

## **PROMOTING GLOBAL HEALTH THROUGH TECHNOLOGY TRANSFER**

Grace Reeder, Whittier College

MUNFW 72ND Session - Commission on Science and Technology for Development (CTSD)

The United Nations' Commission on Science and Technology for Development (CTSD) is the home for discussions on science and technology, and how this affects development and a sustainable future for all. It was founded out of the UN Conference on Science and Technology for Development held in Vienna in 1979 which created an official Committee with the same name. In 1992, the Committee was transformed into a commission as part of the Economic and Social Council (ECOSOC). This commission provides a critical avenue for ensuring developing countries and people are not left behind in technological development. Technology has advanced rapidly since 1992 and the knowledge transfer that takes place through the work of the Commission is more important than ever. The world will not be able to achieve the Sustainable Development Goals (SDGs) without utilizing modern technology to help find new solutions to old problems. Technology is advancing rapidly and the Commission works to ensure that people are not left behind because their government is unequipped to keep up with technological advancements.

The Commission is working diligently to reduce the digital divide between nations and people. It is critical that everyone is able to benefit from the advancements in science, technology and innovation to address their own development challenges - which is why the work of the Commission is an incredibly important vehicle to the United Nations and the world as a whole.

### **COVID-19 Pandemic**

The world came to a stop in 2020. As work-from-home plans were put into place, people all around the world relied even more on technology to remain connected. The work of the Commission is especially important when it comes to addressing the global impacts of the COVID-19 pandemic. The pandemic showed just how important it is for countries to invest heavily in science, technology and innovation (STI) policy. Many countries will be unable to achieve the SDGs without equal access

to advancements in STI. A multilateral approach is the only solution to the problems arising out of both the COVID-19 pandemic and future global health crises that are sure to arise in the future. It is imperative that there is knowledge sharing so that all peoples have *equal access* to the benefits of science, technology and innovation in healthcare; without this, there will be no way to successfully address the problems that arise out of global health emergencies.

The COVID-19 pandemic revealed the deep inequalities among nations in their access to treatments, vaccines, and health-related technologies. For a sustainable recovery from the COVID-19 pandemic, an international coordination of STI must take place; otherwise the most vulnerable will be left behind. The only way to properly address future global health emergencies will be through coordinated global efforts, where information sharing is at the center.

The use of technology has been fundamental in monitoring the outbreak, development of vaccines, tracing cases of the disease, predicting its evolution and assessing infection risks.<sup>1</sup> However, it also exposed clear gaps in access to the Internet, low network speed, skills, and social factors, all of which continued to impact the level of participation in civil society people were able to maintain during the pandemic. These digital divides are influenced by existing social inequalities which are then reinforced. Technological advances must also consider the impact on marginalized peoples when being developed. Social and digital inequalities must be addressed simultaneously or the divide will continue to get worse. This is especially important when considering technological advancements in artificial intelligence (AI) - if algorithms are developed with biases, they will further exacerbate existing inequalities instead of providing helpful solutions. One of the things that the Commission has continued to advocate for is making reliable internet access a public good, such as electricity or water. This would help address existing inequalities and reduce the digital divide.

The COVID-19 pandemic has exposed existing societal divisions, especially when it comes to access to treatments, vaccines, and health-related technologies.

---

<sup>1</sup> Bullet 3

Further, measures such as these would help achieve the 2030 Agenda and would reduce the total disruption that pandemics like COVID-19 has on society.<sup>2</sup> During the 24th annual session of CTSD in 2021, these topics were addressed in depth so that equitable solutions could be developed. The main theme of this session was to use (STI) “to close the gap on Sustainable Development Goal 3, on good health and well-being; and... harnessing blockchain for sustainable development.”<sup>3</sup> STI is essential and has been imperative in addressing the COVID-19 pandemic, especially in response to health, economic, and social disruptions. Additionally, information and community technology (ICT) tools have supported the distribution of diagnostics, community- and self-testing, and digital contact tracing.<sup>4</sup> These are critical components of early warning alert systems, as well as disease tracking and monitoring.

### **Technology Transfer**

Technology transfer is an especially important tool to ensure that all countries and people are well-equipped to meet the 2030 Agenda’s Sustainable Development Goals (SDGs). It enables countries, specifically low- and middle-income countries, to build their capacity, especially related to the field of global health. Technology transfer is defined as “a series of processes for sharing ideas, knowledge, technology, and skills with another individual or institution and of acquisition by the other of such ideas, knowledge, technology, and skills.”<sup>5</sup> Further, it encompasses “education and training, direct investment, licensing, movement of people, supply of materials and equipment, and other elements.”<sup>6</sup> Since the start of the COVID-19 pandemic, the United Nations has continued to facilitate the transfer of knowledge in order to promote global health security.

