

Hanyang Model United Nations VIII

Chair Report

Committee: World Food Programme (WFP)

Chairs: Dayoung Kim, June Yoon

Agenda: Addressing the consequences of global warming on agricultural production and food security, and devising solutions to prevent hunger and regional conflicts.

1. Committee Introduction



The World Food Programme (WFP) is the world's largest humanitarian aid agency, established in 1961 under a UN General Assembly resolution as a joint UN/FAO effort. It has two main goals: one is to save the lives of people in areas suffering from conflicts or disasters by providing food aid. The other is to strengthen self-sufficiency and resilience in vulnerable areas, through activities such as increasing the nutrients of women and children and supporting school meals that bring more students to school. After starting its first mission in 1963, due to its continuous efforts to solve hunger, improve peace conditions in conflict zones, and promote multilateral cooperation, WFP was awarded the Nobel Peace Prize in 2020 (*Who we are* | WFP).

The World Food Programme is governed by the WFP Executive Board of 36

countries. The WFP Executive Board facilitates intergovernmental support and supervises WFP activities. The Executive Director, who represents the organization, is appointed jointly by the Secretary-General of the United Nations and the Director-General of the Food and Agriculture Organization of the United Nations. Cindy McCain has been serving as the Executive Director since April 2023 (*Governance and leadership* | WFP).

As WFP lacks financial resources, it relies on the voluntary funding of donors at all levels, including governments, institutions (other United Nations agencies, non-governmental organizations), companies, and individuals. In this sense, it is committed to being responsible and transparent about every activity, carrying out its own internal audits and periodic independent evaluations (*Funding and donors* | WFP).

WFP's ultimate goal is to solve hunger around the world, and it deals with the issue caused by cause. First, in areas of conflict, WFP provides food and nutrition assistance to people affected by conflict. The activity doesn't only save lives but also supports peace efforts by enhancing access to natural resources in conflict, fostering social connections, reporting the tragedy of conflict zones, and strengthening trust between people and governments regarding the responsibility and service delivery of the state.

Second, the WFP warns local communities about extreme weather events by its established early-warning system to protect people from abnormal weather caused by global warming. It also promotes climate-smart energy solutions, by enhancing access to modern cooking appliances and sustainable energy equipment that could help increase the productivity of smallholder farmers.

Third, the WFP coordinates humanitarian logistics through the Logistics Cluster, making an efficient response to possible disasters by adjusting operations and managing information in the event of large-scale disasters. It works as the head of the Emergency Communication Cluster, which builds and provides communication networks in emergencies. Programs such as Automatic Disaster Analysis & Mapping (ADAM) track earthquakes and cyclones all year round, helping governments to predict the immediate impact and prepare for natural disasters.

Fourth, WFP's Food Assistance for Assets Program provides residents with cash or food when they participate in public projects such as land restoration. The program helps local communities secure public infrastructure, improving inequalities in vulnerable areas and

activating local economies. Farm to Market Alliance connects smallholder farmers to the market and supports them in diversifying their products, improving their business potential.

Lastly, WFP teaches improved post-harvest handling methods to smallholder farmers, to keep their products from insects, rodents, mold, and moisture, reducing food loss after harvest (*Ending Hunger* | WFP).

Besides the activities to solve hunger, WFP also focuses on school meal programs that support governments to ensure that all school-aged children have access to school meals. Through the work, WFP helped influence the quality of life, access to education, and nutritional status of 106 million school children in 77 countries. WFP's work makes a virtuous cycle that enables nations to strengthen their human capital through better nutrition and education, leading each nation to a better future. Often, these programs align with local smallholder farmers, leading to the establishment of better-designed, sustainable food systems that are better in gender equality and minimize the impact on the environment through reduced greenhouse gas emissions in the supply chain (*Ending Hunger* | WFP).

2. Agenda Background

2023 has been the warmest year since 1880 when NASA first started to track the Earth's average surface temperature. Compared to the late 19th century (1850-1900), Earth was about 1.36°C warmer in 2023. Seeing that the ten most recent years are the warmest on record, the trend of the increasing of the temperature is likely to continue, worsening the impact of global warming on our society. The impact would be detrimental to the agricultural industry as it is highly affected by climate.

