

Issue At A Glance:

Climate Change and Food Insecurity

Climate change is one of the foremost factors challenging public health today. Another important public health issue affected by climate change is food insecurity. This brief aims to take a closer look at how climate change affects food insecurity.

Introduction

Changes in global climate have affected health in a variety of ways. Record extremes in temperatures and increases in natural disasters have caused increases in morbidity and mortality related to these extreme weather events, affecting both physical and mental health.¹ In addition to these direct effects on health, climate change influences food supply, thereby impacting food security.

In 2019, approximately 10.5% of the households in the United States were food insecure.² Worldwide, about 805 million people are food insecure, and the prevalence of undernourishment as determined by the Food and Agriculture Organization (FAO) of the United Nations was 9.9% in 2020.^{3,5} In other words, at least one in ten persons worldwide face food insecurity, which climate change can further exacerbate.

From those unable to work due to extreme weather events to seasonal crops failing due to abnormal temperatures, climate change is linked to food insecurity in a real way. This brief looks to further explain how climate change and food insecurity are undoubtedly connected.

Key Terms

Food Insecurity: household-level economic and social condition of limited or uncertain access to adequate food⁴

Food Security: the ability to obtain and use sufficient amounts of safe and nutritious food with little or no reported indications of food-access problems or limitations⁴

Hunger: an individual-level physiological condition that may result from food insecurity⁴

Undernourishment: inability to acquire enough food to meet the daily minimum dietary energy requirements over a period of one year³

Bringing wholeness to individuals and communities, the Institute for Health Policy and Leadership (IHPL) strives to integrate health policy research and education with leadership development. Our goal is to improve the health of our communities by building on our strong heritage of health promotion and disease prevention.

To learn more, visit us at www.IHPL.llu.edu



LOMA LINDA
UNIVERSITY
HEALTH

What is Food Security?

According to the United States Department of Agriculture (USDA), food security is “the ability to obtain and use sufficient amounts of safe and nutritious food.”⁴ According to the FAO, food security is “when all people at all times have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”⁵

There are four components to food security: **availability, access, utilization, and stability**. A person needs to attain all four of these components to be considered food secure.⁵ **Availability** is defined as “the existence of food in a particular place at a particular time.”⁵ For example, if there is bread on the shelf of the supermarket to purchase, then it is available. **Access** is defined as “the ability of a person or group to obtain food.”⁵ In continuing our example, it would be having the money to purchase the bread at the supermarket or being able to get to the supermarket. The next component is **utilization**, which is “the ability to use and obtain nourishment from food. This includes a food’s nutritional value and how the body assimilates its nutrients.”⁵ In our example, those that have gluten allergies or dental issues that preclude adequate chewing would have issues with utilization. The last component is **stability**, which is defined as “the absence of significant fluctuation of availability, access, and utilization.”⁵ In our example, one must be able to consistently buy, eat, and receive nutritional benefits from the bread. Without that consistency in availability, access, and utilization, one is considered food insecure.

Factors that inhibit individuals from one or more of these four components contribute to food insecurity. These factors include changes in food production, processing, and distribution markets; increasing population; changes in wealth; and climate change.⁵

Farmers Fighting Climate Change Act (H.R. 2456)

On April 12, 2021, U.S. Congresswoman Lauren Underwood introduced H.R. 2456 to amend the Food Security Act of 1985 to add climate change mitigation bundles, which are groups of conservation activities that seek to reduce greenhouse gas emissions.⁶ The USDA’s Natural Resources Conservation Service currently runs incentive-based programs that provide support for adoption and continuation of conservation activities over 5-year contract periods, and H.R. 2456 would add comprehensive groupings of conservation activities to this program.⁷ This bill has not moved beyond introduction so its outcome is unclear.



Effects of Climate Change on Food Security

Short-Term Effects

Extreme weather events such as hurricanes and tornadoes can prevent farmers and other laborers from working, and floods and droughts can destroy or damage certain crops.⁸ These extreme weather events create problems with availability, access, and utilization in the short term, affecting food security. For example, local availability of nutritious foods is affected when crops are destroyed. Importing food from elsewhere can temporarily remedy the situation, but it can drive up the price of food, making it not affordable for some groups in the community. Furthermore, these extreme weather events may cause economic hardship to some populations, limiting their access to nutritious foods. An example would be laborers that make a living from harvesting crops. If a drought or flood destroys crops, these laborers would be out of work, causing financial hardship that would limit their access to nutritious foods.^{5,9} Finally, utilization is affected in cases where extreme heat or flooding may spoil the food, causing people to not get the full nutritional value from consumption.

