



Teacher's Guide

Zero Hunger

-Strengthening Food Security-

Introduction 1: Global food crisis

- **Global food crisis of 2008:** A global recession started following the financial crisis that began in the United States in 2007, and global food prices surged over the next two years. The spike in food prices during this period deepened political and economic instability in both developing and developed countries.
- **Doubling and tripling of grain prices:** Due to the global economic crisis, prices of grains, such as wheat and soybeans, soared 2 to 3 times higher. Combined with increased grain demand from China and India, increased use of grain as raw material for bioenergy, and decrease in arable land due to climate change, the situation worsened into a global food crisis.
- **Food riots in more than 40 countries:** The surge in food prices had a fatal impact especially on developing countries in Asia and Africa, and food riots broke out in more than 40 countries around the world. Those who could not buy food due to the high food prices in countries such as Algeria, Mexico, the Philippines, Haiti, and Egypt protested the government.



Introduction 2: Different situations around the globe

- **Those suffering from hunger:** After World War II, the global community created tremendous wealth through advances in science and technology and increased its industrial productivity, but there are still people suffering from hunger. Today, 730 million people suffer from hunger globally.
- **Food waste:** According to the United Nations World Food Programme (WFP), one-third of the world's 4 billion tons



of food that is produced is wasted every year. This means that about 1,200 trillion Korean won worth of food is being wasted every year. Even though we are living in a time when there is more than enough food, a significant amount is discarded and becomes food waste during the distribution process before reaching the customers.

- + **Video on South Sudan's food shortage (UNICEF) – “We are eating grass because there is no food”:**

▶ <https://youtu.be/4WHkA82e9Hk>

- Why are there still people suffering from food shortage in the world?
- Have you ever heard of the term “food security”?

1. What is food security?

- Food security exists when “all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.” (Food and Agriculture Organization of the United Nations, FAO)
- **The most important human right:** Food security is one of the seven components of human security (economic security, food security, health security, environmental security, personal security, community security, and political security), which means that a country must always maintain adequate food supply for its people even during special circumstances such as population growth, natural disasters, and war. Resolving hunger is both an act of satisfying human need and protecting one of the most important human rights.
- + **Universal Declaration of Human Rights, Article 25:** “Everyone has the right to a standard living adequate for the health and well-being of himself and of his family, including food, ...” (Proclaimed by the United Nations General Assembly in Paris on December 10, 1948)
- + **Finding day to day food supply versus emergency food crisis management:** Generally, food security means securing food for the day in poor developing countries suffering from food shortages. On the other hand, in a rich country where food consumption is not a major problem, food security takes on the meaning of crisis management



for emergency situations, such as securing food for its citizens in the event of a catastrophic natural disaster, a trade disruption caused by war, etc.

2. Why is food security an important issue?

- **Stable food supply has been a long-standing task for humankind:** Managing a stable food supply has always been a task for humankind since the beginning of human history. The food problem should have disappeared with material affluence after the 20th century, but many people around the world are still suffering from food shortages.
- **Drop in food self-sufficiency rates across the globe:** After the industrial revolution, major industries moved from primary to secondary and tertiary industries, reducing agricultural area and labor worldwide. As a result, the food self-sufficiency rate has dropped dramatically in many countries as they started to depend on imported foods. The high dependence on foreign countries' food exports will be fatal if the exporting country decides not to export food.
- **Damage caused by agflation:** Agflation is a combination of the terms agriculture and inflation meaning rising food prices caused by increased demand for agricultural commodities. The global economy is greatly intertwined, and so the economic crisis and inflation that start in one country can have a great impact on other countries. As seen during the 2008 food crisis, the global economic crisis led to a global food crisis, causing other global security problems such as starvation, civil unrest and riots.



3. What is the current food security situation of the global community?

- **700 million people go to bed hungry:** 730 million people worldwide are suffering from hunger (UN, 2024). This means that one out of every nine people in the world suffers from severe hunger and malnutrition. If those who are only able to obtain food only sometimes or can obtain only small amounts or low-quality food are also included, 2.4 billion people or 29.6% of the world's population is having difficulty securing food.
- **Increase in the number of starving people since 2015:**



Over the past few decades, the proportion of starving people slowly declined to below 11%, but since 2015, it has rebounded and continues to rise. The global population of hungry people is gradually increasing from 785.4 million people in 2015 to 796.5 million in 2016, and 811.7 million in 2017, due to economic recession and inequality.

