

The cold chain:

Stronger supply chains needed to weather climate emergencies

Temperature-controlled logistics (TCL) can play a role in climate change resilience and adaptation by aiding in medical distribution and food supply during natural disasters.



Storage of perishable products in a cold storage warehouse.

Source: "Unsplash." Accessed 30 September 2022



Supply chain logistics play an instrumental role in timely and effective deployment of emergency assistance.



As climate change continues to affect the weather patterns of the world towards more extreme situations, temperature-controlled logistics (storage, transport, and value-added services) serve as climate adaptive infrastructure for food security and health provision.

The world is experiencing climate-related disasters at higher intensities than ever before and Bangladesh has been no exception.¹ Due to sea-level rise, the extent of flooding might exponentially increase by 6% in the central coastal zone by 2050.² Studies note that Bangladesh is expected to experience a net increase in poverty of approximately 15% due to climate change by 2030³ and an annual loss of 2% in annual GDP by 2050.⁴ Although the Government of Bangladesh has worked towards developing better disaster risk and climate resilience responses, to continue improving Bangladesh's systems to buffer the impact of climate change, maximizing the ability to store, preserve and distribute supplies of critical perishable products should be prioritized.

In June 2022, Bangladesh saw 4.3 million people affected by flood and 900,000 displaced because of the disasters. In the immediate aftermath of any such event, there was the loss of human life, damage to property, destruction of crops, death of livestock, and deterioration of health conditions. Communication links and infrastructure such as power plants, roads and bridges were disrupted, and economic activities came to a standstill. In these cases of emergency, the deployment of water, food and medicine to the inflicted individuals was of utmost importance.

¹ Mahmud, Faisal, "Bangladesh floods: Experts say climate crisis worsening situation," Al Jazeera, 22 June 2022, <https://www.aljazeera.com/news/2022/6/22/bangladesh-floods-experts-say-climate-crisis-worsening-situation>.

² Mojid, M. A. "Climate change-induced challenges to sustainable development in Bangladesh." IOP Conference Series: Earth and Environmental Science. IOP Publishing, 2020.

³ 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 ed The Core Writing Team, RK Pachauri and LA Meyer (Geneva, Switzerland: Intergovernmental Panel on Climate Change (IPCC)) pp 151

⁴ Ahmed M and Suphachalasai S 2014 Assessing the Costs of Climate Change and Adaptation in South Asia (Mandaluyong, Philippines: Asian Development Bank)

Strengthening the logistics sector along key supply chains can have drastic positive impact on emergency responses. TCL infrastructure (i.e., distribution centers, temperature-controlled storages) in strategic locations, whether privately or publicly run, can help deliver necessary supplies to affected populations. Such infrastructure can help mobilize and preserve goods (i.e., food, medicines, vaccinations, and others) without compromising its quality, nutrients, or safety. The development of TCL infrastructure, particularly that of third-party providers, would allow for storage and distribution of essential foods and medicines on behalf of domestic market players. Therefore, TCL operations enhance the government's disaster preparedness plans, strengthen key supply chains and help stabilize communities affected by climate-related disasters.

A dependable and connected storage and distribution network for perishable goods is paramount to food security and health sector resilience. The downstream effects of climate disasters such as floods is immense: the destruction disrupts sectors such as commerce, pharmaceuticals as well tourism. Flooding can harm agricultural prospects by reducing productivity yields between 10 to 40%.⁵ Economic activity gets halted, negatively impacting traders and businesses and the reduced supply of food products raises their prices. Currently, the Government of Bangladesh's Public Food Distribution System would benefit from the modernization and expansion of its facilities storing food reserves such as grain. A 2019 World Bank assessment estimated that in the next 5 years the lack of proper equipment will cause 30 to 45% loss of stored grain.⁶ Fruits and vegetables do not fare much better, with USAID estimating that 23 to 43% will be lost to inadequate storage.⁷ Incentivizing sustainable TCL investments will ameliorate the preservation, handling, storage and transportation of food and agriculture products. This would in turn reduce recovery periods in the market, keeping food prices stable and affordable during moments of vulnerability for the people and the nation's financial ecosystem.

One of the most potent externalities of flooding is a potential disease outbreak. In addition to impacting property and causing displacement, inundation brings with it disruptions of accessible drinking water, expansion of rodent and insect-borne diseases, and transmission of water-borne diseases such as salmonella, diarrhea, and hepatitis.⁸ These diseases can leave long lasting impacts on the health of citizens while the overall economy is hit hard by the cost of controlling diseases, the burden of decreased travel and tourism, loss in business continuity, default on agriculture loans, surges in health care costs, and disrupted trade.^{9 10}

As we have seen with the recent COVID-19 pandemic, the risk of diseases continues to rise as the trends of climate change and globalization increase. Medicines, such as vaccines, are temperature-sensitive and require specialized temperature storage requirements. Like these, other key pharmaceutical products also depend on certified ambient logistics to be stored and distributed. The necessary TLC infrastructure is thus necessary to store and distribute vaccines and pharmaceutical products to ensure a reliable health sector. This type of investment will, in turn, also help Bangladesh in times of crises such as climate-related disasters where medical assistance would be needed.

⁵ Patel, Pradeep Kumar, et al. "Flooding: abiotic constraint limiting vegetable productivity." *Advances in Plants and Agriculture Research* 2014.

⁶ The World Bank. "The World Bank in Bangladesh." The World Bank. 2010.

⁷ USAID. "Post-harvest loss assessment in vegetables systems and recommendations." USAID. 2014.

⁸ Watson, John T et al. "Epidemics after natural disasters." *Emerging infectious diseases* vol. 13,1. 2007.

⁹ "CDC Shows the Economic Impact of GHSA," accessed 28 September 2022. <https://www.cdc.gov/globalhealth/security/ghsareport/2017/economic.html>

¹⁰ Aziz, Maksuda. "As stronger storms hit Bangladeshi farmers, banks are climate collateral damage." *Mongabay*, 15 August 2022. <https://news.mongabay.com/2022/08/as-stronger-storms-hit-bangladesh-farmers-banks-are-climate-collateral-damage/>



Photo Credit: UNICEF

Climate change is causing natural disasters, yet the effects can be mitigated. Important countermeasures on the impact of climate change would be:

- Strengthening of food production systems and
- Improving the health-related supply chain.

Building temperature-controlled infrastructure such as cold storage facilities and transportation networks would improve the capacity of officials and the private sector to respond to crises and ensure stable supply chains for food, pharmaceuticals and other perishable goods.

The Bangladesh Trade Facilitation project aims to expand cross-border trade in agricultural goods and food products. The objective is to address systemic constraints at Bangladeshi ports; simplify and automate import and export processes; improve the capacity of Government regulatory agencies, laboratories, and warehouses; and to foster investment in cold storage facilities and temperature-controlled logistics.

Implementing Organizations



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