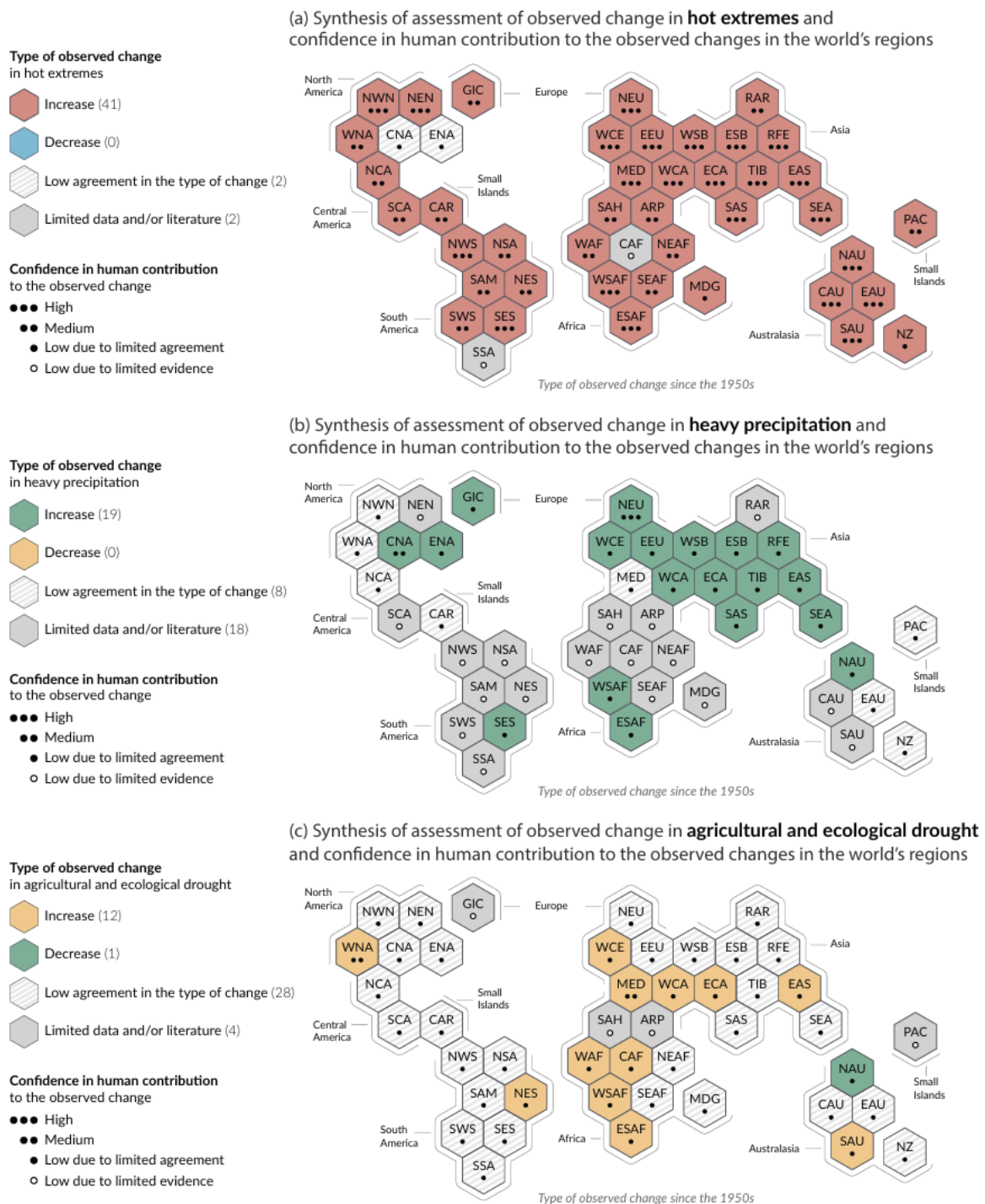


Figure 1. Synthesis of assessed observed and attributable regional changes (Summary for Policymakers | IPCC 6th Report)

The figure shows that hot extremes, heavy precipitation, and agricultural and ecological droughts, which hinder crop growth, will occur worldwide. Changes in the climate will lead to crop losses due to the increased chances of extreme weather conditions for crops

to grow. This will not only affect food security but also social stability.

