Perspectives from the EAT-Lancet report Healthy food for 10 billion people on a healthy planet

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Humanity's 10 000 years of relative stability

Stockholm Resilience Centre and Rockström and others, Ecology and Society 2009:14



The Great Acceleration



Image: GLOBAIA

Planetary boundaries



Food's contribution to planetary boundaries:

Climate 25%

and-system

Freshwa

- Land Use 75%
- Biodiversity 75-80%
- Nitrogen and phosphorous 100%

acid

• Water 70%

Gordon et al. 2017

Safe Operating Space Inside which we have opportunities for change

Zone of Uncertainty Where we see increased risks of rapid change

Planetary Boundaries Large risks to destabilize the biosphere

Rockström et al. 2009, Steffen et al. 2015

Eating habits change with economic growth



Increase with economic growth: More meat, more empty calories, more calories in total

Tilman and Clark 2014



Food in the Anthropocene: The EAT-Lancet Commission on Healthy Diets From Sustainable Food Systems

> Food Planet Health

Willet et al. 2019, Lancet

EAT-Lancet Commission Approach

Define a healthy reference diet using the best available evidence (controlled feeding studies, long-term cohort studies, randomized trials).

Define planetary boundaries for 6 key environmental systems and processes (GHG, cropland use, water use, nitrogen and phosphorus application, extinction rate).

Apply a global food systems modeling framework to analyze what combinations of readily implementable measures are needed to stay within food production boundaries while still delivering healthy diets by 2050.

Outline Strategies to achieve the changes needed to meet the goal of healthy diets from sustainable food systems for all by 2050.

Willet et al. 2019, Lancet

Step 1 – Healthy Diets 2500 kcal/day



		Macronutrient intake grams per day (possible range)	Caloric intake kcal per day
*	Whole grains Rice, wheat, corn and other	232	811
	Tubers or starchy vegetables Potatoes and cassava	50 (0–100)	39
Í	Vegetables All vegetables	300 (200–600)	78
6	Fruits All fruits	200 (100–300)	126
•	Dairy foods Whole milk or equivalents	250 (0–500)	153
)	Protein sources Beef, lamb and pork Chicken and other poultry Eggs Fish Legumes Nuts	14 (0–28) 29 (0–58) 13 (0–25) 28 (0–100) 75 (0–100) 50 (0–75)	30 62 19 40 284 291
6	Added fats Unsaturated oils Saturated oils	40 (20–80) 11.8 (0-11.8)	354 96
	Added sugars All sugars	31 (0–31)	120

Willet et al. 2019, Lancet

Current Intakes vs Planetary Health Diet



Step 2 – Sustainable Food Production

Earth system process	Control variable	Boundary (Uncertainty range)
Climate change	GHG emissions	5 Gt CO₂-eq yr⁻¹ (4.7 – 5.4 Gt CO ₂ -eq yr ⁻¹)
Land-system change	Cropland use	13 M km² (11–15 M km²)
Freshwater use	Water use	2,500 km³ yr⁻¹ (1000–4000 km³ yr⁻¹)
Nitrogen cycling	N application	90 Tg N yr⁻¹ (65–90 Tg N yr ⁻¹) * (90–130 Tg N yr ⁻¹)**
Phosphorus cycling	P application	8 Tg P yr⁻¹ (6–12 Tg P yr⁻¹) * (8–16 Tg P yr⁻¹)**
Biodiversity loss	Extinction rate	10 E/MSY (1-80 E/MSY)
		willet et a

Step 3 – **Modelling the operating space we need** for a healthy diet within planetary boundaries

Actions	Description
Dietary shift Planetary health diet	Planetary health diet – as outlined in Table 1.
Halve waste Reduced food loss and waste	Food losses and waste reduced by half, in line with SDG target 12.3.
PROD Improved production practices Standard level of ambition	Closing yield gaps to about 75%; rebalancing N and P application; improving water management; implementation of agricultural mitigation options; and land is expanded first into secondary habitat and then to intact forests to minimize impacts on biodiversity.
PROD+ Improved production practices High level of ambition	Closing yield gaps to 90%; a 30% increase in N use efficiency and 50% recycling rates of P; phase-out of first-generation biofuels; implementation of available bottom-up options for mitigating GHG emissions; and optimizing land-use across regions to minimize impacts on biodiversity.