Some of the efforts they have undertaken since early 2020, include launching a Tech Access Partnership (TAP) that “aims to address critical shortages of essential health technologies and

---

<sup>2</sup> Ibid

<sup>3</sup> Bullet 2

<sup>4</sup> Ibid

<sup>5</sup> Bullet 4

<sup>6</sup> Ibid

equipment by connecting manufacturers with critical expertise and emerging manufacturers in developing countries to share the information, technical expertise and resources necessary to scale up production of these tools.”<sup>7</sup> The World Health Organization’s (WHO) Director General, Dr. Tedros Adhanom Ghebreyesus, made an important point regarding this partnership, in that “COVID-19 has shown us that a disease outbreak anywhere is a threat everywhere” and further stressed that a multilateral approach is necessary “to support all countries and ensure equitable access to lifesaving technologies.”<sup>8</sup>

In September 2022, Dr. Ghebreyesus gave the opening remarks at the launch of the Lancet COVID-19 Commission’s final report.<sup>9</sup> In this speech, he mentioned how technology transfer has been vital for enhancing local vaccine production. In order to facilitate this transfer, the United Nations “established the mRNA Technology Transfer Hub in South Africa, which... [shares] technology with 15 country recipients.”<sup>10</sup> This was funded by the European Union (EU), France, Germany and other local and international partners. Efforts like these are vital to the global effort in stopping the devastating impacts the COVID-19 pandemic had. The sharing of technology and resources is not just about supporting equity, it is the *only* way to stop future health emergencies.

While the mRNA Technology Transfer Hub is a good start, there is still more that can be done. Innovative technology and solutions were deployed to quickly design effective vaccines that protect against COVID-19. As of August 2022, there are still more than 80% of people on the African continent who have not received a single dose of the vaccine.<sup>11</sup> This inequity was exposed from the start of the vaccine’s development, as the world saw the concentration of the production for this and other health technology focused on a few, mostly rich, countries. This left poorer countries behind, showcasing the need for an expansion of local and regional production of health technology and resources. In order to better address future health crises and pandemics, which will surely arise from

---

<sup>7</sup> Bullet 7

<sup>8</sup> Ibid

<sup>9</sup> Bullet 6

<sup>10</sup> Ibid

<sup>11</sup> Ibid

as the consequences of climate change worsen, a collective investment in the local ecosystems of poorer countries is imperative; developing the supply-chain of life-saving technology in these regions will make the distribution more equitable than what was seen during the COVID-19 pandemic. Ensuring all regions of the world have “state-of-the-art production infrastructure, trained personnel and institutional and regulatory arrangements is a valuable asset for our common health security.”<sup>12</sup> In order for these policy objectives to become reality, governments need to invest heavily in supporting these valuable resources. This investment is imperative in achieving pandemic preparedness and enhancing global response capabilities.

### **Important Resolutions**

The United Nations has adopted many resolutions that support the overall mission and work of CTSD. This work began prior to the COVID-19 pandemic, but the topic has become more important than ever when it comes to addressing global health issues.

In December 2013, the General Assembly adopted Resolution 68/220 “Science, technology and innovation for development.”<sup>13</sup> This resolution takes note of previous resolutions addressing the use of technology for development and CTSD was instrumental in providing their input on this topic. Paragraph 7 discusses technology transfer directly, as it notes “the importance of facilitating access to and sharing accessible and assistive technologies, through the transfer of technology.”<sup>14</sup> Further, paragraph 14 specifically highlights this issue stating that, “science, technology and innovation are critical in meeting development goals, including sustainable development objectives.”

In July 2019, ECOSOC approved Resolution 2019/25 at the recommendation of CTSD.<sup>15</sup> This resolution outlines the importance of technology, including technology transfer and knowledge sharing, in meeting the sustainable development goals. In this resolution, it specifies that this builds

---

<sup>12</sup> Ibid

<sup>13</sup> Bullet 8

<sup>14</sup> Ibid

<sup>15</sup> Bullet 9

more resilient communities who are better equipped to handle societal shock, such as global health and economic emergencies.

In September 2020, the General Assembly adopted Resolution 74/306, which stated that the Covid-19 pandemic has presented the United Nations with one of their greatest global challenges in its history.<sup>16</sup> Further, this resolution stressed the need of global cooperation in responding to this significant threat to global health, calling for a “unity, solidarity and renewed multilateral cooperation.”<sup>17</sup> This includes technology transfer as it is through knowledge sharing and cooperation that Member States are all able to adequately respond to global health crises like the Covid-19 pandemic. Further, a threat to one country is a threat to all as the virus spreads quickly and knows no borders.

