

Research Gaps and Future Directions

NASEM Food Forum

*Food Product Labeling: Challenges of Defining
Sustainability*

Thursday, October 10, 2023

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What is sustainability?

Sustainability means
“meeting the needs of the
present without
compromising the ability of
future generations to meet
their own needs.”

Brundtland Commission, 1987



What are sustainable diets?

“Those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutrition adequate, safe and healthy, while optimizing natural and human resources.”

Burlingame & Dernini, FAO, 2012

Research Gap 1: Developing Tractable and Comprehensive Metrics of Sustainable Foods and Diets

Sustainable food systems and diets



Global burden of
disease and poor
nutrition



Environmental
footprint



Labor and
livelihoods



Rising cost of food

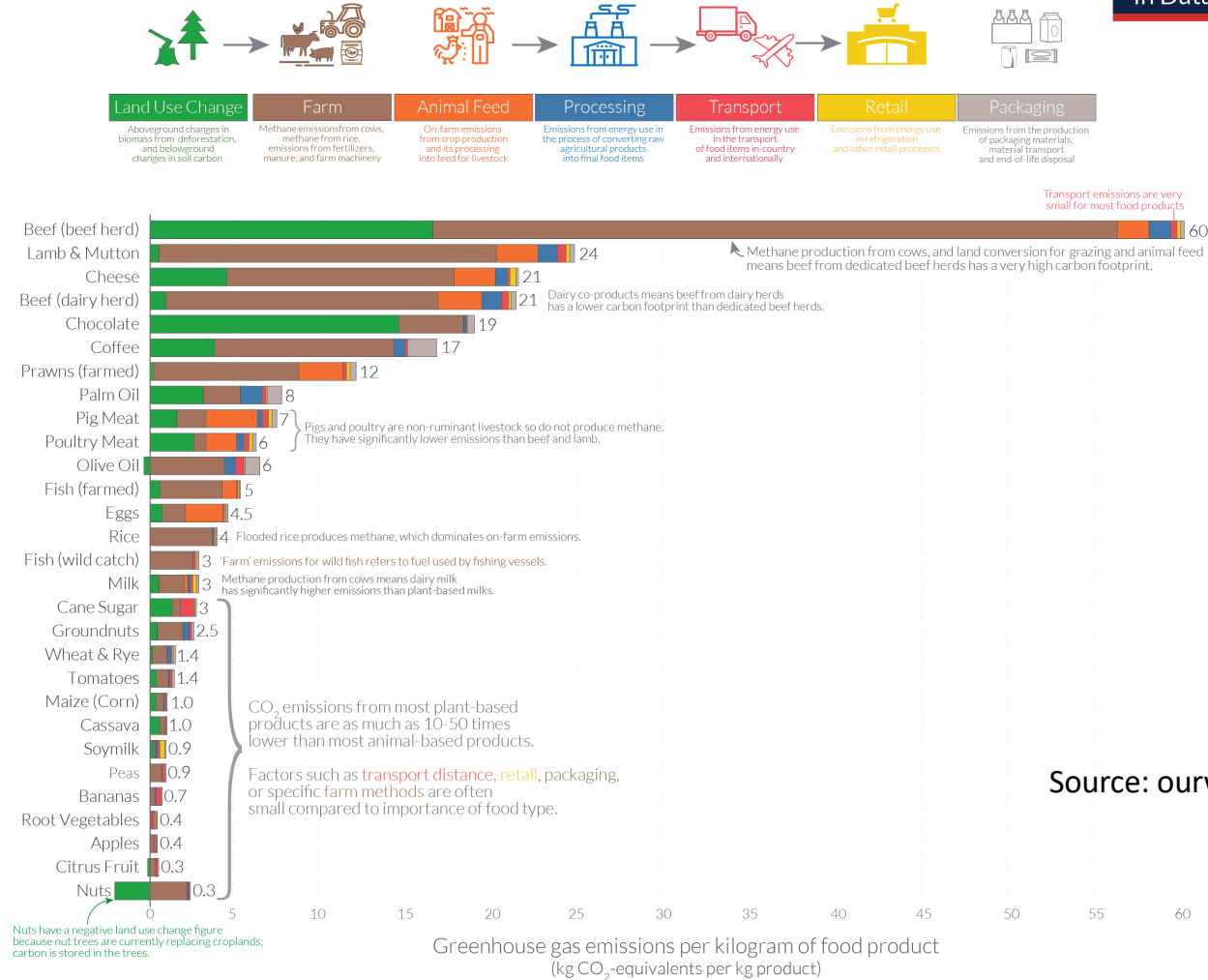
Environmental LCA (E-LCA)