Scenarios - global			illion						
				GHG emistic	10 pm		en `on	Phosphorus application	Biodiversity loss
	Food produ	ction boundary	1	diet to	i f			8 (6.0–16.0)	10 (1–80)
	Baseline in 2	2010	alth	N jaries	1			17.9	100-1000
	Production (2050)	Waste (2050)	eahea.	Junga	- M				
	BAU	- hav	atary	ct	10.	3.0	199.5	27.5	1,043
	BAU	dero de	ne	aroau		3.0	191.4	25.5	1,270
	205SI	thin P.	diet vole	Υ·	18.2	2.6	171.0	23.2	684
14	15 P	NIL. JONE	impro	aste	18.1	2.6	162.6	21.2	885
	copie	implyial	N mand v	8.9	14.8	2.2	187.3	25.5	206
·	be Ne	tantic	S at att	4.5	14.8	2.2	179.5	24.1	351
	1. 51	ibsi od	JAU	8.3	12.7	1.9	160.1	21.5	50
	P. 2.	Jalf TU .ce	Dietary shift	4.1	12.7	1.9	151.7	20.0	102
	PRC 3.	all waste	BAU	8.7	13.1	2.2	147.6	16.5	37
	PROD	Full waste	Dietary shift	4.4	12.8	2.1	140.8	15.4	34
	PROD+	Halve waste	BAU	8.1	11.3	1.9	128.2	14.2	21
	PROD+	Halve waste	Dietary shift	4.0	11.0	1.9	121.3	13.1	19

Seek international and national commitment to shift towards healthy diets



Healthy food needs to be available and accessible

The range from soft (e.g. information) to hard (e.g. regulations) policy options *should be considered* and for actions at multiple scales, municipal, cities, national, international.

Examples of areas of improvements:

Information and food marketing Investing in public health information and sustainability education

Public meals

Using health care services to deliver dietary advice interventions

Reorient agricultural priorities from producing high quantities of food to producing healthy food



Change in Food Production



2050 planetary health diet + halve waste



Sustainably intensify food production to increase high-quality output



Yield gap – difference between actual and attainable yields



More sustainability

Sustainable Intensification

Global redistribution of fertilizers (N & P)

Figure 5

Existing crop yield gaps. Shown is the ratio of current yields to potential yields, as estimated by 92 (see also http://www.yieldgap.org/ water-productivity). A ratio of 0.2 indicates that a nation, on average, has crop yields 20% of what that nation is capable of yielding. Low ratios indicate large yield gaps, or the difference between current yields and potential yields. Countries in gray are missing data on either current yields or potential yields. Clark et al. 2018 Annual Review of Env. Resour.

Strong and coordinated governance of land and oceans



At least halve food losses and waste, in line with UN Sustainable Development Goals



Areas of improvement include

Infrastructure, storage across value chain Packaging and processing technology Food labelling, Food safety policies, Information and education campaigns



In *low income countries* most food loss at production stage

In *high income countries* food loss at consumption stage



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In summary: A future food system needs

- To nourish people and planet
- Diets can be a leverage point to a healthy and sustainable food system...
- ...but only if its combined with action in other sectors,
- including the reorientation of production priorities, cutting food loss and waste, and protecting nature
- Don't forget about gastronomy and community something that connects people together

Without a transformation of the global food system, the world risks failing to meet the UN Sustainable Development Goals (SDGs) and the Paris Agreement and the data are both sufficient and strong enough to warrant immediate action.

Widespread multi-sector, multi-level action is needed including: a substantial global shift toward healthy dietary patterns; large reductions in food loss and waste; and major improvements in food production practices.



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Photo: O.Henriksson/Azote

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