

# Les systèmes agroalimentaires et le changement climatique : défis et opportunités

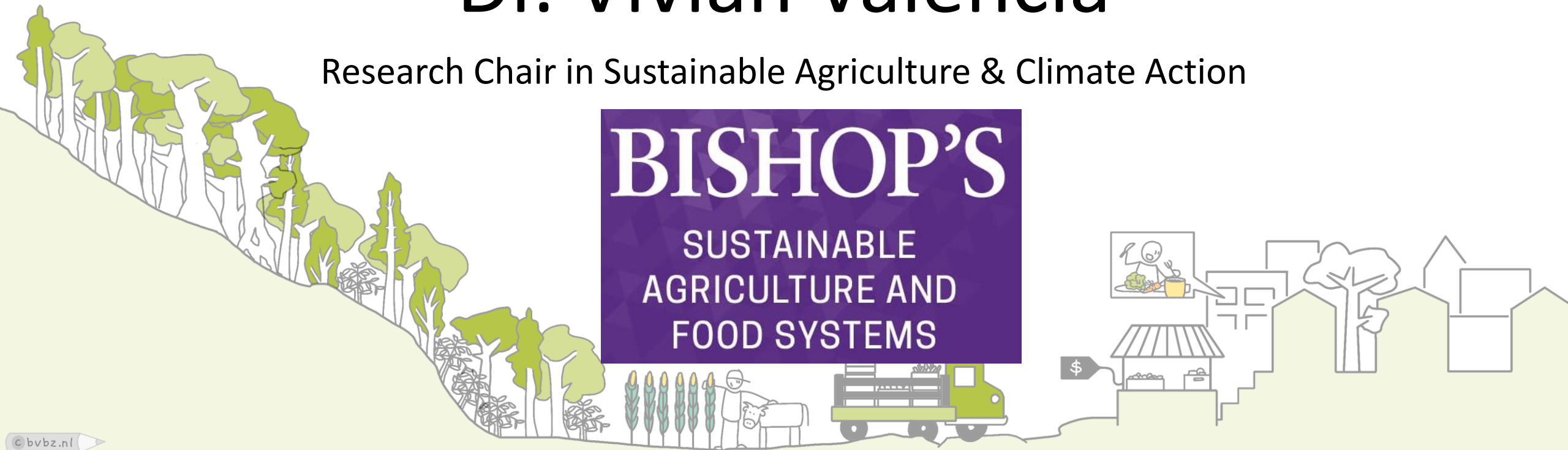
**COP 28 : Les universités québécoises s'unissent pour le climat**