Springmann et al. warn through their study that if the earth's temperature goes up to 2°C by 2050, every person will face reductions of 3.2% in global food availability, 4% in fruit and vegetable consumption, and 0.7% in red meat consumption. The trend would be responsible for 529,000 climate-related deaths worldwide (1937).

In terms of social conflict, although a clear causal relationship has not been established, many researchers have focused on the possibility of the impact of climate change in the Syrian Civil War. The Middle East was affected by severe drought from 2007 to 2009, and a high fallowness rate was reported in 2008 across Syria's cropland regions. Eklund et al. point out the sudden increase in fallowness from 16% in 2007 to 50% in 2008 from the widespread crop failures. They also measured the perceived climate stress that led to a surge in migration in Syria during the drought years. Likely, these factors, combined with distressed sales of household assets and loans and an increase in malnutrition due to reduced food intake, have exacerbated the social instability in Syria (5).

With the general background on food security and social stability established, we'd like to move on to the detailed problems that climate change would cause in the agricultural industry.

a. Pests

In early 2020, a massive desert locust upsurge was detected across Eastern Africa, Southwest Asia, and the area around the Red Sea. Desert locust is an example of a pest as they eat as much as their weight per day, severely harming food crops and forage. A single square kilometer of swarm could be up to 80 million adults, with the capacity to consume the amount that 35,000 people would eat in a day. Through the damage to food crops caused in East Africa and Yemen, 42 million people have faced a food crisis. Although desert locusts existed before the crisis, the sudden upsurge to this magnitude is something that hasn't happened in 70 years.

Sultana et al. have analyzed that the cyclonic rains and floods that happened in October and November 2019 created good conditions (moisturized land) for desert locusts to multiply (146). A tropical cyclone starts with a low-pressure disturbance at sea level. Low pressure forms when warm air above the sea moves upward, and

the surface wind pushes air in to take its place. Ocean temperatures should be at least 26.5°C from the surface to 50 meters deep to provide sufficient energy to turn the disturbance into a cyclone.

The trend of global warming has affected the sea temperature around Yemen, which has led to an increased number of cyclones. The World Bank provides the data that the annual sea surface temperature anomalies displayed an increasing trend in both basins of Yemen across all seasons since 1993, with the highest increase of 0.64°C per decade in the Red Sea (1993-2009) and <0.40°C per decade in the Gulf of Aden over the same period.

A massive upsurge of desert locusts has further impacted even Pakistan. Unusually long summer monsoons in the region combined with the cyclonic rains and floods in the Arabian Peninsula made it possible for large numbers of desert locusts to breed along the Indo-Pakistan border. According to FAO estimates, in May 2020, the locust damage was assumed to have affected 25% of growing crops, and losses were estimated to be 817 billion Pakistani rupees. More than 3 million people in Pakistan were exposed to severe food insecurity, and approximately 34,000 households needed emergency livelihood and food security assistance due to crop losses (Sultana et al. 149).

b. Drought

Australia is one of the main producers of wheat. According to the Australian Export Grains Innovation Centre, Australia produces 25 million tons of wheat per year, which is three percent of the world's wheat and accounts for 10-15% of the global wheat trade. However, droughts in Australia are causing serious risks to the stable production of wheat. From 2006 to 2007, rainfall in Australia's granary recorded the lowest since 1900, and wheat production in 2007 dropped by 57% of the production in the previous year to 10.82 million tons. In 2019 and 2020, due to the severe drought, wheat production dropped to 44.7% and 54.5% of the production in 2017, when it was a bumper year (Wei 100-101).

The Indian Ocean Dipole is the cause of drought in Australia. Indian Ocean Dipole (IOD) is a climate phenomenon in the Indian Ocean, which indicates the difference in sea surface temperatures between the Eastern and Western regions of the

Indian Ocean. Cooler than average sea surface conditions in the eastern Indian Ocean, accompanied by warmer than average conditions in the western tropical Indian Ocean, cause the positive IOD. Positive IOD comes with characteristics of heavy rainfall and floods in East Africa, while it reduces the chance of rain in Australia (Johnson).