- E-LCA = environmental life cycle assessment
 - Method to estimate environmental impacts of a product or service across its life cycle
- “Cradle-to-gate” or “cradle-to-grave”
- Several product-level databases available



Food: greenhouse gas emissions across the supply chain

Our World
in Data



Source: ourworldindata.org, April 2022

Note: Greenhouse gas emissions are given as global average values based on data across 38,700 commercially viable farms in 119 countries.

Data source: Poore and Nemecek (2018). Reducing food's environmental impacts through producers and consumers. *Science*. Images sourced from the Noun Project.

OurWorldinData.org – Research and data to make progress against the world's largest problems.

Licensed under CC-BY by the author Hannah Ritchie.

Social LCA (S-LCA)

- Method to assess the potential social impacts of a product or service across its life cycle
- Combines some of the modeling capabilities of environmental LCA with social science methods
 - Quantitative and qualitative data

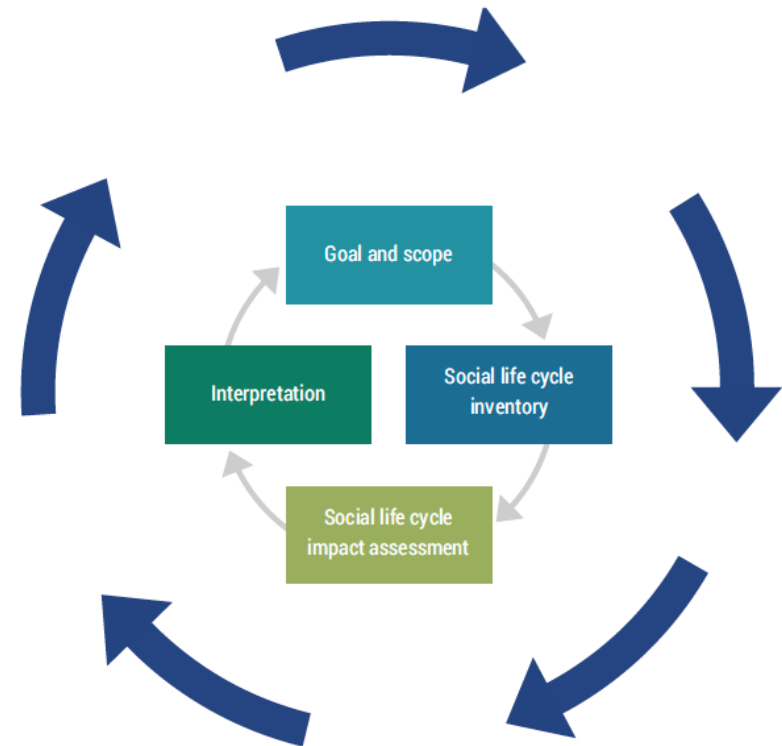
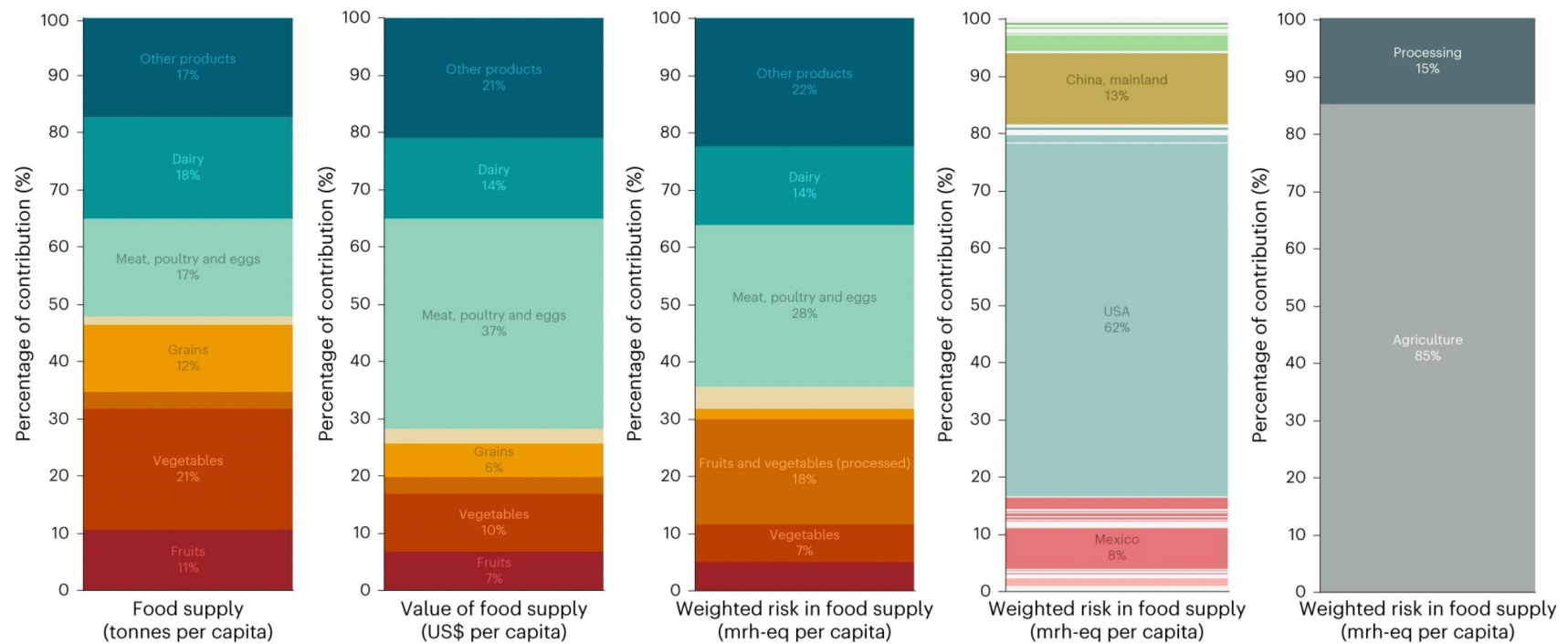