In August 2021, the General Assembly adopted A/75/316, titled “Impact of Rapid Technological Change on the Achievement of the Sustainable Development Goals and Targets.”<sup>18</sup> This resolution works to bridge the gap in digital divides and increase internet access, issues areas that are highlighted by the Covid-19 pandemic. Further, increasing the technological capacity of developing countries is imperative in strengthening their ability to respond to health crises. Technology access is imperative in addressing global health crises as it allows for early alert systems, monitoring outbreaks, vaccine development and more to take place. All countries should be equipped to harness technological advancements and this requires international cooperation to support and invest in these programs.

In July 2022, the Human Rights Council adopted Resolution 50/13, “Access to medicines, vaccines and other health products in the context of the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.”<sup>19</sup> Paragraph one states, “timely, equitable and unhindered access to safe, affordable, effective and quality medicines, vaccines, diagnostics

---

<sup>16</sup> Bullet 11

<sup>17</sup> Bullet 12

<sup>18</sup> Bullet 10

<sup>19</sup> Bullet 11

and therapeutics and other health products and technologies” is of the utmost importance.<sup>20</sup>

Paragraph 5 goes even further and calls upon States to “collaborate... on models and approaches that support the delinkage of the cost of new research and development from the prices of medicines, vaccines and diagnostics for diseases that predominantly affect developing countries... so as to ensure their sustained accessibility, affordability and availability and to ensure access to treatment for all those in need.”<sup>21</sup> This resolution stresses the importance of collaboration and technology transfer as critical to ensuring everyone has their human rights realized; it is a critical resolution for the promotion of overall global health.

## **Conclusion**

The COVID-19 pandemic exposed the massive inequalities among Member States in their ability to respond to global health crises. In order for every country to be able to effectively meet the 2030 SDGs, especially related to global health issues, the transfer of knowledge related to STI advancements, it is critical that everyone is able to benefit from the innovations.

---

<sup>20</sup> Ibid

<sup>21</sup> Bullet 11

### **Questions to Consider**

1. What is technology transfer?
2. What are the root causes of inequity between wealthy countries and low- to middle-income countries when it comes to global health?
3. What impact has the COVID-19 pandemic had on the ability of Member States to meet the 2030 Sustainable Development Goals (SDGs)?
4. What does your Member State think about technology transfer?
5. What statements has your Member State made about technology transfer? About the Covid-19 pandemic?
6. Has your Member State benefited from technology transfer?
7. What level of support has your Member State provided in regards to knowledge-sharing to promote global health?

## Bibliography

1. <https://unctad.org/topic/commission-on-science-and-technology-for-development/covid-19>
- 2.
3. <https://sustainabledevelopment.un.org/index.php?page=view&type=30022&nr=2846&menu=3170>
4. [https://sustainabledevelopment.un.org/content/documents/27458Commission\\_on\\_Science\\_and\\_Technology\\_for\\_Development.pdf](https://sustainabledevelopment.un.org/content/documents/27458Commission_on_Science_and_Technology_for_Development.pdf)
5. <https://www.who.int/teams/regulation-prequalification/lpa/technology-transfer-facilitation>
6. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-launch-of-the-lancet-covid-19-commission-final-report---15-september-2022>
7. <https://www.who.int/news-room/commentaries/detail/sharing-technology-and-supporting-innovation-is-not-just-about-equity-it-s-also-the-best-way-to-stop-pandemics>
8. [https://www.un.org/technologybank/news/un-agencies-launch-tech-access-partnership-joint-effort-scale-local-production-life-saving?ls%20Featured=All&field\\_featured\\_categories\\_tid=1&language=All&sort\\_by=created&sort\\_order=DESC&page=10&ls\\_Featured=All](https://www.un.org/technologybank/news/un-agencies-launch-tech-access-partnership-joint-effort-scale-local-production-life-saving?ls%20Featured=All&field_featured_categories_tid=1&language=All&sort_by=created&sort_order=DESC&page=10&ls_Featured=All)
9. [https://unctad.org/system/files/official-document/ares68d220\\_en.pdf](https://unctad.org/system/files/official-document/ares68d220_en.pdf)
10. [https://unctad.org/system/files/official-document/ecosoc\\_res\\_2019d25\\_en.pdf](https://unctad.org/system/files/official-document/ecosoc_res_2019d25_en.pdf)
11. <https://press.un.org/en/2021/ga12353.doc.htm>
12. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G22/406/74/PDF/G2240674.pdf?OpenElement>
13. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N20/236/00/PDF/N2023600.pdf?OpenElement>

