

Ensuring Food Security in the Age of Climate Change



Learning Outcomes:

- Define food security and explain how it is linked to climate change and global sustainability.
- Identify the key factors that threaten food security globally, including climate change, economic instability, and conflict.
- Propose solutions and actions to address food insecurity at local and global levels.
- Relate food security challenges to the broader goals outlined in the SDGs, particularly SDG 2.

What is food security?

More than just ensuring there will be food to eat tomorrow.

"When all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life".
World Food Summit
1996



Understanding Climate Change

- Climate change refers to long-term shifts in temperatures and weather patterns. These changes are primarily driven by human activities such as burning fossil fuels. Understanding its effects on our planet is crucial for addressing the food security crisis that many regions face today.





AROUND 9 MILLION PEOPLE

die every year from hunger, or causes related to a lack of nutrition.

That means **hunger kills more people** than AIDS, malaria and tuberculosis combined.



The Story of the Sustainable Development Goals (SDGs)

SUSTAINABLE DEVELOPMENT GOALS



What are the SDGs?

The Sustainable Development Goals (SDGs) are 17 global targets set by the United Nations in 2015 to address critical issues like poverty, inequality, and environmental sustainability. They build on the earlier Millennium Development Goals (MDGs), but are broader and apply to all countries, aiming for global peace, prosperity, and environmental protection by 2030. Key features include their inclusivity, comprehensive coverage of social, economic, and environmental challenges, and the emphasis on global partnerships to achieve these goals.

SDG 2: Zero Hunger

What is SDG 2?

SDG 2, one of the 17 Sustainable Development Goals set by the United Nations, aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture by 2030. It is about ensuring that everyone has access to enough nutritious food to live healthy, active lives.

How is Food Security Linked to SDG 2?

Food security is central to SDG 2 because it focuses on:

Availability of food: Ensuring that enough food is produced globally and locally to meet the needs of all people.

Access to food: Making sure that everyone, including vulnerable groups, can afford to buy or grow nutritious food.

Utilization of food: Encouraging a balanced diet and the efficient use of food to promote health.

Sustainability: Promoting agricultural practices that protect the environment and ensure long-term food production.

SDG 2 seeks to solve the underlying problems of hunger and malnutrition by addressing these aspects of food security.

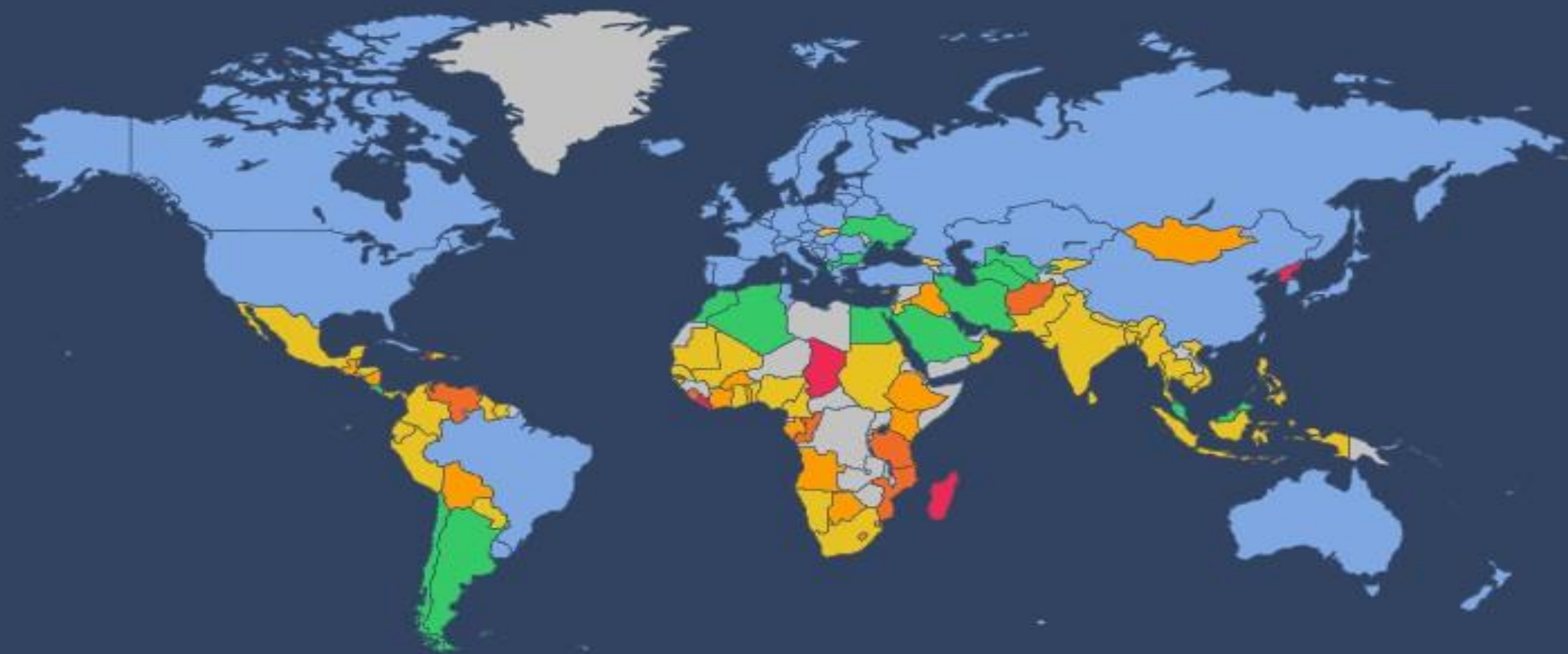
Challenges to SDG 2:

