



Food Systems Transformation:

What's in the policy toolbox?



Contents

Executive summary	4
Introduction	10
Background and aims	10
How the report is organised	12
The role of policy in food systems transformation	13
Gaps in the evidence base on food systems policy levers	18
Method	21
Mapping policy levers: the findings	22
A taxonomy of types of lever	24
Understanding policy interactions	31
Policy packaging as a route to transformation	34
How to use the toolbox	36
Opportunities for further research and analysis	36
Appendix 1: Policy lever mapping: full results	39
Supply Chain Activity/Segments:	
Farming	39
Inputs	42
Distribution and Transport.....	43
Processing and Manufacturing	44
Retail	46
Trade	48
Research	49
Food Service	50
Eating	52
Food Waste	54
Multiple	56
Further details on the method.....	59

Executive summary

Rationale and aims

This report details findings from a project, commissioned by the UKRI Transforming UK Food Systems Programme, to map 'policy levers' for food systems transformation.

The project drew on the authors' previous work mapping food systems and policies; different disciplinary thinking, including political science on policy tools and policy mixes, and systems transformation scholarship; and combined these with a specially created data-set of food systems policies.

Policies have been described as the 'control knobs' that can be adjusted to achieve system change. Understanding which policies do, or could, influence food systems is therefore an important part of catalysing transformation. But information about food systems policy levers tends to be fragmented across different policy sectors or disciplines, with no overarching picture of the available options and their relationships to one another.

The three key reasons for producing an overarching mapping of policy levers are: the need to 1) understand and apply interventions in the context of the broader system; 2) enable a bolder, more innovative approach, utilising the full range of policy levers available; and 3) provide an organising framework for producing a better evidence base on food-related policy levers.

Transforming food systems requires a more holistic approach to applying policy levers. Many policies targeting the food system are aimed at a single activity, such as eating/consumption, or agricultural production; and/or a single outcome, such as health, or farmer livelihoods. These policies are made by many different government and non-government departments and organisations. For example, a mapping of who makes food-related policy in England identified at least 16 government ministries, plus other agencies, connected to food systems.

Because of the connected nature of the system, the application of a policy lever has potential to create intended and unintended cascading effects across the system to other activities and outcomes. The evidence base on these cross-system impacts is patchy, and therefore caution is required when inferring system connections. At the same time, there are pockets of evidence demonstrating how intervening in the system has broader consequences beyond the specific part of the system (activity or outcome) targeted. Unintended consequences of the application of particular policy levers may create incoherence between activities and objectives. Implementing one solution may create problems in other ways (making it critical to see policy development as a continuous adaptive process).

As a result of this burgeoning interest in system connections and coherence, multiple major food systems reports have highlighted how effective food systems policy requires a wide range of policy levers, designed through the lens of an integrated food system, and implemented in joined-up rather than piecemeal ways with increased coordination between different policy making communities (e.g.



agriculture, fisheries, environment, public health), so that various policies are aligned to strengthen each other, or at least do not counteract each other. This requires identifying what the range of relevant levers are.

Transforming food systems will also require a bolder approach to applying levers than has historically been taken, given that the ambition is changing a system where many policies are in place, but which isn't currently working. Innovative solutions to complex policy problems will need to be developed. At the same time, we know – from the work of public policy scholars and think-tanks – that policymakers, and other practitioners and individuals, faced with an overwhelming amount of possibly-relevant information, will take shortcuts, including their own familiarity with issues, to identify policy solutions. We also know that understanding the policy landscape is important for researchers looking to have impact from their work, but knowing which policies are relevant to their area of research, and which policymakers are responsible for them, can be challenging.

The proposition presented in this report is that having a clearer picture of the policy levers available for transformation can help to navigate the complex range of activities, actors, and objectives linked to food systems, by providing a bird's eye view. Having a common organising framework, accessible to different policy sectors and scientists, could be used to facilitate systemic collaboration on food across policy sector and disciplinary boundaries. It could reduce the tendency towards tweaking the current system and proposing the same familiar policy levers ('path dependency'), thus missing opportunities to take a truly transformational and tailored policy approach to improving human and planetary health, and achieving equity in the food chain.

Evidence on food systems policies and how they work in practice is not always available; some levers have been more robustly evaluated than others, and there is relatively little policy lesson sharing between countries. This means the evidence base on the most effective food systems policies is poor or the only available evidence is on the problems, and their causes, rather than effective ways to address them. Mapping examples of the application of different policy levers across the world can support improvements to this patchy evidence and offer an organising framework for that evidence. Having an organising framework could also facilitate a process of policy lesson drawing, particularly between governments at national level, most of which are dealing with similar challenges, and looking for policy solutions to tackle them.

From individual tools to toolboxes

This report aims to support a broader, bolder and better-evidenced approach to food systems policy, by mapping out the range of levers which can be applied to food systems and used by policymakers in practice.



Because of the importance of considering the overall coherence of the policy approach to food systems, it also explores the relationship between different policy levers. The findings begin to document in one place what we know about how these different food systems policy levers impact on one another, or 'interact', and where particular mixes, or 'policy packages' of levers are being used in combination.

By mapping out the range of policy levers which are available, in the form of a food systems transformation toolbox, the report aims to support would-be transformers (policymakers, researchers, other practitioners) to understand:

The complex range of activities, actors, and objectives linked to food systems, and their relationship with policy

The wide selection of levers which could be used to tackle a food system activity or outcome they are interested in

The levers that different governments apply to target particular problems – (given that a particular lever may be used for a many different purposes)

That each lever is part of a toolbox, along with many others

That the policy toolbox is in the hands of multiple policy sectors and disciplines, such as nutrition, agriculture, environment, safety

That individual levers should not be considered in isolation, because policies can enable and constrain one another, meaning additional 'complimentary' policies or 'policy packages' may be required to maximise or mitigate those effects

Method

Policies are the focus of many major food systems reports to have been published in recent years, and an increasing number of projects are analysing and recommending the application of policy levers to support food systems transformation. But no obvious list or source could be identified which lays out the potential toolbox as a whole.

A new inventory of policy levers was therefore created, through an empirically-led 'bottom-up' process, of identifying major reports on food systems and coding them for any levers mentioned. A snowballing approach was taken to incorporating additional levers identified during the research and review process. The data was coded according to type of lever, for example 'tax', 'community projects', 'labelling'. The categorisations used in other databases and lists were used to refine this coding.

There are many ways to organise this kind of mapping. Categorising in terms of food system activities (ie segment of the food chain) was considered of the most practical value when thinking about transforming the system (for example for use in workshops, policy labs, or policy development processes).

Findings

Map of levers by supply chain segment. An initial map of food system policy levers was created, organised according to the different segments of the supply chain (categorised according to the Parsons *et al* 2019 Food System (flower) Diagram).

A more granular mapping of the levers applied at each segment of the chain, alongside implemented examples drawn from the inventory created for the analysis, is presented as an Appendix.

In addition, to help manage the complexity, a simplified categorisation/aggregation of the mapped levers was produced, drawing on the 'toolbox' tradition of the policy sciences. Nine broad categories of policy lever are presented in a taxonomy.

Gaps in the evidence base of policy levers

The project confirmed some of the challenges around evidence on policy: evidence on food systems policy is not always available, and there is relatively little policy lesson sharing between countries. This means the evidence base about the most effective food systems policies is poor. The evidence base on implemented food policy levers is patchy: many are not documented and, where they are, full details of success/evaluation are often not included, and measures of 'success' differ.

Even bigger gaps exist when it comes to processes; how particular levers were developed and implemented. Valuable insights into: who – for example which government ministries – was involved; what resources were needed; how the process worked; where political tensions arose, for example, are few and far between. This makes evaluating the transformative potential, and transferability, of levers more difficult.

Poor evidence on the effectiveness of policy levers should not be a barrier to action: expecting to have definitive evidence of how each lever works in practice is unrealistic. But when implementing solutions, a process of learning by doing should contribute to the evidence base for the good of all. Opportunities to improve this evidence base are included at the end of the report.

In addition, while many different types of implemented lever were identified from around the world, several levers which are recommended in reports as important for supporting transformation were not accompanied by examples of implementation, including: subsidies for the production of healthy foods, or consumption of healthy foods; post-farm gate job creation strategies; and the application of nudge approaches – in real life settings rather than experimental ones. Given these types of lever are being recommended, it would be helpful to identify and publicise implemented examples.



Policy interactions

A natural extension of considering food systems policy levers as part of a broader 'toolbox' is understanding how the different tools work in combination. Though often not explicitly framed as such, the food systems reports analysed for the project offer numerous examples of where particular levers are linked to other system activities, or levers. These were collated into a register of policy 'interactions'.

Examples of 'interactions' include when a policy has negative unintended consequences, or the efficacy of a lever is undermined or 'dampened' by other levers or factors; or several levers are interdependent. These interactions may necessitate additional levers, 'complimentary policies' or a different governance approach to improve effectiveness or negate unintended consequences in other parts of the system, as part of a continual process.

While a full analysis of interactions was not possible, sufficient data was identified to conclude that considering food system levers as part of a policy 'mix', rather than effectiveness as an individual measure alone is an important avenue for further exploration and evidence-building.

Examples of potential 'dampening effects' and therefore potential barriers to transformative impact include:

- the need for agricultural programmes to be accompanied by levers targeting skills/training/knowledge in farmers, to ensure there is buy-in and effective implementation by those farmers;
- supporting Food-Based Dietary Guidelines with additional levers to improve food environments and reduce the potential dampening effects of commercial promotion of unhealthy foods;
- supporting consumption-based food taxes with levers to reduce the perceived and actual impacts on low-income communities, including the use of public information, labelling or subsidies.

Policy packages

Along with understanding and addressing interactions between particular levers, another fruitful avenue for exploration is how levers might be grouped together. The importance of considering policy tools as part of a mix, and the idea of designing 'clusters', 'bundles' or – the term used in this report – 'policy packages', has been a focus in the policy sciences for some time, and been tentatively applied in the context of food systems.

The application of these insights around policy packages has the potential to advance a 'food systems approach' to policies, by targeting a supportive combination which maximises coherence of the mix. Doing this would require an evidence base on policy interactions, and on where such packages have been implemented in relation to food, both previously and as part of the ongoing process of evaluating policies now.

The project findings highlight several examples of policy packages targeting food systems change – though they may not necessarily have been conceptualised as such.

Opportunities for further research and analysis

Several opportunities for further research and analysis are identified, listed under the sub-headings Policy Levers; Policy Interactions; Transformative Potential; Governance. They include reviewing the evidence of the effectiveness of various tools to inform the creation of an optimum toolbox for food systems transformation, and support lesson drawing between cities and countries; and cross-referencing the toolbox with mapping of food systems, and policy systems in a particular country or city, to identify how much of the toolbox is in use, and where problem areas require additional levers to be applied.

How to use the toolbox

The mapping in this report offers a common organising framework, which others can use to support cross-system conversations, research and action. The table shows ways in which an organising framework might be helpful.

Application	Details
Understanding the Range of Levers which can be applied to Food Systems	Provides overview of policy levers relevant to food systems Provides examples of application of those levers from a range of countries
Showcasing Policy Possibilities, Extending and Developing Policy Design	Highlights how levers are used to tackle different food system activities or outcomes. Could encourage: <ul style="list-style-type: none">• re-deployment or extension of existing levers towards new activities or outcomes• design of completely new policy levers, using a 'pick and mix' approach to best bits of what has been tried
Benchmarking a Country/City's Food-Related Policy Levers	Could be used in conjunction with other mapping – for example an inventory of a particular country or city's food-related policies – to identify how much of toolbox is utilised in the current policy approach (which levers are already being wielded, and what is missing).
Comparing Policy Approach Between Countries/Cities	Could support comparison of policy approaches to food systems between countries and cities
Identifying and Addressing Interactions	Offers a reference list when selecting policy levers (to introduce or recommend), from which to identify potential links to existing levers, and address coherence
Identifying Coherent 'Policy Packages'	Could be used to identify a package of policy levers which could be applied in combination to improve coherence and transformative potential
Researching Policy Levers	Could support further investigation into particular levers – their relevance to system activities and outcomes, policy interactions, packaging potential, and transformative potential
Facilitating Policy Lesson Drawing	Could provide inspiration and organising framework for policy learning between cities and countries

Introduction

Background and aims

This report details the findings of a project, commissioned by the Transforming UK Food Systems Programme, to map 'policy levers' for food systems transformation.

The project drew together the author's existing work on mapping food systems and policies, different disciplinary thinking – including political science on policy tools and policy mixes, and systems transformation scholarship – and combined these with a specially-created dataset of food systems policies.

This resulted in four distinct, but connected, outputs:

1. A more granular mapping of policy levers, featuring implemented examples
2. A top-level taxonomy of nine broad types of lever
3. A register of 'Policy Interactions' between levers
4. A list of food-related 'Policy Packages', where multiple levers have been used in combination.

The rationale for operationalising 'policy levers' in this way is that a more granular mapping, presented by segment of the supply chain, was considered the most practical way of applying the idea of policy levers to real-world food system contexts. Each mapped lever is accompanied by an implemented example from a particular city or country.

In addition, inspired by the 'toolbox' tradition of the policy sciences, a broad 'top level' taxonomy of types of lever which constitute the food system transformation toolbox was also created.

A natural extension of considering food systems policy levers as part of a broader 'toolbox' is understanding how those different levers work in combination. This resulted in the register of examples of policy interactions between levers, a selection of which are detailed in the report. Finally, the report provides identified examples of 'Policy Packages': clusters, or bundles, of levers which have been used in combination to tackle food systems challenges.

Why map policy levers?

Understanding the full range of policies which do, or could, impact food systems is an important part of supporting transformation. The three key reasons are: the need to 1) to address the **broader** system in a holistic way;) enable a **bolder**, more innovative approach to food systems policies, utilising the full range of policy levers available¹; and 3) provide an organising framework for creating a **better evidence base** on food-related policy levers.

The need to address policy levers in a **broader**, more holistic way is discussed more fully under *The Role of Policy in Food Systems Transformation*, p36). In short: policymakers and other key actors, including researchers working on food systems, are often focused on a particular (limited) part of the system, be that a particular activity, like farming, or a particular outcome like nutrition. Some types of lever are used across many different activities or outcomes, for example taxes, or training/ skills improvement. But these can take quite different forms, for example taxes on

pesticide inputs, and taxes on sugary drinks. There are levers specific to particular policy sectors, for example environment-related permits and quotas. The proposition presented in this report is that having a clearer picture of the types of levers available for transformation can help to navigate the complex range of activities, actors, and objectives linked to food systems, by providing a bird's eye view. Having a common organising framework, accessible to different policy sectors and scientists, could therefore be used to facilitate systemic collaboration on food across policy sector and disciplinary boundaries.

Transforming food systems also requires a bolder approach to policy than has historically been taken, given that the ambition is changing a system where many policies are in place, but which isn't currently working. Innovative solutions to complex policy problems need to be developed. At the same time, we know from the work of public policy scholars and think-tanks that policymakers and other practitioners and individuals, faced with an overwhelming amount of possibly-relevant information, will take shortcuts, including their own familiarity with issues, to identify policy solutions. We also know that understanding policy processes and the policy landscape of a particular issue area is important for researchers looking to have impact from their work², but can be difficult. Having a clearer picture of the range of levers which are relevant to food systems could help address this situation.

Understanding the range of possibilities could reduce the tendency towards tweaking the current system and falling back on applying the same familiar policy levers (path dependency), thus missing opportunities to take a truly transformational policy approach to improving human and planetary health, and equity in the food chain. It has also been noted, in the context of system change more broadly, that showcasing (policy) innovations in other countries helps to undo the exaggerated 'naturalness of current arrangements'³. Showcasing the levers different government's use to target a particular problem widens the scope for policy design – given that a particular lever may be used for a many different purposes⁴. It could encourage the re-deployment, or extension, of existing levers towards new activities or outcomes. Or even inspire the design of completely new levers, using a 'pick and mix' approach to the best bits of what has been tried.

Finally, evidence on food systems policy is not always available; some levers have been more robustly evaluated than others, and there is relatively little policy lesson sharing between countries. This means the evidence base about the most effective food systems policy levers is poor. Mapping examples of how different policy levers have been applied across the world can contribute to building a better evidence base, and the toolbox could be used as an organising framework for that evidence (see *Opportunities for Further Research and Analysis*, p36). Having an organising framework could also facilitate a process of policy lesson drawing, particularly between governments at national level⁵, most of which are dealing with similar challenges, and looking for policy solutions to tackle them.



Suggestions for possible applications of the toolbox are summarised on p36.

