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FOOD SECURITY

A TOOLKIT FOR EXPLORING FRAMES
AND LINKS TO BIODIVERSITY

FOREWORD

WWF-UK's vision for a well-functioning food system is one that conserves biodiversity, uses resources sustainably, supports action to address global climate change, minimises pollution and eliminates wasteful consumption that allows humans and nature to thrive.

To achieve our vision we have to address food security. How can we provide people with access to sufficient, safe and nutritious food and ensure it is produced in a system that maintains environmental integrity?

Food security is often portrayed as the need to produce more food to feed the hungry. It is so much more. It is about agriculture, fishing, biodiversity, land use, nutrition, energy, climate change and more. You need to take into account short- and long-term goals and recognise that local and global food security is not always compatible. Though catching fish in the open seas can add to short-term global food security, it can influence the future viability of a species and reduce the productivity of the inshore fisheries, thereby impacting both short-term local and long-term global food security.

Food security is about what we eat. Globally we consume more and more resource intensive food, such as white and red meat. However, while we are making these increasing demands, the planet's resources remain finite. Strengthening current production systems will therefore continue to undermine the ecosystems – such as biodiversity and water quality – on which we depend, whilst also impacting on our health through diseases, antibiotic resistance and malnutrition.

Food security is also about investigating the links between production and consumption. To date the majority of work looks at one or the other – largely production – or takes an overview of the whole system. There is very little work that explores the demand side and how working on this can lead to improved food security.

We believe it is important the food security debate evolves into a multifaceted debate by incorporating a plethora of perspectives. That is why WWF-UK commissioned this research. Through this report we hope to achieve a greater understanding of food security, explore the links between food security and biodiversity, and analyse the 'frames' people use to explain the complex challenges we are facing.

Only by doing this can we achieve true food security and a sustainable food system which enables people and nature to thrive.



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1 WHAT IS FOOD SECURITY?

FOOD SECURITY EXISTS WHEN ALL PEOPLE, AT ALL TIMES, HAVE PHYSICAL AND ECONOMIC ACCESS TO SUFFICIENT, SAFE AND NUTRITIOUS FOOD THAT MEETS THEIR DIETARY NEEDS AND FOOD PREFERENCES FOR AN ACTIVE AND HEALTHY LIFE

Ensuring people are sufficiently fed has been a priority for governments and rulers for millennia. However, the last century has seen a rise in global efforts to tackle this major societal challenge. The Food and Agriculture Organization (FAO), founded in 1945, was the first major international organisation with the purpose of ‘ensuring humanity’s freedom from hunger’. More recently, the 2008 food crisis and an increased appreciation of the potential impacts of climate change on the food system have pushed food security up the agenda. This increasing interest has led to a proliferation of responses to global and national food security by policy makers, civil society, the food industry, donors and investors.

Overall, our research has underlined the importance of responding to the challenge of food security in a manner that also allows people to live in harmony with nature. The multiple links and interactions between food security and biodiversity are summarised in Section 2, where we also identify two food security policy areas that potentially pose a threat to biodiversity. Moreover, our research has identified 12 ways in which food security is being ‘framed’ by stakeholders. Understanding and influencing these frames will be important: how food security is framed will affect the attitudes and behaviours of decision makers. The importance of frames – and the food security frames identified in this research – is explored in more detail in Section 3.

1.1 The pillars of food security

The term ‘food security’ only came into popular use in the mid-1970s, following the 1972–74 global food crisis. The most frequently cited definition is the one established at the 1996 World Food Summit: “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”. From this definition four pillars were established: physical availability of food; economic and physical access to food; food utilisation; and stability of the other three pillars over time. To explicitly acknowledge that the natural environment underpins food security The World Resources Institute recently proposed adding a fifth pillar: environmental sustainability. This created the idea of ‘sustainable food security’ and is reflected in the new UN Global Goals.



MALNUTRITION AFFECTS ONE IN THREE PEOPLE ON THE PLANET. WHEREAS 794 MILLION PEOPLE ARE UNDERNOURISHED - UNABLE TO HARVEST OR BUY THE FOOD THEY NEED TO LEAD A HEALTHY LIFE - 1.9 BILLION ADULTS ARE OVERWEIGHT OR OBESE².

