

What Could be the Strategy to Strengthen our Food System?

A case study from Russia - Ukraine War

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- The Russia-Ukraine war threatens the supply of essential commodities, such as food and energy, and causes a spike in their prices.
- Aside from the conflict, financial instabilities during the COVID-19 pandemic and uncertain extreme weather due to climate change remain obstacles to producing enough food.
- Ways to strengthen the food system are diversifying staple food, increasing crop efficiency, and utilizing suboptimal land.

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Food system and the drivers to food scarcity

A food system is all processes of feeding a population on a global, regional, national, or local scale by utilizing all the elements and activities related to the production, processing, distribution and marketing, preparation, and consumption of food (UN Food System Summit, 2021). As shown in **Figure 1-a**, a sustainable food system will lead to food security by utilizing each element as a driver for the activity.

For example, the advancement of technology and innovation combined with a good amount of soil nutrients in the land will increase the efficiency of the production process. However, any disruptions to these activities could hamper food availability and accessibility to the population. It could be globalization, the spike in the demography, uncertain weather and climate change, and the possibility of conflicts and wars. As a result, this condition will provoke famine and starvation,

especially in the most vulnerable countries and regions.

Figure 1-b briefly explains how several disruptions in the food system could result in food insecurity. First, a failure to increase the growth rate of food crop production is an issue for the ever-increasing world food demand. Moreover, the global consumption per capita is expanding (Godfray et al., 2010). It can be shown by the evidence of the rising consumption of energy-rich foods, such as meat, milk, and eggs (Kearney, 2010). Meanwhile, producing this type of food requires grain and corn to feed livestock. So that there is more and more land competition between direct commodities for staple foods or indirectly such as animal feed ingredients. The competition has made the land available for crop production limited. After all, the result is food insecurity and unsustainable living conditions.

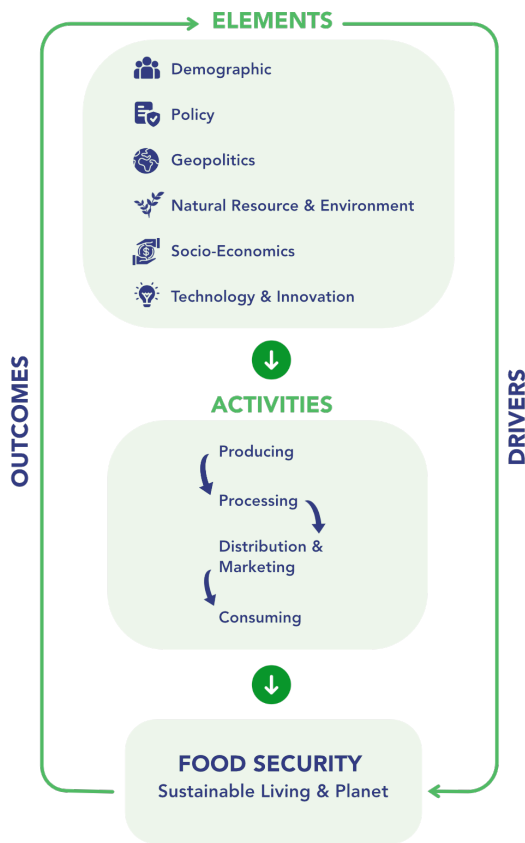


Figure 1-a Sustainable Food System Framework

Adapted from "RFS Food Systems Conceptual Framework" by USAID, 2021, RFS Food Systems Conceptual Framework. Summary Guidance, p. 1. Copyright 2021 by USAID.GOV.