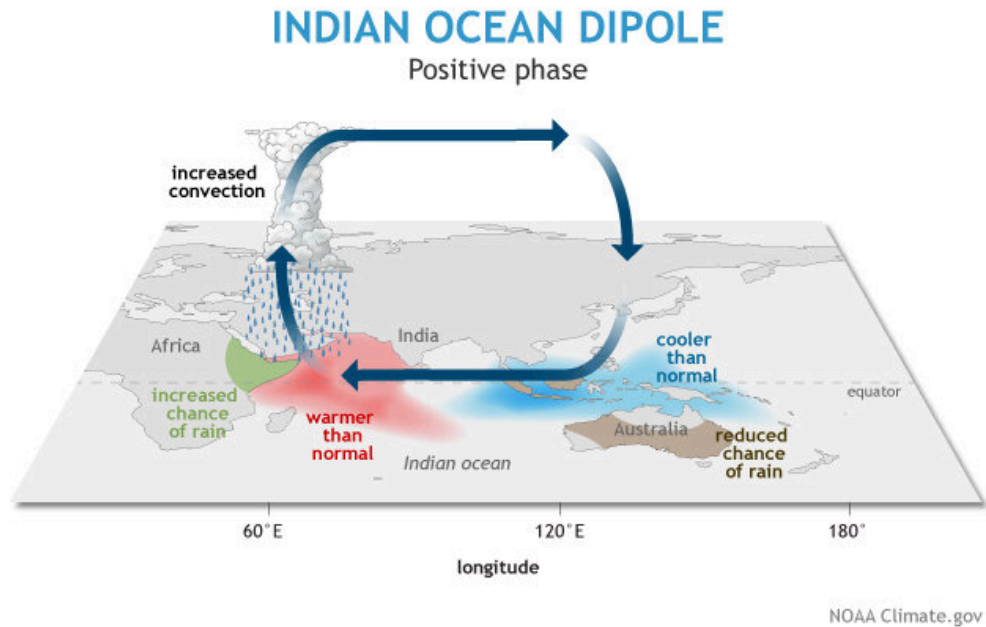


Figure 2. Johnson, Nat. “Meet ENSO’s neighbor, the Indian Ocean Dipole.”

El Niño is one of the causes of positive IOD as it fosters surface warming of the eastern Pacific Ocean, which has consequences for global temperature rise. In fact, with the increasing global temperature, the circulation of positive and negative IOD has been changing.

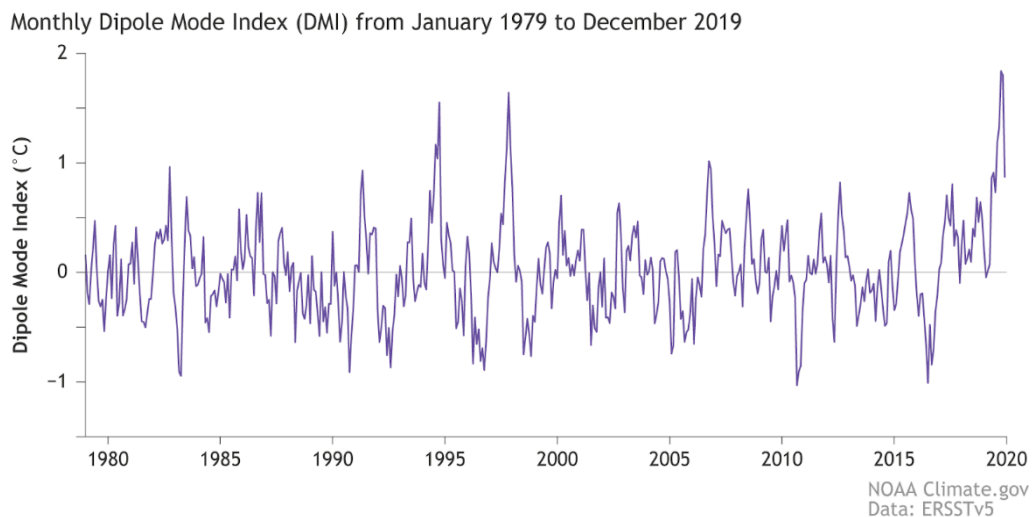


Figure 3. Johnson, Nat. "Meet ENSO's neighbor, the Indian Ocean Dipole."