1.2 The five pillars explained

Food **availability** relates to the supply of food through production, distribution, and exchange. This is associated with a plethora of issues, from land ownership to crop selection, to packaging, and marketing of food. Food availability may have increased over the last 50 years, but this is coupled with added pressure on biodiversity and human health.

Food **access** refers to the affordability and allocation of food, and where possible, the preferences of individuals and households. Direct access is when a household produces food, whereas economic access is when a household purchases food produced elsewhere. In food security terms, access must be socially acceptable. In other words, people must be able to access food without resorting to emergency food supplies, scavenging, stealing, or other coping strategies¹.

Utilisation refers to how people, society and industry treat food and agricultural goods. An increasing number of people use or depend on pre-prepared and processed foods which are high in fat, salt and sugar. Furthermore, crops are being used for a variety of purposes ranging from direct consumption to animal feed, to biofuels. We are also growing a smaller variety of foods, moving away from growing foods that meet nutritional requirements to ones that provide pleasure.

Food **stability** is related to the ability to obtain food over time, whether this is transitory, seasonal, or chronic access. Food might be unavailable for a number of reasons, including crop failure due to natural disasters, floods and droughts; civil conflicts; food-price spikes; loss of employment; and change in productivity due to increased cost of inputs such as oil and fertilisers.

The World Resource Institute refers to the **environment** pillar as food production and consumption patterns that do not deplete natural resources or the ability of the agricultural system to provide sufficient food for future generations. However, the current pressure on natural resources, such as land and water, is mounting due to dietary transition as people move to more animal sourced foods.

Still, the most contentious aspect of food security is the debate over the relative importance of the 'availability' and 'access' pillars. Proponents of the former see food insecurity (especially famine) as a lack of physical food availability, and so responses should focus on increasing food output through agricultural development. Policymakers who perceive food availability as being the main problem might see the expansion of agricultural land into natural habitats as necessary.

The opposing view is that food insecurity occurs due to a lack of 'entitlement', in other words the inability to grow, buy, work for, or be given sufficient food. This calls for interventions that help address underlying causes such as poverty and policies addressing production and consumption changes.

THE CAUSES OF HUNGER AND MALNUTRITION ARE OFTEN NOT A SCARCITY OF FOOD BUT AN INABILITY TO ACCESS AVAILABLE FOOD, USUALLY DUE TO POVERTY³.

SOLUTIONS TO A GLOBAL FOOD SHORTAGE

There is currently more than enough food produced to feed everyone in the world. However, it is predicted⁴ that a 'business as usual' scenario can lead to a global food shortage by 2050. Is availability or access the key to feeding the planet?

Global food shortage could be averted by increasing availability – what and how much food is supplied. Waste reduction and changing diets are possible measures to improve availability; however the dominating argument is to increase production. This approach relies either on expanding the amount of land used for food production and/or intensifying production from existing land and water (which may be done sustainably or unsustainably).

However, increasing farming output by well-off producers will not affect the poor who already lack access to this market. Arguably food accessibility, coupled with enhancing the productivity and incomes of (poor) smallholder family farmers is the most important in the short and medium term to achieving food security⁵.

¹Gary Bickel, Mark Nord, Cristofor Price, William Hamilton, and John Cook, *Guide to Measuring Household Food Security* (USDA Food and Nutrition Service 2000).

²Lawrence Haddad et.al., *Global Nutrition Report 2015* (International Food Policy Research Institute 2015) http://www.fao.org/fileadmin/user_upload/raf/uploads/files/129654.pdf

³United Nations Committee on Economic, Social, and Cultural Rights, *The right to adequate food* (Geneva: United Nations 1999).

⁴Foresight, *The Future of Food and Farming Final Project Report*, (The Government Office for Science, London 2011).

⁵The State of Food Insecurity in the World 2015 <http://www.fao.org/3/a-i4646e.pdf>

2 SYNERGIES BETWEEN FOOD SECURITY & BIODIVERSITY

Increasing food security and protecting global biodiversity are closely related challenges – with many synergies, but also some conflicts. The overlap occurs because:

1. Many drivers of biodiversity loss – such as climate change – cause food insecurity
2. Food security crises can precipitate policymaking that puts biodiversity at risk
3. Global biodiversity hotspots are geographically close to food insecure populations

These areas of overlap are explored in this section.