## Bibliography

1. "City Climate Finance Gap Fund." *World Bank*, [www.worldbank.org/en/topic/urbandevelopment/brief/city-climate-finance-gap-fund](http://www.worldbank.org/en/topic/urbandevelopment/brief/city-climate-finance-gap-fund).
2. "Equal Pay Portal | Gender Pay Gap Reporting." *Equalpayportal.co.uk*, 2017, [www.equalpayportal.co.uk/gender-pay-gap-reporting/](http://www.equalpayportal.co.uk/gender-pay-gap-reporting/).
3. General, Distr. *Progress towards the Sustainable Development Goals*. Report of the Secretary General, 3 June 2016.
4. "Science, Technology and Innovation (STI) and Culture for Sustainable Development and the MDGs | UNITED NATIONS ECONOMIC and SOCIAL COUNCIL." *Www.un.org*, [www.un.org/ecosoc/en/content/science-technology-and-innovation-sti-and-culture-sustainable-development-and-mdgs](http://www.un.org/ecosoc/en/content/science-technology-and-innovation-sti-and-culture-sustainable-development-and-mdgs).
5. "The Sustainable Development Goals 2022 Report on Goal 11." *United Nations Sustainable Development Goals Data Story*, May 2022, [unstats.un.org/sdgs/report/2022/goal-11/](https://unstats.un.org/sdgs/report/2022/goal-11/).
6. UN Women. "The Shadow Pandemic: Violence against Women during COVID-19." *UN Women*, United Nations, 2020, [www.unwomen.org/en/news/in-focus/in-focus-gender-equality-in-covid-19-response/violence-against-women-during-covid-19](http://www.unwomen.org/en/news/in-focus/in-focus-gender-equality-in-covid-19-response/violence-against-women-during-covid-19).
7. United Nations. "Cities - United Nations Sustainable Development Action 2015." *United Nations Sustainable Development*, 2015, [www.un.org/sustainabledevelopment/cities/](http://www.un.org/sustainabledevelopment/cities/).
8. "Goal 11 | Department of Economic and Social Affairs." *Sdgs.un.org*, 2021, [sdgs.un.org/goals/goal11](https://sdgs.un.org/goals/goal11).
9. "Wheelmap." *Wheelmap*, [news.wheelmap.org/en/FAQ/](https://news.wheelmap.org/en/FAQ/).
10. "WomenWatch: Gender Equality and Sustainable Urbanisation - Fact Sheet." *Www.un.org*, [www.un.org/womenwatch/feature/urban/factsheet.html#section8](http://www.un.org/womenwatch/feature/urban/factsheet.html#section8).
11. United Nations Publications, Science, technology and innovation for sustainable urban development in a post-pandemic world (2022). New York, New York. Retrieved from [https://unctad.org/system/files/official-document/dtlstict2022d6\\_en.pdf](https://unctad.org/system/files/official-document/dtlstict2022d6_en.pdf).

## **THE ROLE OF SCIENCE, TECHNOLOGY, AND INNOVATION IN ENSURING FOOD SECURITY**

Piper Lowinger, Whittier College Alumna

MUNFW 72nd Session – Commission on Science and Technology for Development

As the number of new and protracted conflict-related, health, environmental, and food crises continue to rise, more will always be required of the international community. Hunger is perhaps one of the most poignant human experiences that every person can relate to in some capacity, from skipping breakfast one day due to a lack of time to being forced to eliminate breakfast altogether due to a severe lack of food. With traditional humanitarian and food assistance programs already stretched thin, the role of science, technology, and innovation becomes larger and more significant to the international effort to end hunger. Achieving the United Nations' Sustainable Development Goal 2, Zero Hunger, will require a joint effort by humanitarian and development actors at all levels to leverage new and emerging technologies to counter food insecurity. This paper provides a snapshot of the current food insecurity landscape, highlights the impact of climate change on hunger, details international efforts to address food insecurity at large, and identifies leading scientific and technological innovations that are helping to achieve the various dimensions of food security.

### **Global Distribution of Food Insecurity**

Globally, acute food insecurity continues to escalate. According to the 2022 Global Report on Food Crises, 193 million people across 53 countries or territories are facing food insecurity at crisis-level or worse, which is indicated as Phase 3 or above by the Integrated Food Security Phase Classification (IPC).<sup>36</sup> The risk of food insecurity also continues to rise, as a record 49 million people in 46 countries are on the verge of falling into famine or famine-like conditions. This includes 750,000 people who will likely experience starvation or death unless they receive immediate life and livelihoods-saving assistance.<sup>37</sup>

---

<sup>36</sup> Food Security Information Network. (2022). Global Report on Food Crises.