With this in mind, by mapping out the range of policy levers which are available, in the form of a food systems transformation toolbox, this report aims to support would-be transformers (policymakers, researchers, other practitioners) to understand:

1. The complex range of activities, actors, and objectives linked to food systems, and their relationship with policy;
2. The wide selection of levers which could be used to address a food system activity or outcome they are interested in;
3. The levers that different governments use to target particular problems – (given that a particular lever may be used for a many different purposes);
4. That each lever is part of a toolbox, along with many others;
5. That the policy toolbox is in the hands of multiple policy sectors and disciplines, such as nutrition, agriculture, environment, safety;
6. That individual levers should not be considered in isolation, because policies can enable and constrain one another, meaning additional 'complimentary' policies or packages of policies may be required to maximise or mitigate those effects.

How the report is organised

The report begins by discussing the role of policy in food systems transformation, and the potential benefits of a more holistic approach to intervening in the system, expanding on some of the points made above.

It then presents the method used, followed by the findings: a mapping of implemented policy levers categorised by segment of the food supply chain. The results of the mapping illustrate the wide range of possible levers which together constitute the food systems transformation toolbox. In the appendix, a more detailed look at each segment of the chain, where an explanation of each lever – for example input tax, or 'food -based dietary guidelines' – is provided, alongside an implemented example.

These levers range in type: there are information-based, economic, regulatory levers, levers which organise the market for food, and the processes of governing, along with social and technological innovations, and the research undertaken to inform, evaluate and generally support these endeavours. A taxonomy of nine broad types of lever is presented.

This is followed by a discussion of the importance of understanding the relationship between levers, to improve the overall coherence of the policy approach to food systems. The findings begin to document in one place what we know about how these different food systems policies impact on one another, or 'interact', and where particular mixes, or 'policy packages' of levers, have been used with success are offered in this report, but require further examination.

The findings shed additional light on the current state of evidence on the role of policy in food systems transformation, and these are discussed. For example, for many policies, it is difficult to find out about their implementation (whether they happened or not, and whether they were successful in their aims). The report therefore ends by proposing opportunities to build on the work undertaken to date.

The role of policy in food systems transformation

Governments and the private and civil society sectors develop and implement a range of policies to address issues, including those related to food. These 'policy levers' have been described as the 'control knobs' that can be adjusted to achieve system change⁶, or 'transformation' (see box).

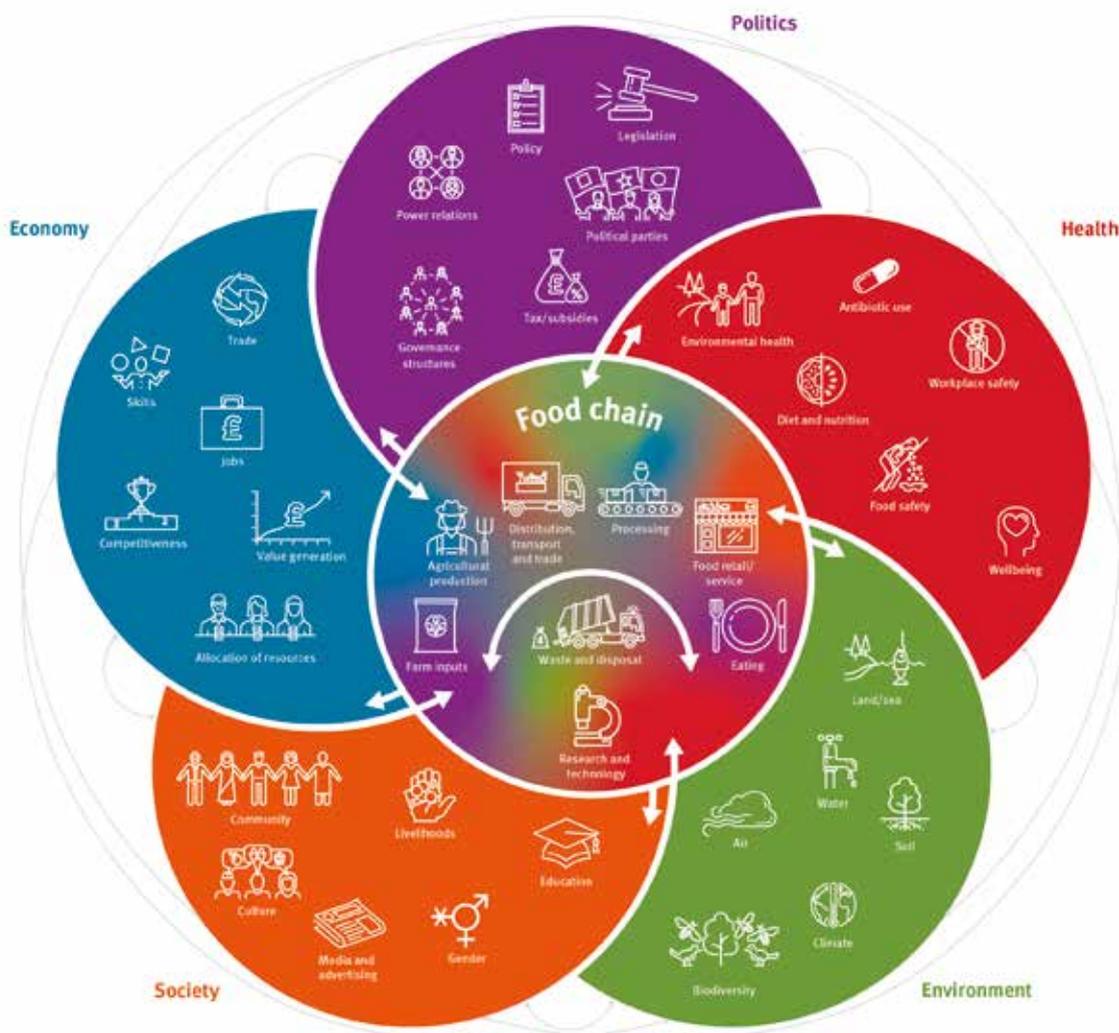
Policy is therefore an important lever for influencing food systems: the 'interconnected system of everything and everybody that influences, and is influenced by, the activities involved in bringing food from farm to fork and beyond'⁷. As illustrated by the diagram below, the food system can be understood as the central food supply chain, from production to consumption, plus a range of dimensions, including health, the environment, and social, economic and political, which are influenced by, and influence the chain (and each-other).

Visualising the food system in this way helps to highlight the many different activities in the food supply chain, and many different outcomes (health, environment, economic, social) which can be the target for policy levers.

What is policy?

In this report, the terms policy, policy lever, tool, and intervention are used as umbrella terms to cover the many types of 'policy' which exist, 'including action plans, strategies, framework legislation, statutes, bills, laws, court decisions, licensing, approvals, directives, regulations, guidelines, standards, codes of practice, specific programmes or voluntary initiatives'

(Hawkes and Parsons 2019)



Source: Parsons K, Hawkes C, Wells R. Brief 2. What is the food system? A food policy perspective. London: Centre for Food Policy; 2019

Policy as a lever for system change

Policy (including Governance) is one of several commonly cited levers for system change along with technology/innovation, knowledge and education, and finance.

As well as being a type of lever itself, policy also has the capacity to enable or constrain the other types of lever, by enabling or constraining the development and application of technology, or advancement and sharing of knowledge, for example (likewise, the levers technology, knowledge and finance may require changes to policy to be realised). Policy can also influence indirectly, by highlighting particular problems to be addressed (and not highlighting others), and framing problems in a particular way (which influences the solutions which are considered).

In reality, the boundaries between these categories of lever – policy, technology; knowledge and education; finance – is blurred, particularly given that policy levers extend beyond 'top-down' public sector (government) policy interventions, to the levers available to and employed by wider governance actors in the food system, including the private and third sectors (food industry and food civil society).

Policies addressing the food system are made by different government ministries – for example policies about what food is grown and how, by agriculture ministries, or policies about what food can be advertised, by health ministries⁸. A mapping of who makes food-related policy in England identified at least 16 government ministries, plus other agencies, connected to food systems⁹. Some policy levers specifically target food-related activities and outcomes. There are other policies, which can have significant impacts on the food system, but which may not be considered to be related to food. These include labour rules and rights, competition rules, and the social welfare system and its accompanying interventions (for example welfare payments).

Policy levers can be applied by different levels of government, such as national-level, or local level, and are also not limited to the government, or 'public sector'. Food policy also involves activities in the private sector, for example when businesses set up their own certification or labelling schemes, and in the 'third sector' (or food civil society) which, for example, runs most of the food banks which exist to provide direct food assistance to those in need.

Many policy levers in the food system target a single activity (e.g. eating/consumption, or agricultural production) and single outcome (e.g. health, or farmer livelihoods). But because of the connected nature of the system, each of these has potential to create cascading effects into other segments and outcomes. This can lead to unintended consequences of applying particular levers and incoherence between competing objectives¹⁰.

The evidence base on these impacts is patchy, and therefore caution is required when inferring system connections. At the same time, there are pockets of evidence demonstrating how intervening in the system has broader consequences beyond the specific part of the system (activity or outcome) targeted. A robust example is policy support to agricultural producers to increase productivity, and its connection to the natural environment; a connection which is now widely recognised in relation to negative environmental outcomes of particular production methods¹¹.

Another example, raised by the Global Panel on Agriculture and Food Systems for Nutrition (Glopan) (2020), is the 'important lessons to be learned from the years of structural adjustment policies when global financial institutions required significant policy shifts over short periods of time, which often led to unintended negative consequences, including rising income inequality over the medium term'. Glopan therefore recommends: '*actions must be carefully calibrated and sequenced in ways that do no harm to the livelihoods, incomes and diets of the poor, and investments in preparedness are essential to mitigate negative impacts of multiple kinds of shocks on progress already made*', with governments urged to '*better trace how a production-focused policy can affect wages or transportation costs, or how a consumer-focused tax may impact food processing and retail companies*'¹².

From tools to toolboxes

As a result of this burgeoning interest in system connections and coherence, multiple major food systems reports have highlighted how effective food



systems policy requires a wide range of interventions, designed *'through the lens of an integrated food system and implemented in joined-up rather than piecemeal ways'* because *'the steps needed to bring about a successful and meaningful transition are interlocking and mutually supportive, which requires a coherent joined-up approach to the choice of instruments to use and how they are implemented'* (Global Panel on Agriculture and Food Systems for Nutrition 2020)¹³. Similarly, the OECD's (2021) Making Better Policies for Food Systems report¹⁴, concludes that *'coherent policies require increased coordination between different policy making communities (e.g. agriculture, fisheries, environment, public health), so that various policies are aligned to strengthen each other, or at least do not counteract each other'*.

The need to consider the range of levers targeted at the system is also emphasised by the International Panel of Experts on Sustainable Food Systems¹⁵, which has called for an integrated food policy for the EU to address policy incoherence across its range of activities. Likewise, the World Resources Institute (2018), which presents a menu of interventions for food systems in five 'courses', across production and consumption, emphasises that action across all of the courses is essential for sufficient impact¹⁶.

At present, though recommendations to take a more connected 'food systems approach' circulate, little detail on how this can be put into practice, particularly by policymakers, accompany them. Glopan recently noted that *'despite growing calls for food system transformation, the essential steps in any transition have not been well defined'*¹⁷. The same can be said for policy. Despite growing calls for policy transformation – in the form of joined-up approaches, or 'integration' – the essential steps for governments, and other stakeholders, to put this into practice have not been well defined. For example, recommendations from the academic community can remain un-grounded in policymaking realities (partly because of the often opaque nature of policymaking).

Where recommendations for the application of particular policy levers are made, these tend to be presented without their broader system context (for example what needs to happen in conjunction) or without analysis of success or applicability. In its 2019 'Synthesis of existing food systems studies and research projects in Europe', the European Commission's Standing Committee on Agricultural Research observed *'a paucity of studies that define, implement and test innovations from a food systems perspective'*. The challenge this creates for policymaking was articulated in the recent UK House of Lords Select Committee on Food, Poverty, Health and the Environment report: *Hungry for Change: Fixing the Failures in Food*, which presented the findings of a wide-ranging inquiry¹⁸ into *'the links between inequality, public health and food sustainability'*.

The authors note:

'We heard repeatedly of the need for 'whole system change'. We recognise that this call reflects the serious concerns that individuals and organisations have about the state of the food system; to many, a systemic shift is required. It was also evident that what 'whole system change' might look like, what it might involve and how it might be realised, are issues that many organisations are still grappling with.

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We agree that a radical shift is required but have avoided simply calling for whole system change without quantifying what that means'. (House of Lords 2020).

More effort needs to be directed towards operationalising the idea of whole system change as it relates to policy. This policy lever mapping aims to contribute to such efforts.

Understanding how policy levers work together

Positioning each lever as part of a broader toolbox enables a more structured consideration of which combination of policy levers, or 'policy mix' can target the range of food system objectives most effectively and avoid 'counter-productive instrument mixes'¹⁹ which result in the sum of food systems policy representing less than its individual parts. Policy scientists have pointed to how layering new policies on to an existing mix of policies can undermine effectiveness and result in incoherence²⁰.

To ensure the food systems policy mix offers the best opportunity for transformation, more evidence is needed on how particular levers relate to one another (evidence which can be built through examining past and present policy action). A broad-ranging evidence review on food systems by the European Commission's Science Advice Mechanism/SAPEA, concluded that: 'the precise interactions between instruments, as well as with surrounding contextual factors, remain uncertain, which is for a large part explained by the relatively recent emergence of this field of research'²¹. The review highlighted some promising examples of where evidence suggests that combining different policy initiatives into synergetic policy mixes – or policy packages – generally has greater impact than single measures on their own. These include the Danish Wholegrain Initiative, (combining dietary guidance with product reformulation, communication and educational activities, effective marketing, monitoring and evaluation) and the food insecurity policy of Brazil (encompassing subsidised food sales, food and nutrition assistance, the creation of local food markets, support to local agriculture, and education programmes)²². These two examples are included in the examination of policy packages on p34.

An existing real-world example of where a mix of policy levers has been implemented is around agriculture: countries have imposed production constraints (such as a production quota) to limit the negative impacts of interventions which raise market tariffs (such as import tariffs or output subsidies). Though not a mix which is likely to positively transform food systems – indeed, governments as a rule are moving away from this kind of policy lever – this example highlights the possibility of combining for more balanced overall outcomes.

The evolution in thinking on nutrition policy might provide an instructive signpost to the direction of travel: there is a growing acceptance that there is no 'silver bullet' for tackling obesity, and that levers which provide consumers with information about healthy diets are not effective unless part of a wider package of measures (with growing emphasis on the concept of 'food environments'). As Hawkes explained back in 2013:

'all [nutrition education] actions have the potential to be effective, but that the design and context can have a significant impact on the effectiveness of the action,

“
Coherent policies require increased coordination between different policy making communities (e.g. agriculture, fisheries, environment, public health), so that various policies are aligned to strengthen each other, or at least do not counteract each other.

meaning that some actions are rendered ineffective. One emerging possibility is that actions are most effective when they involve multiple components; e.g. information provision, behaviour change communication (including skills training), and policies to change the food environment²³.

In addition, an important consideration, as touched on above, is that the control knobs are not operated by government alone, given the range of activities in the food system which are currently dominated by industry and civil society leadership. The Eat-Lancet *Food in the Anthropocene* report²⁴ illustrates the spread of action across the different actors, necessary to achieve transformative change as follows.

Table 1: Role of government, industry and civil society in food system transformation

	Description	Indicative government role	Indicative industry role	Indicative civil society role
Eliminate choice	Channel actions only to the desired end and isolate inappropriate actions	Set goals for a zero or negative-effect food system	Withdraw inappropriate products; diversify the business	Win public support for elimination of unhealthy diets
Restrict choice		Model choice editing or rationing on a population scale	Allocate funding to favour sustainable and healthy products	Campaign for banning and pariah status of key products and processes
Guide choices through disincentives	Apply taxes or charges	Develop multicriteria interventions, building on existing developments such as carbon and sugar taxation, and scoping others such as marketing controls, carbon-calorie connections	Use of contracts and conditions to shape supply chains	Disinvestment campaigns
Guide choices through incentives	Use regulations or financial incentives	Interagency, cross-government engagement with the consuming public	Consumer reward schemes	Build cultural appeal for healthy diets from sustainable food systems
Guide choices by changing default policy	Provide better options	Recognise the problem but not give it high priority	Already being pioneered by retailers in their own-label products, and by in food service actors through menu planning, reformulation	Legislative change campaigns
Enable choice	Enable individuals to change behaviour	The market economics position, currently manifest via logos and branding appeals	Focused marketing on only healthy and sustainably produced foods	Campaign for alternative products
Provide information	Inform or educate the public	Mass, public information campaigns	Prioritisation of brands which appeal to eat differently,	Led by NGOs, brands and some commercial interests
Do nothing	No action or only monitor situation	The all-too common baseline of inactivity, which can be maintained by vested interest support	Rely on public relations or media advisers to alert as to coming difficulties	Ignore the wider picture and stick to narrow spheres of interest

Source: Reproduced from Willet et al 2019²⁵

Policy levers to target multiple food system goals

Along with considering the policy mix, another possible route to a more systemic and coherent approach to policy is to design individual levers to work harder to support multiple food system objectives. This has been highlighted as an important tactic for improving the impact of policy in food systems transformation: Glopan, in its recent *Foresight 2.0* report, recommended that: ‘...every policy and investment decision taken at the government or commercial level should be focused on ‘gain multipliers’; that is, on actions that can have multiple beneficial outcomes combined, or at least do no harm to related sectors of activity where gains are more narrowly focused on just one domain’.