Recently, the intensity and consistency of positive IOD is getting stronger and stronger. Cai et al. suggest that the frequency of extreme positive IOD events will increase by almost a factor of three, from one event every 17.3 years over the twentieth century to one event every 6.3 years over the twenty-first century (254). They have derived the results using the scenario of the high greenhouse gas emissions model (Representative et al. 8.5). Therefore, as global warming continues, the drought in Australia is likely to get intense, causing serious harm to both domestic and global wheat consumption.

c. Floods

The IPCC's sixth report predicts that at 1.5°C, global warming, heavy precipitation, and associated flooding are expected to intensify and occur more frequently in most regions in Africa and Asia (high confidence), North America (medium to high confidence), and Europe (medium confidence) (Masson-Delmotte et al. 24).

Floods impact a wide range of people by reducing the availability and access to food. Flooding causes nutrient and soil loss, and it also harms farm infrastructure, weakening resilience to climate disasters. Reed et al. say that about 12% of the people in Africa experienced food insecurity from 2009 to 2020 due to flooding (1).

d. High Temperature

Heats negatively affect the crop quality, which directly correlates with the nutrition status of people who consume the crops. For instance, Siebers et al. have found that when the canopy of maize was exposed to the heat wave for three days in an early reproductive age, it reduced total reproductive biomass by 16%, seed yield by 13%, and kernel number by 10% (162).

A study conducted by Mishra et al. explains why this is likely to happen. Heat-stress-induced cell damage in the root leads to a decline in root growth and the overall concentration of proteins. As protein plays an essential role in nutrient uptake in plants, excessive heat reduces the chance of plants getting sufficient nutrition to grow and also affects the activity of specific uptake proteins, such as their transport or

reaction rates (14).

The prevalence of heat waves would decrease the level of nutrition and quality of crops, which would significantly affect the people who rely on plants for the nutrition they need for the basics of their lives.

e. Increased Sea Level

Global mean sea level is likely to rise by 0.28 to 0.55m under the very low emissions scenario (SSP1-1.9) and 0.63 to 1.02m under the very high emissions scenario (SSP5-8.5) by 2100, compared to the average from 1995 to 2014. The rise of sea level will lead to serious water-logging and frequent floods, severely harming the croplands in coastal areas and beside rivers.

The book *Food Crisis, The Future Has Already Begun* (Wei 111-112) describes examples of the impact on countries in southeast Asia. If the sea level increases by 1 meter, 30,000 square kilometers of land will be submerged in Bangladesh, and its croplands close to the coast will decrease in production due to the damage by salt. India is also predicted to lose 6,000 square kilometers of croplands due to salt damage.

As the rise of the sea level wouldn't only be limited to coastal areas but also inland close to rivers, there stands a high risk of a decrease in the amount of land that each nation could utilize for crop production.

3. Previous Actions and Solutions

a. Domestic Actions

i. Republic of Korea

Crop Disaster Insurance is a governmental social safety net that compensates for crop damage caused by natural disasters to enhance the economic stability of farmers. It is aimed at individuals and corporations engaged in agriculture and forestry, and approximately 50% of disaster insurance premiums are supported by the government. In 2023, 1.1759 trillion won

insurance premiums were given to 208,000 farm households due to the spring cold damage and heavy rain and typhoons in summer. It was the largest insurance premium given in the past 5 years, and the role of insurance would likely become more and more important as the risk of abnormal climate is increasing every year.

ii. China

China's agricultural industry mainly consisted of small family farms across the country rather than the large factory-farming models found in many developed countries. Therefore, China has been tackling the problem of a lack of advancements in production technology and disaster resilience due to the absence of methods that can reach out to largely dispersed farm households.

To solve the problem, China established the National Agricultural Technology and Education Cloud Platform in 2015, which could promote knowledge sharing and independent learning of agricultural workers on a digital platform. When farmers provide data on crops, pests, and environmental conditions, they can access online training courses, diagnostic AI, and advice.