Fig. 3: Quantity and value of the US land-based food supply versus embedded forced labour risk by product category, country of origin and supply chain stage.

From: [Forced labour risk is pervasive in the US land-based food supply](#)



(Blackstone et al., 2023, *Nature Food*)



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Measurement of diets that are healthy, environmentally sustainable, affordable, and equitable: A scoping review of metrics, findings, and research gaps

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Introduction: Research on the impacts of dietary patterns on human and planetary health is a rapidly growing field. A wide range of metrics, datasets, and analytical techniques has been used to explore the role of dietary

Knowledge Gaps – Sustainable Diets

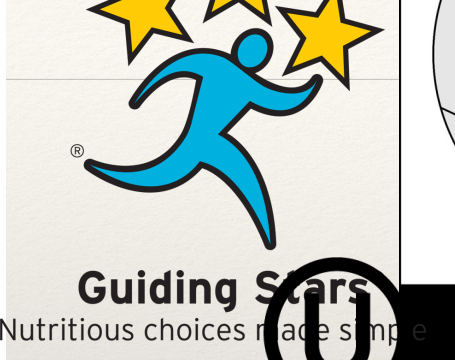
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- Greater transparency and clarity in methods is needed
 - More integration of social and economic issues (tradeoffs!)
 - More representation of LMICs
 - Greater inclusion of processed foods
 - Greater attention to (real) implications for policymakers

Research Gap 2: Communicating these Metrics of Sustainability



PER SERVING

450 CALORIES	5g SAT FAT 25% DV	360mg SODIUM 15% DV	14g SUGARS	500mg POTASSIUM 100% DV	3g FIBER 12% DV
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Nutrition Facts
8 servings per container
Serving size 2/3 cup (51g)

Amount per 2/3 cup	
Calories	230
% DV*	
12%	Total Fat 8g
5%	Saturated Fat 1g
	Trans Fat 0g
0%	Cholesterol 0mg
7%	Sodium 160mg
12%	Total Carbs 37g
14%	Dietary Fiber 4g
	Sugars 1g
	Added Sugars 0g
	Protein 3g

Each 1/2 pack serving contains

MED	LOW	MED	HIGH
Calories	Sugar	Fat	Sat Fat
353	0.9g	20.3g	10.8g
18%	1%	29%	54%

of your guideline daily amount



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All ecolabels

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Alphabetical index of 456 ecolabels.