Similarly, the UN Food Systems Summit aims to identify ‘game changing and systemic solutions’; feasible actions, ‘based on evidence and best practice, that would shift operational models or underlying rules, incentives, and structures that shape food systems, acting on multiple parts of the system or across the system, to advance global goals and which can be sustained over time’.

Analysis on the potential to create ‘co-benefits’ across health, environmental, social and economic food system goals, has highlighted several existing policy levers – such as food public procurement – which show promise. A sister publication to this report ‘*What would a transformational approach to...Food Public Procurement, look like?*’ explores the transformative potential of this lever, by examining: which food systems activities and outcomes it could impact if designed to be transformative, and which other levers interact with public procurement – including the additional levers which may be required to improve its chances of successful implementation. This provides a model for deeper dives into the transformative potential of different policy levers. The lists of levers and interactions in this report could be used to support such endeavours, by providing an inventory to select from.



For this reason, the levers listed in this report may be applied by government, industry, or by civil society, or a combination of these different actors. This highlights the importance of also recognising the interactions between the different responsible actors. For example, if government has proposed a change it expects to be carried out by another sector, has it been designed in a way that makes it likely to be implemented? Or ensured the conditions are conducive to high policy compliance?

A final point – and a sentiment expressed in the literature – is that the deficit of evidence on implementation of particular levers, and policy mixes, should not be taken as reason not to act. If the ambition is food system transformation, rather than more marginal improvements to the status quo, policy intervention will likely need to look beyond what is currently implemented, to more innovative approaches – or redesigning, extending and grafting on to existing levers – to better reflect the pressing need for action to meet challenges to human and planetary health, and improve equity in the food chain.

Gaps in the evidence base on food systems policy levers

A missing ‘birds eye view’ of the range of available levers across food systems is one barrier. Another is evidence on the individual levers themselves. Discussions and activities on data gaps related to food systems tend to be dominated by a focus on evidence on the problems, rather than on the effectiveness of policy solutions or policymaking arrangements. As noted in the SAM/SAPEA (2020) Evidence Review on sustainable food systems:

‘Our Report highlights a significant gap in knowledge regarding the effectiveness of policy interventions where a rich body of systematic evaluations of proposed interventions are often not available in sufficient numbers’.

The evidence base on implemented food policy levers is patchy: many are not documented, and where they are – for example the Nordic Food Policy Lab's 'Food Policy Solutions Menu'²⁶ – full details of success/evaluation are often not included, and measures of 'success' differ. A recent report 'What Can We Learn: A Review of Food Policy Innovations in Six Countries'²⁷, produced to inform the forthcoming National Food Strategy for England, makes a strong contribution towards building this evidence base, though only covering six countries and without full analysis of policy evaluations.

Even bigger gaps exist when it comes to how particular levers were developed and implemented. Valuable insights into: who, for example which government ministries, was involved; what resources were needed; how the process worked; where the political tensions arose, are few and far between. This makes evaluating the transformative potential, and transferability, of levers more difficult. Poor evidence on the effectiveness of policy levers should not be a barrier to action: expecting to have definitive evidence of how each lever works in practice is unrealistic. But when implementing solutions, a process of learning by doing should contribute to the evidence base for the good of all.

Finally, while it is possible examples have been missed when creating the data set for this analysis, the findings highlight gaps around particular levers. There are several which are recommended in reports as important for supporting transformation, but which were not accompanied by examples of implementation²⁸.

These are:

1. Subsidies for the production of healthy foods (apart from the 1970s agricultural programme in North Karelia, Finland)
2. Subsidies for consumption of healthy food across the general population (cf voucher schemes focused on food insecurity)
3. Job creation strategies focused on food production beyond farming (in developing countries)
4. Nudge behavioural approaches (being applied on the ground, rather than in experimental settings). Although it could be argued that certain levers which are listed – such as labels or taxes – can be classed as 'nudges'.

Given that these levers have been recommended in multiple reports and are (or at least likely to be) politically popular, it would seem wise to prioritise improving the evidence base on their potential contribution to food systems transformation, going forward.

The evidence base as contained in food systems reports and papers is further complicated by the spread across developed and developing country contexts, where the potential for policy transfer (the application of a policy implemented in one country to another) is rarely addressed. Here there is also a tension – deserving of further exploration – between having transferable policy levers which could be taken off the shelf from other countries (less politically costly), and the need for an open-minded approach to what levers may be required for a truly transformative action (which will require moving beyond the status quo, and may involve consideration of the application of measures put in place in developing countries, for example around food prices, or natural resource management, in developed country contexts).

As noted in the SAM/SAPEA (2020) evidence review on sustainable food systems:

Our Report highlights a significant gap in knowledge regarding the effectiveness of policy interventions where a rich body of systematic evaluations of proposed interventions are often not available in sufficient numbers.

What are 'transformative' policy levers?

This report maps the range of levers available but does not extend to assessing their transformative potential. The question of how transformative policy levers are a complicated one; arguably requiring navigation of historically distinct bodies of disciplinary knowledge, including policy-and systems-science.

For example, the concept of transformation is used in many different ways in relation to system change generally, and to food system change more specifically. While the need for transformation is widely acknowledged, there is less agreement on what transformation looks like (including how it can be measured) and how to make it happen. Borrowing from a similar point made by Garnett (2014), the notion of 'food system transformation' is characterised by a 'broad spectrum of opinions, some more radical than others in their analysis of the problems and their vision of the solutions'. Different disciplines – nutrition, agriculture, socio-ecology – working on food systems embed 'different views and interpretations...about the nature of the 'crisis', and consequently about the research and priorities needed to 'fix' the problem'²⁹.

In policy studies, evaluation of an intervention traditionally focuses on whether it was successful in achieving its original aims. There are also different ways to characterise the 'strength' of policies. Distinction may be made between hard and soft, or 'tough' (coercive and sanction-based) and 'tender' policy tools (relying on incentives, persuasion, and capacity building)³⁰. Another distinction is whether policies target action via the individual (such as providing consumers with information about healthy eating) or alter structures (for example banning the sale of unhealthy or environmentally-unfriendly foods)³¹. An example of a harder/tough intervention, which was effective in delivering its original aim of reducing sugar consumption, might be the UK's soft drinks industry levy³².

Meanwhile, systems transformation thinking utilises the idea of 'shallow' and 'deep' leverage points. In the classic Meadows (1999) hierarchy of intervention points for leveraging system change, shallow leverage points are 'places where interventions are relatively easy to implement yet bring about little change

to the overall functioning of the system'. In comparison 'deep' leverage points might be 'more difficult to alter but potentially result in transformational change'³³. Examples of shallow points include modifiable, mechanistic characteristics such as taxes, incentives and standards, or physical elements of a system, such as sizes of stocks or rates of material flows, while examples of deep leverage points include the norms, values and goals embodied within the system³⁴. Transformations to sustainable systems have been argued to require simultaneous, substantive change in three spheres (of human interaction with the environment): The Personal – beliefs, attitudes and values; The Practical – Behaviours, technologies and institutional reform; and The Political – System-level dynamics and structures³⁵. A comprehensive approach to transformation needs to address all three spheres.

How these different perspectives from policy and systems science coalesce is worthy of further exploration, to better understand what transformative means in food systems policy terms. For example, being successful in its original aims may not necessarily equate to a transformative lever in the systems change sense, if the impact is limited and 'shallow'. A lever – such as a fiscal lever like a food tax – may be considered 'cost-effective and particularly effective for targeting individuals of lower socio-economic status' in isolation³⁶ but not necessarily have significant impacts across the rest of the systemⁱ. This might be compared to, for example, an organic (food and farming) strategy as pioneered in Denmark, which involves multiple parts of the food supply chain and has the potential to benefit multiple outcomes across environment, economy, and health and social, and contribute to changes in the overall food culture, but might be considered a 'softer' lever. There are different dimensions and definitions of transformation which could be applied, including the potential of a lever to: influence the personal, practical and political spheres; or to have cascading impacts across the rest of the system; or to meet multiple food system objectives (See box '*Policy levers which hit multiple food system goals*'); or its transferability across contexts.

i. Though it may have cascading impacts on reformulation in the manufacturing sector

Method

Perhaps surprisingly, while policy is the focus of many major food systems reports to have been published in recent years, and an increasing number of projects are analysing and recommending policy levers to support transformation, there is no obvious list or source which could be identified which lays out the possible toolbox.

There are several databases and classifications covering parts of the system. The literature (grey and academic) on different food policy levers crosses multiple disciplines, where lists of levers tend to hone in on a particular segment of the supply chain or particular outcome – such as improving dietary health, or environmental instruments targeting carbon.

Because no practical evidence base could be identified from which to create a map of policy levers for food system transformation, a new data set – or 'inventory' – was created by identifying major reports on food systems and coding them for any policy levers mentioned. Existing databases were used to supplement the inventory, and additional examples of levers from the academic and grey literature were also added where they did not already appear in reports. This approach also enabled the inventory to go beyond only government-initiated policies, to include levers applied by e.g. the private sector, such as certification, or labelling.

The inclusion and categorisation of levers is based on the researcher's judgements about where to draw the boundaries on food systems-related policies. The listed levers in the mapping are also shaped by the data sources – for example, reports tend to focus less on laws as 'policy levers'. Levers listed may be underpinned by specific legislation, for example agricultural market levers by an enabling agriculture law, or a labelling scheme by a regulation on labelling, but these laws are not included as separate levers in an attempt to reduce the complexity. More details on this can be found in the Appendix under '*Further Details on the Method*'.

By drawing on categorisations used in other databases and lists, including the Nourishing and FAO FAPDA categorisations, the data was categorised according to type of lever, for example 'tax', 'community projects', 'labelling'. Each lever was then further categorised according to the primary segment of the food supply chain it targeted, using the categorisation of supply chain segments in the Parsons et al (2019) Food System Flower Diagram³⁷.

There are many ways to organise this kind of mapping. Categorising in terms of food system activities (ie segment of the food chain) was considered of the most practical value when thinking about transforming the system. An alternative is to organise the levers according to the food system outcomes targeted, although this was deemed less likely to break down existing boundaries between policy sectors/issues, and be more challenging to apply in real-world discussions about transforming particular systems.

In the toolbox tradition, the long list of levers was also distilled into a shorter taxonomy of broad types of lever (p24).

The mapping and taxonomy will require refinement, and the input from other researchers. Limitations of the current method are outlined in the appendix, along with further detail on how the research was done and why.



Mapping policy levers: the findings

The first section of the findings presents a mapping of key food system policy levers. Figure 1 summarises the overall findings of the mapping exercise. This is followed by presentation of a broad taxonomy of types of lever, and findings on policy interactions and policy packages.

Figure 1 presents the headline findings of the mapping of levers at each point in the chain. There is also a category of cross-cutting levers which are applied across multiple segments, such as governance arrangements, and cross-cutting framework policies (for example on food security). As discussed in the introduction to this report, while the majority are what might traditionally be considered 'policies' made primarily by governments, the lists also include levers applied by the private and third sectors. These may or may not be supported by governments (for example community projects, certification schemes, or cooperatives).

One important lever, which is included under the segment Multiple/Cross-cutting, is that of waivers and exemptions, which can be applied to particular activities in the food system (for example to small businesses, in the form of a tax waiver, or exemption from particular safety requirements).

In the appendix, a more detailed analysis of each segment of the supply chain is provided, outlining the key identified levers applied to it, and implemented examples. One implemented example is provided per lever (many more are listed in the inventory database), with an effort made to ensure a range of coverage of countries at different stages of development.



Figure 1: Food Systems Transformation Policy Toolbox: A map of policy levers.

RESEARCH AND TECHNOLOGY

Collaboration
Funding

FOOD WASTE

Collaboration
Consumer Behaviour Change Measures
Data (Collection and Application)
Fiscal Incentives
Food Waste Infrastructure Solutions
Food Waste Valorisation Initiatives
Framework Policy: Food Waste
Improving Skills/Training/Knowledge
Labelling
Rules on Food Waste Reduction
Supply Chain Efficiency Initiatives
Surplus Food Redistribution Programmes

EATING

Breastfeeding (Programme/Rules/Campaign)
Community Projects
Data (Collection and Application)
Direct Food Provision
Education
Food-Based Dietary Guidelines
Improving Skills/Training/Knowledge
Labelling
Rules on Promotion/Advertising
Public Information/Campaigns
Subsidies
Taxes
Technology/Innovation

FOOD SERVICE

Certification of Production Methods/Products
Collaboration
Composition/Reformulation (Food)
Data (Collection and Application)
Framework Policy: Food Service Sector
Framework Policy: Food Culture
Improving Skills/Training/Knowledge
Incentivising Improved Provision
Labelling
Planning
Procurement Rules/Standards
Rules on Promotion/Advertising
Rules on Composition/Reformulation
Rules/Standards on Provision (Health/Sustainability)
Standards: Safety/Quality/Traceability
Subsidies
Technology/Innovation

MULTIPLE

Finance/Investment (targeting food business impacts)
Framework Policies: Cross-Cutting:

- Circular Economy
- Food Culture
- National/Urban Food Strategy
- Food Security
- Job Creation
- Obesity

Food Governance Arrangements:

- Bodies
- Direct Spending/Funding
- Leadership/Political Will
- Monitoring, Mapping, Measurement
- Participation
- Transparency

General Laws impacting across the food chain:

- Animal Welfare
- Consumer Protection
- Environment
- Food Integrity
- Labour
- Trading Practices

National Security Policies
Welfare Payments
Waivers and Exemptions (from policies)

INPUT

Certification of Production Inputs
Framework Policy: Input Use
Market Intervention: Local Input Production/Provision
Rules on Inputs
Subsidies for Inputs
Taxes on Inputs

FARMING

Agricultural Market Intervention
Certification of Production Methods/Products
Collaboration
Community Projects: Agriculture Cooperatives (Support for)
Data (Collection and Application)
Finance/Investment/Insurance (Support for)
Framework Policy: Agricultural Production
Impact Assessment: Agriculture
Improving Skills/Training/Knowledge
Labelling
Land Ownership/Reform/Management
Rules on Natural Resource Management
Standards: Safety/Quality/Traceability
Subsidies (for production)
Short Supply Chains (Support for)
Taxes applied to (or removed from) Agricultural Production
Technology/Innovation

DISTRIBUTION AND TRANSPORT

Agricultural Market Intervention Food Purchase/Storage)
Agricultural Market Intervention (Storage/Infrastructure/
Distribution Support)
Rules on Food Packaging
Standards: Safety/Quality/Traceability
Technology/Innovation

TRADE

Export Subsidies/Taxes
Framework Policy: Export Promotion
Import Tariffs/Duties
Rules on Import/Export of Foods
Trade Agreements
Trade Facilitation Arrangements

RETAIL

Certification of Production Methods/Products
Collaboration
Data (Collection and Application)
Direct Food Assistance (Retail Support)
Finance/Investment/Insurance (Support for)
Framework Policy: Retail Sector
Improving Skills/Training/Knowledge
Incentives for Improving Provision
Labelling
Planning
Rules on Promotion/Advertising
Rules/Standards on Provision (Health/Sustainability)
Standards: Safety/Quality/Traceability
Technology and Innovation

