Global Food Security
Sustainable, healthy food for all

Food Systems Approaches to a Sustainable Future

This policy brief conveys five key messages for this year's Conference of the Parties to the United Nations Framework Convention on Climate Change (COP24), based on the outputs of the Global Food Security programme's recent Paris-Compliant Healthy Food Systems scenarios exercise.*

Key messages

1) **To ensure future food security, food systems need to be compliant with both the Paris Agreement and the wider Sustainable Development Goals (SDGs).** Focussing solely on greenhouse gas (GHG) emissions instead of wider metrics of sustainability could result in the loss of ecosystems and greater social inequality. Addressing both UN treaties warrants the integration of IPCC and SDG governance.

2) **Meeting the Paris Agreement and SDGs requires radical transformation of the current food system.** These agreements demand that stakeholders across the food system embrace transformative changes, including the implementation of nutrition-sensitive, low footprint food production, higher costs in the food system, widespread dietary change, and the transition towards circular economies. A systems approach is required to anticipate and minimise the trade-offs of these necessary changes.

3) **Making our food system Paris- and SDG-compliant requires the development and implementation of a range of different technologies, depending on the future scenario.** The implementation of novel technologies in all future food system scenarios emphasises the importance of investment in research and innovation. However, the technologies that will have the greatest societal benefit are likely to depend on how the future unfolds.

4) **The full life cycle of food must be considered in the carbon budget.** This can be achieved by moving towards consumption-based accounting (CBA) in the national GHG budget, instead of production-based accounting. CBA includes all the GHG emissions that occurred in the course of production and distribution to the final consumers, for both imported and domestic produce.

5) **Strategies to meet the Paris Agreement and SDGs will vary greatly depending on a country's reliance on global trade.** There is no one-size-fits-all approach to honouring these commitments and each nation's strategy needs to be adaptable to changing global circumstances, particularly with regard to trade and multi-lateral cooperation. If globalised trade deteriorates, countries reliant on the globalised food system must be ready to adjust their strategies.

* Please note that the scenarios were not developed to predict the future, but to stimulate thought, identify potential opportunities and threats, and inform today's decisions.

Introduction

In 2015, 195 countries signed a landmark, international commitment to accelerate and intensify the actions and investments required to combat climate change, known as the Paris Agreement. The overarching goal of this treaty is to keep global warming below 2°C above pre-industrial temperatures, with the aim to limit global warming to 1.5°C [1]. Soon after, the UN launched the Sustainable Development Goals (SDGs), a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity [2].

This year the 24th Conference of the Parties is being held in Katowice, Poland. This meeting has been hailed as "Paris 2.0", with a strong focus on establishing the necessary guidelines to build a functional framework for climate action [3]. In particular, there will be an emphasis on land use and agriculture in the fight against climate change.

90% of participating countries' "nationally determined contributions" (NDCs) towards limiting global warming have touched on agriculture for two reasons. Firstly, our food sector is heavily reliant on fossil fuels, producing over 20% of GHG emissions and accounting for approximately 30% of global energy consumption [4]. Thus, energy-smart food systems are imperative in the transition towards a carbon-neutral future.

Secondly, climate change is already increasing the incidence and severity of extreme weather events, as well as long-term and gradual climate risks such as rising sea levels and accelerated glacial melt [5]. These factors will impact food availability, food access, food utilization and food stability, and thus global food security. In order to meet the Paris Agreement and SDG number 2 (Zero Hunger) by 2050, we will need to simultaneously limit climate change and transform our food systems.

Our Food System in 2050: A Scenarios Exercise

To explore what the UK food system might look like by 2050 in a global or local context if we aimed to meet the overarching goals of the Paris Agreement (limiting climate change) or the SDGs (sustainable development), and how this might be applied in other countries, the Global Food Security programme ran a scenarios exercise with a taskforce of multidisciplinary experts from across research, industry and government.

Four scenarios were developed using the two axes method [6], considering two critical uncertainties (Figure 1). Firstly, will the UK food system be more localised or more globalised by 2050? And secondly, should our future food system aim to address climate change (the Paris Agreement) or a wider range of sustainability goals, which include climate action (the SDGs)?