## Dr. Vivian Valencia

Research Chair in Sustainable Agriculture & Climate Action



**BISHOP'S**  
SUSTAINABLE  
AGRICULTURE AND  
FOOD SYSTEMS

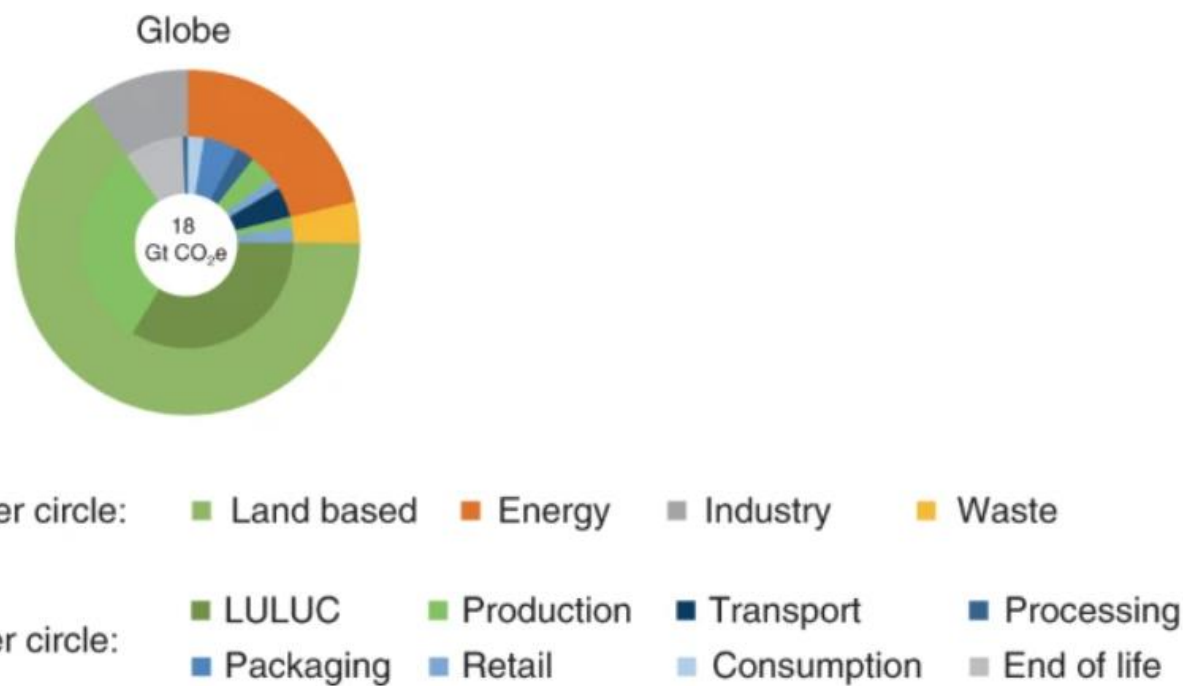


# What are food systems

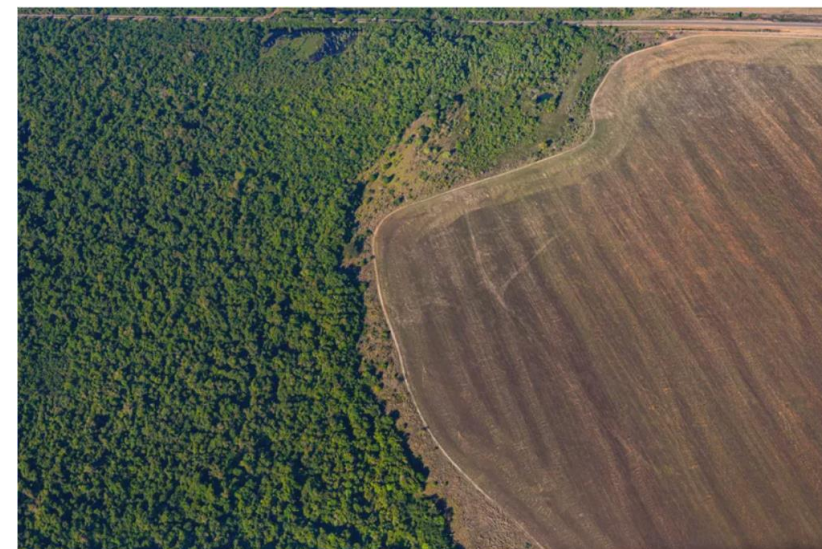