PROCESSING AND MANUFACTURING

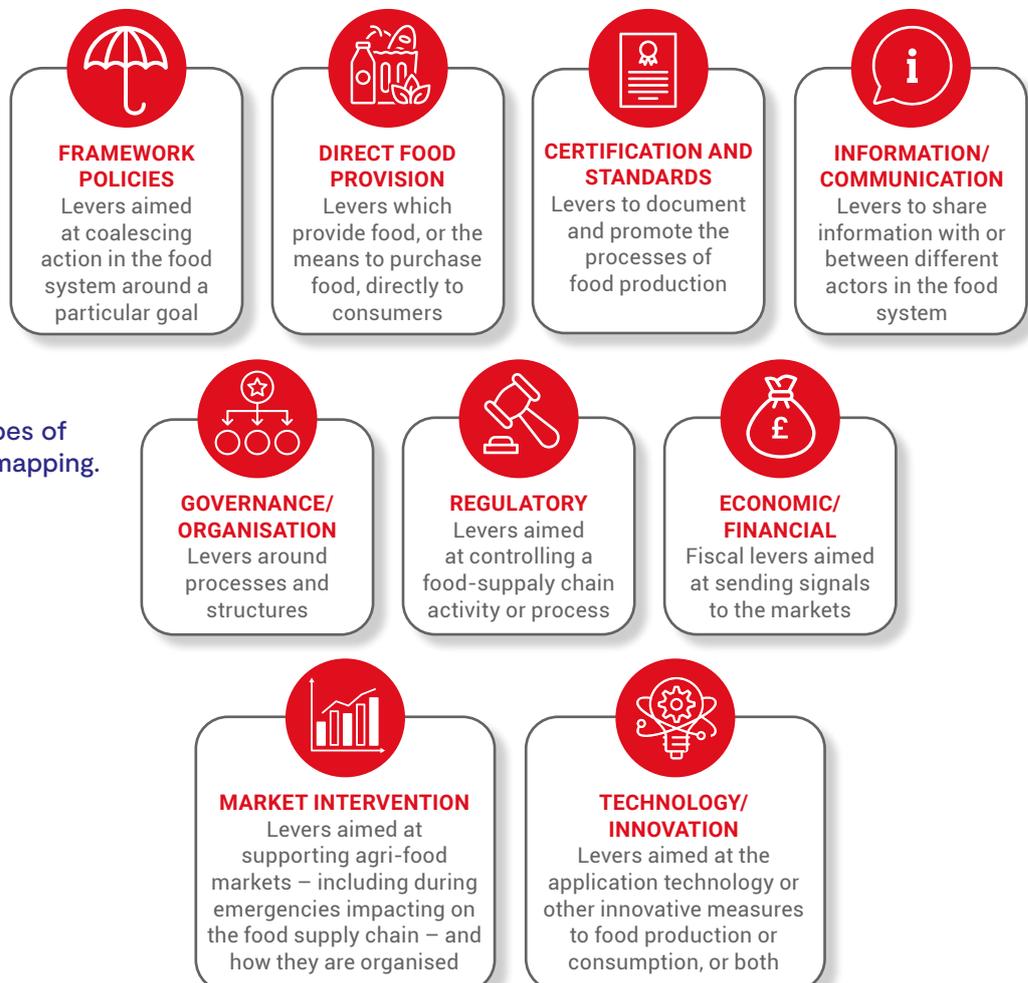
Agricultural Market Intervention (Processing Facilities, including Abattoirs)
Certification of Production Methods/Products
Collaboration
Data (Collection and Application)
Framework Policy: Processing/Manufacturing Sector
Improving Skills/Training/Knowledge
Labelling
Rules on Composition/Reformulation
Rules on Promotion/Advertising
Standards: Safety/Quality/Traceability
Taxes
Technology/Innovation

A taxonomy of types of lever

The mapping presented in this report illustrates the wide range of possible levers which constitute the food systems transformation toolbox. These range across information-based, economic, regulatory levers, levers which target how the market for food is organised, or the processes of governing, along with social and technological innovations, and the research undertaken to inform, evaluate and generally support these endeavours.

Detailing the key levers applied at each stage of the supply chain was deemed to be the most practically-helpful to those wishing to understand which levers they may use to achieve their particular aims for the food system.

In addition, when producing the report, it was felt that a simplified categorisation/ aggregation of this diverse collection of implemented levers into some generic categories could also be helpful to manage the complexity. The following taxonomy of therefore presents some broad classes of lever. It does so with a recognition that aggregation is based on judgement, and that reality tends to be messier and more blurred. For this reason, many of the categories are overlapping, and some levers could be placed under various headings, making them a hybrid. It is also important that aggregation to manage complexity is balanced with the need for applicability to real-life phenomena, in order to make it relevant to those exploring the toolbox. Any levers should be recognisable in terms of the real-life language used in policies, and real-life examples which are implemented.



Broad taxonomy of types of lever identified in the mapping.



FRAMEWORK POLICIES

Coalescing action in the food system around a particular goal

Framework Policies are a class of lever which involve a plan or agreement, also sometimes called a 'strategy', 'programme', 'initiative', 'roadmap' or 'covenant'. They are aimed at eliciting action on a particular food system activity or objective. They may be focused on agricultural production, food exports, or promoting food culture. They may also be cross-cutting policies on food, which bring together lots of activities and outcomes under a single umbrella – an example being the EU's Farm to Fork Strategy. Collaboration interventions link up different food system stakeholders, either within a particular segment (such as networks of farmers, or of restaurant/chefs), or across multiple segments of the chain such as farming, processing and retail. Collaboration may be focused on a particular outcome – such as health or sustainability – or bring together the participants from the supply chain for a particular food, for example dairy. In reality both framework policies and collaboration tend to be used in conjunction.

Framework Policies may involve the application of a range of supporting levers such as, mapping, measuring and monitoring, including target-setting, establishment of rules to be followed (self-regulation), and skills, training and knowledge provision.

A key sub-set of Framework Policies are Natural Resource Management programmes, aimed at limiting or repairing the environmental impacts of food production on the natural environment. These can take many forms, and are likely to be a hybrid

of multiple types of lever, crossing: information and communication, such as the training of farmers in climate-friendly agricultural techniques; regulatory – such as restrictions on land expansion, or particular agricultural inputs; and economic – such as subsidies to encourage or compensate for particular activities or fees or charges for environmental damage caused or resources consumed, or 'payments for ecosystem services', which provide finance for natural resource management. Permits, rights, and quotas are a type of environmental policy lever which can be used to limit impacts on natural resources – such as fish, or climate emissions – and these may be tradeable between users.



REGULATORY

Controlling food-supply chain activities or processes

The regulatory class of lever encompasses a range of different strengths and breadths of rules which control what is allowed at a particular point in the food chain, often linked to the objective of reducing negative social or environmental outcomes. Regulatory levers come in different forms: they may be 'framing', and broadly set out the aims without specifying the means to achieve, for example the EU's General Food Law Regulation, which is translated into national guidance by the UK's Food Standards Agency. Or they may be more specific, such as regulations banning particular foods or ingredients, such as the mandatory removal of trans fats which have been introduced in several countries.

While some regulation is mandatory (classed as a 'harder' measure), there are many policies which set rules form controlling food chain activities or processes which are voluntary – often described as 'self-regulation', for example commitments by the food industry to limit advertising to children, or to remove junk food from supermarket check-outs.

Regulatory levers may also involve the use of mapping, measuring and monitoring (including target-setting), as part of implementation, or impact assessment.



ECONOMIC/ FINANCIAL

Fiscal signals to the market

Economic levers involve the provision of financial incentives (such as subsidies, or tax concessions), or charging of penalties (such as taxes), in order to encourage or discourage certain activities. They also include support for access to finance/investment/insurance for particular food production activities. Fiscal levers are generally considered to be 'harder' measures, and can be aimed at the producer/organisation level, or at individuals.



MARKET INTERVENTION

Supporting agri-food markets – including during emergencies impacting on the food supply chain – and influencing how they are organised

This class of lever involves intervening in the market for food, including regulating the food supply, to ensure availability. It includes levers such as setting price limits on produce, public

sector storage of produce, support for local infrastructure, such as roads, or processing facilities, assisting producer organisations to improve supply, and other crisis-related measures to shore up supply in periods of market disruption (for example as applied in response to Covid-19). In addition to government-backing of producer organisations for particular commodities, there are private-sector policies to facilitate cooperation arrangements between different segments of the food chain (for example farmers). There are also levers – primarily private sector-led, by farmers themselves, or civil society-led – which target particular types of trading arrangements, such as supporting short supply chains between producer and consumer.

Market interventions also encompass those levers applied to facilitate trading, including around trading practices (such as competition law, and unfair trading practice rules), and trade agreements between countries and other trading arrangements.



DIRECT FOOD PROVISION

Providing food, or the means to purchase food, directly to consumers

The class Direct Food Provision encompasses a range of different types of lever, some of which also fit under other categories, such as the economic lever of subsidies. Two main types of direct provision are identified, direct food provision aimed at tackling food insecurity, and public procurement of food (for example for serving in schools, hospitals or other government-run institutions. Procurement is linked to multiple other levers, including standards (because standards for particular types

of food may be set, for example the UK's school food standards), and certification, because certified produce is often part of any procurement policy, as a way of demonstrating commitments to particular production methods. Direct food provision has a strong social welfare dimension (thus overlapping with welfare provision such as the UK's Universal Credit scheme) and covers levers such as: food vouchers or cash; food banks; meals on wheels provision of food to the elderly; (free) school meals, breakfasts and fruit and veg provision; and holiday hunger and other schemes covering periods outside of school hours.



CERTIFICATION AND STANDARDS

Documenting and promoting the processes of food production, or contents of food

Certification can be used to assure the application of particular production methods and products (for example organic, or Fair Trade), and tends to be private-sector led. However, the lines between public and private sector in regard to certification can be blurred: private certification schemes may be accompanied by government-baseline standards – such the EU-derived organic standards, and the UK Soil Association's organic certification scheme, which operates above the baseline standard, or the UK's independent private sector Red Tractor Assurance scheme, which is formally government endorsed or approved.

Linked to certification, therefore, are standards-setting levers which can be applied – and can be either mandatory or voluntary – to assure food safety, quality, or composition (for example the presence or absence of particular ingredients

for nutrition reasons). Along with the organic example stated, other examples are food safety laws, such as the EU's General Food Law, and bans or voluntary reformulation to remove high levels of salt, fat or sugar in food products. Standards are therefore overlapping with the regulatory class (because standards may be introduced by law).

Certification and standards are also linked to traceability levers, which monitor foods through their supply chain journey, to ensure compliance with safety standards, for example, and often involve the application of technology.



INFORMATION AND COMMUNICATION

Sharing information with or between different actors in the food system

This class consists of what might be considered 'softer' levers, around information. Specific levers include: public information/campaigns, such as the UK's Change4Life campaign; interpretive tools to provide information in accessible ways, such as (food-based) dietary guidelines like the UK's Eatwell Plate; and labelling, such as front-of-pack traffic light labels, along with more straightforward ingredients and production process labelling; the inclusion of food as part of education provision, which may involve: nutrition advice, cooking and growing activities; and sensory/taste education in schools. Finally, there are professional education interventions beyond schools, involving the provision or sharing of skills, knowledge, and training at different points in the supply chain, including farmers, processors and manufacturers, and caterers, and health professionals (such as doctors).

Information and communications tools are also linked to certification and standards, which may provide the foundation for any labelling or other information provided.

Information and communication are also linked to mapping, measuring and monitoring interventions, and data-related levers.



GOVERNANCE/ ORGANISATION

Addressing processes and structures

Alongside levers applied with substantive aims, is a class of lever which address organisational process and the structures of decision-making arrangements. These can broadly be placed under the umbrella of 'governance'. They encompass: the creation of bodies to connect decision-making across government horizontally and vertically, and with outside stakeholders (participation and transparency); a government's approach to funding food-related activities directly; and the mapping, measuring and monitoring of activities and outcomes, and policies, in the food system. Framework policies overlap significantly with the governance/organisation class.

Other dimensions of governance – though not interventions per se – are leadership/political will, transparency and participation. These are included in the lever mapping because they are potentially-important influences on food system transformation.



TECHNOLOGY/ INNOVATION

Applying technology or other innovative measures to food production or consumption, or both

Technology/innovation is a lever for system transformation beyond policy itself, and can be applied at all points in the food supply chain, to the service of multiple objectives, from purely economic to environmental. Such interventions may be private-sector or civil society-led, or have a link with government. Public sector involvement may be through the development and oversight of a Framework Policy – like the UK's Agri-tech Strategy to increase the application of technological innovation in farming – or through financing of, or providing support for finance/investment in, particular innovative activities, or organisation of collaboration across food system stakeholders. The collection and application of data is an important intervention in this category. Who owns the technology, or who accesses it, is an important consideration.

Technology/Innovation can also encompass social innovations, such as community projects. Community projects related to food span initiatives around cooking skills; food growing; food sharing; and the distribution of food surplus.

Research activities targeting the food system could also be encompassed within this category.

As noted in the introduction, a final point is that there are policy levers applied in other sectors which impact on the food system and could be considered part of the broader transformation toolbox, for example rules around land ownership and management, and labour rules/rights, competition rules, and social welfare systems.

Where does behaviour change fit?

One type of lever which was highlighted during the mapping research was that of 'behaviour change'. Behaviour change insights are increasingly being applied to policy more broadly, and food-related interventions specifically. This report makes the distinction between behaviour change as a broad category of outcome, and levers which specifically target the choice architecture in particular food settings. Behaviour change as an outcome can be targeted many different types of lever – for example changing consumer behaviour through the use of labels or taxes on particular products or using fiscal or other incentives to change the activities of food businesses. There are many implemented examples of this type of approach being used, dating back decades. Interventions focused on making changes in choice architecture – for example on menus, or in canteens – have well-evidenced potential to change behaviour, but the mapping findings indicate that examples of this type of lever being applied tend to be research experiments, rather than implemented policies







Understanding policy interactions

As detailed earlier in the report, taking a food systems approach means policy tools are not treated in isolation: doing so risks undermining the effectiveness of a lever, through the dampening effects of other activities, resulting in incoherence .

Though often not explicitly framed as such, the food systems reports analysed for this policy lever mapping offer numerous examples of interactions with other system activities, or requirements for additional levers. These have been collated into a register of policy interactions. A full analysis of these is yet to be completed, but a rapid analysis of interactions suggests a range of potential 'dampening effects', or barriers to transformative impact, which should be considered when designing and implementing policy levers aimed at food system transformation. Select examples include:

- The need to ensure agriculture programmes to increase production are accompanied by appropriate mechanisms for natural resource management, to negate potential negative environmental impacts from additional resource use, including land and water, and pollution.
- Accompanying agricultural programmes, or agri-environment schemes – including those aimed at carbon sequestration – with measures to improve skills/training/knowledge in farmers, to ensure there is buy-in and effective implementation.
- Supporting Food-Based Dietary Guidelines with additional levers which improve food environments and reduce potential dampening effects of commercial promotion of unhealthy foods on dietary advice to improve health; plus training of health professionals in dietary guidelines to ensure effective dissemination and support uptake.
- Monitoring of the implementation of schemes – for example public procurement standards – to ensure effective implementation.
- Accompanying any attempts to reduce production and consumption (for example meat), or increase production and consumption (for example fruits and vegetables) with appropriate labour measures, to compensate and redeploy producers/ensure availability of a skilled labour force.
- Supporting consumption-based food taxes with levers which reduce perceived and actual impacts on low income communities, including use of public information, labelling and subsidies.

A selection of examples from the register are listed in Table 3.