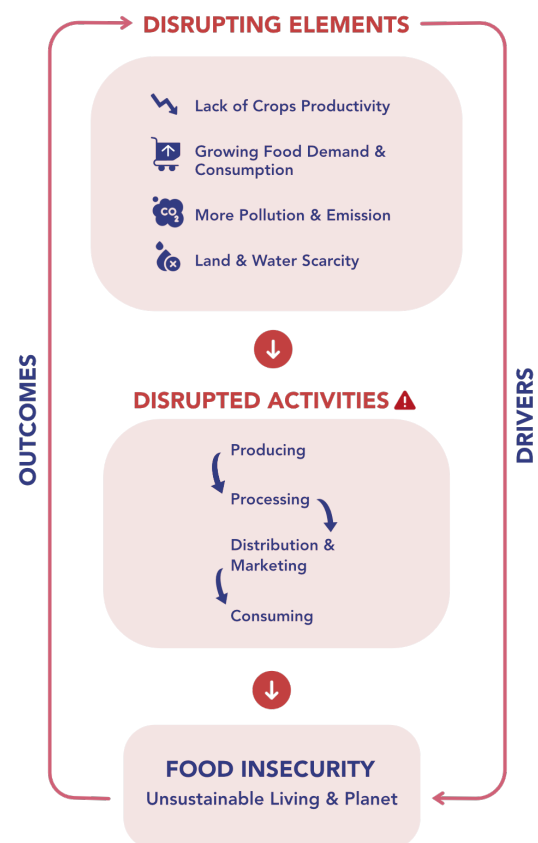


Figure 1-b Disrupted Food System

Aside from food insecurity, disrupted food systems could result in environmental-related problems. The effort to increase production without careful consideration of the environment induces deforestation, loss of biodiversity, and large amounts of emissions. During the IPCC 2014 event, it was reported that the agricultural sector, including forestry and land uses (AFOLU), has contributed to almost a quarter of the total direct greenhouse gas (GHG) emissions (**Figure 2**).

The percentage is just a tad below the electricity and heat production (25%). Apart from the direct carbon dioxide emission, the emission from agriculture also comes in methane and nitrous oxide. This condition, therefore, induces global warming and raises the earth's temperature. The increase in temperature will affect the cultivation process as it depends on the crop's ability to adapt to the climate. In addition, the declining level of soil quality and water scarcities have made it even more difficult for farmers to produce food crops.

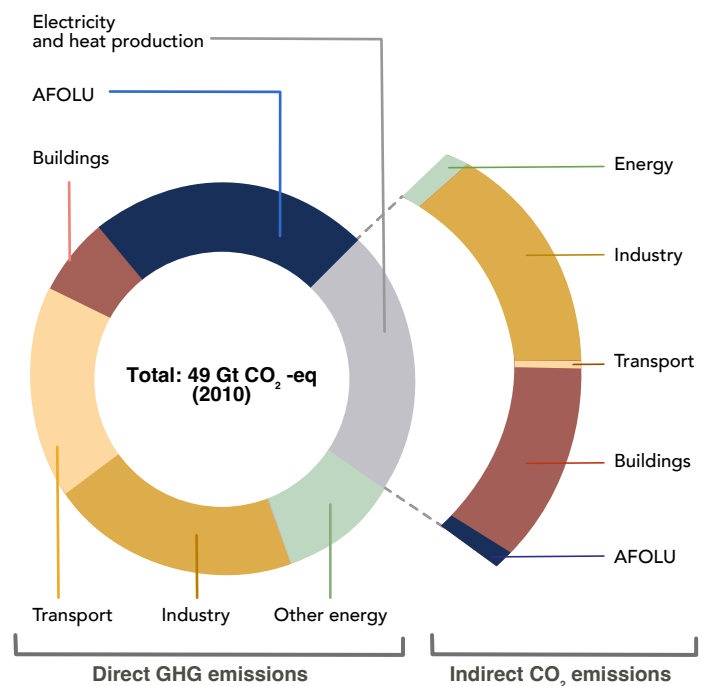


Figure 2. Greenhouse gas emissions by economic sectors

Sourced from Climate Change 2014: Synthesis Report (p. 47) by IPCC, 2014, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

Another driver for disrupting the system is conflict or war between two or more parties. Friction will trigger economic instability between countries, thus affecting food production, processing, and distribution activities (FAO, 2016). The lack of financial stability of farmers and the government to obtain adequate inputs will hamper pre-production activities such as land preparation and seeds.

Then, farmers will find it difficult to cultivate land during unsafe conditions. The supply chain, such as processing and distribution activities, will also be disrupted. Moreover, the disruption will not only affect conflicted countries but also countries that have been relying on their agricultural products. This chaotic condition is not desired by anyone, especially considering its impact on global food security.

Unwanted disruption from the world's breadbaskets

The shortage of food supply during the COVID-19 pandemic was an alarming issue for the global food system. It showed the vulnerability of the current food system. In the meantime, many parties were actively involved in efforts to resolve these problems. The goal is clear: to end the spillover effects of the COVID-19 pandemic as soon as possible.