Climate Change: Changing weather patterns affect crop yields and food availability.

Conflict: War and political instability disrupt food production and supply chains.

Economic Inequality: Many people cannot afford enough food, leading to hunger and malnutrition.

Countries Experiencing Chronic Hunger in 2020



Prevalence of undernourishment in the total population (Percent) in 2017-19



Source: WFP

What Causes World Hunger?

Poverty and Hunger



780 MILLION

The number of people living in extreme poverty around the world.
(earn less than \$1.90 per day)

...That equates to



11%
of the Earth's population.

! This kind of desperate poverty has a direct effect on hunger...

...Without enough money, poor families **have to skip meals, buy substandard food** that lacks nutritional value, **or stop eating regularly altogether...**



In low and middle income nations, **one-third of children are afflicted with chronic undernutrition...**



... This means they suffer from undernutrition that has **permanently stunted their cognitive and physical development.**

War and Conflict Have a Damaging Impact on World Hunger



10/13 of the world's worst **food crises** are caused by war and conflict.



80% of humanitarian aid is in response to **damages caused by conflict.**



The latest figures estimate that **79 MILLION PEOPLE ARE DISPLACED** by conflict...



44 MILLION PEOPLE are internally displaced. (Within their own country).



20 MILLION PEOPLE ARE REFUGEES (Displaced outside of their own country).

!!! (The remaining 15 million displaced people fall under different classifications)



77 MILLION

acutely food-insecure people live in countries where conflict is the main cause of hunger.



50% OF THESE PEOPLE are located in the Middle East and Africa.



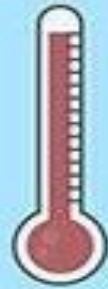
40% of the global poor live in **regions plagued by violence, war and fragility.**



That figure could rise to **67% by 2030.**

How a single aspect of climate change can make food less safe

Rising temperatures can affect food across the world by



Increasing the incidence of infections by food- and waterborne pathogens



Promoting higher uptake of toxic heavy metals in staple crops



Expanding harmful algal blooms and affecting seafood safety



Driving plant pests into new territories, potentially leading to overuse of pesticides



Making plants more susceptible to fungal infections and mycotoxins emerging in new regions



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COURTESY/FAO

Global Food Insecurity : Real-World Challenges and Impacts

Worksheet : Analyzing Global Food Insecurity



Students will explore case studies on the drought in Sub-Saharan Africa and crop failures in South Asia, analyzing how these events affect local populations and global food markets.

Responding to Food Insecurity



Sustainable Agriculture Practices

Innovative agriculture techniques, such as vertical farming and permaculture, can significantly enhance food production. These methods not only increase yield but also promote biodiversity and reduce the environmental impact, paving the way for a sustainable future.

Reducing Food Waste

Food waste is a critical issue, with one-third of food produced globally never consumed. Innovative solutions, such as upcycling and improved supply chain logistics, can drastically reduce waste and redirect resources to those in need.





Rashaya Public High School, Lebanon

VOTE FOR US!



Lebanon

Click on the link below to learn how the students at Rashaya Public High School have worked on their soft skills and devel... See more



Empowering Local Communities

Empowering local communities through education and resources fosters resilience in food systems.

Initiatives that support local farmers and promote sustainable practices can enhance food security while preserving cultural traditions and biodiversity.