- **Africa and Asia are more vulnerable:** 22.8% of Africa's population suffers from malnutrition. In Asia, the number of malnourished people has steadily decreased over the past decade, but 11.3% of its population remains malnourished. Both continents face a significant hunger problem.
- **Primary victims of food crisis are children:** The primary victims of food crisis are children who are growing and developing. According to a survey conducted by FAO in 2020, 144 million children under the age of five were stunted. Children, mostly in South Asia and sub-Saharan Africa, are suffering from food problems, along with other related threats such as malnutrition, malaria, AIDS, and war.

(Emphasizing the issue: Many people are starving.)

- **Food security and inequality:** The most important issue related to food security is inequality. Around the world, enough food is produced to feed all the population, but there are still people who do not have access to basic food supply. Although some countries recorded remarkable economic growth due to technological innovation, the number of hungry people is soaring in developing countries due to deepening inequality across regions.
- **Global issue that calls for everyone's attention:** Not only is helping people suffering from hunger important on a humanitarian level, it is also important on a global security level. If food security is not guaranteed, it can lead to regional conflict and violence. Therefore, the entire global community should work together to overcome food crisis.
- **+ Watch video "What is food security?"**

▶ <https://www.youtube.com/watch?v=ZLvnzfV5sxo>



4. What causes food crisis? (Demand)

- **Steady world population growth:** The world population exceeded 3 billion in the 1960s, and since then, it has steadily increased by about 1 billion every 10 years, surpassing 8 billion in 2024. If this trend continues, the world population is expected to reach 9.7 billion by 2050. The top countries contributing to the growth in the world's population are mostly developing countries in Asia and Africa, which are also the most vulnerable countries in terms of food security.
- **Increase in meat consumption:** The global community has become a fan of delicious meat and dairy products, and now consumes a huge amount of meat. The most popular meat is beef, and both developing and developed countries use a huge amount of grain to raise cattle faster and stronger. Cattle raising takes up 24% of the world's land. Planting rice on 1 hectare of land produces a year's worth of food for 20 people, while raising cattle on the same area of land produces only a year's worth of food for 0.3 person. The increase in meat consumption leads to a higher demand for grain. About 7~8 kilograms of grain are needed to produce 1 kilogram of beef, and the consumption of grain as animal feed accounts for more than 40% of the world's grain production.
- **Increase in biofuel usage:** Bioethanol is a fuel made by fermenting starch crops such as sugar cane, wheat, corn, potatoes, and barley that is used as a fuel additive in vehicles. Unlike fossil fuels, they do not emit pollutants and since it comes from plants, can be regenerated at any time. However, producing enough bioethanol for a medium-sized car requires an amount of corn a person can eat for a year. As a huge amount of corn is used to produce bioethanol, the amount available for human consumption will inevitably decrease. In fact, corn prices rose as a result of high demand for corn as bioethanol fuel, and food crisis occurred in Latin American countries where corn was their staple food.
- **Food waste:** Approximately half of the food consumed is thrown away while being transported from farm to market, without reaching the dining tables of households. Because



of the high competition between large retailers, many foods that are slightly withered or scratched are discarded. Many individuals also throw away 20 to 30 percent of the food they purchase.

5. What causes food crisis? (Supply)

- **Climate change and water shortage:** Over the past 100 years, the Earth's temperature has risen by about 1°C. The accelerated use of fossil fuels after the industrial revolution caused this global warming phenomenon, and if the use of fossil fuels continues without change, the average global temperature is expected to rise by about 6.4°C at the end of this century. If the global temperature rises 6°C higher, natural disasters will become common phenomena and most life on Earth will become extinct. Due to the climate- dependent nature of agriculture, global climate change is taking a heavy toll on crop growth, with increasing uncertainty in agricultural production due to frequent floods, droughts, massive typhoons and tidal waves.
- **Reduction in arable land:** The area of arable land per capita decreased from 0.38 ha in the 1970s to 0.23 ha in the 21st century and is expected to continue to decrease to 0.15 ha by 2050. As human population grows, food production should increase, but due to climate change and other factors, arable land for food production is expected to decrease (UN forecast).
- **Monopoly by the world's largest grain companies:** If a small number of large grain companies control the food market and adjust crop prices as they want, those without economic power will not be able to purchase food. There are only a few major food exporting countries including the United States, Canada and Australia, and 60% of the market for processing and distributing flour is owned by four major grain companies from the United States. If the major grain companies decide to fix prices to maximize their profits, food will not be available to those who do not have purchasing power.