<sup>37</sup> *Ibid.*

Ethiopia, Nigeria, South Sudan, Yemen, Afghanistan, and Somalia are at the highest alert level. These countries all have populations that require the most urgent attention because they are identified or projected to experience starvation or death (Catastrophe, IPC Phase 5), or are at risk of deterioration towards catastrophic conditions.<sup>38</sup> The Democratic Republic of the Congo, Haiti, Sudan, Syria, Kenya, and the Sahel region are of very high concern. Additionally, Sri Lanka, West African coastal countries (Benin, Cabo Verde, and Guinea), Ukraine, Zimbabwe, Angola, Lebanon, Madagascar, and Mozambique are hunger hotspots.<sup>39</sup>

Across all countries, rural populations have the greatest exposure to food insecurity because of limited access to food and financial resources.<sup>40</sup> Subsistence and smallholder farmers are among those most affected, as they are often the first to experience the adverse effects of climate shocks, such as droughts. It is also important to note the gender aspect of food, as women disproportionately serve as agricultural labor and experience compounding environmental and societal vulnerabilities.

### **Contributing Factors to Increased Food Insecurity**

The areas most affected by food insecurity share commonalities—they experience a combination of pervasive conflict, protracted humanitarian crises, climate shocks, and/or widespread poverty. Poverty is of global concern not only because of its oppressive nature in regard to human rights, but also because it induces a host of internationally sensitive and interconnected issues.

Approximately 70 percent of the world's extreme poor are located in Southern Asia and sub-Saharan Africa; in the latter, 42 percent of the population is below the poverty threshold. Of the world's 780 million extreme poor, approximately 70 percent live in 5 countries (listed in descending

---

<sup>38</sup> *Ibid.*

<sup>39</sup> *Ibid.*

<sup>40</sup>United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030.*

order of extreme poor population): India, Nigeria, Democratic Republic of Congo, Ethiopia, and Bangladesh. A majority of the 43 countries with poverty rates above 18 percent are located in sub-Saharan Africa.<sup>41</sup> According to the World Bank, three-fourths of sub-Saharan countries reported poverty rates above 18 percent in 2015, and, of the world's 28 poorest countries, 27 are sub-Saharan with poverty rates above 30 percent.<sup>42</sup> In 11 sub-Saharan countries, more than half of the population lives in extreme poverty. Although extreme poverty is comparatively lower in the Middle East and North Africa, the average poverty rate doubled between 2013 and 2015 to reach five percent, representing 18.6 million people.<sup>43</sup>

Another factor that contributes to food insecurity is conflict. The effects of the war in Ukraine (which disrupted the country's agricultural sector and food exports) have exacerbated the global economic fallout of the COVID-19 pandemic, causing a steady increase in food and energy prices and a deterioration in macroeconomic conditions. Consequently, humanitarian organizations are experiencing sharp cost increases for their operations, as the skyrocketing price of fuel adds additional costs to the production and transport of food and humanitarian assistance. Further, the international community is concerned that civil unrest may emerge in some countries that are acutely strained by the global health and economic situation.<sup>44</sup>

### **Climate Change: A Risk Multiplier**

Though addressing poverty and conflict are critical to ensuring food security, this paper highlights climate change, as it is a risk multiplier that has the potential to affect the global population at large.<sup>45</sup>

---

<sup>41</sup> United Nations. Ending Poverty.

<sup>42</sup> World Bank. (2018). Poverty and Shared Prosperity 2018 : Piecing Together the Poverty Puzzle.

<sup>43</sup> United Nations Development Programme. (2019.) Multidimensional Poverty Index 2019: Illuminating Inequalities.

<sup>44</sup> United Nations Economic and Social Council Humanitarian Affairs Segment. Fighting Food Insecurity and famine: A call for coordinated action and multi-sectoral solutions against global hunger. 22 June 2022.

<sup>45</sup> Almost 70 per cent of people facing acute food insecurity lived in areas affected by conflict and insecurity. The international community remains concerned that conflict is the chief driver of food

The increase in frequency and severity of extreme weather- and climate-related events not only create greater and more urgent demand for humanitarian assistance, but also stress an already overwhelmed humanitarian infrastructure. Climate affects, such as droughts and floods, interact with other drivers of humanitarian need to exacerbate vulnerabilities, especially in countries with preexisting crises. Recurring disasters with compounding effects and few solutions make community recovery extremely difficult, if at all likely.<sup>46</sup>