Global Collaboration Efforts

Global partnerships are essential for addressing food security. Initiatives like the UN's Zero Hunger program unite countries, NGOs, and private sectors to share knowledge and resources, promoting collective action towards a common goal.



Playing Roles:



Food Security Bingo: Engaging Minds, Inspiring Changes

| | | | | |
|-------------------------|--------------------------------|--------------------------------|-----------------------|--------------------------|
| Famine | Sustainable Agriculture | Water Scarcity | Food Desert | Urban Farming |
| Hunger | Soil Erosion | Fair Trade | Crop Failure | Malnutrition |
| Climate Change | Biodiversity | Poverty | Local Sourcing | Food Access |
| Nutrition | Food Waste | Agricultural Innovation | Supply Chain | Food Policy |
| Land Degradation | Food Production | GLOBAL Warming | Droughts | Food Distribution |

Definitions for the terms included in the bingo cards:

- 1. Malnutrition:** A condition resulting from a diet lacking essential nutrients, leading to poor health, stunted growth, or vulnerability to diseases.
- 2. Sustainable Agriculture:** Farming practices that maintain productivity while protecting the environment, ensuring the long-term sustainability of the land.
- 3. Food Waste:** Edible food discarded at various stages of production, distribution, or consumption.
- 4. Hunger:** The physical sensation or condition of needing food, often associated with chronic food scarcity.
- 5. Local Sourcing:** The practice of purchasing food and goods from local producers to reduce transportation impacts and support the local economy.
- 6. Climate Change:** Long-term changes in global or regional climate patterns, largely due to human activities, especially fossil fuel consumption.
- 7. Food Desert:** Areas where residents have limited access to affordable, healthy food options, typically due to a lack of nearby grocery stores.
- 8. Biodiversity:** The variety of life in a particular ecosystem, critical for maintaining ecosystem stability and resilience, including in agricultural systems.
- 9. Water Scarcity:** The lack of sufficient available freshwater resources to meet the demands of water usage in a region.
- 10. Food Distribution:** The system of transporting and delivering food from farms to consumers, including processing, packaging, and retailing.
- 11. Food Access:** The ability of individuals to obtain sufficient, safe, and nutritious food to meet their dietary needs.
- 12. Global Warming:** The increase in Earth's average surface temperature due to rising levels of greenhouse gases.
- 13. Food Production:** The process of growing crops and raising animals for food, involving farming, fishing, and livestock breeding.
- 14. Poverty:** The state of lacking financial resources to meet basic living needs, often resulting in food insecurity.
- 15. Crop Failure:** The total or partial loss of crops due to adverse conditions such as drought, pests, or diseases.

16. Nutrition: The process by which organisms take in and use food for growth, energy, and health.

17. Land Degradation: The decline in the quality of land due to overuse, deforestation, or poor agricultural practices, reducing its ability to support crops.

18. Drought: An extended period of low rainfall, causing water shortages that impact agriculture, food production, and water supplies.

19. Supply Chain: The series of processes involved in producing and distributing food, from farming to consumer delivery.

20. Agricultural Innovation: New technologies, practices, or methods in farming that increase productivity and sustainability.

21. Famine: Extreme scarcity of food, often caused by environmental or political factors, leading to widespread hunger.

22. Fair Trade: A movement to ensure that producers in developing countries receive fair wages and work under safe conditions, especially in agriculture.

23. Soil Erosion: The removal of topsoil due to water, wind, or human activity, which reduces the land's fertility and agricultural productivity.

24. Urban Farming: Growing food in urban areas through gardens, rooftop farms, or small-scale agricultural projects.

25. Food Policy: Governmental guidelines and actions that influence how food is produced, distributed, and consumed, ensuring food security and safety.

These definitions will help students understand the terms during the bingo game, fostering learning while having fun

Food Security: A Shared Responsibility

Ensuring global food security is a shared responsibility that requires innovative thinking and collaboration.

By embracing creativity and technology, we can build a sustainable future where everyone has access to the food they need to thrive.



Ensuring Food Security in the Age of Climate Change

Overview:

This lesson plan aims to educate students on the concept of food security, the global challenges posed by climate change, and the actions that individuals, governments, and organizations can take to ensure food security for all. The lesson will introduce students to the Sustainable Development Goals (SDGs), with a specific focus on SDG 2: Zero Hunger. The session will incorporate interactive discussions, group activities, and problem-solving tasks.