Table 3: Selected examples of interactions between food systems levers

Policy Lever	Possible interaction ('dampening effect' or barrier to transformative impact)	Additional levers required
Aquaculture Programme	Aquaculture is a relatively efficient means of supplying animal-based protein, but can create environmental challenges, including conversion of valuable wetland habitats (such as mangroves), use of wild-caught fish in feeds, high freshwater demand, water pollution, and effects of escaped farm fish on wild fish. ³⁹	Natural Resource Management programme Environmental Planning Regulation
Agri-Environment Scheme	Agri-environment schemes may not be effective if farmers do not have the knowledge to implement them effectively. ⁴⁰	Agricultural Advisory Services
Carbon sequestration measures for agriculture	Measures to increase carbon sequestration in agricultural soils and above ground might come at a cost to near-term yields and consequently to farm economy. ⁴¹	Finance/Investment Subsidies
Circular economy strategy to reduce food waste	Circular Economy approaches may require creation of a supportive legislative framework, including rolling back regulations that limit entrepreneur's ability to innovate – for example changing the legal definition of 'waste' – as well as tax incentive schemes and financial investments. ⁴²	Regulation Taxes Finance/Investment
Community Projects: Meal- Sharing	Tensions exist between food-sharing initiatives and regulators, particularly around health and hygiene, food safety and risk but also with respect to access to land and spaces to share food. ⁴³	Standards: Safety Land Reform
Consumer Tax – high GHGE foods	Increases in prices of high GHGE foods might impose disproportionate financial burdens on low-income households, and may not be publicly acceptable. ⁴⁴	Subsidies Consumer information Labelling
Financial support for cost of inputs to fishing	Government support to fisheries lowers the cost of fuel, vessels and gear— and thereby encourages overfishing, incentivising environmental damage.	Alternative levers which provide financial support to fishers Natural Resource Management Programme Environmental Planning Regulation Advisory Services
Food-based Dietary Guidelines	Healthy dietary guidelines may be undermined by permission for fast food chains near schools, or by food marketing concentrated on highly processed food categories high in salt, sugar and fats. ⁴⁵	Planning Restrictions Advertising Restrictions
	Consumption of healthy diets may have environmental impacts, for example, tree nuts are products with a large water footprint. According to one recent modelling study, almost two-thirds of irrigated nuts are produced in countries facing 'severe water stress', including India, China, Pakistan, and parts of the Middle East. ⁴⁶	Natural Resource Management Programme Certification Labelling
	Dietary Guidelines would be more effective if teachers, doctors and other public health professionals were trained in these guidelines. ⁴⁷	Skills/Training/Knowledge (health professionals)
Funding for development of novel food ingredients	Consumer trust may be a barrier to spread of novel foods. ⁴⁸	Consumer Information Campaign Labelling

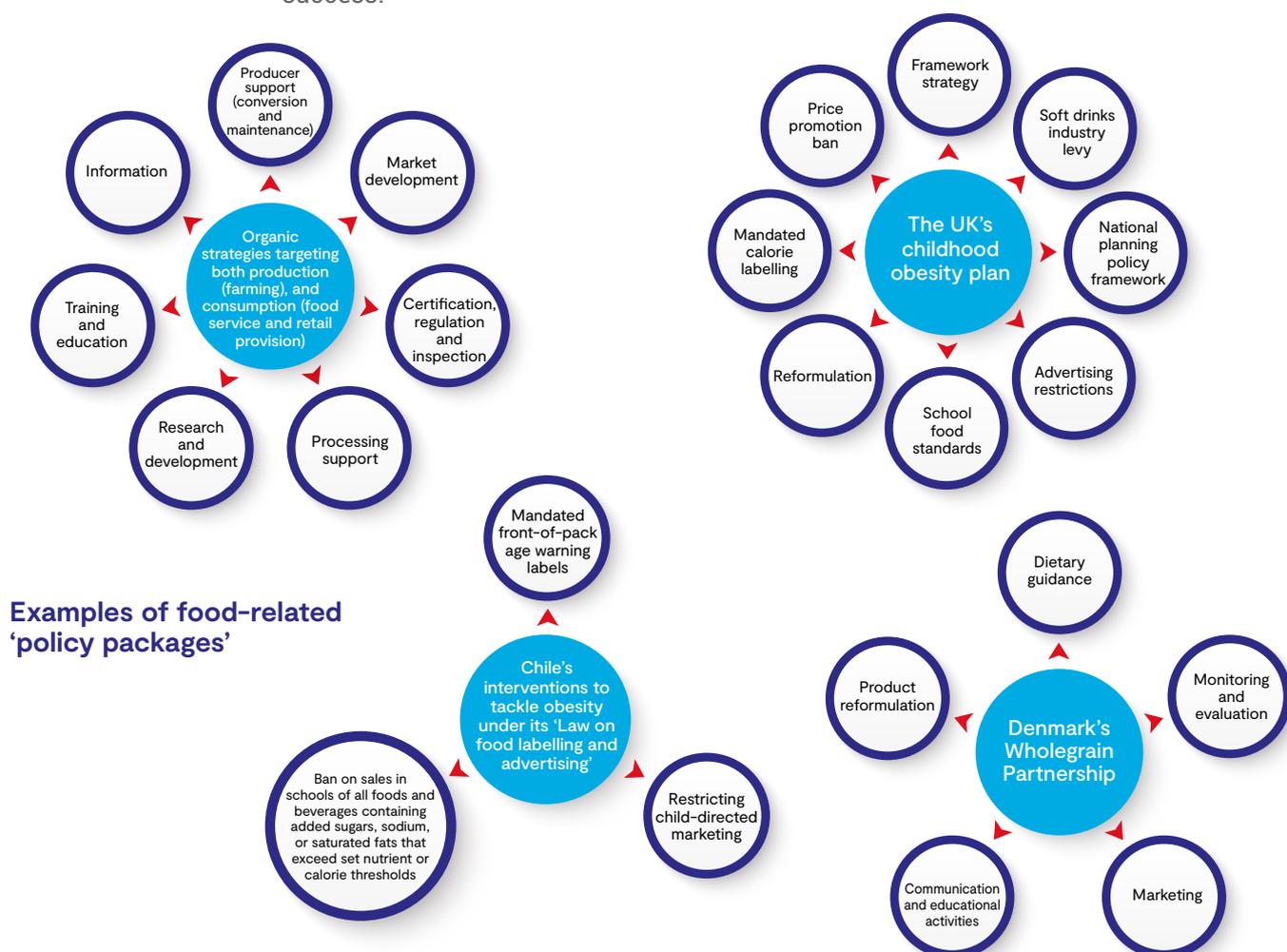
Policy Lever	Possible interaction ('dampening effect' or barrier to transformative impact)	Additional levers required
Input Restrictions: Chemicals	The Nitrates Directive (covering chemical inputs and effluent restrictions) is seen by the farming community as a barrier to efficient production, with many refusing to accept that farming is responsible for any problems. ⁴⁹	Skills/Training/Knowledge Subsidies
Interventions to increase consumption of fruit and vegetables	Changes in diet can open up positive prospects for labour-intensive forms of fruit and vegetable growing ⁵⁰ (though they may also have negative impacts due to pesticides and water usage).	Horticulture job creation policy Training/Skills/Knowledge Input restrictions Water Resource Policy
Interventions to switch production and consumption toward alternative proteins/ plant-based foods	The US meat industry directly employs nearly 800,000 people and jobs could be at risk from the expansion of a more diversified protein market. ⁵¹	Support for displaced workers (for example through a regional economic development strategy) More diversified and expanding local food economies ⁵² and linkages with cities ⁵³
Policies to increase the supply of nutrient-rich foods	Policies to increase the supply of nutrient-rich foods will fail if individuals are not persuaded to consume them, nor will they be viable without innovation and investment in the storage, processing, and transportation of perishable foods. ⁵⁴	Consumer Information Campaign Funding and support for storage, processing, transportation
Procurement Rules	Implementation of procurement rules is patchy and undermines the effectiveness of the intervention. ⁵⁵	Governance: Mapping/ Measuring/Monitoring
Public Information/ Campaigns on Healthy Eating	Public regulators of communications and marketing often struggle to limit advertising of highly processed food, confectionary and sugary drinks, which tend to be aimed at children. Food companies in the United Kingdom spend around £150 million a year marketing crisps, confectionary and sugary drinks, compared to public health spending on better diets of £5 million. ⁵⁶	Advertising Restrictions
Reformulation to reduce saturated fat, salt and/or sugar in unhealthy processed foods (Composition/ reformulation)	There is a risk with reformulation interventions of replacing sugars with fats (and vice versa) in some categories and thereby increasing the calorie content. ⁵⁷	Governance-Monitoring, Mapping, Measuring
Scheme to increase the use of agricultural technologies	Agri-tech solutions may negatively impact human labour in farming. ⁵⁸	Rural Employment Programme
Subsidies for growing healthier foods	International trade policies often encourage imports and exports of highly processed food of low nutritional content because these, as opposed to "pure" agricultural products, are rarely protected by tariffs and quotas. ⁵⁹	Trade Restrictions

Policy packaging as a route to transformation

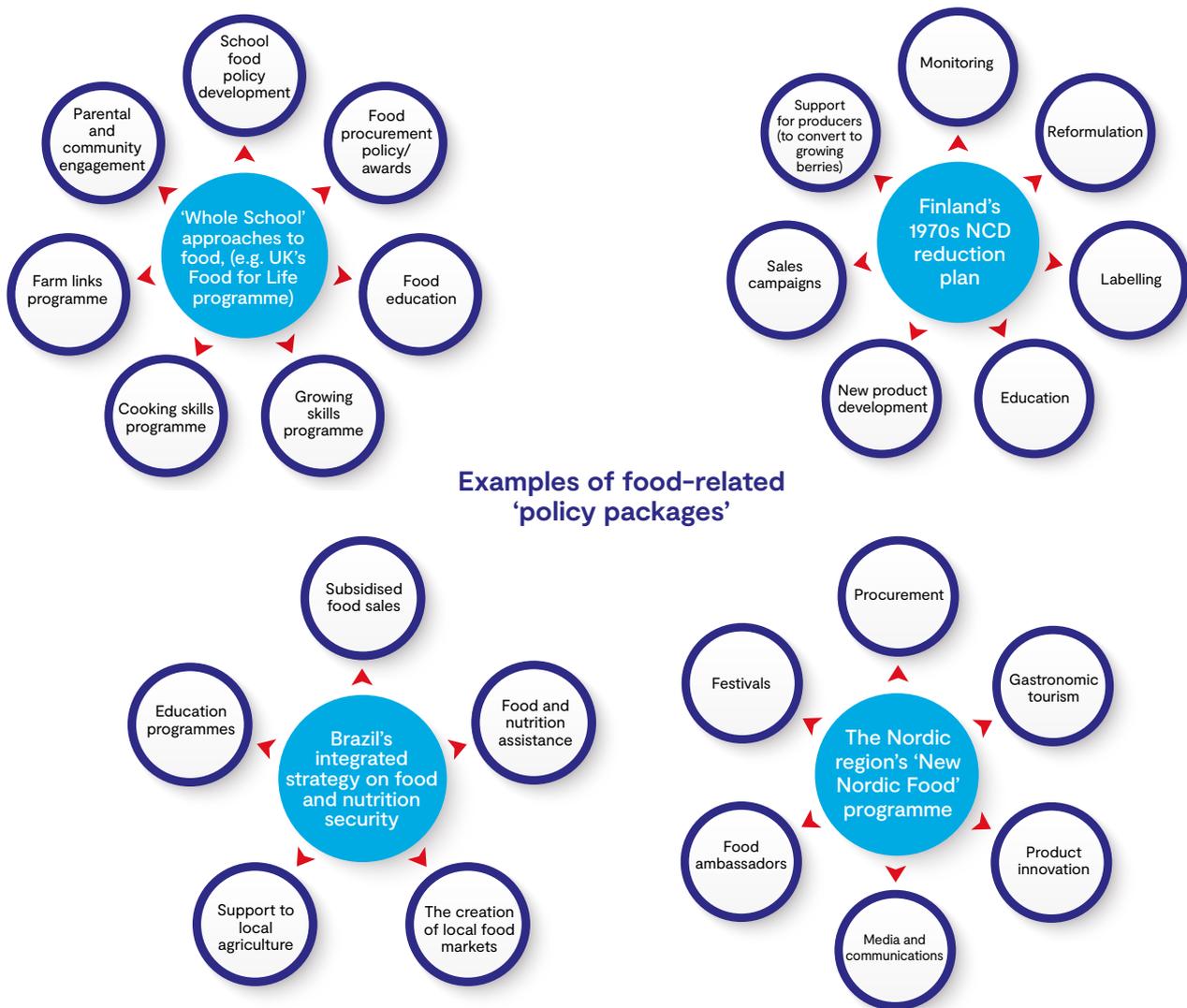
Along with examining the interactions between particular levers, thinking about the overall policy mix, or broader toolbox, could help to identify and design in combinations of different policy instruments which work in conjunction.

The importance of considering tools as part of a 'mix', 'cluster', 'bundle' or – the term used in this report – 'package', has been a focus in the policy sciences for some time, and been tentatively applied in the context of food systems⁶⁰. There are also overlaps, and potential synergies, with recent work exploring the 'bundling' of socio-technical innovations for agri-food systems transformation⁶¹.

The application of these insights around policy packages offer a potential practical way for governments to apply the somewhat abstract principle of a 'food systems approach' to their policies, by targeting a supportive combination which maximises coherence of the mix. Doing this would require an evidence base on policy interactions, and on where such packages (which may not necessarily conceptualised as such) have been implemented in relation to food. There are specific examples of packages of levers which could represent the seeds of a more coherent transformational approach based on effective food systems policy packages. Some examples – ranging from bigger packages of different levers to narrower collections – have been implemented, with some limited evidence of success.



Examples of food-related 'policy packages'



Examples of policy packages identified in the mapping process as seen here include:

- Denmark's Wholegrain Partnership⁶²
- Brazil's Integrated Strategy on Food and Nutrition Security⁶³
- Chile's interventions to tackle obesity under its 'Law on Food Labelling and Advertising'⁶⁴
- Organic Strategies targeting both production (farming), and consumption (food service and retail provision)⁶⁵
- 'Whole School' approaches to food, (e.g. UK's Food for Life programme)⁶⁶
- The UK's Childhood Obesity Plan (Chapters 1-3)⁶⁷
- Finland's 1970s NCD Reduction Plan⁶⁸
- The Nordic Region's 'New Nordic Food' programme⁶⁹

Another practical benefit of combining different levers might be addressing challenges of push back – in terms of consumer acceptance or political feasibility – of applying particular food-related levers. For example, consumers may be more amenable to 'harder' policy levers which aim to remove particular foods from the market, if they are combined with levers providing financial or other incentives/rewards.⁷⁰

Potential for further analysis on the role of policy packages in food system transformation is discussed in the 'Opportunities for Further Research and Analysis' section.

How to use the toolbox

This Policy Lever Mapping is not presented as an end point, but rather a starting point: it aims to present a common organising framework, which others can use to support cross-system conversations, research, and action. The table below provides some ways in which the organising framework might be helpful. As described in the subsequent section, additional research will be required to maximise the potential of the mapping, to best support food systems transformation.

Application	Details
Understanding the Range of Levers which can be applied to Food Systems	Provides overview of policy levers relevant to food systems Provides examples of application of those levers from a range of countries
Showcasing Policy Possibilities, Extending and Developing Policy Design	Highlights how levers are used to tackle different food system activities or outcomes. Could encourage: <ul style="list-style-type: none"> • re-deployment or extension of existing levers towards new activities or outcomes • design of completely new policy levers, using a 'pick and mix' approach to best bits of what has been tried
Benchmarking a Country/City's Food-Related Policy Levers	Could be used in conjunction with other mapping – for example an inventory of a particular country or city's food-related policies ⁷¹ – to identify how much of toolbox is utilised in the current policy approach (which levers are already being wielded, and what is missing).
Comparing Policy Approach Between Countries/Cities	Could support comparison of policy approaches to food systems between countries and cities
Identifying and Addressing Interactions	Offers a reference list when selecting policy levers (to introduce or recommend), from which to identify potential links to existing levers, and address coherence
Identifying Coherent 'Policy Packages'	Could be used to identify a package of policy levers which could be applied in combination to improve coherence and transformative potential
Researching Policy Levers	Could support further investigation into particular levers – their relevance to system activities and outcomes, policy interactions, packaging potential, and transformative potential
Facilitating Policy Lesson Drawing	Could provide inspiration and organising framework for policy learning between cities and countries

Opportunities for further research and analysis

This project has only scratched the surface when it comes to the potential use of the dataset created to produce the mapping, and the potential further evidence which could be collected to improve understanding of the best ways to instigate food systems change using the totality of the policy toolbox. Several opportunities for further research and analysis have been identified, listed here under the sub-headings Policy Levers; Policy Interactions; Transformative Potential; Governance.

Policy Levers

Establishing a more robust and accessible evidence base on the range of levers

Some of the levers in the toolbox have good evidence for their effectiveness. Others do not appear to have had any evaluation conducted. It is not always clear when reading recommendations for policy levers in food systems reports whether the recommendation is based on evidence from real-life implementation or from research papers which estimate their impacts. A process of reviewing the evidence of the effectiveness of various levers (for example has a systematic review been produced), and bringing this together in one place, could be conducted to inform the creation of an optimum toolbox for food systems transformation, and support lesson drawing between cities and countries.

Evidence gaps on particular recommended levers

As noted above, several levers which are recommended in reports as important for supporting transformation were not accompanied by examples of implementation: subsidies for the production of healthy foods, or consumption of healthy foods; post-farm gate job creation strategies; and the application of nudge approaches – for example choice editing in canteens – in real life settings rather than experimental ones. Given these types of lever are being recommended, it would be helpful to identify and publicise implemented examples.

A food systems approach to individual policy levers

The mapped levers could be further analysed in terms of their impacts on system activities, and system outcomes beyond those they are primarily targeting (this analysis has been done in a light touch way for the preparation of this report, but there is considerable scope for further analysis). This could be used to improve policy design and coherence of the range of levers which target food systems, including the extending of existing levers to encompass multiple system outcomes, maximising 'co-benefits', or turning individual levers into 'gain multipliers' as articulated by Glopan 2020⁷².

Policy Interactions

Food system policy levers: understanding interactions and packages

The examples of interactions between a lever and other system activities, including the requirement for additional complimentary levers to be grouped together in packages to increase their transformative potential, could be further analysed and a more definitive set of interactions and packages created, to support more effective implementation of the food systems transformation toolbox.

Transformative Potential

Understanding the transformative potential of particular levers

A review of levers for their transformative potential could combine insights around:

- Whether the lever has been evaluated and how successful it was in achieving its original aims
- How 'transformational' the lever is likely to be – drawing on the existing systems transformation/transition literature and the concept of shallow and deep leverage points.