# FOOD SYSTEMS AND CLIMATE CHANGE

**Fig. 1: GHG emissions from the food system in different sectors in 2015.**



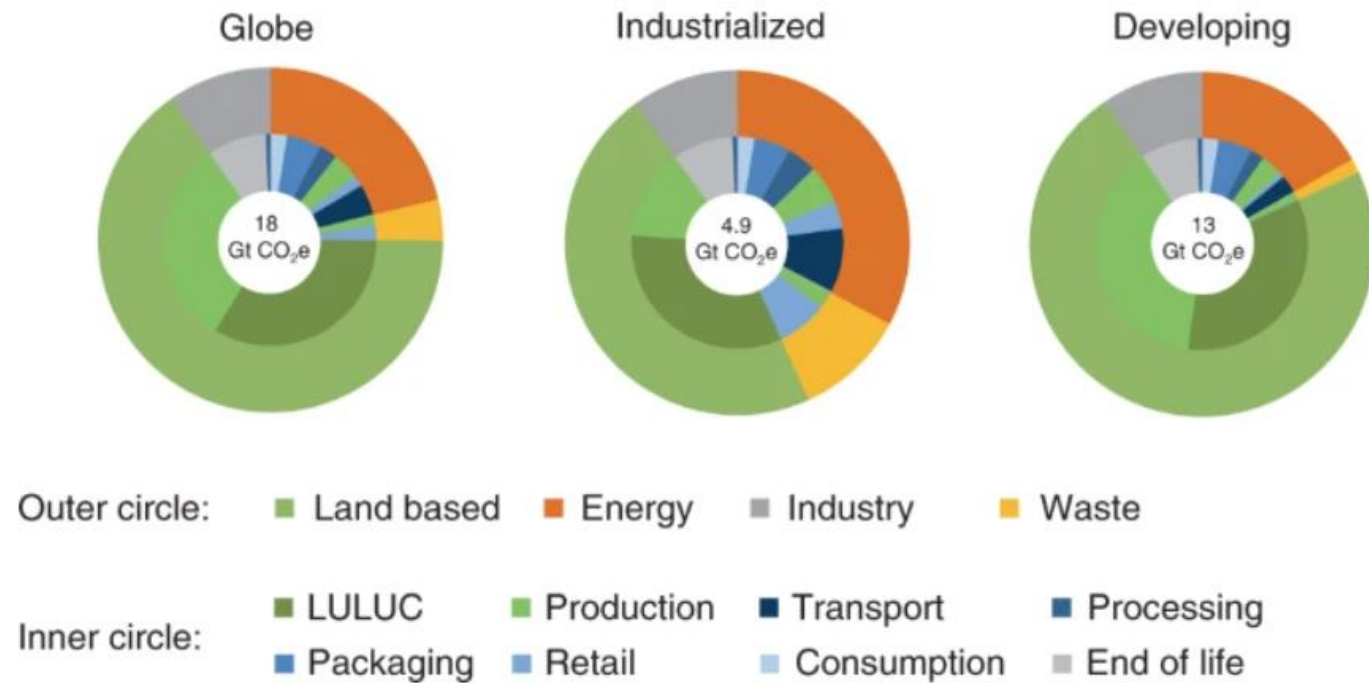
The largest contribution of GHG emissions come from agriculture and land use/land cover change activities.