However, there was another surprise. In February 2022, the invasion of Russian troops in Ukraine exacerbated already worrying conditions. Food and energy supplies are tightening and the world is amid the greatest possible famine, spikes in the prices of essential commodities, and many related socio-economic and political conflicts.

Ukraine and Russia are among the top global wheat producers or so-called breadbaskets. In Ukraine, wheat has become the most cultivated agricultural crop. Thanks to the black soil called 'chernozem' which is highly fertile and a perfect input for producing crops for Ukrainian (Bernoux et al., 2014).

Meanwhile, after the collapse of the Union of Soviet Socialist Republics (USSR) era, Russia has turned from a net importer of wheat to one of the largest wheat producers (Duggal and Haddad, 2022). By 2020, FAO (2022) reported that Ukraine and Russia collectively have accounted for at least a quarter of the global exported wheat. In addition, these two countries have had an increasing trend of wheat production since 1990 (Figure 3).

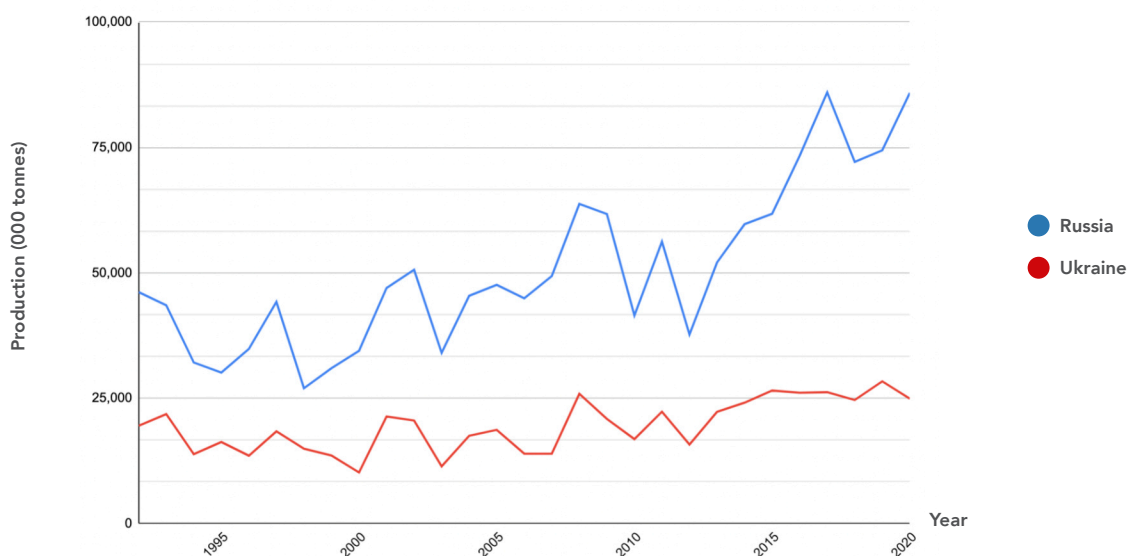


Figure 3. Ukraine's and Russia's wheat productions in 2020

Data sourced from Observatory for Economic Complexity, 2020.

A diagram briefly describes the food system disrupted by the conflict in Ukraine (**Figure 4**). Currently, the world bans Russia from entering global markets, including selling wheat and fertilizer products. However, the sanction is not only affecting the respective country but also the world's food supplies. This shortage of wheat stocks - previously supplied by Russian agriculture—must be well-addressed. Unfortunately, the urgency to increase crop productivity could be another problem given many inhibiting factors such as climate change and extreme weather.

At the same time, the Ukrainian agricultural sector is under heavy pressure. Ukrainian civilians, including farmers, are currently voluntarily defending their country or fleeing to neighboring countries. They could not do much to continue cultivating their land. In addition, the closure of the port of Odessa restricted Ukrainian crops to the market. Meanwhile, David Beasley, the Executive Director of the United Nations World Food Program (WFP), has warned of the importance of opening the port of Odessa to reduce the possibility of food shortages worldwide (WFP, 2022).