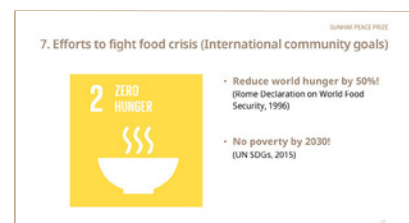
6. Food crises around the globe

- **Food crisis in East Africa (2006):** In 2006, acute food shortage occurred in the Horn of Africa, a region that includes countries such as Somalia, Djibouti, Ethiopia and Kenya. As food production declined due to prolonged droughts, grain prices rose, and as a result, more than 11 million people suffered from severe hunger.
- **Rice crisis in the Philippines (2008):** The Philippines is one of the world's largest rice importers. The 2008 financial crisis caused rice exporters to stop exporting rice due to concerns over a shortage of rice stocks in their countries, which led to a 50% rise in rice prices in the Philippines. The Filipino citizens competed fiercely to buy government rice, which was sold for half the price of regular rice, and there were cases where soldiers carrying M16 rifles were stationed to guard the rice shops. As major rice exporting countries banned or regulated rice exports in 2008, rice prices doubled from 2007 prices and increased by five times compared to 2001 prices.
- **Food crisis in Haiti (2010):** In January 2010, a powerful 7.0 magnitude earthquake struck Haiti, killing 220,000 people and injuring more than 300,000 people. The earthquake that hit Haiti, the world's poorest country, brought serious damage, worsening the food crisis that already existed in the country. The news showed children making and eating dry mud cookies made from actual mud, salt and butter shocking the entire global community.



7. Efforts to fight food crisis (International community goals)

- **Reduce world hunger by 50%! - Rome Declaration on World Food Security:** In 1996 the World Food Summit was held in Rome, Italy, where the Rome Declaration on World Food Security was adopted to address global hunger and future food security issues. The declaration reaffirmed the fundamental right of everyone to be free from hunger with an immediate view to reducing the number of undernourished people to half the level in 1996 by no later than 2015.
- **No poverty by 2030!- United Nations SDGs:** The UN's



Sustainable Development Goals are an international commitment to a sustainable planet consisting of 17 common goals, including no poverty, no hunger, reduced inequalities, and climate action, agreed upon by the international community to achieve by 2030. Poverty eradication is a top priority among the SDGs, and the UN is working to reduce the population of those living under \$1.25 a day by 2030.

7. Efforts to fight food crisis (International organizations)

- **United Nations Food and Agriculture Organization (FAO) that promotes the production and distribution of food:**

The United Nations Food and Agriculture Organization (FAO) was established in 1946 to defeat hunger and improve nutrition and food security by improving production and distribution efficiency of food. The main function is to collect, analyze and disseminate information on nutritional status, food and agriculture of countries around the world, conduct scientific, technical, social and economic research on nutrition, food and agriculture, and adopt related relief policies. FAO also provides technical assistance to poor countries.

- **United Nations World Food Programme (WFP), the world's largest food-assistance organization:** WFP was established in 1961 to support global food security and agricultural development issues in poor countries, discuss food development policies, and organize fundraising for food aid and provide food-assistance policy related support in developing countries. It supports 100 million people in 83 countries worldwide every year and is working to eradicate poverty and achieve the goal of zero hunger by 2030. WFP received the Nobel Peace Prize in 2020 for its works.

- **Global Agriculture and Food Security Program (GAFSP) for increasing agricultural productivity:** The GAFSP is an international fund and managing organization established in 2010 under the consensus that agricultural development is necessary for poverty eradication. Focusing on the fact that 75% of the world's poor make a living based on agriculture, GAFSP carries out activities such as improving agricultural productivity in low-income countries, reducing



agricultural barriers, and improving rural living conditions. The organization was launched with an \$880 million investment from the United States, Canada, South Korea, Spain, and the Bill Gates Foundation.

- + **Watch the video “Zero Hunger Future”:**

 <https://youtu.be/cHz0jPs5KQU>

7. Efforts to fight food crisis (Nations)

- **Increasing food self-sufficiency:** A country's self-sufficiency rate is directly related to food security. What would happen if a country that has long exported food in large quantities suddenly stopped exporting food? The people of the importing countries would suffer from hunger and economies will collapse one after another. It is important for all countries to secure a stable domestic grain supply in case of an emergency, and various policies should be prepared to increase food self-sufficiency, including securing enough farmland, developing a functional irrigation system, and managing water resources through embankments.
- **Urgent support for the most vulnerable:** Governments should expand social security plans for the most vulnerable. Experts predict that by providing opportunities for fair economic growth, the purchasing power of the poorest 2 billion people will improve, thereby increasing demand, creating new jobs and boosting the local economy.
- **Direct farm-to-market transactions:** To solve the food crisis, many people need to have access to nutritious food at low prices. If the direct supply chain linking farms and markets is expanded, it will be easier to supply low-cost, high-quality food. The country should help farmers secure a wider consumer base by improving fundamental infrastructure such as roads, warehouses, and power while maintaining existing infrastructure in markets and rural areas.