The combination of findings could be used to create an optimum toolbox for food systems transformation, which could be helpful in designing policies and also in the various participatory labs on future food systems which are currently being held around the world.

Understanding how transformative a country/city approach is: UK case study

The range of potential levers identified in this report could be cross-referenced with mapping of food systems, and policy systems in a particular country or city, to identify how much of the toolbox is in use, and where problem areas require additional levers to be applied. In the case of the UK, this could draw on:

- The results of the UK Food System Mapping undertaken by Hasnain et al (2020)⁷³ for the Transforming UK Food System Programme, which highlights particular problem areas in the UK food system
- The Parsons (2020)⁷⁴ mapping of government actors and activities in England (current policies in place).

This could be used as an example of benchmarking which could be replicated in other countries.

Governance Processes and Structures

The role of governance processes and structures in supporting the application of transformative policy levers

As noted earlier in the report, often evidence on particular policy levers focuses on the content of the end policy (and its implementation), and does not include details of how the policy was developed; who was involved (and how they were incentivised to be), how much it cost, what the barriers – including political feasibility etc – were to introduction. Having more of this kind of data on popular – or potentially transformative – policy levers, could contribute to lesson drawing between different countries and cities, and make the best use of resources by building on existing experiences.

What governance mechanisms can provide capacity for understanding and addressing policy interactions?

Many policy levers are applied by a particular government department. Understanding and targeting the interactions between these levers may not be feasible given the expertise or resources available to individual departments responsible for a particular policy sector. A new mechanism – an inside unit, or outside body – may be required to provide oversight and analysis of system interactions. Further evidence is required on how that process might work, and what structures might be most appropriate to support it.

APPENDIX 1: Policy lever mapping full results

Supply chain activity/segment:

INPUTS



This section on inputs covers the activities of input supply into the food production system. Inputs into food production include chemicals (such as fertilisers and pesticides), seed, and feed for animals. There are also levers to support plant and animal breeding research, which are relevant to the input stage of the chain, and are covered under Research and Technology.

Examples of levers targeting this part of the system include certification, framework policies, and fiscal measures such as subsidies and taxes. There is a notable split between developed and developing country approaches, for example in terms of supports for, vs restrictions on, chemical inputs to improve production yields.

Policy Lever	Details	Example of Implementation
Certification of Production Inputs	The certification of particular production inputs, for example as organic, which can be government-led or private sector	The UK Soil Association's 'Approved and Verified Inputs Scheme' which assures that an input, such as fertiliser or composts, complies with the Soil Association standards and organic regulations
Framework Policy: Input Use	Policy/Programme/Plan/Strategy targeting inputs used in food production	EU member state National Action Plans for the Sustainable Use of Pesticides, aiming to increase uptake of Integrated Pest Management
Market Intervention: Local Input Production/Provision	Government support for local production, or provision, of inputs	Niger's Input Shops – linked to producer organisations – to improve the supply and distribution of agricultural inputs
Rules on Inputs	Restricting (can be mandatory or voluntary) the application of, particular chemical, seed, feed, and or fuel inputs. May involve incentivising the substitution of one input for another (for example a switch to integrated pest management). May involve the use of biofortified seed inputs	France's Ban on the use of Neonicotinoid insecticides (a type of pesticide)
Subsidies for Inputs	Fiscal measures which subsidise (including via vouchers, or distribution of products) particular chemical, seed or livestock, feed, or fuel inputs, or agricultural machinery	Malawi's input subsidy programme for fertilisers and maize seeds to smallholder farmers
Taxes on Inputs	Fiscal measures which add or remove taxes on particular chemical, seed or livestock, feed, or fuel inputs, or agricultural machinery.	Denmark's Pesticide Tax, which earmarks 100% of the revenue generated for environmental purposes and to compensate farmers

Supply chain activity/segment:

FARMING



This section covers all types of food production activities, including agriculture, horticulture and fishing and aquaculture (for short – ‘agriculture’).

There are a range of levers with the objective of increasing agricultural production/ supporting farm incomes (with or without added objectives around, for example, environmental sustainability), including framework policy agriculture programmes, community projects, providing subsidies, and support for accessing finance, investment and insurance, improving farmers’ skills and knowledge, collaboration and cooperation, and the application of technology. There are also a group of levers which provide protections to farmers and fishers, including agricultural market measures which provide guaranteed prices and/or high import tariffs for produce, and unfair trading practice rules. According to the OECD’s agricultural policy monitoring, the vast majority of support to the sector is market price support (i.e. policies to make domestic market prices higher than the world price).

Several levers target the links between farming and the natural environment, including framework policies targeting natural resource management, impact assessments, and land ownership policies.

Finally, there are levers which make links between farmers and consumers, such as certification and labelling, which can detail provenance or methods of production used, the application of safety/quality standards, and short supply chain initiatives.

Policy Lever	Details	Example of Implementation
Agricultural Market Intervention	Rules and measures to regulate and support the marketing of agricultural products and stabilise markets. Can involve purchasing (including government purchasing from domestic farmers) and storage by governments (or supporting private sector to do this – see below), and setting guaranteed prices for suppliers or consumers. (See also tax below)	The EU has a set of Market Measures, including ‘Public intervention’, where products are purchased and stored by EU countries governments or their agencies until being sold back onto the market at a later date, to prevent prices from dropping to unsustainably low levels
Certification of Production Methods/ Products	The certification of particular production methods and products (for example organic, or Fair Trade) (which can be government-led or private sector)	The Dutch ‘Better Life’ (in Dutch: Beter Leven) certification for meat produced at welfare standards exceeding the regulatory requirement
Collaboration	Networks of farmers, or farmers and multiple other stakeholders from different parts of the food supply chain, to facilitate working together towards a particular objective. The objective may be outcome-based (such as economic, environmental or health), and/or food product based (for example dairy, or fruit and vegetables). Often linked to a Framework Policy	The Global Agenda for Sustainable Livestock, a partnership of livestock stakeholders committed to the sustainable development of the sector
Community Projects: Agriculture	Community-based projects that target agricultural production as an activity	The Pacific Islands’ community food projects to promote the domestic cultivation of fruit and vegetables in place of imported food products

Policy Lever	Details	Example of Implementation
Cooperatives (Support for)	Collective organisations of groups of individual farmers aiming to improve their position in the market place (may also be referred to as producer organisations), which can be the focus of policy support	Spain's fruit and vegetable cooperatives
Data (Collection and Application)	The collection and application of agriculture and fishing data	Kenya's CocoaCloud pre-competitive data platform, which collects data, sends local weather forecasts and farm management alerts and allows exchanges of knowledge and feedback between farmers and extension services
Finance/Investment/Insurance (Support for)	Support for financing of or investment in agricultural production, or insurance. Includes facilitating access to credit (for example mandating credit, establishing bank branches in rural areas, subsidised interest rates and financial support for public banks). Government may also provide finance to producers directly, for example involving the principle of payments for delivery of public goods – or 'ecosystem services' – through production, which overlaps with other lever categories	Vietnam's diverse incentives, co-financed from public programmes, private sector investment and civil society initiatives, to support fisher-folk to comply with mangrove restoration and protection regulation, and improve the sustainability and livelihood benefits of shrimp fisheries
Framework Policy: Agricultural Production	Policy/Programme/Plan/Strategy targeting agricultural production, which may involve a range of additional measures, such as subsidies and skills/training/knowledge provision (often referred to as 'Agricultural Extension'). Can have a range of primary objectives, ranging from productivity at the base level, and/or other objectives such as: Food Safety; Health/Nutrition Sustainability in General Climate; Agroforestry; Aquaculture; Urban Agriculture	Japan's 'Plan to Create Dynamism through Agriculture, Forestry and Fisheries and Local Communities', which aims to improve productivity and competitiveness, and decrease producer support funds
Impact Assessment: Agriculture	Assessment of the impacts of agricultural activities (on the environment)	Sweden's requirement for an environmental impact assessment for a wide range of agricultural activities, the cost of which is borne by farmers
Improving Skills/Training/Knowledge	Interventions to provide the necessary skills and knowledge required for (sustainable) agricultural production, which may involve technical advice (sometimes called 'extension')	Cameroon's training sessions offered to local non-governmental organizations and farmer group leaders to enhance their knowledge of indigenous techniques for improving soil fertility
Labelling	Labelling of foods for their contents, production methods or potential impacts, which encompass a range of types of label including: labelling of ingredients; 'interpretive' front-of-pack-labelling on health; sustainability impact labelling; quality/production labelling.	The EU's rules on the mandatory indication of the country origin for certain meats

Policy Lever	Details	Example of Implementation
Land Ownership/ Reform/Management	Interventions around land which may involve reform of land ownership, land use planning, or requirements for particular types of land management. They may specifically target indigenous populations	Scotland's land ownership transition supported by a community right to buy law, supported by a Land Rights and Responsibilities Statement and Land Commission
Public Information/ Campaigns on agricultural products	Promotion of agricultural produce to the public	The UK 'Milk Your Moments' campaign – a joint initiative between government and the food producer peak bodies, to increase the sale of milk
Rules on Natural Resource Management	Interventions to protect environmental resources, including: climate, land; forests; soil/ peatland; biodiversity; water; fishing, either individually or as a package. May include the use of permits, quotas, or rights issued for resources such as fish, or on impacts such as GHG emissions, and these may be tradeable between users	Costa Rica's comprehensive biodiversity law, with objectives on conservation of biodiversity, sustainable use of resources, and fair and equitable sharing of the benefits arising from the utilisation of genetic resources
Standards: Safety/ Quality/Traceability	The application of safety or quality standards to agricultural production (which can be government-led or private sector), and/or tracing of produce through the supply chain. (Standards may also be referred to as Non-Tariff Measures)	CanadaGAPs, the Canadian horticultural council's on-farm food safety program
Subsidies (for production)	Subsidies for production of particular crops or animals/fish (sugar and rice are the most common targets), or for the delivery of particular environmental outcomes	Finland's subsidies to help farmers switch from livestock to berries as part of its NCD reduction programme
Short Supply Chains (support for)	Interventions to support short supply chains, which may be aimed at farmer-consumer links, or farmer-procurement (food service) links	Poland's Cooperative Initiatives, which links organised group of consumers to producers
Taxes applied to (or removed from) agricultural production	Adding or removing taxes to support production. May include tax exemptions (or lower/ preferential rates), for example on fossil fuel, or tools such as income averaging/smoothing/ deferrals/offsetting to support producers' income risk management	Japan's exemption from diesel tax for diesel used in agricultural machinery and greenhouses
Technology and Innovation	The application of technology to agriculture and fishing, which may target objectives around productivity/sales, transparency, sustainability, health	Kenya's Hello Tractor programme, which enables farmers to share equipment through a mobile app and mobile payments

Supply chain activity/segment:

DISTRIBUTION & TRANSPORT



This section covers activities around storage (of agricultural produce); infrastructure (including local agricultural processing facilities such as abattoirs); transport; and packaging needed for distribution.

Levers in this segment can overlap with those in farming, such as agricultural market measures around storage of agricultural produce, and supports for infrastructure – including the transport and processing infrastructure – required by farmers to get their products to market. Levers targeting packaging are also included here, due to its relevance in distribution of food.

Policy Lever	Details	Example of Implementation
Agricultural Market Intervention (Food Purchase/Storage/Distribution)	Purchasing and storage of agricultural products by governments (or supports to private sector), to stabilise agricultural markets and maintain prices for farmers/support food security/availability. Distribution systems for direct food provision (e.g. food grains)	The EU's Public Intervention Scheme, where products are purchased and stored by EU countries governments or their agencies until being sold back onto the market at a later date
Rules on Food Packaging	Rules on food packaging materials and processes, which may involve safety or environmental objectives	The Australian Capital Territory's Container Deposit Scheme, providing refunds on empty beverage containers and supporting recycling
Standards: Safety/Quality/Traceability	The application of safety or quality standards which cover storage and distribution activities (which can be government-led or private sector), and/or tracing of produce through the supply chain	The widespread private food industry use of radio frequency identification (RFID) in cold chain monitoring of food (storage and distribution)
Agricultural Market Intervention (Storage/Infrastructure/Distribution Support)	Supports for infrastructure required for store, transport farming outputs	Brazil's investments in expanded warehouse capacity
Technology/Innovation	The application of technology to distribution and transport, which may target objectives around transparency, sustainability, health	The UK Online Retailer Ocado's use of robot pickers in warehouses

Supply chain activity/segment:

TRADE



This section covers activities around the export and import of foods. Trade-related levers include using import tariffs and composition standards, which can encourage or limit certain foods from entering the country, export-related levers such as framework policies on export, and trade agreements and other arrangements between countries on their approach to trade.

Policy Lever	Details	Example of Implementation
Export Subsidies/ Taxes	Subsidies provided to encourage the export of specified products, or derive revenues from food exports	Argentina's 20% export tax on soya beans
Framework Policy: Export Strategy/ Promotion	Strategies to increase the exports of primary or processed food products. May involve a focus on promotion of a particular food culture, or national 'brand'	Denmark's creation of a gastronomic "brand" to inspire food sustainability and increase exports
Import Tariffs/Duties	Tariffs applied to foods, or removed from foods, which may be used to encourage (healthy foods), or discourage (unhealthy foods) their consumption. Also includes 'trade-defence measures' such as anti-dumping duties (additional duty on goods sold at less than their normal value), 'countervailing duties' (tariffs levied against imports subsidised by the exporting country's government, and 'safeguards' (measures that restrict imports if they cause injury to domestic industry)	Fiji's removal of the excise duty on imported fruits, vegetables and legumes, to encourage consumption
Rules on Import/ Export of Foods	Restrictions, or bans on foods which can be imported into a country, or out of it. May involve composition standards restricting a particular ingredient	Ghana's standards on the permitted level of fats in beef, pork, mutton and poultry in response to rising imports of low-quality meat
Trade Agreements	Agreements to reduce barriers to trade between two or more countries, which can specify particular standards for food, and involve impact assessments (for example on the environmental or health impacts) of the agreement	The US and EU's use of mandatory trade agreement impact assessments, including Environmental Impact Assessments for all new trade agreements, which sometimes also incorporate Health Impact Assessments
Trade Facilitation Arrangements	Arrangements between countries to coordinate on market information and stocks	The Association of Southeast Asian Nations (ASEAN) multilateral coordination through the ASEAN Rice Trade Forum

Supply chain activity/segment:

PROCESSING & MANUFACTURING



This section covers processing and/or manufacturing of food products. In this segment, there is a more noticeable emphasis on levers targeting health objectives, which include rules on food composition and reformulation initiatives around the healthiness of foods being processed, rules on promotion/advertising aimed at reducing promotion of unhealthy produce, fiscal measures such as taxes to discourage the production of unhealthy foods, and food labels providing nutrition information and other guidance to assist consumers. Environmental objectives are less of a focus of processing-related levers, with the exception of certification, which may relate to the sustainability of products and processes.

There are also a set of more generic levers, around collaboration between processing businesses, the use of data, improving skills and knowledge, targets and other commitments, and the application of technology, which are less directly connected to particular food system outcomes such as health.

Policy Lever	Details	Example of Implementation
Agricultural Market Intervention (Abattoirs)	Supports for local abattoirs, including mobile slaughter units (MSUs)	Government support for Mobile Slaughter Units has been provided in several countries, including Sweden, Germany and Canada
Certification of Production Methods/ Products	The certification of particular production methods and products (for example organic, or Fair Trade) (which can be government-led or private sector)	The company Unilever's commitment to using certified fish in its frozen food business
Collaboration	Networks of processors, or processors and multiple other stakeholders from different parts of the food supply chain, to facilitate working together towards a particular objective. The objective may be outcome-based (such as environmental or health), or food product based (for example dairy, or fruit and vegetables). Often Linked to a Framework Policy.	Norway's Partnership for a Healthier Diet facilitates cross-sectoral co-operation between business associations, food retailers and food and drink manufacturers, to reduce consumption of saturated fat, sugar and salt, and increase the intake of fruit and vegetables, fish and whole grains
Data	The collection and application of data on food processing.	The company Nestle's use of Blockchain data to trace milk from farms and producers in New Zealand to Nestlé factories and warehouses in the Middle East
Framework Policy: Processing/ Manufacturing Sector	Policy/Programme/Plan/Strategy targeting processors, or processors and multiple other stakeholders from different parts of the food supply chain, to achieve particular outcomes. The objective may be outcome-based (such as environmental or health), or food product based (for example dairy, or fruit and vegetables). May be government-initiated or private sector-led	The UK Food and Drink Federation (national trade association for manufacturers) 'Ambition 2025: Water' commitment, to improve the use of water across the supply chain and take action to ensure sustainable water management and stewardship

Policy Lever	Details	Example of Implementation
Improving Skills/ Training/Knowledge	Interventions to provide the necessary skills and knowledge required for (sustainable) food production	The UK's National Skills Academy for Food and Drink
Labelling	Labelling of foods for their contents, production methods or potential impacts, which encompass a range of types of label including: labelling of ingredients; 'interpretive front-of-pack-labelling on health; sustainability impact labelling; quality/production labelling	Australia and New Zealand's Healthy Star Rating Scheme, which takes into account four aspects of a food associated with increasing risk for chronic diseases; energy, saturated fat, sodium and total sugars content along with certain 'positive' aspects of a food such as its content of fruit, vegetables, nuts and legumes, and, in some instances, dietary fibre and protein
Rules on Composition/ Reformulation	The specification of limits on, or presence of, particular ingredients in food products, which may be mandated or voluntary. These can encompass ingredient/nutrient levels, removal of ingredients, fortification with particular nutrients. May include the use of reduced portion sizes	Denmark's prohibition on the sale of products containing trans-fats
Rules on Promotion/ Advertising	Restricting the advertising or other promotion, including brand sponsorship, of particular foods, which encompasses: Nutrition and Health Claims; Broadcast Advertising; Other Media Advertising; Sponsorship; and School-specific rules	The EU's rules on the use of specified nutrient content and comparative claims (ie levels of fat for a low-fat claim)
Standards: Safety/ Quality/Traceability	The application of safety or quality standards to processing (which can be government-led or private sector), and/or tracing of produce through the supply chain	The widespread use of the Hazard Analysis and Critical Control Point (HACCP) procures in food businesses
Taxes	Fiscal measures applied to particular ingredients, for example sugar	The UK's Soft Drinks Industry Levy
Technology/ Innovation	The application of technology to processing, which may target objectives around sales, transparency, sustainability, health	The creation of plant-based alternative protein products, by companies such as Beyond Meat, and Mosa Meat

Supply chain activity/segment:

RETAIL



This section covers the sale of foods through shops of all kinds, from large chain supermarkets to corner stores.

