

## Theme: Environment & Sustainability

### Food for Thought:

#### Investigating Food Production's Ecological Impact

##### **Problem statement** (Environment Challenge)

As the global population continues to expand, the demand for food, energy, and water has surged, leading to complex environmental challenges. Food production is not only a critical contributor to greenhouse gas emissions but also heavily reliant on water and energy resources. Balancing the need for nourishing diets with sustainable practices has become one of humanity's greatest challenges. This challenge revolves around understanding the environmental impacts of different foods and agricultural practices.

Data scientists can play a pivotal role in addressing this challenge by exploring a comprehensive dataset that sheds light on the environmental footprint of 43 common foods cultivated worldwide. This dataset encompasses various metrics related to land use change, greenhouse gas emissions (CO2 equivalents), and factors contributing to eutrophication, a major environmental concern linked to agriculture.

Acknowledgements: [1] <https://ourworldindata.org/environmental-impacts-of-food>

##### **Data description**

The dataset comprises ~43 commonly grown foods across the globe, with 23 columns representing their respective environmental impacts. Some of the features include:

Land Use Change - Kg CO2 Equivalents per kg Product

Animal Feed - Kg CO2 Equivalents per kg Product

Farm - Kg CO2 Equivalents per kg Product

Processing - Kg CO2 Equivalents per kg Product

Transport - Kg CO2 Equivalents per kg Product

Packaging - Kg CO2 Equivalents per kg Product

Retail - Kg CO2 Equivalents per kg Product

These metrics quantify greenhouse gas emissions (in Kg CO2 equivalents per kg of product) across different stages of food production, including farming, processing, and distribution. Additionally, the dataset addresses eutrophication, a significant environmental issue caused by nutrient runoff from agriculture.

##### **Audience roles**

- Policy Makers and Regulators: Seeking insights to formulate sustainable food production policies.
- Consumers: Interested in making informed choices to reduce their environmental footprint.
- Agricultural Industry: Eager to optimize practices to minimize environmental impacts.

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- Environmental Activists: Aiming to raise awareness about the ecological consequences of food production.
- Researchers: Exploring patterns and correlations to inform sustainable agriculture.

#### **Suggested outputs**

- Identifying High-Impact Foods: Analyzing the dataset to determine which types of foods have the most significant environmental impact, considering factors like CO2 emissions and land use change.
- Sustainable Dietary Recommendations: Offering insights into which foods and production methods should be promoted to ensure nutritious diets in an environmentally sustainable way.
- Impactful Food Production Stages: Investigating which stages of food production contribute the most to greenhouse gas emissions, helping identify areas for improvement.
- Comparing Plant-Based vs. Animal-Based Foods: Contrasting the carbon footprints of plant-based and animal-based foods to guide dietary choices.
- Protein-Rich Foods Analysis: Assessing the environmental impact of protein-rich foods to inform protein source decisions.
- Data Visualization: Creating compelling visualizations to communicate findings effectively to a broad audience.
- Environmental Awareness: Developing educational materials or campaigns to increase public awareness of the environmental consequences of food choices.

[1] Hannah Ritchie, Pablo Rosado and Max Roser (2022) - "Environmental Impacts of Food Production". Published online at OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/environmental-impacts-of-food>' [Online Resource]