As climate events worsen, agricultural industries of several developing countries wither under intense heat waves and prolonged droughts. Droughts alone have affected more than one billion people in the last decade, as subsistence farming is the primary source of food and income for, on average, three out of four people in developing countries.<sup>47</sup> A 2017 World Bank Report reveals that droughts have decimated produce stocks that could have fed approximately 81 million people daily since 2001.<sup>48</sup> Rising food costs threatened still more households. For example, the Horn of Africa entered 2022 on the verge of catastrophe, following three failed rainy seasons in lowland areas. In Kenya, drought-inspired low harvests exhausted families' coping capacities and left 2.9 million people in urgent need of humanitarian assistance.<sup>49</sup> Further, harvests are also sabotaged by high dependence on a few crops without rotation (which depletes soil nutrients), salinization and erosion of soil, and persistent pests and disease. This deterioration and shrinkage of agricultural spaces nods to future challenges in meeting the demand for food.<sup>50</sup>

---

insecurity, as forced displacement and targeted destruction of civilian infrastructure and objects indispensable for survival (i.e. water and sanitation infrastructure, health-care facilities, and food production infrastructure) strain access to basic services like health care, education, and food markets.

<sup>46</sup> United Nations General Assembly and Economic and Social Council, *Report of the Secretary-General: Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, A/RES/77/72—E/RES/2022/50, 12 April 2022.

<sup>47</sup> Schwartz, E. (2018). Quick facts: How climate change affects people living in poverty. Mercy Corps.

<sup>48</sup> World Bank. (2017). *Uncharted Waters: The New Economics of Water Scarcity and Variability*.

<sup>49</sup> United Nations General Assembly and Economic and Social Council, *Report of the Secretary-General: Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, A/RES/77/72—E/RES/2022/50, 12 April 2022.

<sup>50</sup> United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030*.

In light of this, humanitarian actors are developing and implementing programming and responses to the climate crisis. Many humanitarian organizations joined the Climate and Environment Charter for Humanitarian Organizations, which provides guidance when facing climate and environmental crises. The “Needed Actions” outlined in the Charter include: stepping up response, mitigation, and adaptation efforts; reducing emissions; increasing research and analysis; collaborating beyond the humanitarian sector; reinforcing and supporting local leadership, preparedness, responses, and resilience; and advocating for ambitious climate action, including increasing climate financing to vulnerable countries.<sup>51</sup>

The Sendai Framework for Disaster Risk Reduction 2015-2030 is another United Nations instrument that also aims to address natural disasters and extreme weather events. Building up disaster risk education, assessment, prevention, mitigation, and response capacities; improving disaster risk management at all levels of government; and increasing public and private investment in disaster risk reduction for economic, social, health, cultural, and environmental resilience are crucial pillars of the Framework.<sup>52</sup>

### **International Efforts to Address Food Insecurity**

One of the overarching themes that guide international efforts to address food insecurity is Sustainable Development Goal 2, which aims to end hunger and ensure universal, consistent access to sufficient and nutritious food. The Goal addresses a multitude of diverse tasks, including increasing crop yields, developing more effective and efficient agroinfrastructure, and improving the functioning of local markets and international trade systems.<sup>53</sup> Its eight targets support three interrelated components: ending hunger, achieving food security and improved nutrition, and

---

<sup>51</sup> United Nations General Assembly and Economic and Social Council, *Report of the Secretary-General: Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, A/RES/77/72—E/RES/2022/50, 12 April 2022.

<sup>52</sup> United Nations Office for Disaster Risk Reduction (UNDRR), *The Sendai Framework for Disaster Risk Reduction 2015-2030*, 18 March 2015.

<sup>53</sup> United Nations. Sustainable Development Goals.

promoting sustainable agriculture.<sup>54</sup> Many instruments developed after the adoption of the Sustainable Development Agenda are designed to address these same components.

In 2021, humanitarian efforts to address the threat of famine and acute food insecurity intensified across several regions, catalyzed by the Secretary-General's creation of a high-level task force on preventing famine to strengthen a whole-of-system approach and advocate for famine prevention resources and improved access to food and other life-saving assistance. Over 500,000 people facing catastrophic levels of acute food insecurity (IPC Phase 5) in north-eastern Nigeria, South Sudan, and Yemen received humanitarian assistance, with 100,000 families receiving livelihood assistance.<sup>55</sup> In South Sudan, humanitarian action brought six counties back from the brink of famine through a targeted, multisectoral scale-up in the most food-insecure areas. However, efforts to alleviate the situation continue to experience impediments by parties to conflict and inadequate funding, thus preventing sustained, positive change.<sup>56</sup>