2.1 Drivers of biodiversity loss also influence food security

Food insecurity and biodiversity loss share many of the same underlying drivers, such as poverty and climate change (see Table 1 below). In some cases, addressing food insecurity and protecting biodiversity offers clear ‘win-win’ opportunities. However addressing many of these drivers in the name of food security could pose a risk to biodiversity if not carefully designed. For example, global and national institutions see improvements in agriculture and infrastructure as critical to enabling access to markets, reducing poverty and increasing food security. And while these investments and policy changes can yield environmental benefits (e.g. reduced food waste and reduced pressure on land if yields are increased sustainably), policies in these areas could also directly threaten biodiversity if poorly designed and implemented.

2.2 Food security crises destabilise policymaking

Potential exists for transitory *crises* to destabilise national and international food systems – as was seen during the 2007/8 food price spike. According to a review by the FAO and the Organisation for Economic Co-operation and Development (OECD), the policy responses to the 2007/8 crisis were “*ad hoc*”, “*taken hastily*”, “*somewhat inconsistent*” and “*largely uncoordinated at international level*”. These reactive decisions have the potential to magnify threats identified in Table 1 above. For example, in response to the 2008 crisis, the Indian government included provisions to boost investment in water resource development and establish the Irrigation and Water Resources Finance Corporation. It was established to fund major irrigation projects in order to improve agricultural production. These schemes – while of potential benefit to food producers – also had the potential to impact adversely on biodiversity through altering hydrology.

Food price spikes are destabilising and have the potential to drive agricultural expansion into pristine (and ecologically valuable) habitats. It can also drive overexploitation of water resources as it is difficult for technological responses to raise production volumes as rapidly as land expansion or increases in water use. It is easier to adapt to and manage a gradual rise in food prices – achieved for instance through improvements in technology and productivity. This in turn has the potential to deliver long-term economic development. With the ‘threat

multiplier' of climate change, some see increasing inequality and volatility within the food system as 'very plausible'. This could increase the severity and frequency of these food system crises and put environmental gains at risk through reactive decision-making.

2.3 Biodiversity hotspots are close to food insecure populations

Many of the world's most exceptional ecosystems and habitats sit within countries suffering from alarming levels of food insecurity today – particularly African countries, India and Nepal (see Figure 1 below). In the short term, these are at most risk from the issues identified in Table 1 above. However, it is worth noting that large scale habitat loss in the Amazon is driven to a significant extent by large scale agriculture – such as cattle ranching, soybean farming and plantation agriculture – and so is not linked to the short-term food security agenda.