Long-Term Effects

As extreme weather events occur more often in the long term, there will be less stability with the weather and those that work as farmers and other food producers will have to adapt.⁵ Also, people may have to adjust their diets in order to cope with these changes.

Beyond challenges to the production of food, climate change poses risks to other elements of global food systems that are vital for food security. These include the processing, storage, transportation, and consumption of food. Food processing, packaging and storage are likely to be affected by a rise in temperatures which may increase distribution costs and lead to an increased likelihood of spoilage. Furthermore, rises in sea level along with a change in precipitation patterns that alter river and lake levels may cause impediments to the transportation of food. Natural disasters from climate change may also cause delays for railway and road transportation. These challenges to global food systems and supply chain pose threats to access, utilization, and stability, which in turn may make more communities food insecure.⁵

As the magnitude and rate of climate change increase, so will the climate-related risk to food security. A worst-case projection based on 850 parts per million greenhouse gas concentration levels estimates that additional 175 million people will be at risk of being undernourished by 2080 compared to current figures.⁵ Although adaptations by the global food systems can reduce its vulnerability to climate change, socioeconomic conditions of those within that system can limit adoption of adaptation options.⁵ As such, thoughtful, innovative approaches are needed to mitigate the negative effects of climate change.

Conclusion

While 805 million people worldwide suffer from food insecurity, global temperatures continue to increase at levels double those from before 1981.^{5,10} As such, the risks to food availability, access, utilization, and stability will only continue to increase unless something is done to mitigate climate change and its effects.

Interventions lowering the rate of greenhouse gas emissions to slow the rate of climate change are preferred, but mitigation efforts by the global food systems are important steps as well.⁵ These efforts, however, need to be mindful of unintended consequences that may disproportionately affect vulnerable populations. For example, an adaptation technology that leads to an increase in food price will disproportionately affect those with less economic means. Food insecurity remains an important issue exacerbated by climate change, and the world will need thoughtful and proactive mitigation and adaptation efforts to improve this issue in an equitable manner.

References

1. <https://ijmhs.biomedcentral.com/articles/10.1186/s13033-018-0210-6>
2. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/key-statistics-graphics/>
3. <https://www.fao.org/state-of-food-security-nutrition>
4. <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-u-s/definitions-of-food-security/>
5. <https://www.usda.gov/sites/default/files/documents/FullAssessment.pdf>
6. <https://www.congress.gov/bill/117th-congress/house-bill/2456/text?r=1&s=1>
7. <https://underwood.house.gov/sites/underwood.house.gov/files/Farmers%20Fighting%20Climate%20Change%20Act%202021.pdf>
8. <https://www.bbc.co.uk/programmes/w3ct1htm#:~:text=Scientists%20say%20that%20extreme%20weather,to%20the%20grasslands%20of%20Africa.>
9. https://www.usda.gov/sites/default/files/documents/CCFS_FAQs.pdf
10. <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature#:~:text=According%20to%20NOAA's%202020%20Annual,more%20than%20twice%20that%20rate.>
11. <https://www.cafoodbanks.org/hunger-data#:~:text=California%20produces%20nearly%20half%20of,for%20a%20healthy%2C%20active%20life.>
12. <https://www.cafoodbanks.org/wp-content/uploads/2020/12/County-Food-Insecurity-Rates-2020.pdf>



Did you know?

According to weekly household census data from 2020, 1 in 5 Californians are food insecure.¹¹ As recently as October 2020, 18.6% of San Bernardino County households reported being food insecure.^{11,12}



LOMA LINDA UNIVERSITY
HEALTH

Institute for Health Policy and Leadership

11209 Anderson Street
Loma Linda, CA 92354
Phone: 909-558-7022
Fax: 909-558-5638
www.IHPL.llu.edu

Special guest contributor:
Jacob Bulf, BA, MPH candidate

Questions?
Please contact the Institute for Health
Policy & Leadership (ihpl@llu.edu).