In today's highly constrained funding environment, where the need for humanitarian assistance is growing dramatically, a coordinated response is more critical than ever to respond to food security needs in an integrated, effective, and efficient manner. New approaches are urgently needed to reverse the alarming increases in acute food insecurity and save lives for those at risk of famine. Urgent humanitarian efforts are essential to meet immediate needs and protect and restore agriculture and livelihoods. However, these interventions alone cannot prevent famine long term or sustainably reverse rising trends in food insecurity. Globally and at the country level, UN, NGO, and local partners are collaborating to take comprehensive and coordinated action to strengthen food systems and increase access to improved and diversified livelihoods, nutrition, healthcare, and clean water, sanitation, and hygiene.<sup>57</sup> These efforts seek to support communities, families, institutions,

---

<sup>54</sup> United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030.*

<sup>55</sup> United Nations General Assembly and Economic and Social Council, *Report of the Secretary-General: Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, A/RES/77/72—E/RES/2022/50, 12 April 2022.

<sup>56</sup> *Ibid.*

<sup>57</sup> *Ibid.*

and countries to manage multiple interconnected risks through longer-term systems strengthening and a shift to anticipatory action and prevention, alongside humanitarian response.<sup>58</sup>

More than 80 organizations subscribe to the Anticipation Hub, a platform hosted by the International Federation of Red Cross and Red Crescent Societies and the German Red Cross, to facilitate knowledge exchange, learning, and guidance regarding anticipatory action. In 2021, the humanitarian community developed and implemented anticipatory programs in over 60 countries.<sup>59</sup> In addition to pilot approaches that prepare for flooding in Bangladesh, drought in Ethiopia, and drought and food insecurity in Somalia, the Office for the Coordination of Humanitarian Affairs collaborated with humanitarian partners to create similar frameworks in Malawi for drought and dry spells, Nepal for floods, and the Philippines for storms.<sup>60</sup> Combined, these pilots are projected to provide anticipatory humanitarian assistance to over four million people if the need arises. The real-world impact of these approaches can be seen in Somalia, where anticipatory livestock treatment secured an estimated 5.45 million liters of milk, or one glass every day for 200,000 children for six months.<sup>61</sup>

### **Science, Technology, and Innovation for Food Security**

The United Nations Conference on Trade and Development has identified four distinct dimensions of food security that should inform action: food availability, food access, food use and utilization, and food stability. The table below details two challenges and corresponding potential innovative solutions for each dimension.<sup>62</sup>

---

<sup>58</sup> United Nations Economic and Social Council Humanitarian Affairs Segment. *Fighting Food Insecurity and famine: A call for coordinated action and multi-sectoral solutions against global hunger*. 22 June 2022.

<sup>59</sup> United Nations General Assembly and Economic and Social Council, *Report of the Secretary-General: Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, A/RES/77/72—E/RES/2022/50, 12 April 2022.

<sup>60</sup> *Ibid.*

<sup>61</sup> *Ibid.*

<sup>62</sup> United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030*.

<b>Dimension</b>	<b>Challenge</b>	<b>Innovative Solution</b>
Food Availability	Environmental stresses	Salt-tolerant crops (quinoa, potato); Climate-resistant crops
	Lack of water availability	Water storage technologies; Rainwater harvest systems; Conservation agriculture
Food Access	Post-harvest loss (storage, refrigeration, transport)	Seed and grain drying, aeration, and storage technologies; Off-grid refrigeration; Low-cost refrigerated vehicles
	Need for harvesting equipment	Bicycle-powered crop threshers
Food Use and Utilization	Lack of nutritious staple crops	Orange-fleshed sweet potatoes; Vitamin A-enriched cassava and maize; Iron and zinc-fortified rice, beans, and wheat
	Lack of information about healthy diets	Dissemination of nutrition information (health applications for mobile format)
Food Stability	Inability to predict when and how to farm	Accessible weather-forecasting technologies
	Lack of financial mechanisms to ensure income	Index-based insurance (crop and livestock)

The food availability dimension considers solutions to challenges that are directly or indirectly caused by environmental change. Genetic modification of plant varieties and technology transfer can be used to improve crops' drought tolerance, disease resistance, and yield product. For example, farmers in the Peruvian highlands, collaboratively with government, private, and international actors, used conventional and biotechnological methods to develop new seeds that

were better adapted to survive in the mountainous weather conditions.<sup>63</sup> Another significant environmental challenge is the lack of available water for food production. Potential solutions include increasing access to low-cost drills, affordable renewable energy-powered pumps, and capacity-appropriate technologies for desalination and efficient water use.