Learning Outcomes:

By the end of the lesson, students should be able to:

1. Define food security and explain how it is linked to climate change and global sustainability.
2. Identify the key factors that threaten food security globally, including climate change, economic instability, and conflict.
3. Propose solutions and actions to address food insecurity at local and global levels.
4. Relate food security challenges to the broader goals outlined in the SDGs, particularly SDG 2.

Resources Needed:

- PowerPoint Presentation on "Food Security and Climate Change"
https://drive.google.com/file/d/15h90awM8HhBMokPGvi-XUhckCZ4V3P24/view?usp=drive_link
- SDG Handout (focused on SDG 2: Zero Hunger)
https://drive.google.com/file/d/1N90el7ZqQBiQjuhOhh6s5MrHMv9ICec/o/view?usp=drive_link
- Printed worksheets for group activities
- https://drive.google.com/file/d/17ZeUXOIqPs7GPZmmgxGDAozRHmXy_RZt/view?usp=drive_link
- Materials: world map, coloured markers, post-its
- Bingo cards and markers for an interactive game
- Access to computers or tablets for research activities

Lesson Structure:

Introduction (15 minutes):

Slides 1 & 2: lesson's Title and Objectives

Slides 3 & 4: Introduction to Food Security and Climate Change

- Define food security, discussing how access to enough nutritious food is essential for a healthy life.
- Explain how climate change poses significant risks to food production and distribution.

Slides 5 & 6: Linking Food Security to SDG 2 and showing the countries suffering from hunger around the world

- A brief introduction to the SDGs and their importance in global sustainability. (SDGs Handout)
- Focus on SDG 2: Zero Hunger and the role it plays in ensuring food security for all.

This can be done by following this activity:

Food Map Activity:

Instructions: Have students research food security levels in different regions of the world. They can mark areas that struggle with hunger and food insecurity and discuss why certain regions face these challenges.

Activity 2: Understanding Food Security (20 minutes):

Slides 7 & 8 : Causes of Food Insecurity

- Students will work in small groups to brainstorm the major causes of food insecurity, such as climate change, poverty, and conflict.
- Each group will be assigned one factor and will present their findings to the class. Encourage discussions on how climate change exacerbates these challenges.

Slide 9: Global Examples of Food Insecurity

- Present global case studies of food insecurity, such as drought in sub-Saharan Africa and crop failures due to flooding in South Asia. Students will analyze the effects of these events on local populations and global food markets. (**Worksheet: Analyzing Global Food Insecurity**)

https://drive.google.com/file/d/17ZeUXOIqPs7GPZmmgxGDAozRHmXy_RZt/view?usp=drive_link

- **ANSWERS:**

https://drive.google.com/file/d/1p_6JRf4qto4vM0W5XzUyUiaakjbAb_rGW/view?usp=drive_link

Activity 3: Responding to Food Insecurity (30 minutes):

Slides 10- 13: Solutions to Food Insecurity

Introduce possible solutions to food insecurity, focusing on climate-resilient agriculture, reducing food waste, and sustainable farming practices.

Slide 14: Playing Roles and Sharing Solutions

Group Activity: Each group will receive a specific role: students, farmers, policymakers, advocates, and government officials. They will propose practical actions their assigned group can take to improve food security.

Each group will share their solutions with the class. The class will engage in a collaborative discussion to evaluate the feasibility of these solutions.

Interactive Game: Impact of Climate Change on Food Security (20 minutes)

Slide 15: Food Security Bingo: Engaging Minds, Inspiring Changes

1. Preparation: Create bingo cards with various food security-related terms and concepts (e.g., “malnutrition,” “sustainable agriculture,” “food waste,” “hunger,” “local sourcing,” “food desert”).

2. Gameplay:

- Distribute the bingo cards to students and provide markers.
- Call out definitions or descriptions instead of the terms. Students will mark the corresponding term on their cards.

Bingo Definitions:

https://drive.google.com/file/d/1bCyHKJDjCFjXGtBZQs_gFXkTo2n-hVoa/view?usp=drive_link

3. Winning

- The first student to get a row (horizontal, vertical, or diagonal) shouts “Bingo!” and must explain the terms in their winning row to validate their win.

Conclusion (15 minutes):

Slide 16: Can We Ensure Food Security for All?

Food Security: A Shared Responsibility

- Recap the key points discussed in the lesson and how food security can be achieved with collective action.

Homework Assignment:

Students will research a country facing food security challenges due to climate change. They will write a short report (300-400 words) (or a problem-solution

essay) discussing the main challenges and possible solutions that could help improve food security in that region.