[A](#)[B](#)[C](#)[D](#)[E](#)[F](#)[G](#)[H](#)[I](#)[J](#)[K](#)[L](#)[M](#)[N](#)[O](#)[P](#)[Q](#)[R](#)[S](#)[T](#)[U](#)[V](#)[W](#)[X](#)[Y](#)[Z](#)



4C Association

The 4C Association is a multi-stakeholder organization that brings together actors that are committed to addressing the sustainability issues of the coffee sector in a pre-competitive manner. The members of the 4C Association include coffee farmers (both big and small), traders (importers and exporters), industry players (coffee roasters and retailers) and civil society (non-governmental organizations, ...)



80 PLUS

The original premise of the 80 PLUS program was to enlist utilities and computer manufacturers to participate in an innovative upstream buy-down program to integrate more energy-efficient power supplies into desktop computers. The program has now evolved into the Ecos Plug Load Solutions program, which promotes and incents a broad array of highly energy-efficient commercial and retail technologies.



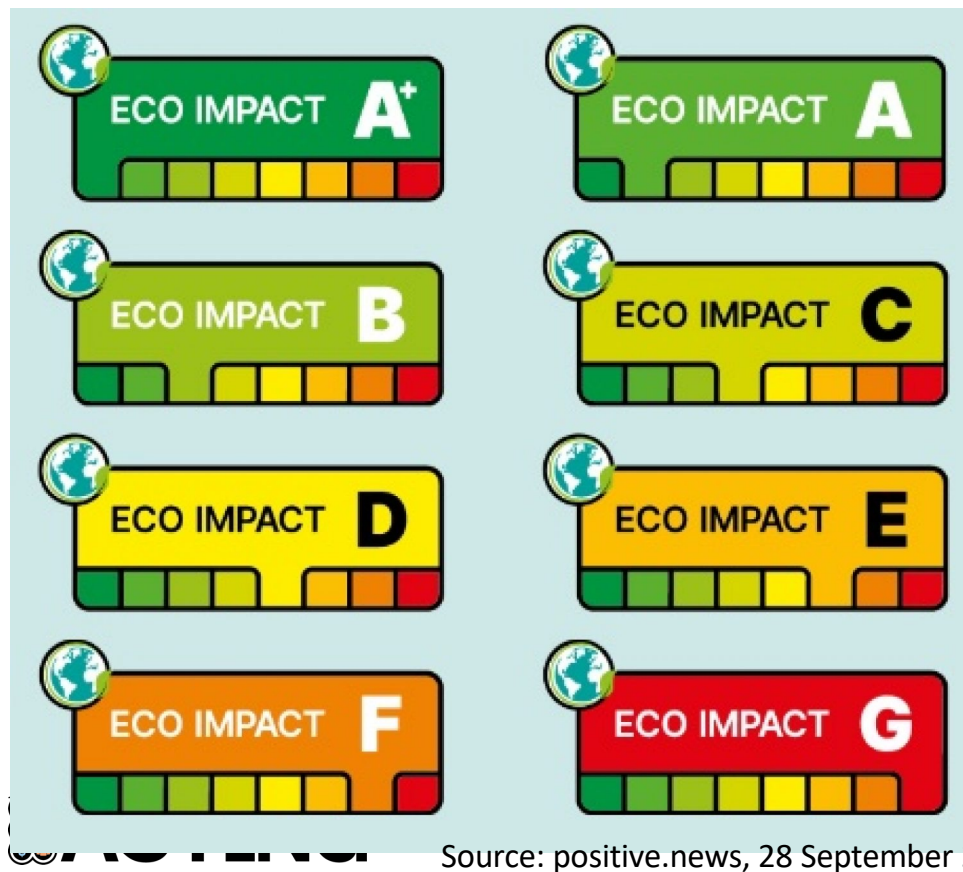
AB (Agriculture Biologique)

France's national logo for organic products since 1985. Organic products carrying the logo must contain more than 95 percent organic components, and be produced or processed within the [EU](#), and were certified by one of the inspection bodies accredited according to EN 45011.