FIGURE 1: FOOD SECURITY LEVELS IN COUNTRIES WITH BIODIVERSITY HOTSPOTS

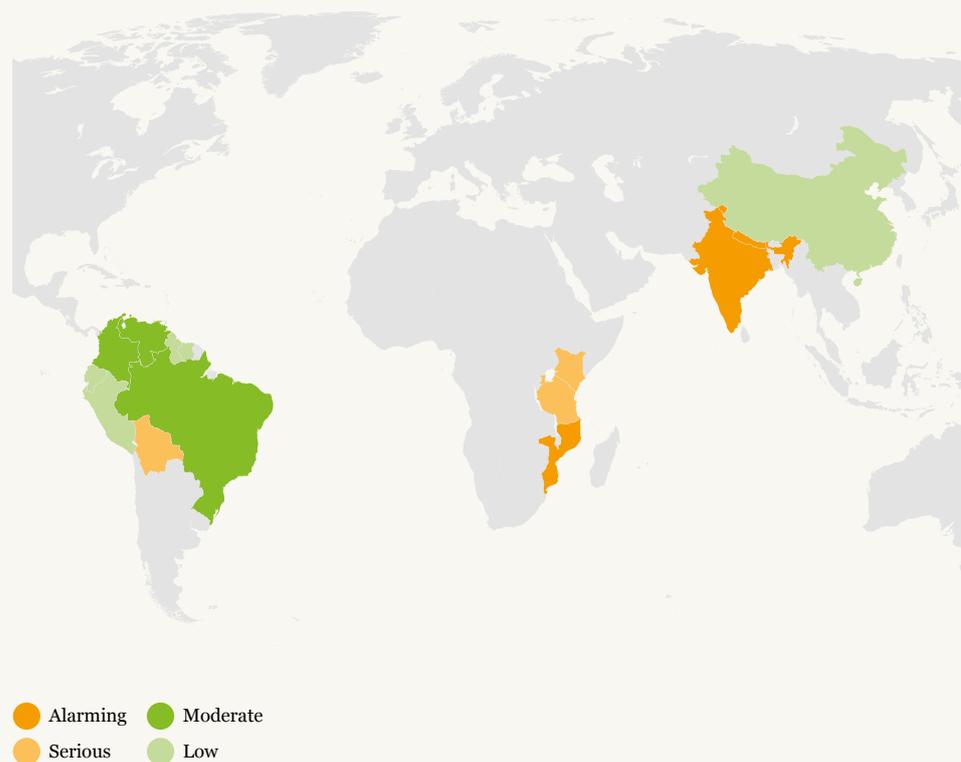


TABLE 1: DRIVERS OF BIODIVERSITY LOSS AND THEIR RELEVANCE TO FOOD SECURITY

DRIVER OF BIODIVERSITY LOSS	RELEVANCE TO ADDRESSING FOOD SECURITY	WIN/WIN FOR BIODIVERSITY IF DRIVER ADDRESSED?	EXPLANATION
POVERTY	High	Not necessarily	Poverty is identified by the World Food Programme as one of the six key causes of hunger. Poverty and biodiversity are also inextricably connected. Addressing poverty and food security has the potential to protect biodiversity. However food and agriculture policies intended to promote economic development could damage natural resources.
CLIMATE CHANGE	High	Not necessarily	Climate change poses both global and local threats to food security. In its most recent Assessment Report the IPCC reframed climate change as a food security issue. However some related energy policies intended to reduce fossil fuel dependency could - such as hydroelectricity - threaten biodiversity.
INFRASTRUCTURE	High	Not necessarily	The food security agenda is unlocking billions of dollars' worth of agricultural development and infrastructure funding. Infrastructure could reduce post-harvest food waste and reduce pressure on agricultural land, however major infrastructure projects can also have a direct impact on biodiversity.
OVEREXPLOITATION OF WILD CAUGHT FISH	High	Not necessarily	Marine capture fisheries are an important source of food, particularly for many low-income populations. Food insecurity puts these resources under increased pressure, so policies to address food security have the potential to be beneficial to biodiversity. However, fisheries policies intended to reduce food security could result in overexploitation of these resources.
ILLEGAL WILDLIFE TRADE	High	Yes	Food insecurity increases illegal poaching and wildlife trade. By addressing food security there is potential to reduce pressure on these species.
EXPANSION OF AGRICULTURAL LAND	High	Not necessarily	Smallholders account for substantial land-cover change in much of Africa and South Asia. The food security agenda is unlocking billions of dollars' worth of agricultural development funding. Further expansion of agricultural land into high conservation value habitats is one of the key concerns associated with achieving long-term food security. This is exasperated by increased demand for animal feed, biofuels to other non-human edible crops.
OVER-EXTRACTION OF WATER IN AGRICULTURE	High	Not necessarily	Limited water resources are already a constraint on development in many countries. Long-term food security depends on good water governance and management. However short term decisions to increase food production could result in over-exploitation.
URBANISATION	Medium	Unclear	Urban food security depends increasingly on households being able to purchase food. The migration of rural poor to urban poor will likely have implications for how people and governments respond to food insecurity.
INAPPROPRIATE GOVERNANCE	Medium	Yes	Researchers have concluded that countries with poor governance are more likely to achieve production increase by area expansion rather than yield increase. Efforts to improve national and local food system governance should protect biodiversity.