As with food processing, there is a notable emphasis on health objectives in the range of retail-related levers, including rules on promotion/advertising aimed at reducing the promotion of unhealthy produce, and food labels, which provide nutrition information and other guidance to assist consumers. Objectives around food insecurity become relevant to some of the retail levers, including initiatives to increase retail sales of healthy foods to food insecure communities, such as through particular incentive schemes, or via government-backed stores in remote locations. Planning rules can also be used to determine whether certain types of stores are permitted in a particular area.

Environmental objectives are less of a focus, again with the exception of certification, which may relate to the sustainability of products and processes.

In the retail segment, collaboration, and targets and other commitments are more likely to be aimed at health or environmental objectives. While the use of data, skills and knowledge training and application of technology examples identified focus more on economic objectives.

Policy Lever	Details	Example of Implementation
Certification of Production Methods/ Products	The certification of particular production methods and products (for example organic, or Fair Trade) (which can be government-led or private sector)	The UK retailer Co-op's commitments to selling Fairtrade-certified products
Collaboration	Labelling of foods for their contents, production methods or potential impacts, which encompass a range of types of label including: labelling of ingredients; 'interpretive front-of-pack-labelling on health; sustainability impact labelling; quality/production labelling	UK retail trade association the British Retail Consortium's climate statement and decarbonisation plan
Data (Collection and Application)	The collection and application of data on food retail supply/purchasing/sales	Kroger, the grocery retail chain's use of predictive analytics to reduce wait time at the cash register
Direct Food Assistance (Retail Support)	Government support for food retailing in remote areas (often with health objectives in mind)	Australia's Outback Stores programme, which manages remote stores on behalf of Indigenous communities in an attempt to address the problems with remote community stores and availability of healthy foods
Finance/Investment/ Insurance (Support for)	Support for financing of or investment in retail outlets (in underserved areas)	New York City's 1,000 licences for Green Carts, issued to street vendors who exclusively sell fresh fruit and vegetables in neighbourhoods with limited access to healthy food

Policy Lever	Details	Example of Implementation
Framework Policy: Retail Sector	Policy/Programme/Plan/Strategy targeting retailers, or retailers and multiple other stakeholders from different parts of the food supply chain, to achieve particular outcomes. The objective may be outcome-based (such as environmental or health), or food product based (for example dairy, or fruit and vegetables). May be government-initiated or private sector-led	The UK's Courtauld Commitment, a voluntary agreement between UK supermarkets and the Waste & Resources Action Programme (WRAP)
Improving Skills/ Training/Knowledge	Interventions to provide the necessary skills and knowledge in food retailing (which may involve health or environmental objectives)	The UK trade association British Retail Consortium's Retail Leadership and Management apprenticeship training
Incentivising Improved Provision	Schemes providing financial and other support to retailers to encourage the provision of healthy foods and discourage the provision of unhealthy foods. May include the use of reduced portion sizes	New York City's Healthy Bodega Initiative, working with corner stores in poor neighbourhoods to encourage the sale and promotion of healthier items
Labelling	Labelling of foods for their contents, production methods or potential impacts, which encompass a range of types of label including: labelling of ingredients; 'interpretive' front-of-pack-labelling on health; sustainability impact labelling; quality/production labelling	UK Supermarket Tesco's use of carbon labelling on its products
Planning	Using planning rules which allow the establishment of particular types of food business	Japan's Large Scale Retail Law, aimed at limiting the spread of large retailers
Rules on Promotion/ Advertising	Restricting the advertising or other promotion, including brand sponsorship, of particular foods, which encompasses: Nutrition and Health Claims; Broadcast Advertising; Other Media Advertising; Sponsorship; and School-specific rules	Various UK retailer's voluntary removal of unhealthy foods at checkouts
Rules/Standards on Provision (Health/ Sustainability)	Rules – which may be public or private sector-led – on the nutritional content (or sustainability impacts) of foods	The USA's Supplemental Nutrition Assistance Programme minimum stocking requirements for retailers participating in its food voucher scheme
Standards: Safety/ Quality/Traceability	The application of safety or quality standards to processing (which can be government-led or private sector), and/or tracing of produce through the supply chain	UK trade association British Retail Consortium's Global Standard for Food Safety standards programme
Technology and Innovation	The application of technology to retailing, which may target objectives around sales, transparency, sustainability, health	Chinese e-commerce company 7Fresh's use of smart carts, which follow shoppers around so they can shop hands-free, and magic mirror technology which displays information about products, such nutritional data and place of origin

Supply chain activity/segment:

FOOD SERVICE



This section covers the sale of foods via caterers of all kinds, including restaurants, institutions such as hospitals and schools.

In this segment there is an emphasis on health objectives in many of the levers applied, in particular those around composition of foods served, incentives on provision, including subsidies of healthier ingredients, labelling, rules on planning and promotion, and the application of standards to particular settings, such as schools and hospitals. Certification may also target environmental objectives, as may procurement initiatives, training/skills/knowledge, and collaboration and targets and other commitments, which may be linked to a framework policy.

Policy Lever	Details	Example of Implementation
Certification of Production Methods/ Products	The certification of particular production methods and products (for example organic, or Fair Trade) (which can be government-led or private sector)	The UK Food for Life voluntary three tier award for schools
Collaboration	Networks of food service operators, or food service and multiple other stakeholders from different parts of the food supply chain, to facilitate working together towards a particular objective. The objective may be outcome-based (such as environmental or health), or food product based (for example dairy, or fruit and vegetables). Often linked to a Framework Policy	The Global Chefs Manifesto Network peer-group education with other chefs via professional bodies
Data	The collection and application of data on food service supply/provision/purchasing/waste.	The Belgian 'Foodwin' programme, based on measuring and reducing food waste in healthcare settings
Framework Policy: Food Service Sector	Policy/Programme/Plan/Strategy targeting food service providers, or food service providers and multiple other stakeholders from different parts of the food supply chain, to achieve particular outcomes. The objective may be outcome-based (such as environmental or health), or food product based (for example dairy, or fruit and vegetables). May be government-initiated or private sector-led	The UK Sustainable Restaurant Association's FoodSave programme, which set targets for restaurant food waste reduction
Framework Policy: Food Culture	Strategy targeting restaurants and other food service providers as a means to improve food culture	Denmark's Gastro 2025 plan to create a gastronomic "brand" to inspire food sustainability and increase exports and economic growth
Improving Skills/ Training/Knowledge	Interventions to provide the necessary skills and knowledge in food service (which may involve health or environmental objectives)	Denmark's bespoke training programmes for staff in public kitchens
Incentivising Improved Provision	Schemes providing financial and other support to food service providers, to encourage the provision of healthy foods and discourage the provision of unhealthy foods. May include the use of reduced portion size.	Singapore's Healthier Dining Initiative (formerly Healthy Hawker Programme), where food operators are encouraged to offer lower calorie meals and use healthier ingredients such as oils with reduced fat content, and/or whole grains

Policy Level	Details	Example of Implementation
Labelling	Labelling of foods for their contents, production methods or potential impacts, which encompass a range of types of label including: menu labelling of calories; labelling of ingredients; 'interpretive front-of-pack-labelling on health; sustainability impact labelling; quality/production labelling	The USA's requirement that all chain restaurants with 20 or more establishments display energy information on menus
Planning	Using planning rules which allow the establishment of particular types of food business to reduce the availability of unhealthy foods, or increase the provision of healthy foods in a particular location	UK Local Authorities' use of supplementary planning documents to restrict the establishment of hot food takeaways
Procurement Rules/ Standards	Rules (which may be mandatory or voluntary) specifying the types of foods which can be procured and served by particular (government-linked) organisations, including: Hospitals; Schools; Workplaces; as well as on the Government Estate. May include particular nutrition or environmental or other standards	Copenhagen's Organic Procurement Programme, which involves almost 90% organic purchasing
Rules on Promotion/ Advertising	Restricting the advertising or other promotion, including brand sponsorship, of particular foods, which encompasses: Nutrition and Health Claims; Broadcast Advertising; Other Media Advertising; Sponsorship; and School-specific rules	Chile's ban on the use of cartoons on food products
Rules on Composition/ Reformulation	The specification of limits on, or presence of, particular ingredients in food products, which may be mandated or voluntary	Argentina's law on mandatory maximum levels of sodium permitted in meat products and their derivatives, breads and farinaceous products, soups, seasoning mixes and tinned foods
Rules/Standards on Provision (Health/ Sustainability)	Rules – which may be public or private sector-led – on the nutritional content (or sustainability impacts) of foods	Mexico's mandatory guidelines for food and beverages in schools, which promote the daily intake in schools of healthy food, such as fruit, vegetables and water; ban sodas; limit the availability of other soft drinks, whole milk, salty and sweet snacks, and desserts
Standards: Safety/ Quality/Traceability	The application of safety or quality standards to processing (which can be government-led or private sector), and/or tracing of produce through the supply chain	The UK's Food Hygiene 'Scores on the Doors' System, to indicate how well-managed food preparation is in food service establishments
Subsidies	Application of fiscal measures to incentivise the use of particular ingredients	Singapore's Healthier Ingredient Subsidy Scheme subsidy of oils with a saturated fat level of 35 per cent or lower
Technology and Innovation	The application of technology to food service, which may target objectives around sales, transparency, sustainability, health	Winnow's food waste technology to automate food waste capture

Supply chain activity/segment:

EATING



This section covers consumer-directed interventions and consumer-led activities (such as community projects).

Many of the levers detailed in the earlier segments also have a direct impact on consumers, and the boundaries are blurred, but the levers categorised under eating are those which are predominantly aimed at changing consumer behaviours directly. They include many different types of policies aimed at supporting consumers to access and eat healthier diets, including community projects teaching about growing and cooking, education initiatives, dietary guidelines, information campaigns, labels. There are also a class of levers which provide direct food assistance, through the provision of food, or cash to buy it, plus food banks, school-related food provision, and subsidies for particular healthy foods. Taxes can also be applied to foods to discourage consumption.

Policy Lever	Details	Example of Implementation
Breastfeeding (Programme/Rules/Campaign)	A policy to support breastfeeding, which may involve physical infrastructure; rules; incentives; public information and other measures.	Cambodia's strategy for increasing rates of exclusive breastfeeding, which included rules on marketing of infant products; public information campaigns; accreditation; support groups; training of media and policy.
Community Projects	Projects originating in, and often provided by – a particular community, which may focus on a range of different activities, including: Meal Sharing; Gardening; Distribution and Utilisation of Food Surplus/Waste; Skills including Cooking	Mexico's Comer en Familia initiative, which encourages families to share meals and the experience of food preparation together
Data	The collection and application of data on consumer eating	The widespread use of QR Codes to provide additional information to people purchasing food
Direct Food Assistance	Provision of food, or the means to buy food, to those that cannot afford it (food insecure). A range of different intervention types exist, including: Cash/Vouchers; Public Distribution Systems; Food Banks; School Breakfast Provision; School Meal Provision; School Milk/F&V Provision; Holiday Hunger (outside of school time) Provision; and Provision to the Elderly or other vulnerable. Direct assistance may also involve providing 'therapeutic feeding', such as maternal supplements; emergency funding for malnourished children; dietary supplements for those with special nutrition requirements (e.g. elderly)	New York's 'Health Bucks to farmers' markets programme
Education	The inclusion of food as part of educational provision, which may involve: Cooking and Growing Activities; Nutrition Advice; Sensory/Taste Education	France's SAPERE method, where children are supported to learn about food colours and textures and provenance

Policy Lever	Details	Example of Implementation
Food-Based Dietary Guidelines	Method of public information, in the form of accessible (science-based) advice on foods to support health. Most commonly focused only on nutrition across whole diets, but may also target specific foods only (for example drinks/water only policies), and may include additional information on sustainability of foods	Brazil's national dietary guidelines, which address healthy eating from a cultural, ethical and environmental perspective
Improving Skills/ Training/Knowledge	Interventions to improve food skills and knowledge (which may involve health or environmental objectives), which may be direct to individuals, or through health professionals	Peru's Community Kitchens (Comedores Populares), which are community-focused and involve cooking programmes to develop food skills and basic nutrition education
Labelling	Labelling of foods for their contents, production methods or potential impacts, which encompass a range of types of label including: labelling of ingredients; 'interpretive' front-of-pack-labelling on health; menu labelling; sustainability impact labelling; quality/production labelling	Chile's requirement that packaged food companies prominently display black warning logos in the shape of a stop sign on items high in sugar, salt, calories, or saturated fat
Public Information/ Campaigns	Provision of information on foods to the public, which encompasses: information on food safety, healthy Foods; on unhealthy foods; on breastfeeding; nutrition advice and counselling, on food sustainability, including food waste. Campaigns may involve messages shared by particular groups, such as chefs, or youths	Peru's Dame Anchoveta (Give me Peruvian Anchovy) campaign to increase awareness of the nutritional benefits of fish (specifically anchovies) compared with other meat
Rules on Promotion/ Advertising	Restricting the advertising or other promotion, including brand sponsorship, of particular foods, which encompasses: Nutrition and Health Claims; Broadcast Advertising; Other Media Advertising; Sponsorship; and School-specific rules	London's ban on junk food advertising across the public transport network removes posters for food and drink high in fat, salt and sugar, to reduce children's exposure to junk food advertising and empower Londoners to make healthier food choices
Subsidies	Fiscal measures which subsidise the cost of particular foods (to support health or environmental objectives)	The USA Special Supplemental Nutrition Program for Women, Infants and Children (WIC) subsidy for healthy food purchases by low income families
Taxes	Fiscal measures which add taxes to particular foods (to support health or environmental objectives)	Chile's sugar-sweetened beverages tax
Technology/ Innovation	The application of technology to consumer eating activities	Columbia's SiembraViva e-commerce platform, which connects rural organic smallholder farmers with growing urban consumer markets

Supply chain activity/segment:

FOOD WASTE



This section covers food waste, activities around which take place throughout the chain (meaning there is some overlap with previous segments, for example the close connection between food waste and packaging covered under 'distribution and transport').

Here, broadly speaking, there are levers – which may be mandatory laws, or voluntary initiatives, or infrastructure solutions – targeting the reduction of food waste, and then another set of initiatives aimed at utilising the food waste that is created, through surplus distribution, and re-valorisation into new products of different kinds. Along with levers with food waste as a primary focus, are many levers listed in other segments – for example agricultural programmes, procurement – which can target food waste as an outcome.