Lucas Ninno / Getty Images

# FOOD SYSTEMS AND CLIMATE CHANGE

**Fig. 1: GHG emissions from the food system in different sectors in 2015.**



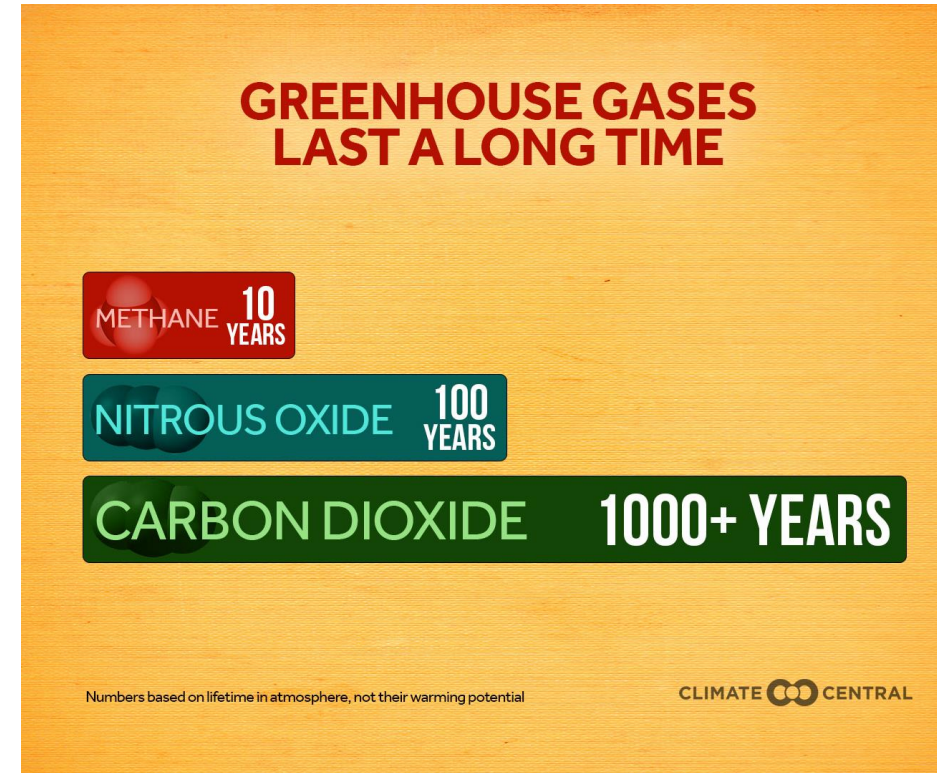
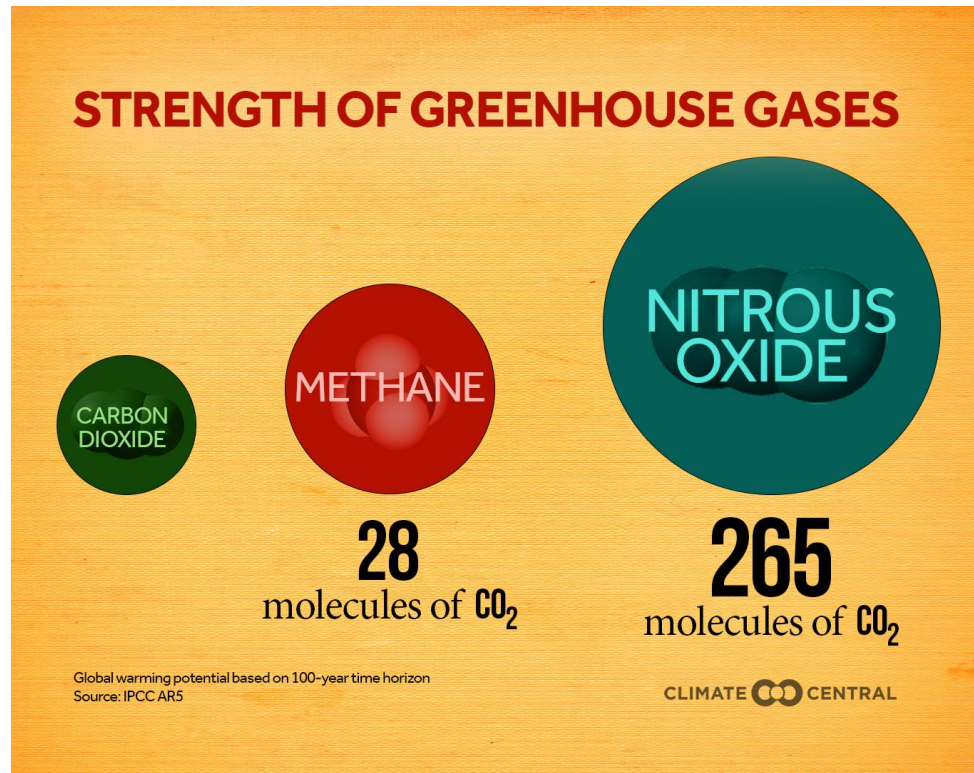
**Food system emissions represent one-third of the total GHG emissions; 73% is emitted by developing countries while 27% is emitted by industrialized countries.**