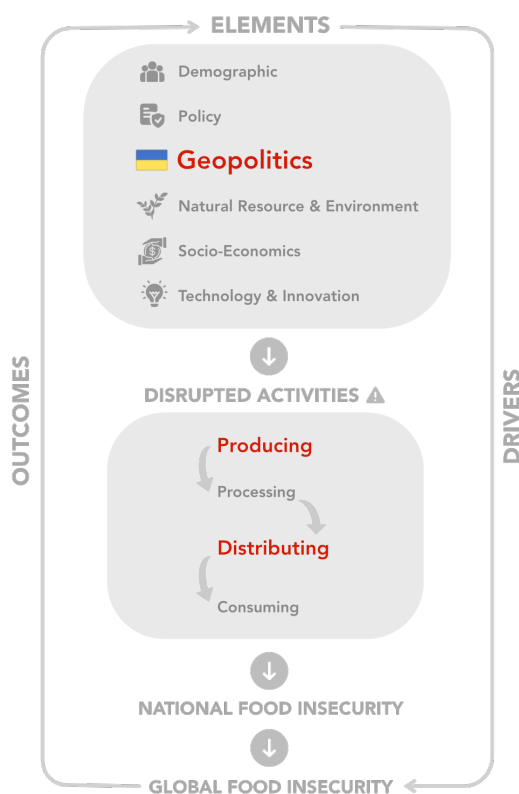


Figure 4. Diagram explaining how the conflict in Ukraine is disrupting national and global food systems

Apart from the limited availability of wheat and fertilizers, the conflict in Ukraine also affects world energy supplies and the price of related commodities. Many countries depend on Russia for their energy supply.

The risk of energy scarcity lifts various problems ranging from lowering the industrial sector's capability to produce goods to the food crisis in respective countries. In addition, the limited supply of wheat seeds can influence the soaring prices of processed wheat foods such as cereals, crackers, wheat flour, instant noodles, and indirectly, such as substitute products.

The conflict causes chaotic effects in the developing countries

The conflict in Ukraine can cause economic destabilization, especially in developing countries. Due to limited financial capacity, some will prioritize their budget to complete food and energy needs. Besides, some countries are net importers of staple commodities supplied from other countries. It causes dependence on international trade activities. If there are problems in the commodity trading process, what may happen next is the regional economic turmoil and price instability. Thus, it can induce chaos due to the people's inability to buy their basic needs.

Since the 1990s, the food sources in the Middle East and North Africa (MENA), such as Egypt, Nigeria, Algeria, Yemen, and Sudan, have been highly dependent on the world's grain supply, including from the two countries in conflict. Egypt is the largest wheat importer accounting for 5.2 billion US dollars in 2020 (**Figure 5**).

A report from UNCTAD shows that Egypt's dependence on wheat production from Ukraine and Russia is around 80%. Moreover, Somalia is a country that depends entirely on the availability of wheat to Ukraine and Russia (UNCTAD, 2022). Other regions, such as South Asia and Southeast Asia, were as dependent as MENA countries regarding wheat stocks from exporting countries.

