2021 ICM
Problem E: Re-Optimizing Food Systems

Recent events have shown us that our global food system is unstable even in the parts of the world that it generally serves well. These instabilities are partly a result of our current global system of massive national and international food producers and distributers. This food system allows for food to be produced and distributed relatively cheaply and efficiently, thus suggesting this current model prioritizes efficiency and profitability.

Despite the efficiencies of this system, the United Nations estimates 821 million people worldwide suffer from hunger[1], even though there is sufficient food produced to feed every person in the world.[2] **Food insecure** people, those without access to sufficient affordable and nutritious food, live on every continent, in every country, and in every community. And, areas of **food scarcity,** where sufficient quantities of food and nutrients are not available, occur even in wealthy countries. Moreover, the current food system leaves a massive environmental footprint accounting for "29% of greenhouse gas emissions, … up to 80% of biodiversity loss, 80% of deforestation, and 70% of all freshwater use."[3] As our global population continues to rise while we experience the increased impact of decades of environmental abuse, the ability to produce more food while sustaining, and even improving, the health of our environment has never been more critical. Consequently, a comprehensive examination of our current food system appears a reasonable and warranted endeavor.

The **International Comestibles Management (ICM) Committee** challenges your team to re-imagine and reprioritize our food systems through development of a model. While the ICM committee is leaving it up to your team to decide what aspects of these systems deserve to be the focus of your modeling activities, you should provide a food system model that is robust enough to be able to be adjusted to optimize for various levels of efficiency, profitability, sustainability, and/or equity.

Regardless of how globally or locally you focus, food systems are complex. Some questions you should consider include, but are not limited to:

- What happens if a food system is optimized for equity and sustainability? How would that system differ from the current one? How long would such a system take to implement?
- What are the benefits and costs of changing the priorities of a food system? When would they occur? How do these benefits and costs differ between developed and developing countries?
- Once you have developed your food system model, apply your model to at least one developed and one developing country to support your findings.
- Discuss the scalability (to larger or smaller food systems) and adaptability (to other regions) of your model.

The ICM Committee, an interdisciplinary and diverse group from the fields of environmental science, nutrition policy and science, government, and mathematics, looks forward to your final report.

Your PDF solution of no more than 25 total pages should include:

- One-page Summary Sheet.
- Table of Contents.
- Your complete solution.
- References list.

Note: New for 2021! The ICM Contest now has a **25-page limit**. All aspects of your submission count toward the 25-page limit: Summary Sheet, Table of Contents, Main Body of Solution, Images and Tables, Reference List, and any Appendices.

Glossary

Food Insecure: Being without reliable access to sufficient affordable and nutritious food. This can be a result of food scarcity.

Food Scarcity: When sufficient quantities of food and nutrients are not available to sustain the local population. Scarcity may be due to not enough food produced or from uneven distribution of resources.

Cited References

Note that we provide the following as citations to support the Problem Statement. We have pulled the important ideas from these resources. Although your team may use these sources, access is not required to complete the problem. Instead, your team is encouraged to look for other sources to support your work. Ensure you cite any ideas or materials from outside sources used in your report.

[1] Food, United Nations. Retrieved from: 'https://www.un.org/en/sections/issues-depth/food/index.html'

[2] World Hunger, Poverty Facts, Statistics 2018 – World Hunger News, World Hunger News, 2018. Retrieved from: 'https://www.worldhunger.org/world-hunger-and-poverty-facts-and-statistics/'

[3] The 2021 Food Systems Summit, United Nations, 2020. Retrieved from: 'https://www.un.org/sustainabledevelopment/food-systems-summit-2021/'