.5kg AS/ha	Cert: No Legislation: EU AS: < 2.5kg AS/ha
Orange	Cert: No Legislation: outside EU AS:>2.5 kg AS/ha	Cert: No Legislation: outside EU AS:>2.5 kg AS/ha	Cert: No Legislation: outside EU AS:>2.5 kg AS/ha	Cert: No Legislation: outside EU AS:>2.5 kg AS/ha

[a]Reliable certification of organic production gives 'one step better' evaluation for biodiversity impact.

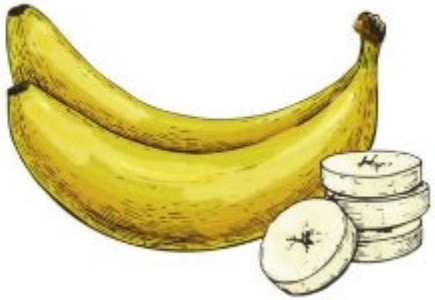
Results products

GROUP	PRODUCT	CLIMATE	BIODIVERSITY	WATER	PESTICIDE USE	FINAL EVALUATION
Protein sources						
	Beans, dried, imported	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Beans, dried, Sweden	GREEN STAR	GREEN STAR	GREEN	YELLOW	GREEN
	Beans, dried, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Beans, dried, organic, Sweden	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Lentils, dried	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Lentils, dried, Sweden[2]	GREEN STAR	GREEN STAR	GREEN	YELLOW	GREEN
	Lentils, dried, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Lentils, dried, organic, Sweden[2]	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Ready-made, soy-based	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Ready-made, soy-based, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Almonds	GREEN	YELLOW	ORANGE	ORANGE	ORANGE
	Almonds, organic	GREEN	YELLOW	ORANGE	GREEN STAR	YELLOW
	Peanuts	GREEN STAR	GREEN STAR	YELLOW	ORANGE	YELLOW
	Peanuts, organic	GREEN STAR	GREEN STAR	YELLOW	GREEN STAR	GREEN
Carbohydrate sources						
	Pasta	GREEN	GREEN STAR	GREEN	YELLOW	GREEN
	Pasta, Sweden	GREEN STAR	GREEN STAR	GREEN	YELLOW	GREEN
	Pasta, organic	GREEN	GREEN STAR	GREEN	GREEN STAR	GREEN
	Pasta, organic, Sweden	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Quinoa	GREEN	YELLOW	GREEN	ORANGE	YELLOW
	Quinoa, organic	GREEN	YELLOW	GREEN	GREEN STAR	GREEN
	Potatoes	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Potatoes, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR

GROUP	PRODUCT	CLIMATE	BIODIVERSITY	WATER	PESTICIDE USE	FINAL EVALUATION
Fruit and berries						
	Apples	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Apples, Sweden	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Apples, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Bananas	GREEN	ORANGE	GREEN	ORANGE	ORANGE
	Bananas, organic	GREEN	YELLOW	GREEN	GREEN STAR	GREEN
	Oranges	GREEN STAR	GREEN STAR	YELLOW	ORANGE	YELLOW
	Oranges, organic	GREEN STAR	GREEN STAR	YELLOW	GREEN STAR	GREEN
	Pears	GREEN STAR	GREEN STAR	GREEN	ORANGE	GREEN
	Pears, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Strawberries	GREEN	GREEN STAR	YELLOW	ORANGE	YELLOW
	Strawberries, Sweden	GREEN STAR	GREEN	GREEN	ORANGE	YELLOW
	Strawberries, organic	GREEN	GREEN STAR	YELLOW	GREEN STAR	GREEN
	Strawberries, Sweden, organic	GREEN STAR	GREEN	GREEN	GREEN STAR	GREEN
Vegetables and mushrooms						
	Asparagus, Europe	YELLOW	GREEN	YELLOW	ORANGE	ORANGE
	Asparagus, Europe, organic	YELLOW	GREEN	YELLOW	GREEN STAR	YELLOW
	Asparagus, south America,	ORANGE	YELLOW	ORANGE	ORANGE	ORANGE
	Cucumber	YELLOW	GREEN STAR	YELLOW	ORANGE	YELLOW
	Cucumber, Sweden	GREEN STAR	GREEN STAR	GREEN	YELLOW	GREEN
	Cucumber, organic	YELLOW	GREEN STAR	YELLOW	GREEN STAR	GREEN
	Cucumber, Sweden, organic	GREEN STAR	GREEN STAR	GREEN	GREEN STAR	GREEN STAR
	Eggplant	YELLOW	GREEN STAR	YELLOW	ORANGE	YELLOW
	Eggplant, organic	YELLOW	GREEN STAR	YELLOW	GREEN STAR	GREEN
	Tomatoes	YELLOW	GREEN STAR	GREEN	ORANGE	YELLOW
	Tomatoes, Sweden	GREEN	GREEN STAR	GREEN	YELLOW	GREEN
	Tomatoes, organic	YELLOW	GREEN STAR	GREEN	GREEN STAR	GREEN
	Tomatoes, Sweden, organic	GREEN	GREEN STAR	GREEN	GREEN STAR	GREEN
	Mushrooms[a]	ORANGE	GREEN STAR	GREEN	ORANGE	YELLOW
	Mushrooms, organic[a]	ORANGE	GREEN STAR	GREEN	GREEN STAR	GREEN