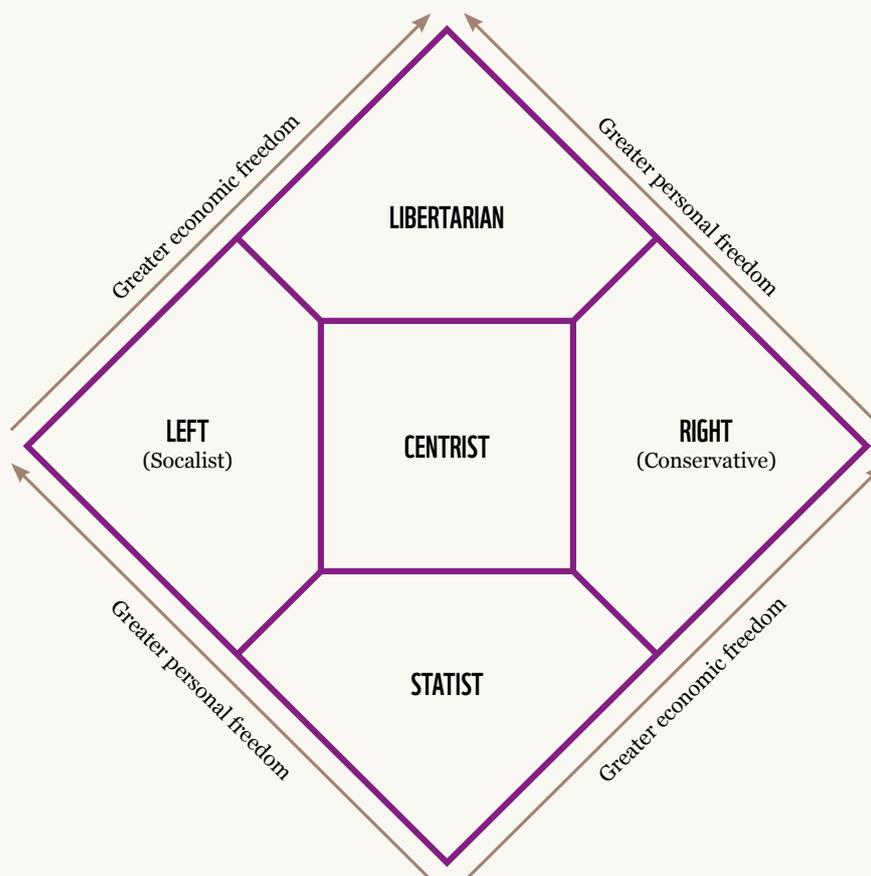
3 HOW ARE DECISION-MAKERS ‘FRAMING’ FOOD SECURITY?

3.1 What is ‘framing’ and why is it useful?

The question of how to achieve food security and a world in which people live in harmony with nature is a complex one. ‘Framing’ is one way in which people understand complexity – by creating simplified stories about the world that are more easily understood, by ourselves and by others. Imagine holding a picture frame up to a complex scene. By moving it around we focus on some parts of the landscape and de-emphasise others. Frames are ‘stories’ constructed from concepts, metaphors, beliefs and images that enable us to locate and label what is going on in the world. The frames we use to understand the world shape how we discuss complex issues with others and how we formulate our ideas for appropriate actions and policies.

It is important to recognise that when choosing our frames we are shaped by our own experiences. Ultimately individual, political and corporate positioning is often based on underlying world views. These are the frames behind the frames. They include the role of government, man’s relationship to nature, economic beliefs, being right or left wing.

FIGURE 2: THE FRAMES BEHIND THE FRAMES



It follows that organisations seeking to influence external policy on complex issues must be aware of and carefully use framing in their communications in order to increase chances of receptiveness to their position. At the same time, considering the potential reactions and responses to a particular frame can be a useful way of ensuring key stakeholders or target audiences are not alienated. A fuller exploration of the use of framing can be found in a report commissioned by WWF-UK and partners: “*Common Cause, The Case for Working with our Cultural Values*”.

3.2 Food security frames currently in use

Our research mapped out the different food security frames in use by scrutinising a range of sources and input from WWF and external reviewers. In all we identified 12 frames in use. We have attempted to define each frame to withstand scrutiny, and nuance them to avoid overly-simplistic, one-dimensional perspectives. Some frames overlap with others in terms of their positioning on key issues, while others are more clearly in opposition. Some frames are more sophisticated than others and nearer to ‘official’ definitions of food security. It would be fair to say that all frames have some merit, and that organisations often draw upon different framings when talking to different audiences. Table 2 below summarises the 12 frames (in alphabetical order). A deliberately pithy description is provided to give a flavour of each frame’s angle on food security.