# Agricultural production's contribution to global warming

Agricultural activities worldwide accounts for roughly:

- Nearly half of global methane (CH<sub>4</sub>) emissions,
- Two-thirds of **nitrous oxide** (N<sub>2</sub>O) emissions, and
- 3% of **carbon dioxide** (CO<sub>2</sub>) emissions.

# Global warming potential and lifetime of greenhouse gases in the atmosphere

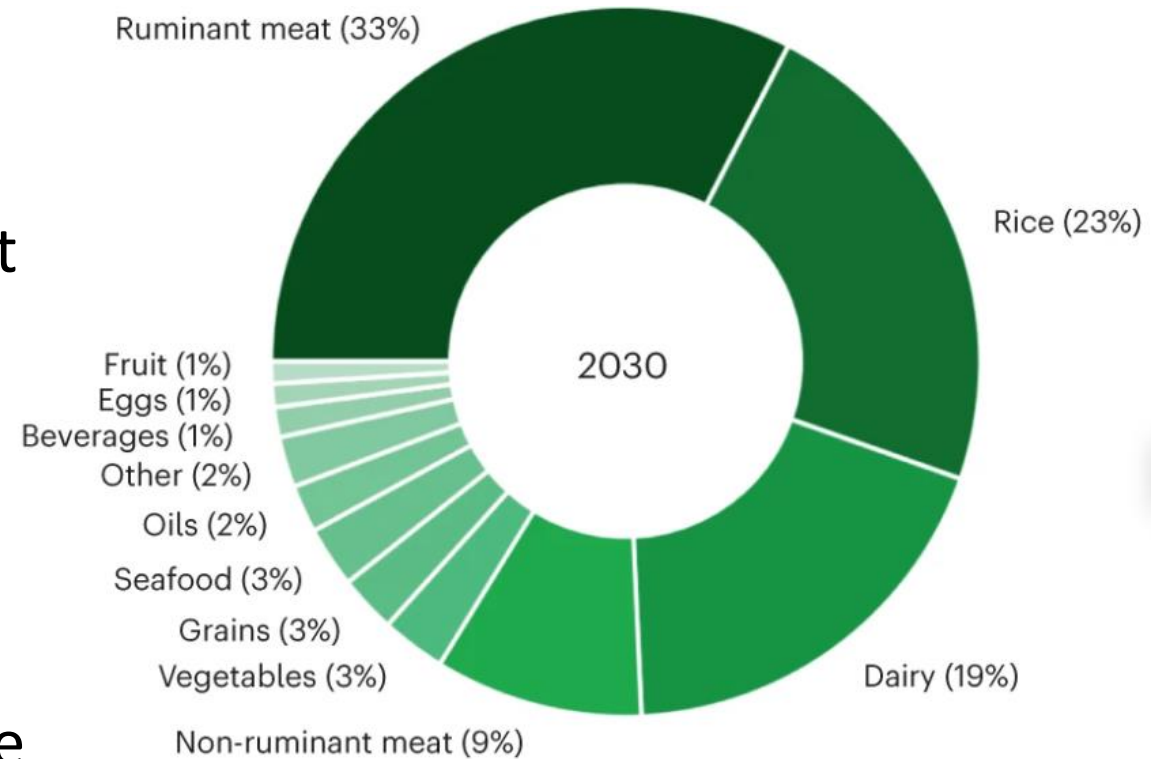


# Greenhouse gas emissions by food type

- GHG emissions from the production of food: **57%** corresponds to the production of **animal-based** food (including livestock feed), **29% to plant-based foods** and 14% to other utilizations (e.g., cotton, palm oil)
- Rice and beef are the largest contributing plant- and animal-based commodities (12% and 25%, respectively)
- These foods are high sources of methane

# If dietary patterns continue unchanged...

- Global food consumption alone could add nearly 1°C to warming by the year 2100.
- 75% of future warming from global food consumption will be driven by foods that are **high sources of methane**, such as ruminant meat (e.g., beef), dairy and rice
- **Over 55% of anticipated warming from global food consumption could be avoided** by *optimizing* the system, i.e., improving production practices, and *redesigning* consumption patterns by the adoption of a healthy and sustainable diet



Relative contribution of food groups to global warming, projection for 2030.

## A GLOBAL call to action

CO



- In 2022, during the 27th COP of the UNFCCC, there was a significant emphasis placed on **transforming our food systems**. This was the **first time** that food and agricultural systems were given such prominence in the climate global negotiations.
- In December 2022, this momentum carried to COP15 on Biodiversity (CBD) in Montreal, where discussions focused on the centrality of '**food for the future of nature**'.

These recognitions at a global level acknowledge that without transforming our food systems, we cannot attain a stable climate, adequately feed the world's population, or preserve biodiversity.



# How do we get to (more) sustainable, climate-friendly food systems?

How can we change...

how we **produce and consume** our food?

the **institutions and rules** that keep the “status quo” in place?

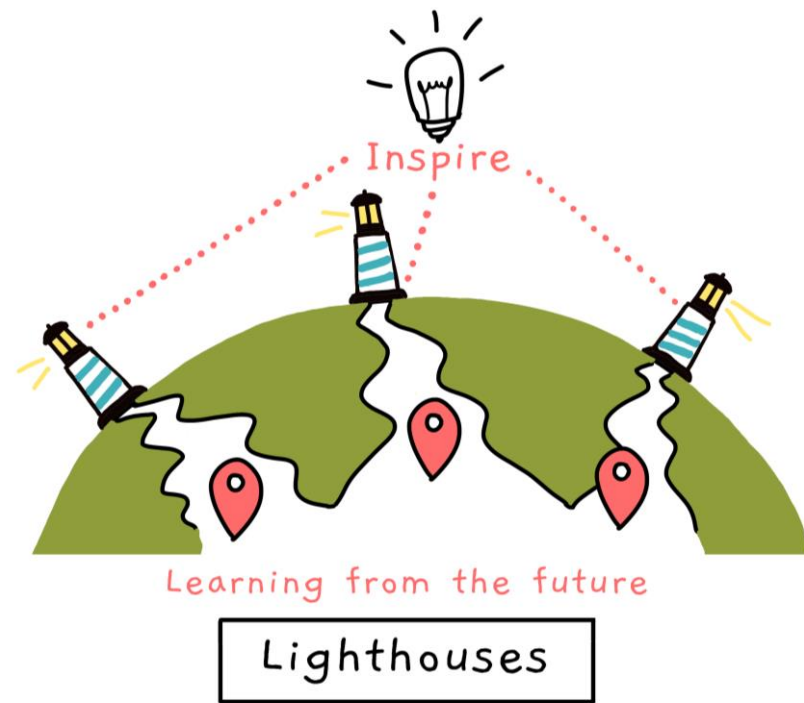
our **norms and values** around food?

