The Warren Centre
& Professor Ron Johnston

Humanitarian *Innovation* Hackathon

Challenge C

Boosting genetic diversity in our food production systems

Overview

Surprisingly, the food we eat looks very similar around the world, with **75%** of global calories consumed coming from just **nine species:** rice, wheat, maize, potatoes, barley, soy, sugar and palm oil. It is estimated that humans have cultivated over **6000 species** of plants throughout our agricultural history, but due to industrial farming, much of this diversity has been lost.[2]

With some of the greatest change in traditional diets being seen in low and middle-income countries, as more Western-style eating habits are adopted. This lack of diversity increases the risks of **plant diseases** and **crop failures,** which increases climate change susceptibility. Efforts are needed to boost the genetic diversity of plant species grown and to rediscover traditional foods.

2 ZERO HUNGER

THE GLOBAL GOALS
For Sustainable Development

SDG 2 End Hunger, achieve food security and improve nutrition and promote sustainable agriculture

Target 2.5 Maintain Genetic Diversity in Food Production

By 2030, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

Challenge Task

Design an accessible program for smallholder farmers in low and middle-income countries to access a wider range of genetic diversity in the plant types that they grow for food.

Consideration should also be given to the changes in consumer choices needed to facilitate sustainability.

2 ZERO HUNGER

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Overarching Challenge

Globally, hunger and food insecurity have shown a rapid increase since 2015, due to the combined impacts of the COVID-19 pandemic, conflict, climate change, and deepening inequalities.

In 2022, **9.2%** of the population (735 million people) were experiencing chronic hunger, and **2.4 billion** people faced moderate to severe food insecurity, which indicates the scale of the crisis.[3]

Overcoming hunger and malnutrition is critical to achieving sustainable development. People are not able to realise their full potential when suffering from hunger and/or malnutrition, as they are **more likely to get sick,** which further reduces their abilities to generate a livelihood.

Tackling global hunger is a complex process that requires cross-disciplinary teams to consider multi-dimensional approaches.

In India, rice production is under threat due to climate-induced blast disease becoming more severe.[4]

Considerations

In designing your zero hunger innovations, the principles of Humanitarian Engineering need to be employed. These principles can be summarised as solutions that are:

Effective
The desired change is logically achievable.

Affordable
Financially feasible for lower-income households or local business projects in low and middle-income countries (LMIC).

Appropriate
Wanted by the community and culturally acceptable within the regional context.

Sustainable
Consideration for how the innovation will be sustained into the future (e.g. public funding sources or market mechanisms).

Do no harm
The innovation considers inclusiveness and does not cause harm.

References

1. The Guardian, 2022, *Our Food System isn't ready for the climate crisis,* **theguardian.com/food/ng-interactive/2022/apr/14/climate-crisis-food-systems-not-ready-biodiversity**
2. The Guardian, 2022
3. United Nations, 2024, *SDG 2. Zero Hunger,* **un.org/sustainabledevelopment/hunger**
4. Umakanth et al., 2017, *Diverse Rice Landraces of North-East India Enables the Identification of Novel Genetic Resources for Magnaporthe Resistance*. Frontiers in Plant Science, v.8, **doi.org/10.3389/fpls.2017.01500**