FIGURE 3: SUPPORTING THE NATIONAL SECURITY FRAME IN THE UK

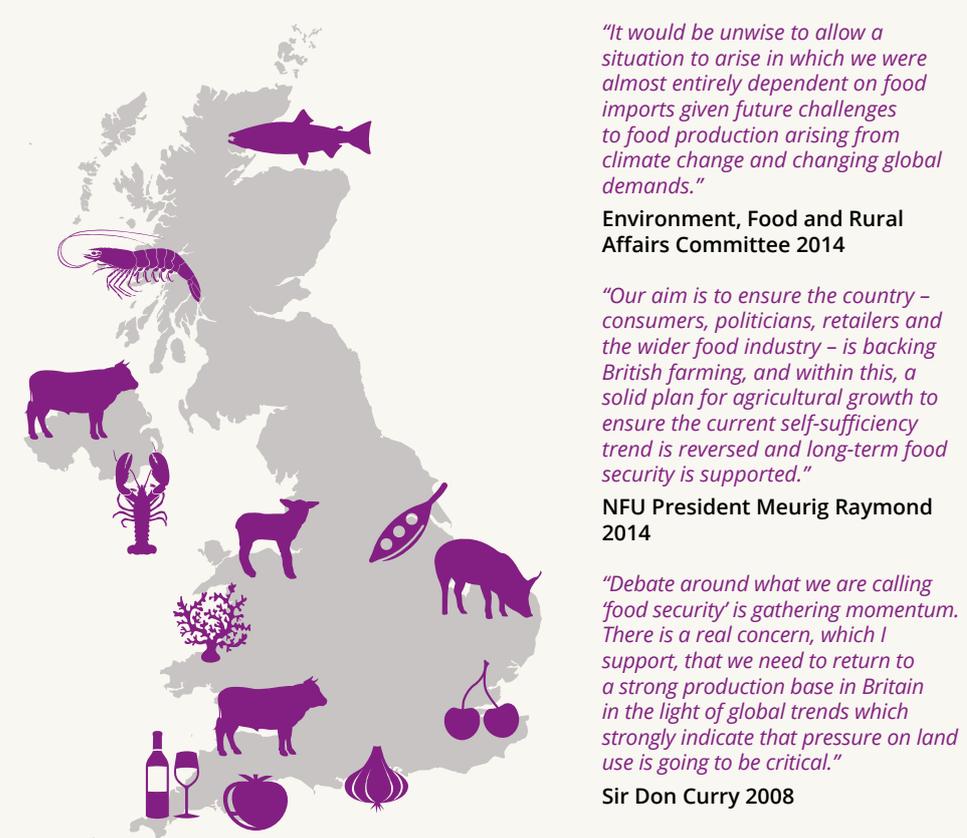


FIGURE 4: TWELVE FRAMES OF FOOD SECURITY IDENTIFIED DURING THE RESEARCH

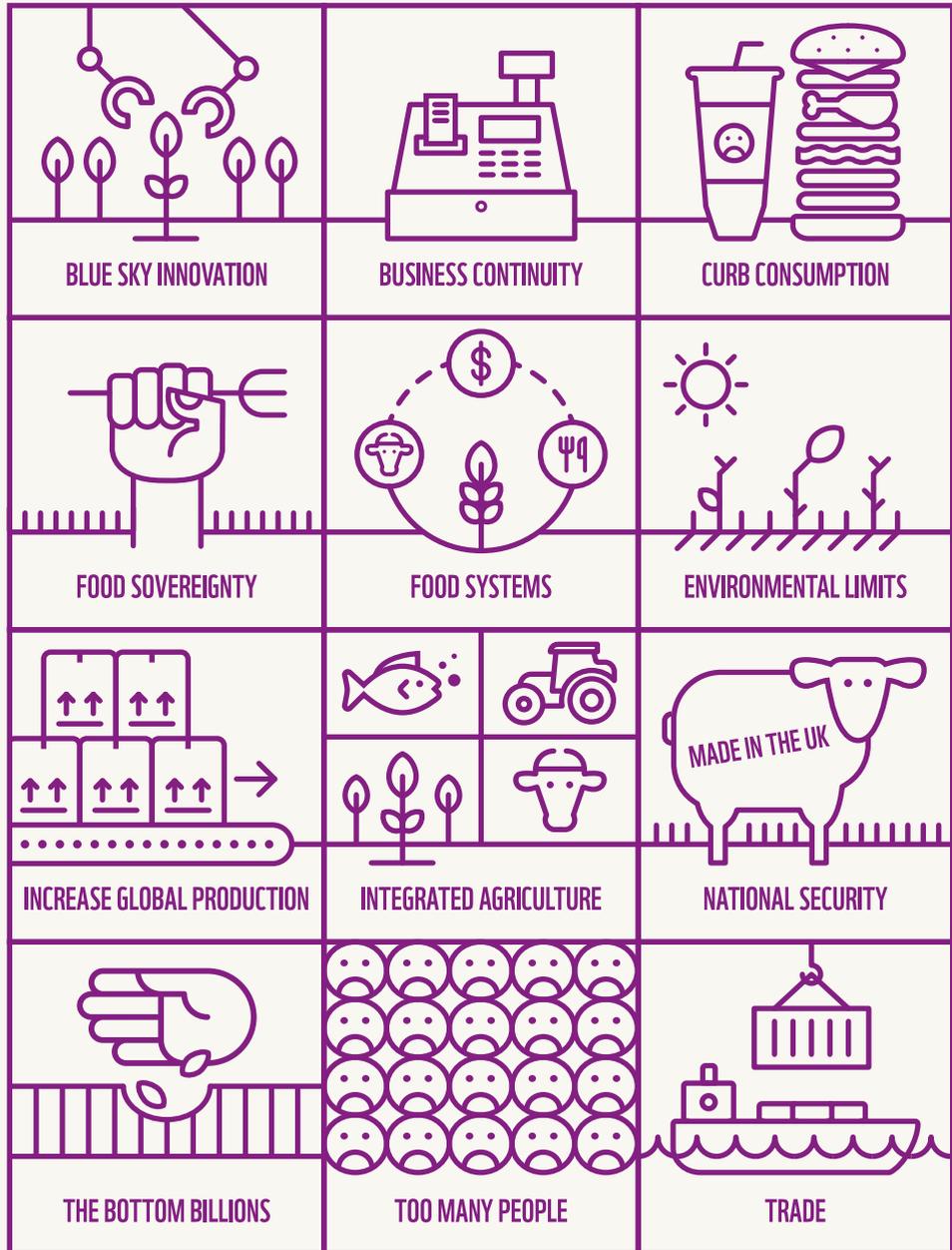


TABLE 2: SUMMARY OF FOOD SECURITY FRAMES IDENTIFIED

NAME	DESCRIPTION	IS BIODIVERSITY IN THE FRAME?
1. BLUE SKY INNOVATION	Radical changes to deliver food in an urbanised world. This frame is production-orientated and looks to radical new food system models that can deliver more resource efficient/ sustainable food – often to urban consumers. Examples include new foods (e.g. ‘lab meat’, insects), new food systems (e.g. vertical and urban agriculture, aquaponics) and technologies (e.g. ‘farmbots’, advanced forecasting).	No – Most of the popular approaches rely on technological solutions that often replace natural systems. Protecting biodiversity seldom promoted as benefit.
2. BUSINESS CONTINUITY	Adaptation and enlightened self-interest to secure raw materials. This is a business frame that adopts the food security terminology, but is most interested in making supply chains more resilient. This can also manifest itself as enlightened self-interest, where ‘farmer first’ programmes aim to deliver social benefits and ensure producers remain in business (e.g. Nestlé Cocoa Plan).	Partially – Some appreciation of dependencies on ecosystem services e.g. pollination.
3. CURB CONSUMPTION	Eat differently and better. The frame focuses on the need to curb over-consumption of resource intensive foods, alongside significant reductions in consumer food waste. It assumes that Western levels of consumption cannot be delivered sustainably and are unhealthy, so demand-side measures are essential (e.g. consumption taxes, incentivising behaviour change, etc).	Yes – A key aspect of this frame is that ‘land’ is an important food system resource that is over-exploited and limited. As a result negative environmental impacts occur e.g. deforestation.