We must disrupt the status quo



# Lighthouse Framework:

## Extraordinary cases that illuminate ways forward

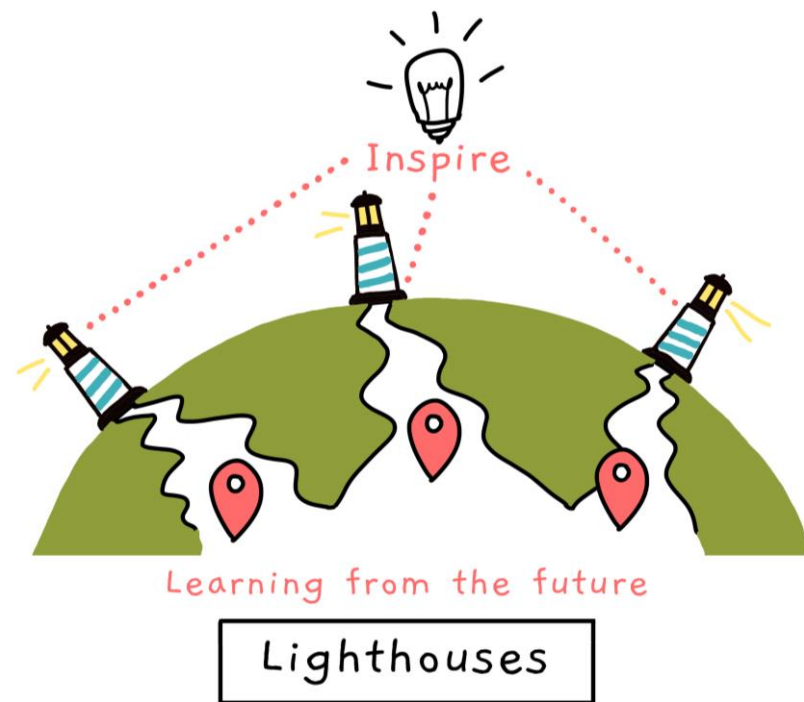


**ENVIRONMENTAL RESEARCH**  
LETTERS

**PERSPECTIVE**

Learning from the future: mainstreaming disruptive solutions for the transition to sustainable food systems

Vivian Valencia<sup>1,\*</sup>, Elena M Bennett<sup>2</sup> , Miguel Altieri<sup>3</sup>, Clara Nicholls<sup>4</sup>, Annemiek Pas Schrijver<sup>1</sup> and Rogier P O Schulte<sup>1</sup> 



| Initiative                         | Positive outliers          | Societal transformation |
|------------------------------------|----------------------------|-------------------------|
| Global Network of Lighthouse Farms | Lighthouses                | Scaling up              |
| Agroecological Lighthouses         | Agroecological lighthouses | Scaling out             |
| Seeds of Good Anthropocenes        | Bright spots               | Scaling deep            |
|                                    | Seeds                      |                         |

# How are we applying this framework to investigate transitions to more sustainable food systems?



Agroecological restoration in Ethiopia



PhD student Tewodros  
Gebreegziabher



Towards circular food  
systems: rethinking waste



PhD student Laura Schutz de Rivera

# Establishment of Lighthouse Network in Canada

## Planting seeds of change

13 September 2023 at 18 h 18 min

Reading time: 1 min 30 s



*Bishop's University appoints new Research Chair in Sustainable Agriculture and Climate Action*

 **laTribune**

 Info

## La production alimentaire dans la mire d'une professeure de Bishop's

Par Lilia Gaulin, La Tribune | 7 septembre 2023



en compagnie

 **CBC LISTEN** Live Radio

## All in a Weekend with Sonali Karnick



New research chair at Bishop's University searches for a "lighthouse network" of innovators

 Play Segment

10:41

 Share Segment

Vivian Valencia is a new research chair in Sustainable Agriculture and Climate Action at Bishop's University in Sherbrooke. She talks to us about her new role in the creation of a 'lighthouse network'. These lighthouses are innovative approaches to food production and distribution that will be ecological and sustainable. (If you know of any, you can contact her at [vvalenci@ubishops.ca](mailto:vvalenci@ubishops.ca).)

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# Establishment of Lighthouse Network in Quebec

- For research, education, and outreach
- Criteria for 'lighthouses'? what can a network offer? what can we learn?



Workshop with students and faculty to discuss 'lighthouse network', Sept. 2023.

Merci!

Dr. Vivian Valencia

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