The exercise produced four very different scenarios, however there were some commonalities across all future food systems. In every scenario, UK food system changes were triggered by climate change-induced extreme weather events and political shifts resulting from global trade-wars. Some of the potential outcomes were universal across the scenarios too, such as higher food prices, significant dietary change across the UK population and drastic reductions in food-related waste. However, the social and environmental outcomes were very different in all four scenarios, as were the research agendas for each.

It should be noted that the scenarios do not attempt to predict what will happen, nor do they suggest what the preferred future might be; the scenarios were designed to stimulate thought, to spell out some of the opportunities and threats we might face in the future and to inform today's decisions [7]. The full report from the Paris-compliant healthy food systems taskforce will be released in early 2019.
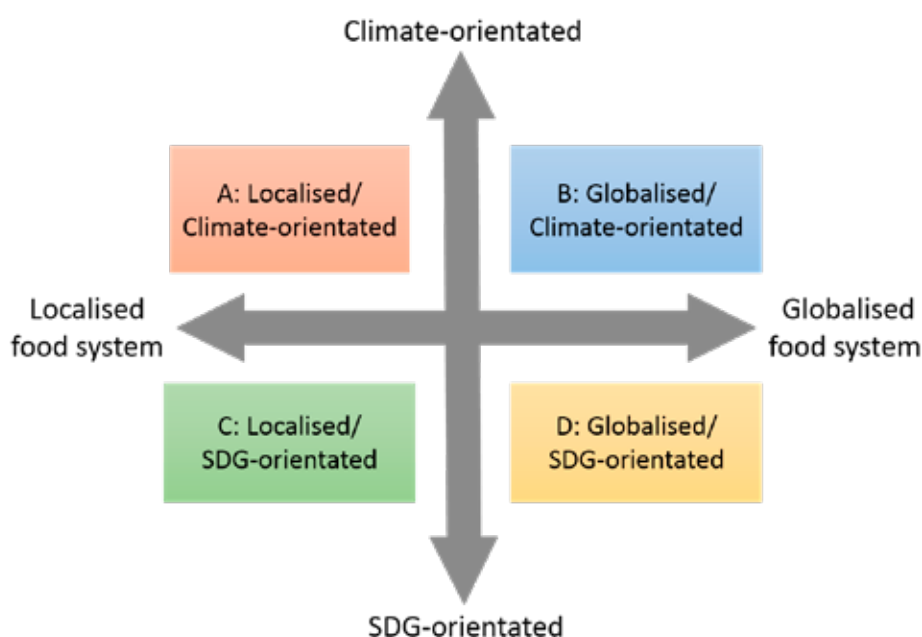

Figure 1. Scenario planning matrix for 2050 food system scenarios

Conclusions

According to the IPCC Special Report published in October 2018, global temperatures are expected to increase to 1.5°C above pre-industrial levels within 12 years if global warming continues at the current rate, severely impacting many natural, managed and human systems [8]. Given that 39 million people were already experiencing food insecurity as a result of climate change in 2017 [9], global food insecurity is set to dramatically increase without the rapid upscale and global coordination of climate action. However, climate action should not be implemented at the expense of the wider dimensions of sustainable development.

Reshaping our food system provides key opportunities to combat climate change while simultaneously addressing the wider SDGs. For example, recent studies have indicated that a global dietary shift towards plant-based diets would not only reduce the carbon-, land- and water-footprints of our food [10], but also reduce the global burden of many diet-related diseases [11].

Although the exact nature of our future food system remains uncertain, one thing is not: "business as usual" is not an option.

Role for the Global Food Security programme

Global Food Security (GFS) is a cross-government research programme that takes a systems approach to the global food security challenge. Since its establishment, GFS has funded scientific projects worth £12M that aim to increase the resilience of the UK food system and published various reports on the transformative changes required for our food systems to meet the Paris Agreement, as well as the extreme weather events and environmental tipping points that threaten the global food system.

References

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Disclaimer

This policy brief is based on the outputs of an academic workshop that was organised by the Global Food Security programme. It will help to inform policy and practice, which are based on a wide variety of factors, including evidence from research. This document does not necessarily reflect the policy positions of individual programme partners.