4. FOOD SOVEREIGNTY	Citizen movement for better access via local food supply. Movements such as ‘food sovereignty’ tend to support the removal of agriculture from the international trade system. These oppose biotechnology and industrial agriculture in favour of localised food production and the protection of rural livelihoods. It frames the food challenge principally around people’s rights to control the production of their food.	Partially – The farming systems promoted are often organic/ integrated (i.e. ‘biodiversity friendly’), however the focus of this frame is food system governance.
5. FOOD SYSTEMS	Food security is complicated and needs multiple interventions. This future-orientated frame could be characterised as the ‘academic’ viewpoint. It acknowledges that there are no silver bullets to food security in the face of climate change – and all options are on the table. A potential weakness of this frame it is that it does not provide a firm basis for decisive action and can’t be understood or communicated easily.	Yes – Biodiversity at the local level is essential for food security e.g. pollination, natural pest control, fisheries.
6. GLOBAL & LOCAL ENVIRONMENTAL LIMITS	Environmental resources are critical to functioning food systems. This frame sees the food production as dependent on natural resources such as climate, water, carbon and nitrogen cycles, but also critically water availability and soil fertility at the local level, etc. It is unlikely to advocate specific production systems but rather engage pragmatically with trade-offs.	Yes – Similar to ‘Food Systems’ frame.
7. INCREASE GLOBAL PRODUCTION	Increased supply needed to feed the growing billions. This has been identified as the dominant framing of food security in Western countries. It sees food demand growth as inevitable and the most effective way to advance food security through continuing progress in crop yields across the globe (including the West). This frame often quotes the ‘70% increase’ FAO food demand projections.	Partially – The concept of ‘sustainable intensification’ is often used in this frame. One of the aims of this approach is to reduce pressure on natural habitats through intensifying production.

