

5.2I: LONG-TERM CONSERVATION OF FOOD DIVERSITY IN GENE BANKS AND IN THE FIELD, AND SUSTAINED DIVERSIFICATION OF THE FOOD BASKET.

What problem is the solution trying to address?

Food biodiversity, also called agricultural biodiversity or agrobiodiversity, refers to the great variety of domesticated plant and animal species that provide humanity with sustenance, cultural connection, and enjoyment through eating. Food biodiversity also applies to the many thousands of different forms, varieties, and breeds of these crop and livestock species. These plants and animals, together with the associated knowledge, are the foundation of nutrition and livelihoods for families and communities around the world. In addition the crops and livestock domesticated and breed over centuries – and in that have changed from their wild ancestries - have become a cornerstone to our modern agricultural system.

Climate extremes that have increased in frequency and intensity due to climate change such as heat, drought, and flooding. Climate change is among the major drivers of biodiversity loss.

Climate change is having far-reaching impacts on agriculture and food systems across the globe affecting food security (IPCC 2019: p.9) through different means e.g. crop productivity. Productivity of the top ten crops (barely, cassava, maize, oil palm, rapeseed, rice, sorghum, soybean, sugarcane and wheat) is already disturbed (Ray et al. 2019: pp.8-10). Yet, modern agriculture dependent on high-input mostly monocultures is a major contributor to climate change with 27% of GHG emissions coming from the sector. Livestock production by itself produces 14.5% of global GHGs. One third of land surface and 75% of freshwater use is for crop and livestock production. Concurrently, agriculture, is a major driver of biodiversity loss. Agricultural activities have the largest impact on ecosystems that people depend on for food, clean water and a stable climate ([Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services \(IPBES\)](#)). These climate and biodiversity-loss induced effects lead to socio-economic insecurities and health challenges. The reliance on a narrow food basket of crops and animals further aggravates the situation (for example out of approximately 30,000 documented palatable plant species humanity depends mainly on only 12 crops for the majority of its nutritional needs. This condition has crucial consequences with the accelerated loss of biodiversity as several underutilized plants could be at risk as other foremost crops because of climate change).

The global heritage of food biodiversity is at risk as agricultural production and markets have become more uniform, leading to an erosion of diversity from field to fork. Traditional knowledge about the husbandry and use of diverse foods is in turn disappearing. And the ongoing efforts to conserve food biodiversity have not succeeded in fully stemming the tide of these losses. While genebanks and similar initiatives have largely succeeded in developing the technologies needed to adequately safeguard food biodiversity, insufficient or inconsistent funding, poor infrastructure investment, and natural disasters too often threaten this diversity even within these repositories. Moreover, conservation of food biodiversity in such repositories is not practical for all crop and livestock species and their wild relatives, and such ex situ conservation has limited potential to facilitate the continued evolution of these organisms and their associated cultural knowledge in their natural and agricultural habitats. The complementary conservation of these species on farms and in wild spaces is therefore essential to the husbandry and engendering of food biodiversity.

Going forward we need to diversify our food basket and to manage inputs such as water and fertilizers in a systemwide level to balance cost with potential production increases and associated negative impacts on soils. The current trajectory of managing agroecosystems in isolation from their surrounding natural environment, focusing on individual crops or a narrow basket of protein sources, and not preserving our current available biodiversity is a risk not only our resilience, but to our survival.

What, in brief, is the solution?

The overall strategy is to tackle these interrelated challenges as part of a connected system rather than as individual challenges. This “systems” approach should include:

- Investments in new crops [*e.g. orphan crops*], new plant varieties and new food sources [*e.g. insects, algae, seaweed*] that provide reliable nutritious sources of food that are less polluting and require fewer inputs in the face of climate change.
- Investment in mainstreaming these new food sources within the food basket
- creating incentive schemes to engage a wider audience in the endeavour to safeguard agrobiodiversity and to ensure the sustained diversification of our food systems. This potential engagement ranges from financial support to outreach and communication activities.

What was/ were the source(s) from which this solution emerged?

Papers above include the source of the recommendations

Why does this solution align to the definition and criteria for a ‘game changing solution’ developed by the Summit?

Diversification of the food basket has the potential for impact at scale, it is actionable if investments were provided, and is the sustainable way to ensure that we can feed the growing population.

Furthermore, it has positive effects on ensuring equitable livelihood opportunities, advancing human health, and regenerating environmental integrity, with focus on youth, women, marginalized and disabled populations

It is a departure from the existing focus on a few staple crops and animals and ensures a more sustainable production that is resilient to shocks. The solution is disruptive, because it can significantly change the way we define and produce food and the way we address the conservation of our food diversity. It therefore leaves a lasting impact in the way our food systems operate in the future.

The solution is an ambitious undertaking that will require concrete efforts on many fronts.