With startups participating in strategic AI technology, farmers can receive help identifying pests and recommendations on pesticides that target specific species. In addition to the digital platform, the central government sends specialized expert teams to areas affected by natural disasters or falling behind in crop production to promote advanced agricultural technology (Dong et al.).

iii. Malaysia

Inisiatif Pendapatan Rakyat-USahawan Tani (IPR-INTAN) was introduced in 2023 to expand supply chains in agriculture and raise the income of local farmers. IPR-INTAN focuses on sites in poverty, particularly the people who are in the bottom 40% of income earners, providing public funding for infrastructure costs, agricultural inputs, training, technical advisory, and pre-harvest allowance. It also supports the production of strategic crops, such as chili and grain corn, to enhance Malaysia's self-reliance on imports. With cooperation across ministries, agencies, state governments, and the private sector, it has been implemented

nationwide. After its first launch in March 2023, IPR-INTAN covered 16 sites, more than 364 ha of land, and 1000 participants (Wong et al. 6-7).

b. International Actions

i. COP 28

Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action

The declaration mainly aims to lift the threat the climate impacts are causing to the resilience of agriculture and food systems, especially to the vulnerable, which would cause widespread hunger, malnutrition, and economic stresses. The declaration was endorsed by 160 countries in COP 28, which was held in the United Arab Emirates.

First, the declaration considers all forms of food producers, including farmers and fisherfolks. Related to the production sector, the declaration focuses on providing financial and technical support for enhancing resilience against climate change, such as by building infrastructure, innovations, and early warning systems. Implementing solutions is also expected to improve the livelihoods of rural communities, smallholders, and family farmers.

In the consumption sector, the declaration focuses on promoting food security and nutrition by increasing efforts to support vulnerable people. These efforts include strengthening social protection systems and safety nets, school feeding and public procurement programs, and targeted research and innovation. It also takes the specific needs of the vulnerable (i.e., women, children and youth, indigenous people, smallholders, etc.) as important factors to consider.

ii. World Bank

Climate Insurance

Insurance solutions help governments protect national budgets and the lives and livelihoods of their citizens in case of disasters. The World Bank established the Disaster Risk Financing and Insurance Program (DRFIP) in 2010 as a joint initiative of finance, competitiveness, and Innovation Global Practice of

the World Bank Group to improve nations' overall resilience against natural disasters. It enables governments to implement and develop comprehensive financial protection strategies, including sovereign disaster risk financing, agricultural insurance, property catastrophe risk insurance, and extensive social protection programs.

The World Bank is also supporting other insurance programs to support post-disaster funds, help governments develop their infrastructure, and equip each nation's readiness for climate change. Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) has worked on providing Vanuatu with \$2 million to support its recovery from cyclone Pam, which caused serious damage across the country.

In addition, the Global Index Insurance Facility (GIIF) provides solutions and index-based insurance in case of catastrophic disasters that can help smallholder farmers, micro-entrepreneurs, and microfinance institutions in developing countries. It has taken its role mainly in Sub-Saharan Africa, Asia, Latin America, and the Caribbean, facilitating \$151 million for insurance that covers up to 6 million people.

iii. Food and Agriculture Organization (FAO)

1. Climate-Smart Agriculture

The Climate-Smart Agriculture (CSA) approach stems from the fact that the world's poor mostly live in rural areas, and agriculture works as their primary income. Therefore, climate change, which is expected to hit hardest in developing countries without sufficient measures to mitigate the harm, would severely worsen the lives of local farmers who mainly rely on agriculture for their living.

CSA poses a solution to mitigating the harm of climate change, enhancing productivity, and strengthening adaptation to climate change on a local to global scale. CSA implementation includes developing policy frameworks for plans, investments, and coordination on the adaptation of agriculture to climate change and increasing financing through national

sector budgets and ODA.

Most importantly, CSA also provides farmers with knowledge about their environment, agroecosystems, crops, livestock, and local climatic patterns. FAO has been running Farmer Field Schools in Tanzania to provide an opportunity for local farmers to experiment with new technologies that help them identify and understand suitable climate-smart options, which would lead to better productivity and higher resilience to climate disasters.

2. Declaration of the World Summit on Food Security

The declaration addresses the issue of climate change threatening food security and agriculture, increasing the danger for smallholder farmers in developing countries, Least Developed Countries, and already vulnerable populations. It claims that the measures for coping with climate change should include adaptation of agriculture, including conservation and sustainable use of genetic resources for food and agriculture.