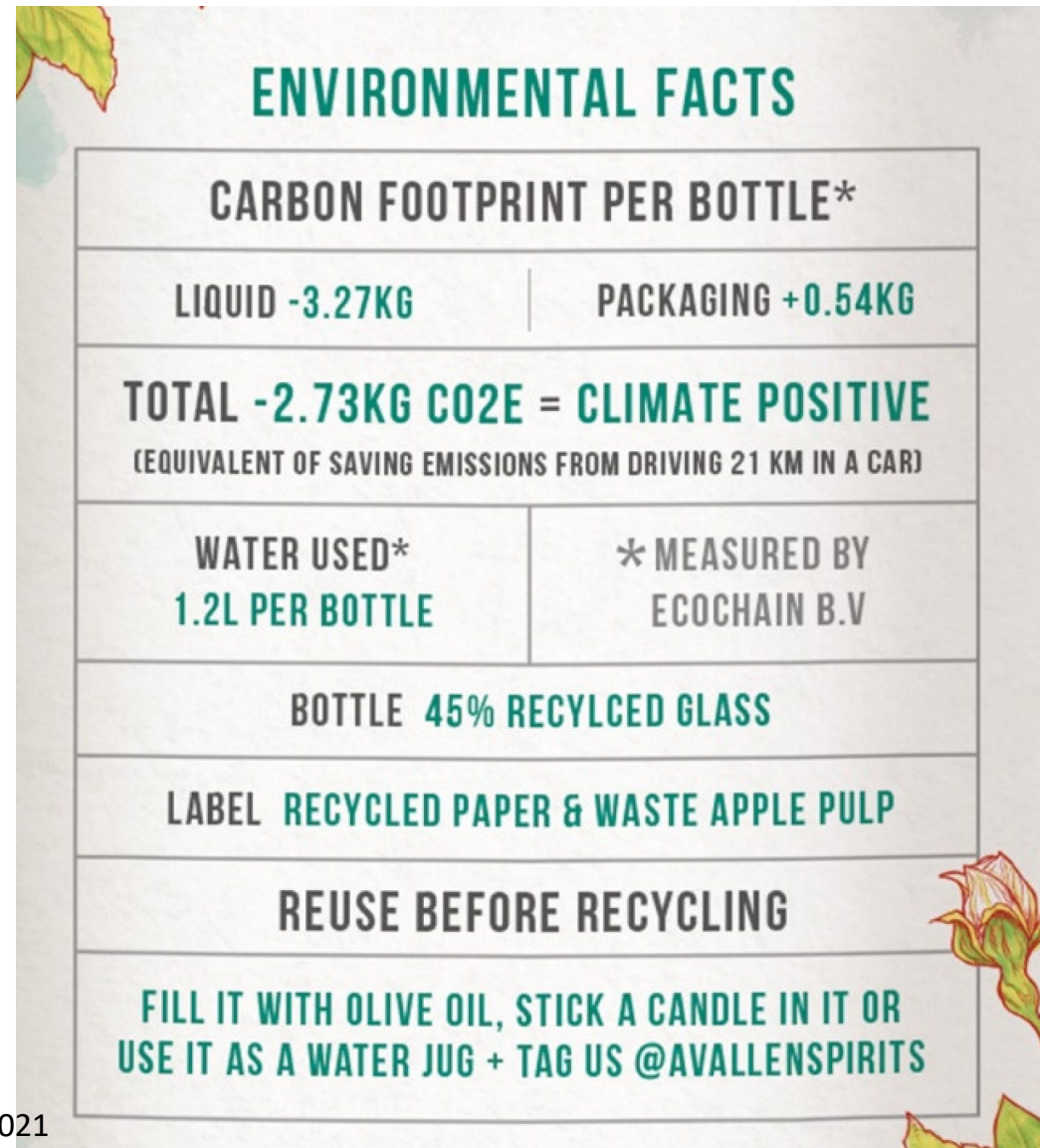
L'Agence Bio began managing and promoting the label in 2008.