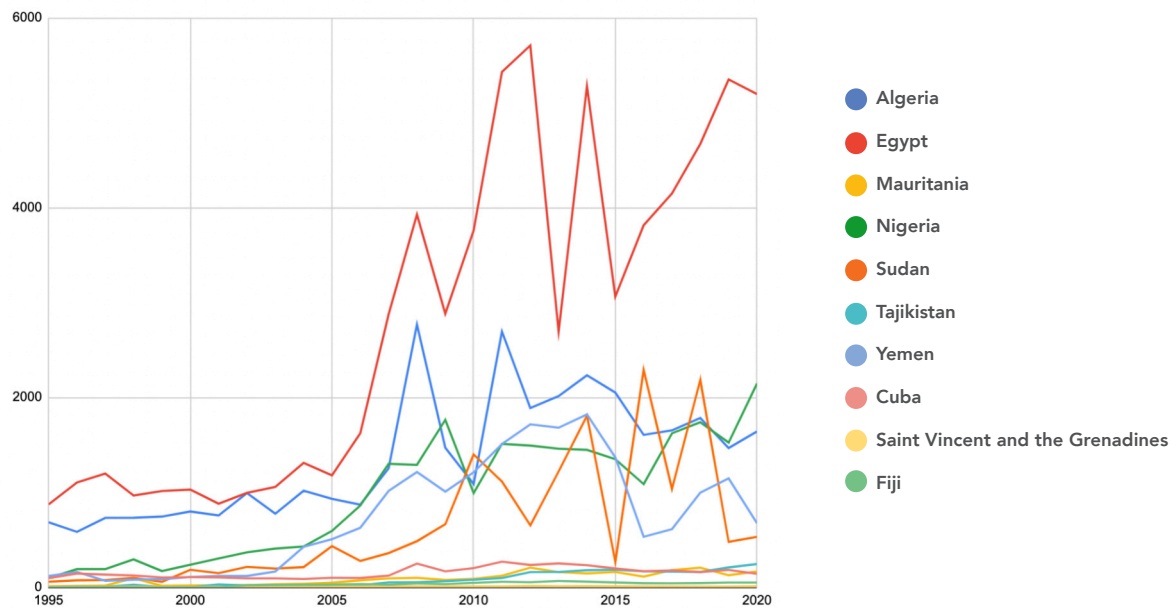


Figure 5. Top 10 net wheat importer countries in the world

Indonesia, the second-largest consumer of instant noodles after China (Buccholz, 2020), has accounted for a wheat import value of 2.08 billion US dollars in 2020 (OEC, 2022). The Central Bureau of Statistics Indonesia (BPS) reported that wheat from Ukraine is the most significant supply. In 2020, they supplied almost 3 million tons of wheat to Indonesia (BPS, 2020). Indomie, the well-known Indonesian brand for instant noodles, has more than 60% of its ingredients sourced from wheat flour. Besides, the ban on Russia's oil and gas export poses the all-time highest spike in the oil price. This situation will impact the shipping cost; thus, concerning the high production cost of instant noodles.

A soaring price of instant noodles can be an example of the conflict's spill-over effect. Indonesia, the second-largest instant noodle consumer after China (Bucholz, 2020), has contributed to the import value of wheat by 2.08 billion US dollars in 2020 (OEC, 2022). The Central Statistics Agency (BPS) reported that grain from Ukraine was the most significant supplier. In 2020, they supplied nearly 3 million tonnes of wheat to Indonesia (BPS, 2020). Indomie, a well-known Indonesian brand for instant noodles, more than 60% of its ingredients are sourced from wheat flour. In addition, the ban on Russian oil and gas exports led to the highest oil price spike of all time.

In addition to the wheat problem, the reduced supply of world fertilizers because of export sanctions against Russia has caused chaos in the developing countries. The government of Sri Lanka, whose country is experiencing an economic crisis following the outbreak of the COVID-19 pandemic, could not provide farmers with some fertilizers because of the high buying price. The conditions threaten the future availability of food in Sri Lanka (Al Jazeera, 2022).

Moreover, others have restricted their export activities as a preventive measure to avoid a shortage of domestic food commodity supplies. Recently, Malaysia imposed a policy of stopping chicken exports due to a potential regional food crisis (Bloomberg, 2022).

Strengthening the food system in a sustainable way

Many have argued that the current food system is not resilient enough to deal with a situation where the world is entering an era of food crisis (Agmemyang and Kwofie, 2021; Alexander et al., 2017; Countinho et al., 2019). For example, the conflict in Ukraine has so far had an impact on the food system: especially its production and distribution activities.

Before the conflict, the agricultural sector had already experienced disruptions due to global financial issues during the COVID-19 pandemic, and most developing countries struggled to ensure national food security (FAO, 2021). Meanwhile, there will be an addition of at least 2 billion people to make the total world population reach more than 9 billion in 2050 (UN Department of Economic and Social Affairs, 2019). The global food demands will be increasing. In light of the current situation, strengthening the food system into a more resilient and sustainable system can be the solution to prevent the world from severe hunger.

Some of the weaknesses of the current food system are heavy dependence on food imports, large amounts of food and agricultural wastes, and land availability for cultivating crops (Alexander et al., 2017; Kennedy et al., 2021). Recently, import dependency issues have appeared in MENA, such as Egypt, Nigeria, Algeria, etc. These countries consume a lot of wheat, but the tropical climate does not allow their farmers to cultivate. To overcome this, they import quite a lot from western countries, including Ukraine and Russia. As a result, these countries depend on the two countries in conflict for their stocks.

Another weakness is the waste generated during the production process. In this process, various things such as lack of nutrients needed by plants, soil quality, use of inappropriate tools and technology, or extreme weather such as drought or flooding cause food ingredients that should be available in the market to be lost.