The declaration stresses the need for a twin-track strategy, dealing with immediate hunger for the most vulnerable and medium—and long-term action to eliminate the root cause of hunger and poverty, which would lead to progress in the right to adequate food. Suggested solutions are rural development, production increases through access to improved seed and inputs, the adaptation of agriculture to climate change, developed plans for rural infrastructure and support services, and strengthening social protection measures and programs.

It also points out the need for emergency food and humanitarian assistance for the most vulnerable populations and for national research systems to share information and best practices, particularly in Africa.

iv. Ministerial Declaration on The Emergency Response to Food Insecurity

The declaration was adopted on 17 June 2022 at the Twelfth Session of the Ministerial Conference of the World Trade Organization. It aims to make progress on ending hunger, achieving food security and improved nutrition, and

promoting sustainable agriculture and food systems that enhance productivity, aligning with the achievements of the United Nations' SDG 2.

The declaration promised to consider the interests of small-scale producers in developing countries. Countries that have adopted the declaration will cooperate to enhance the access of food to poor and vulnerable countries, especially in humanitarian emergencies.

The nations would also actively participate in information exchange to react against food price spikes and excessive price volatility, cooperating with other international organizations.

4. Possible Actions and Solutions

a. Investments in climate resilience infrastructure and technologies

Global warming is rapidly worsening, and the impact of an abnormal climate would cause more severe damage to developing countries with less preparation on these issues. The impact of climate disasters on crop production and quality is immediate, while the process of enhancing resilience and improving technologies to deal with the problem takes a significant amount of time.

Therefore, investment is needed in developing countries to prevent the implementation of the practices to adjust to climate change being postponed by lack of budget, domestic backlash, or lack of awareness of its necessity. Investments could be in the form of financial support or technology transfer that would mitigate the harms of climate disasters, ultimately protecting the local agriculture, which is crucial in building food security.

b. Providing food aid to areas suffering from food insecurity

Along with long-term measures, we also need solutions that can deal with the urgent need for food and nutrition due to food insecurity. As the WFP has long been the leading humanitarian organization dedicated to food aid, countries could cooperate to provide food aid to regions under food insecurity with the cooperation of the WFP.

c. Regional cooperation on stable supply chain

Regional stability is a key factor when it comes to ensuring the sustainable supply chain of food. To prevent regional conflicts that cause critical harm to food security, countries could seek the potential of cooperation at the regional level to enhance food security. Adjacent geographical features hold important implications for countries in finding ways to cooperate. At the regional level, countries could share information on climate status and adaptation technologies to climate change. Furthermore, countries could cooperate in the recovery from the climate disasters in the region, which would be more effective in further coping with the needs by sharing similar food cultures and major crops.

5. Defining of Key Terms

a. Food Security

Personal Level: Having sustainable access to fulfill one's dietary needs and nutrition to maintain life

National Level: Having sufficient capacity to produce their food and power to secure the international food trade routes either by diversified targets, negotiations, or irrevocable treaties

b. Supply Chain

The logistics process starts from the network of individuals and corporations who produce the products to the distribution of final goods to the consumers.

c. Climate Resilience

The ability or readiness to mitigate the impacts of climate disasters, such as heavy rain and heat waves, and recover from the harm they have caused.

6. Key Questions

- a. What are the implications of differences in agricultural productivity and technology between developed and developing countries for agricultural markets? How can we ensure the participation of developed countries in providing advanced farming technologies and information to developing countries?
- b. How can we measure the potential risk of global warming in the agricultural sector? What geopolitical factors should be considered in developing regionally tailored strategies to address climate change?
- c. What other entities could contribute to establishing a sustainable agricultural environment in cooperation with states and international organizations?
- d. Are there any domestic political institutions that can distribute international aid transparently and effectively and use it to build the country's capabilities? If not, how can we enforce long-term plans that would enhance the self-reliance of countries that received the aid?
- e. Should we consider the difference in greenhouse gas emissions by country? Is it fair to impose more responsibility on countries that emit more greenhouse gases when implementing international actions to solve food security across regions?

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