Source: ecolabelindex.com/ecolabels, Sept. 2023

Reductionist vs. detailed labels



Source: positive.news, 28 September 2021



Research Gap 3: Connecting Labeling and Food Choice to Impacts



- Not (just) for marketing
- Not (just) for estimating willingness to pay
- Not as a convenient/fun mechanism for other research goals
- What is needed is real research linking labeling & consumer food choice to impacts — observed and not just predictive modeling

Research Gap 4: Labeling Influences on Producers and Product Formulations



Amount Per Serving		cup (121g)
Calories 25		Container about 3.5
Total Fat 0g		Calories from Fat 0
Saturated Fat 0g	% Daily Value*	0%
Trans Fat 0g		0%
Cholesterol 0mg		0%
Sodium 340mg		
Total Carbohydrat		
Dietary Fiber 1		
Sugars 3		

CA
TO H
PAN. H
TASTE;
TO MICROW
MICROWAVE
AND STIR. SEA

Research Challenge: Funding Landscape

- 
- NSF
 - NIH
 - USDA NIFA
 - Other agencies
 - Foundations

Future Directions: Sustainability labels are influenced by more than labeling policy



Production and policy necessities will drive sustainability labeling trends as much as consumer interest.

Climate Change Is Changing Your Coffee and Not in a Good Way

Here's another thing global warming is attempting to take from us.

By [Megan Schaltegger](#) Published on 10/27/2021 at 5:57 PM



WAVEBREAK MEDIA/SHUTTERSTOCK

Obviously, we had already concluded that climate change is bad. It's the reason for our wildfires, severe storms, and loss of species. Now, it's coming for our coffee, too.

A recent scientific review conducted by a team of researchers at Tufts University and Montana State University found that global warming is not only changing the coffee bean crop's growth, but is also changing its taste, aroma, and overall quality, [Food & Wine reports](#). Translation: Your cup of joe is going downhill thanks to a little thing called climate change.

"A subpar cup of coffee has economic implications as well as sensory ones. Factors that influence coffee production have great impacts on buyers' interest, the price of coffee, and ultimately the livelihoods of the farmers who grow it," senior author of the study and professor at the Tufts' Friedman School of Nutrition Science and Policy Sean Cash said, according to *F&W*. "If we can

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Coffee taste and aroma challenged by climate change, finds US study

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27 Oct 2021 --- Coffee's sensory qualities, such as taste and aroma, are being impacted by shifts in climate change. This is according to researchers at Tufts and Montana State University in the US who found that yield is not the only factor vulnerable to environmental shifts.

Subtle changes in flavor notes, brightness, and other variables to terroir should also be taken into account.

"A subpar cup of coffee has economic implications as well as sensory. Factors that influence coffee production have great impacts on buyers' interest, coffee price, and ultimately the livelihoods of the farmers who grow it," says Sean Cash, a professor in global nutrition at Tufts and senior author on the study.

The work published in [Frontiers in Plant Science](#) reviewed 73 published articles, examining the effects of 10 prevalent environmental factors. It also details current adaptation strategies that could combat these effects, providing hope for positive outcomes.





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Press Release

SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors

FOR IMMEDIATE RELEASE
2022-46

Washington D.C., March 21, 2022 — The Securities and Exchange Commission today proposed rule changes that would require registrants to include certain climate-related disclosures in their registration statements and periodic reports, including information about climate-related risks that are reasonably likely to have a material impact on their business, results of operations, or financial condition, and certain climate-related financial statement metrics in a note to their audited financial statements. The required information about climate-related risks also would include disclosure of a registrant's greenhouse gas emissions, which have become a commonly used metric to assess a registrant's exposure to such risks.

"I am pleased to support today's proposal because, if adopted, it would provide investors with consistent, comparable, and decision-useful information for making their investment decisions, and it would provide consistent and clear reporting obligations for issuers," said SEC Chair Gary Gensler. "Our core bargain from the 1930s is that investors get to decide which risks to take, as long as public companies provide full and fair disclosure and are truthful in those disclosures. Today, investors representing literally tens of trillions of dollars support climate-related disclosures because they recognize that climate risks can pose significant financial risks to companies, and investors need reliable information about climate risks to make informed investment decisions. Today's proposal would help issuers more efficiently and effectively disclose these risks and meet investor demand, as many issuers already seek to do. Companies and investors alike would benefit from the clear rules of the road proposed in this release. I believe the SEC has a role to play when



Source: www.sec.gov/news/press-release/2022-46, 21 March 2022



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The takeaway

- Important research gaps exist in
 - Developing tractable metrics of sustainable foods and diets
 - Looking at tradeoffs across all aspects of sustainability
 - Communication of sustainability metrics
 - Understanding how labeling regimes influence formulations
 - Connecting labels to impacts
- The federal funding landscape is not fully suited to address these gaps
- Production and policy necessities will drive sustainability labeling trends as much as consumer interest



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