The amount of food supply became less than expected. While in the uncertain situation in Ukraine, wheat-producing countries need to focus on the efficiency and effectiveness of their wheat farming. Apart from hoping to increase productivity, reducing waste while increasing cropping efficiency can create sufficient food yet minimum environmental impacts due to agricultural activities (Foley et al., 2011). Therefore, re-inventing agriculture must be made to ensure the high potential yields of the wheat-producing countries.

In addition to dependence on imports and waste problems, currently, the availability of land for the cultivation of food crops is decreasing. It was affected by a growing interest in using productive land for agriculture as fuel and energy. Regarding the conflict in Ukraine, the issue of land availability is crucial to encourage domestic production and obtain food security, especially for developing countries. Moreover, several developing countries have the advantage of the availability of agricultural lands, both optimal and sub-optimal. The latter is a land that is often forgotten, although it may support sustainable living and planets.

There is a growing literature on suboptimal land use as a food security solution. Suboptimal land is the less-productive soil that can be improvised and used as an alternative to the typical arable land. Despite being commonly known as a low-productive and limited use for agricultural purposes (Wiegmann et al., 2008), studies have shown the potential of suboptimal land to provide socio-economic benefits with no or very minimum pollution and environmental damage (Rahmasary et al., 2020; Usman et al., 2020). When referring to peatlands, the agriculture practice with proper land and water management will result in minimal sustainability problems, especially those related to the environment (Lakitan and Gofar, 2013; Qurani et al., 2022). Based on the literature, suboptimal land can support the food production, hence, helping to strengthen the food system.

Additionally, policies and regulations become very important to ensure the resilience of the global food system in the current situation. Some appropriate policies can also help reduce the increased risk of a global food crisis despite maintaining the availability of domestic food supplies. An example of this circumstance is India, which has just announced a halt to wheat exports to meet domestic food needs. Meanwhile, India is one of the world's largest wheat producers; thus, India's contribution to the global wheat supply is crucial, especially after the shortage of wheat stocks from Ukraine and Russia. Therefore, policies need to be re-allocated to become a catalyst in bridging national and international interests in food security.

Conclusion

Any disruptions to the food system can trigger food insecurity, for example, a conflict between Ukraine and Russia. The role of Ukraine and Russia as the world's food barns shows the urgency of the two countries for world food security. The unexpected shortage of grain and fertilizers has overwhelmed many wheat importing countries, especially since many of these countries are developing countries with low economic stability. In addition, conflicts and problems with wheat stocks led to a spike in the prices of related commodities.

There are several strategies to strengthen the food system, especially those related to the ongoing conflict in Ukraine. First, dependence on food imports, in this case, wheat from Ukraine and Russia, must be overcome by switching to local food. Second, increasing crop efficiency while reducing production failures, especially in major wheat-producing countries.

Furthermore, encouraging sub-optimal land use can support the two previous strategies. Last but not least, it is also crucial to generate policy impacts in regulating and monitoring a more sustainable food system.

In addition to overcoming the situation due to the conflict in Ukraine, the transformation of the food system is very important for future global food security. Conceptually, food security is about availability, accessibility, utility, and stability (FAO, 2003). The three ideas in the previous paragraph are expected to increase food security, particularly food availability and accessibility. More so, those ideas require the involvement of various parties who support the creation of a sustainable food system. Given all the circumstances, can we together achieve the second sustainable development goal (SDG): to end hunger and ensure access for all by 2030?

What have they said about the food system?

"The war in Ukraine is inducing a three-dimensional crisis – food, energy and finance – with devastating impacts on the world's most vulnerable people, countries and economies."

António Guterres, Secretary-General of the United Nations



"The reality is that we are facing an era of food crisis. This could be more dangerous than the previous crisis. Therefore, we need everyone's help to solve this problem. More importantly, we must act now."

David Beasley, Executive Director of UN World Food Program

"When buying food at the supermarket, we must think local, choose organic, know your farm, know your food."

Birke Baehr, Speaker at TEDx NextGeneration 2010



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ABOUT TJF

Tay Juhana Foundation (TJF) is a nonprofit organization dedicated to promote the advocacy of the conversion and cultivation of suboptimal lands into productive lands, through the most environmentally, economically, and socially sustainable manner.