Reflection and Assessment:

- At the end of the lesson, students will reflect on what they have learned and how they can contribute to addressing food insecurity.
- Teachers can assess students' understanding through their participation in group activities and their homework assignments.

Worksheet: Analyzing Global Food Insecurity

Instructions:

Read the case studies below about food insecurity in different regions of the world. After reading, answer the questions for each case to analyze how these events affect the local population and the global food markets.

Case Study 1: Drought in Sub-Saharan Africa

Sub-Saharan Africa faces recurrent droughts due to changing climate conditions. These droughts reduce crop yields, leading to widespread food shortages. Many families rely on farming for their livelihoods, and when crops fail, they lose their main source of income and food. Drought has led to increased hunger and malnutrition, especially among children.

1. How does drought affect the availability of food in Sub-Saharan Africa?

2. What impact does this have on local communities?

3. How might this event affect the global food market (e.g., food prices, supply chains)?

Case Study 2: Crop Failures Due to Flooding in South Asia

In South Asia, heavy monsoon rains often result in severe flooding, destroying large amounts of crops, particularly rice, a staple food in the region. Farmers face economic losses, and food prices increase due to reduced supply. This leads to a rise in food insecurity, particularly for low-income families.

1. What are the immediate effects of flooding on food production in South Asia?

2. How does the destruction of crops impact the local population's access to food?

3. In what ways can crop failures in South Asia influence global food security (e.g., import/export, price fluctuations)?

Analysis Questions:

1. What are the common factors contributing to food insecurity in both regions?

2. How can local governments and international organizations help reduce the impact of food insecurity in these regions?

3. In your opinion, what sustainable solutions could prevent these types of food crises from happening in the future?

Answers to the worksheet: Analyzing Global Food Insecurity

Case Study 1: Drought in Sub-Saharan Africa

- 1. How does drought affect the availability of food in Sub-Saharan Africa?**

Drought reduces the amount of water available for irrigation, leading to poor crop yields and food shortages. This affects the overall availability of food in the region, as many communities rely on agriculture for their sustenance.

- 2. What impact does this have on local communities?**

Local communities experience increased hunger, malnutrition, and poverty. Families lose their main sources of income when crops fail, leading to a reliance on food aid or migration to find work. Vulnerable populations, such as children and the elderly, are at higher risk of malnutrition-related health issues.

- 3. How might this event affect the global food market (e.g., food prices, supply chains)?**

Drought in Sub-Saharan Africa can cause a reduction in the global supply of certain crops, especially those exported to other regions. This could drive up food prices, particularly for grains like maize and wheat, and increase food insecurity in importing countries.

Case Study 2: Crop Failures Due to Flooding in South Asia

- 1. What are the immediate effects of flooding on food production in South Asia?**

Flooding destroys crops, washes away topsoil, and damages agricultural infrastructure such as irrigation systems. This immediately reduces food production, particularly for rice, which is a staple in the region.

- 2. How does the destruction of crops impact the local population's access to food?**

The local population faces food shortages, with staple food prices rising due to decreased supply. Low-income families, in particular, struggle to afford food, leading to hunger and malnutrition.

- 3. In what ways can crop failures in South Asia influence global food security (e.g., import/export, price fluctuations)?**

South Asia is a major producer of rice, and crop failures can lead to reduced exports, impacting global rice availability. This could cause price hikes in

global markets, affecting countries that rely on rice imports. It also creates pressure on international food aid systems.

Analysis Questions:

- 1. What are the common factors contributing to food insecurity in both regions?**

Both regions face natural disasters (drought in Sub-Saharan Africa and flooding in South Asia) that reduce food production. Climate change is a key factor in the frequency and intensity of these disasters. Both regions also have vulnerable agricultural systems and populations heavily dependent on local crops for food and income.

- 2. How can local governments and international organizations help reduce the impact of food insecurity in these regions?**

Local governments can invest in resilient agricultural practices, such as drought-resistant crops and flood prevention infrastructure. International organizations can provide food aid, support agricultural development, and promote climate adaptation strategies to strengthen local food systems. Collaborative efforts in technology transfer and disaster preparedness are also essential.

- 3. In your opinion, what sustainable solutions could prevent these types of food crises from happening in the future?**

Sustainable solutions include improving irrigation systems, promoting sustainable agricultural practices, and diversifying crops to reduce reliance on a single staple. Developing early warning systems for natural disasters, creating social safety nets, and addressing climate change through global initiatives are also vital for preventing future food crises.

Food Security: A Shared Responsibility

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By embracing creativity and technology, we can build a sustainable future where everyone has access to the food they need to thrive.