A critical component of food access is minimizing food losses during production, storage, and transport. Many smallholder farmers lack functional harvesting tools (threshers) and adequate grain storage facilities that are protected from moisture, heat, and pests. Similarly flawed storage facilities at local markets fail to preserve highly perishable imported foods, such as meats, vegetables, and fruit. A number of post-harvest-loss technologies are being introduced to smallholder farms and local markets; for example, investing in the development of local talent to fabricate and repair proper storage facilities, refrigerated transportation, and small- to medium-sized threshers can address the affordability and availability of such technologies.<sup>64</sup>

Food use and utilization largely pertains to nutrition. Globally, approximately one billion people suffer from insufficient calories and nutrients and two billion people have sufficient calories but insufficient nutrients.<sup>65</sup> Biofortification—the breeding of critical micronutrients and vitamins into staple crops—has proven to be an effective method to address malnutrition in developing countries. In particular, the International Food Policy Research Institute’s work in biofortified staple crops like cassava, maize, rice, and sweet potatoes has had a positive effect on ten million people in over 40 countries and shows generational promise.<sup>66</sup>

Sustainable food systems are the key to food stability because their security lays the foundation for economic and social advancement. As climate change continues to disrupt traditional

---

<sup>63</sup> United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030*.

<sup>64</sup> *Ibid.*

<sup>65</sup> Ingram, J. (2016). *What determines food security status?* Presentation at the Colloquium on Food Security and Nutrition in the Context of the 2013 Agenda: Science and Knowledge for Action, University of Hohenheim, Germany. 27 September 2016.

<sup>66</sup> United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030*.

agriculture, there is greater demand for modern climate education and technology at the local level. Efforts to address this should focus on information provision, knowledge transfer, and increasing accessibility to meteorology technology and the Internet.

### **Local Solutions with International Support**

The United Nations Conference on Trade and Development recommends that the orientation of science, technology, and innovation for food security include the following elements: partnership with local, regional, and state organizations and NGOs; use of genetic research and engineering to create locally-adapted crops; increased investment in local capacity building; promotion of diversification of production systems and agricultural techniques; and support for the development of activities that increase the value added at smallholder level.<sup>67</sup>

To capitalize on the benefits of science and technological innovation for food security, these new approaches must be made available to those at the front line of hunger and climate change—smallholder and subsistence farmers. This includes, among other things, investing in local capacity (especially women and youth), enabling infrastructure for sustainable food systems, establishing appropriate governance structures for agricultural innovation, and strengthening knowledge flows between farmers and scientists.<sup>68</sup>

---

<sup>67</sup> United Nations Conference on Trade and Development. (2017.) *The Role of Science, Technology and Innovation in Ensuring Food Security by 2030*.

<sup>68</sup> *Ibid.*

### **Questions to Consider**

1. What are the gaps to achieving a robust, multi-sectoral response to food insecurity and what exemplifies good practice in coordination?
2. What are examples of successful multi-sector and innovative interventions when tackling global food insecurity?
3. What are the key actions for policy makers to support implementing partners to more effectively address the continuing increase in global acute food insecurity?
4. How can humanitarian and development actors increase participation of local populations, particularly women and youth?
5. What practices can the international community put in place to make science, technology, innovation, and capacity-building more accessible to financially-limited populations?

## Bibliography

1. Food Security Information Network. (2022). Global Report on Food Crises.
2. Ingram, J. (2016). *What determines food security status?* Presentation at the Colloquium on Food Security and Nutrition in the Context of the 2013 Agenda: Science and Knowledge for Action, University of Hohenheim, Germany. 27 September 2016.
3. Schwartz, E. (2018). Quick facts: How climate change affects people living in poverty. Mercy Corps.
4. United Nations Conference on Trade and Development. (2017.) The Role of Science, Technology and Innovation in Ensuring Food Security by 2030.
5. United Nations Development Programme. (2019.) Multidimensional Poverty Index 2019: Illuminating Inequalities.
6. United Nations Economic and Social Council. Resolution 2022/10, *Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, E/RES/2022/10, 23 June 2022.
7. United Nations Economic and Social Council Humanitarian Affairs Segment. *Fighting Food Insecurity and Famine: A Call for Coordinated Action and Multi-Sectoral Solutions Against Global Hunger*. 22 June 2022.
8. United Nations Economic and Social Council, *Press Release ECOSOC/5759: Statement of Commitment for Action to Eradicate Poverty Adopted by Administrative Committee on Coordination*, 20 May 1998.
9. United Nations. Ending Poverty.
10. United Nations General Assembly and Economic and Social Council, *Report of the Secretary-General: Strengthening of the Coordination of Emergency Humanitarian Assistance of the United Nations*, A/RES/77/72–E/RES/2022/50, 12 April 2022.
11. United Nations. Sustainable Development Goals.
12. World Bank. (2018). *Poverty and Shared Prosperity 2018: Piecing Together the Poverty Puzzle*.