NAME	DESCRIPTION	IS BIODIVERSITY IN THE FRAME?
8. INTEGRATED AGRICULTURE	Holistic approaches to farming for greater resilience. This frame focuses on improving the ecological performance of agricultural production, typically through the use of more extensive mixed farming systems that are integrated with biological processes (e.g. natural pest control, soil management, etc.).	Yes – ‘Working with nature’ is key to the delivery of food security in this frame.
9. NATIONAL SECURITY	Self-sufficiency and agricultural investment for societal stability. This frame is often associated with discussions of increased self-sufficiency. In the developed world it is used by farmers’ groups or governments in the context of protecting consumers from fluctuations in prices. Elsewhere it is cited in connection with avoiding civil unrest.	No – Not mentioned. Likely to be barrier to acting to prevent short-term crisis and disruptions.
10. THE BOTTOM BILLIONS	Addressing poverty, access and distribution. This frame focuses on the global poor who are most at risk from food insecurity <i>today</i> . Principal interest is in household-level food security and increasingly in ‘nutrition’ security. Trade is often seen as beneficial if it is done equitably.	Partially – Although the frame takes a ‘people first’ approach to food security, it acknowledges the critical importance of natural resources.
11. TOO MANY PEOPLE	Overpopulation underlying cause of resource constraints. This ‘neo-Malthusian’ frame is supported by organisations such as Population Matters: <i>“We should spend as much attention on helping people to have smaller families if we want to ensure food security for the future.”</i>	No – Not mentioned, as its focus is purely on consumption-side measures to reduce pressure of key resources.
12. TRADE	Trade critical for economic development and overcoming lack of resource endowments. This frame argues that domestic and international trade’s greatest contribution to food security is helping to raise incomes, thereby increasing the ability of households to purchase food. It says that trade helps countries with a lack of resource endowments. It also encourages greater productivity and stabilises prices.	No – Not mentioned as focus is on economic – not primary production – system.

4 CONCLUSION

Our research has underlined the importance of responding to the challenge of food security in a manner that also allows people to live in harmony with nature. How policymakers and agri-food businesses address food insecurity will be influenced by the frames that dominate the discourse in this area. Framing is therefore an important tool to enable organisations to understand and influence debates and policy decisions on food security. For example, a key concern is that far-reaching agriculture and infrastructure decisions – made in the name of food security – will not adequately protect biodiversity. Indeed, our review of frames found that many framings of food security likely to be used by key decision-makers, do not put biodiversity ‘in the frame’ – despite the many areas of overlap. Our analysis also identified that biodiversity loss and food security have many shared drivers – however policy responses to the latter may increase the former if not carefully designed. Organisations with an interest in protecting biodiversity therefore need to be able to understand the food security frames that key decision actors are using, offer a convincing and consistent framing of their own, and be able to create bridges between these frames.

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