8. What are some ways to solve the food crisis? (Future food)

- **Lab grown meat:** Lab grown meat is meat obtained by indefinitely multiplying meat muscle cells. Meat, milk, and leather can be made through lab grown meat technology, and the variety of products that can be created by this technology is expected to increase in the future while production costs are reduced. When the technology was first developed in 2013, the price of a hamburger patty was about 340 million Korean won, but by 2024 it dropped to about 10,000 to 20,000 Korean won for about 100 grams.
- **Plant-based meat (e.g. meat analogue):** Meat can be made from tofu. These days, technology has allowed the development of plant-based meat with similar composition, texture, and flavor as beef.
- **Edible insects:** Since edible insects are highly productive and provide high-quality protein, research and discussion on edible insects as an alternative to food are increasing. Larvae such as silkworm pupae and maggots are being widely studied as edible insects.



8. What are some ways to solve the food crisis? (New agricultural technology)

- **Vertical farm:** A vertical farm is the use of urban high-rise buildings as agricultural land. It has the advantage of artificially controlling all conditions that affect farming (temperature, humidity, light, water, etc.) so that it can be produced all year round regardless of weather. This will help increase production and serve as a stable food supply. Growing plants in multiple floors of a high-rise building will help solve the problem of agricultural land shortage by increasing land use efficiency by 10 times.
- **Urban agriculture:** Urban farm means growing vegetables on urban idle land, building rooftops, and apartment verandas. Robot agriculture can also be implemented for urbanites who do not have farming expertise. Urban farms not only have a positive impact on urban people's emotional health, but they also have the advantage of increasing vegetable consumption and reducing logistical costs.
- **Digital agriculture:** Digital agriculture refers to an approach that increases agricultural productivity by

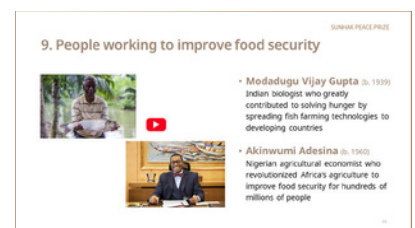


using technologies such as internet of things, drones, and satellites. By using drones and satellites to check the cultivation process and situation in real time, a supply and demand plan can be made for the crops. These technologies can also be used to determine the appropriate time to use pesticides. By using less water and fewer pesticide through such technology, it will be possible to produce higher price agricultural products at lower costs.

9. People working to improve food security

- **Modadugu Vijay Gupta (b. 1939):** Indian biologist who greatly contributed to solving hunger by spreading fish farming technologies to developing countries. A world-renowned authority in the field of fish genetics, Dr. Gupta lived together with people in war zones and extreme poverty to research localized fish farming technologies and led the study of fish genetics through which he contributed greatly to increasing fish production. He was awarded the World Food Prize in 2005 and the Sunhak Peace Prize in 2015.
- **Akinwumi Adesina (b. 1960):** Nigerian agricultural economist who revolutionized Africa's agriculture and improved food security for hundreds of millions of people across the continent. To increase the income of poor farmers, Adesina invented the E-wallet system, which allows farmers to increase food productions and gain more profit by directly sending farmers electronic vouchers to purchase fertilizers and cutting out the middlemen. He also collaborated with banks and international NGOs to initiate an innovative financial system that allowed poor African farmers to take out agricultural loans. He received the 2019 Sunhak Peace Prize.
- **+ Watch Akinwumi Adesina's video:**

 https://www.youtube.com/watch?v=Eer1Pmon_AM



(Brainstorming - Let's think together about possible solutions.)

- (Let the students discuss actions they can take in their daily lives to help solve the food crisis. Remind the students that small actions in everyday life can bring a big change and encourage them to come up with various actions they can take.)
- **What can we do to solve the food crisis?:** Consume local food, shop at local markets rather than wholesale markets, buy fair trade foods, reduce meat consumption, produce less food waste, continue to take interest in the global food crisis, participate in campaigns or make donations, etc.