Online tool

BANANER



Bananer växer på så kallade bananstockar på bananplantor i tropiska länder. På en bananstock finns upp till 200 bananer! Stocken hänger lodrätt ner från plantan med en stor mörkröd bananblomma längst ner. Det finns över 1000 olika bananSorter i världen, och två huvudgrupper är ätbananer – som är de vi äter mest av i Sverige – och kokbananer. I Vegoguiden pratar vi om ätbananer.

Bananer i svenska butiker kommer ofta från länder i Mellan- och Sydamerika. Att odla bananer kan innebära hög risk för förlust av biologisk mångfald eftersom odlingarna kan anläggas i områden som är naturligt artrika. Bananplantager kan alltså tränga undan dessa viktiga arter. Användningen och lagstiftningen kring bekämpningsmedel har också uppmärksammats och konsumenttrycket har därför gjort att konventionella bananer nu nästan är borta från marknaden i Sverige, och de ekologiska har blivit standard.

WWFs råd

Ät gärna

Ekologiska bananer
Ekologiska bananer är odlade utan kemiska bekämpningsmedel och konstgödsel. Kolla efter KRAV-märkta eller EU-ekologiska!

Ät ibland

Bananer certifierade med Rainforest Alliance
Rainforest Alliance har starka krav för att stötta ökad biodiversitet i bananodlingarna, men kemiska bekämpningsmedel får användas.

Var försiktig

Bananer

- CITRON OCH LIME

- CLEMENTINER OCH MANDARINER

- DADLAR

- GRAPEFRUKT

Reflections

- Interesting!
- WWF final decision
  - How much that should be visible for the consumer
  - Green star for water

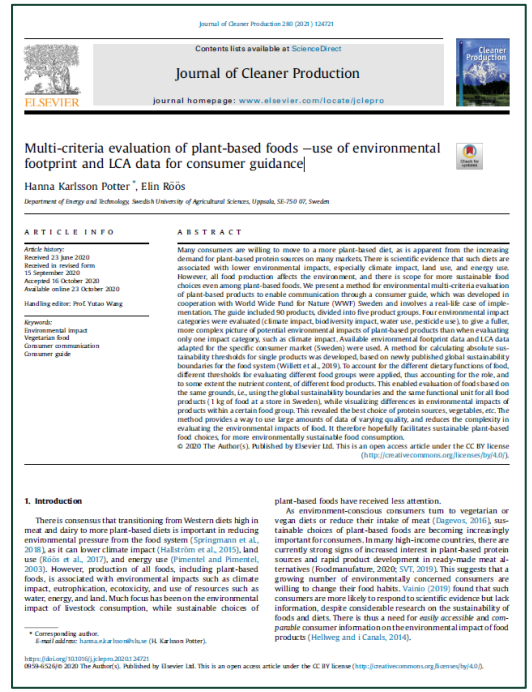
More information

Report:

Environmental impact of plant-based foods – Data collection for the development of a consumer guide for plant-based foods

Scientific article:

Multi-criteria evaluation of plant-based foods – use of environmental footprint and LCA data for consumer guidance



Thank you!

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