Policy Lever	Details	Example of Implementation
Collaboration	Networks of stakeholders from different parts of the food supply chain, to facilitate working together on food waste objectives. Often utilises target-setting. Often linked to a Framework Policy	The Champions 12.3 '10x20x30' "whole chain" approach to fighting food loss and waste initiative, where 10+ of the world's largest food retailers each engage at least 20 suppliers to halve food loss and waste by 2030
Consumer Behaviour Change Measures	Various measures which target changing consumer behaviour around food waste, including awareness/educational campaigns, digital tools, school programmes and awards	Norway's book titled "Kunsten å ikke kaste mat" (the way not to waste food), a photo collection of 70 different food items close to their expiry date with clear guidance on how to store and reuse them
Data (Collection and Application)	The collection and application of data on food waste	Finland's Food Waste Monitoring and Roadmap Initiative, to improve data collection on food waste along the supply chain
Fiscal Incentives	Financial incentives and disincentives for food waste-related activities (by organisations). May include tax relief for food donation or uptake of technology/innovation, or fees for sending waste to landfill	Croatia's tax incentives, part of its food donation legislation, where ordinance VAT is not imposed when food is being donated to registered charity organisations
Food Waste Infrastructure Solutions	Initiatives to create collective storage facilities, developing food processing technologies and infrastructure, or investing in cold chains	India's support for foreign direct investment in multi-brand retail to facilitate investment in the cold storage market
Food Waste Valorisation Initiatives	The use of by-products from food production, which may to create production inputs (such as fertiliser), new food products, non-food products, or fuel. May also include re-purposing of food with an organisation, for example in-store, through re-processing foods at end of shelf-life	Japan's use of (treated) food waste as animal feed
Framework Policy: Food Waste	Policy/Programme/Plan/Strategy targeting food waste reduction	Australia's National Food Waste Strategy, which provides a framework to support collective action towards halving Australia's food waste by 2030

Policy Lever	Details	Example of Implementation
Improving Skills/ Training/Knowledge	Training of staff on waste reduction	UK company Compass's staff engagement programme, to help chefs and staff understand food waste-reduction program and its associated benefits, using webinars, case studies, and videos
Labelling	Labelling foods to discourage food waste, for example through re-designing best before information	The Danish initiative to add "often good after" to goods labelled "best before" to remind consumers that food may still be edible after that specified date
Rules on Food Waste Reduction	Laws, and other initiatives (including voluntary agreements) aimed at supporting organisations or individuals to reduce food wasted	France's Food Waste Law, banning supermarkets from sending surplus food to landfill and requirement to donate to non-profits
Supply Chain Efficiency Initiatives	Measures including process or product innovation, measuring and monitoring, training, digital tools, certification and awards	French company Sodexo's 'WasteWatch powered by LeanPath (WWxLP)' programme to prevent and reduce food waste, covering tracking, monitoring, reduction actions and communicating success
Surplus Food Redistribution Programmes	Interventions to redirect surplus food which would otherwise be wasted to be utilised, often targeting the food insecure. May involve government support for harvesting, processing/packaging, transportation costs related to food donation. May connect business-to-business; business-to-consumer; consumer-to-consumer	UK FoodCycle's community-led model of diverting surplus food away from landfill to those who need it

Supply chain activity/segment:

RESEARCH



This section covers levers around research on food, which primarily include research collaboration and funding.

Policy Lever	Details	Example of Implementation
Collaboration	Initiatives to support collaboration between researchers working on food systems	The EU Research and Innovation Project Food 2030's focus on key food system outcomes
Funding	Funding for research on food systems. Funding may be from the public sector, or private sector, or a combination of the two (public-private partnerships). Includes research and development on plant and animal breeding, and other types of innovation	Sweden's collaborative funding approach to organic food R&I

Supply chain activity/segment:

MULTIPLE



This section covers levers which tend to apply across multiple segments. The primary focus is governance: the processes and other organisational arrangements around making food systems policies, including who participates.

There are also several levers which are applicable across the supply chain which are (re) listed here, including framework policies – for example on the circular economy or food culture, and (supporting access to) finance and investment, and general laws/regulations – for example on labour, environmental protection, or food safety and authenticity – which have significant impacts on the food system.

Policy Lever	Details	Example of Implementation	
Finance/Investment (targeting food business impacts)	Finance-related measures, such as preferential finance rates, or specialised investment funds directed towards sustainable production behaviours by businesses in the food supply chain	Walmart's Sustainability Index Program with HSBC, where global suppliers get improved financing rates tied to their sustainability performance	
Framework Policies (cross-cutting)	Circular Economy	Policy/Programme/Plan/Strategy targeting a circular economy approach (to food), covering the whole supply chain	Finland's Roadmap to a Circular Economy covers transport, phosphorus, microbiome management and reductions in single-use plastic packaging, enhanced forest management
	Food	Policy/Programme/Plan/Strategy which combines multiple food system objectives, and involves multiple government departments and stakeholders	Scotland's Good Food Nation policy, which sets a vision and coordinates policies on food, and Good Food Nation Bill which will create a statutory framework on food policy
	Food Culture	A Strategy aimed at enhancing and showcasing a country or city's food culture, through use of various interventions including providing advice and training to food producers, and linking producers with consumers, which may specifically be aimed at tourism	The Nordic Region's 'New Nordic Food' movement
	Food Security	Policy/Programme/Plan/Strategy documenting a government's activities around food security objectives	India's National Food Security Act
	Job creation	Programme/Strategy to promote opportunities to work in the food sector	No implemented lever could be identified (post farm-gate, although there are examples of interventions to encourage participation in farming, primarily in developing countries as a method of poverty alleviation)
	Obesity	Policy/Programme/Plan/Strategy targeting obesity reduction	The UK's Childhood Obesity Plan

Policy Lever	Details	Example of Implementation	
Food Governance Arrangements	Bodies	Organisational structures – such as taskforces, units, advisory bodies, independent/arms-length bodies – set up to support working on food systems policies (in a connected way)	Brazil's National Council of Food and Nutrition Security (CONSEA), a body made up of civil society and government representatives, which advises the President's office on matters involving food and nutrition security
	Direct Spending/ Funding	Providing funding for food-related interventions. Encompasses direct government funding of ministries with food-related responsibilities; funding for particular policy initiatives, e.g. around obesity, or for cross-food system activities; funding from private donors (e.g. for development), or direct provision of funds to individuals (social protection measures)	As part of its National Food Policy, Canada launched a five-year, \$50 million Local Food Infrastructure Fund, designed to support community-led projects that improve access to safe, healthy and culturally diverse food
	Leadership/ Political will	Demonstrable support of political leaders on food systems issues/ interventions	The Nordic region's Nordic Council of Ministers' New Nordic Food Programme and Nordic Food Policy Lab
	Monitoring, Mapping, Measurement	Monitoring, mapping and measuring food systems activities and policies (and their impacts). Can include target-setting	China's Ecological and Agricultural Mapping and Red-Lines programme, for the diagnosis of challenges facing food and land use systems and the design of solutions
	Participation	Involvement of outside government stakeholders in the development of food-related policy	France's Estates General of Food, attempt to bring all stakeholders to the table to discuss the future of food in France
	Transparency	Interventions to make the process of policymaking, including the use of evidence, transparent to/accessible for outside stakeholders	The UK Food Standards Agency's open policymaking approach, including public participation in board meetings
General Laws/ Regulations/ Rules which impact the food chain	Animal Welfare	Laws around animal welfare, which may encompass animal welfare practices on farms, in transport, at markets and at slaughter. Linked to the intervention standards, and certification	Austria's Animal Welfare Act, which suggests that the protection of the wellbeing of animals should be held to a value that is equal to humankind
	Consumer Protection	Laws to protect consumers in relation to the supply and household use of goods and services.	The Consumer Protection Acts which exist in many countries, for example India's Consumer Protection Bill.
	Environment	Environmental laws, which may encompass environmental protections related to water, soil, waste, biodiversity, air, and climate	Denmark's Climate Act, which sets a near-term target of reducing Denmark's total greenhouse gas emissions by 70% by 2030

Policy Lever	Details	Example of Implementation	
General Laws/ Regulations/ Rules which impact the food chain	Food Integrity	Laws on food and feed safety, authenticity and hygiene, and encompassing animal and plant health/diseases (prevention and control). Enforced through audits, inspections, sampling, analysis ('official controls') and therefore connected to the lever of 'standards	The EU's General Food Law, which applies to all stages of production, processing and distribution of food and feed
	Labour	Laws, standards, and other initiatives, related to labour, which may include rights and protections, conditions and practices, and minimum wages, and the use of temporary/seasonal labour	The UK's Modern Slavery Act, which places a duty of transparency on major businesses – including many food companies – in relation to the possible existence of slavery in their operations or supply chains
	Trading Practices	Laws, and other initiatives, addressing unfair practices in business-to-business dealings, or business-to-consumer dealings, including as a result of imbalances of power between large and small businesses, or the negative impacts of sectoral consolidation (e.g. competition law)	Finland's Food Market Act, which aims to protect primary producers from unfair business practices
National Security Policy	Plan/Strategy laying out how a government will provide for its own security and that of its population. Often address defence, plus non-military dimensions, which may include food (security)	Food is designated one of the UK's 13 'critical national infrastructure' sectors which must be protected against wide-ranging threats and hazards	
Welfare Payments	Government programs designed to protect citizens from economic risks and insecurities	Recommendation to link welfare payments to (healthy) food costs, are regularly made, though no implemented example could be identified	
Waivers and Exemptions (from policies)	Interventions which remove an existing requirement, for example waiving hygiene rules on small quantities of primary products directly supplied to the consumer or retail establishments, or exempting producer organisations from competition law	Czech Republic's waiver of certain EU hygiene rules for slaughterhouses that handle small quantities of animals	

Further details on the method

Because no source which clearly laid out the range of policy levers which can be applied to food systems could be identified, a new data set was created for the purposes of mapping policy levers for food systems transformation.

While policies are the focus of many major food systems reports to have been published in recent years, and an increasing number of projects are analysing and recommending the application of policy levers to support transformation, no attempt to aggregate these into a simple taxonomy or list could be identified.

There are several databases of policies and classifications, covering particular parts of the food system – either particular food system outcomes (e.g. nutrition); particular activities (e.g. agriculture); or particular geographical contexts (e.g. the EU).

An example is the Nourishing database; a taxonomy of nutrition-focused policy tools, and repository of nutrition-related interventions, maintained by World Cancer Research Fund. The UN Food and Agriculture Organisation manages multiple databases⁷⁵, including a database and classification of food and agriculture policies⁷⁶, which was used to cross-check the classification (see below). A database of EU food systems policies (focused on regulation), was created as part of the FitforFood2030 Project⁷⁷. Inventories of policies on food environments, and policymaking arrangements, are collated under the Informas Food-EPI (environment policy index) initiative⁷⁸.

Alongside these, the literature (grey and academic) on different food policy instruments crosses multiple disciplines, and any lists of possible levers tend to hone in on a particular segment of the supply chain or particular outcome – such as improving dietary health, or environmental instruments targeting carbon.

A new data set was therefore created on which to base the analysis, through an empirically-led 'bottom-up' process, of identifying major reports on food systems – listed in the references – and coding them for any policy levers mentioned (rather than selecting an existing taxonomy of tools and cherry picking examples of their application in food systems). Several of these food systems reports are large-scale research endeavours involving wide-ranging evidence reviews and collaboration by a range of organisations, with contributors from government, the private sector, civil society and academia, across a range of countries and disciplines. Once the major reports were coded, a snowballing approach was taken to identifying and coding additional reports or academic papers cited. This was also supplemented by an extraction of data from the Nourishing database. The categorisation was later cross-checked against the FAO FAPDA database classification, and the FitforFood2030 database, and refined following feedback from reviewers with expertise in food systems and policy.



Additional levers which were not yet in the inventory, but were considered relevant for transforming food systems were added as they were highlighted during the research process.

The inclusion and categorisation of levers is based on the researcher's judgements about where to draw the boundaries on food systems-related policies. This type of judgement is less relevant when the case for inclusion as food systems policy levers is clear, for example, for agriculture policy, and food-related health policy.

Judgement comes into play when broadening out to policies sectors such as environmental policies, where it is not always as easy to draw the line around what is food relevant. There are policy levers applied in other sectors which impact on the food system and could be considered part of the broader transformation toolbox, for example labour rules/rights and social welfare systems. These have the potential to significantly shape the food system – perhaps more than what might traditionally be considered food policies – so a decision was taken to list them as broad categories in the 'Multiple/Cross-cutting' segment of the map but not to go into detail. One additional criteria for inclusion in the inventory was that – where possible – levers highlighted, or recommended in reports, had been implemented (rather than a proposal not yet been put into practice, or only tested through modelling or experiments).

All data was coded according to the following themes:

- **Data Set 1-Inventory of Implemented Policy Lever Examples: Coded Themes**
- **Primary Supply Chain Segment**
- **Source**
- **Source Publication Date**
- **Lever Type**
- **Lever**
- **Country/City**
- **Details**
- **Evidence of Evaluation/Impact (as provided in report)**

For the purposes of mapping out the toolbox in a user-friendly way, the levers were categorised according to the main food system activity (segment of the food supply chain) they target. Where a particular lever can be used to target more than one type of activity it is listed under each segment. Presenting the inventory according to particular (leverage) points in the food supply chain was deemed the most practically useful way – for both researchers and policymakers – of presenting the range of levers which could be applied to transform particular activities. An alternative would have been to focus the categorisation on particular food systems outcomes – such as health, environment, economic – but this was considered to offer less opportunity to transcend existing policy sector-based taxonomies.

Creating the taxonomy

In addition to mapping out the levers across the food chain, a broader taxonomy of types of policy lever was drawn up, by aggregating the entries in the inventory,

and aligning these with established toolbox taxonomies from the political science literature.

Political science literature provides some basic taxonomies of policy tools – the most simple being ‘Carrots, Sticks and Sermons’¹⁷⁹ – roughly translated as regulative instruments, economic instruments, and informational instruments. Probably the most famous is Hood’s NATO typology of the tools governments’ have at their disposal:

Nodality (Information)	Being at the centre of an information network	Advice, training, reporting
Authority (Permission)	Legitimacy/ability to force societal actors	Licenses, regulation, certification
Treasure (Economic)	Economic tools	Grants, loans, taxes, Expenditures
Organisation (Government Processes)	Government’s own capacity and capability	Bureaucratic administration

Source: Author from Hood and Margetts 2007⁸⁰

Such typologies – while not sector specific – are useful for broadly understanding the range of policy levers, though their applicability to food systems policies (which are not necessarily top-down public sector interventions) is not always obvious. There are food-related policy levers which fit uncomfortably within these categorisations, particularly those around ‘softer’ measures such as what might alternatively be labelled as ‘programmes’, ‘initiatives’, ‘strategies’, and policy levers based primarily on the collaboration between multiple stakeholders (which might be labelled as ‘multi-stakeholder partnerships’, or ‘public-private partnerships’).

The ill-fit of such levers is linked to the shift from top-down government to wider network governance, where a range of actors are responsible for applying levers. As Salamon et al (2002 p5) highlight in their book on *Tools of Government: A Guide to the New Governance*:

“newer” tools share a significant common feature: they are highly indirect. They rely heavily on a wide assortment of “third parties” -commercial banks, private hospitals, social service agencies, industrial corporations, universities, day-care centres, other levels of government, financiers, and construction firms, to deliver publicly financed services and pursue publicly authorized purposes. The upshot is an elaborate system of third-party government in which crucial elements of public authority are shared with a host of nongovernmental or other-governmental actors, frequently in complex collaborative systems that sometimes defy comprehension, let alone effective management and control’.

Data on policy interactions

In response to the need to ensure coordination and coherence between levers; alongside the database of levers, a examples of policy interactions between levers cited in original source material (the reports and other identified papers) were noted. An example of an ‘interaction’ might be when the efficacy of an lever is undermined or ‘dampened’ (by other levers or factors), or several levers are interdependent; requiring additional levers or ‘complimentary policies’ or a different

governance approach to improve effectiveness or negate unintended consequences in other parts of the system.

A coding exercise on the wider system impacts of each lever which consisted of:

1. Expanding the focus on 'Primary supply chain segment targeted' to consider an lever's 'Potential impacts on other supply chain segments/activities', and
2. 'Assessing the Primary food system outcome targeted (Health, Environment, Economic, Social)' and extending this to the 'Potential impacts on other food system outcomes' was the obvious next step in analysing the data set, but is beyond the scope of this report (see Opportunities for further research and analysis section).

Limitations of the method

The approach to data collection and analysis was limited by the scale of the task and resources (author time) available to conduct. Further refinement of both the method and data sets would strengthen the robustness of both. There is more work to be done to link the broad taxonomy with the mapping of levers – for example categorising the levers under the nine broad headings, to bring these two elements of the toolbox together. Similarly, there is scope to better link, or harmonise, the levers with the register of interactions and the list of packages.

As noted, the categorisation of levers is based on the researcher's judgements about where to draw the boundaries on food systems-related policies, and other researchers may have drawn the boundaries in a different way. The categorisation is therefore presented as a starting point, and designed to be tested and further developed by other researchers, for example scientists working on food systems in different disciplines. It is possible, for example, that the inclusion of the Nourishing database of over 600 nutrition-related policies, may have skewed the data in the inventory more heavily towards health-related levers, as the identified data sources for agricultural policies – for example the formatting of the FAO's FAPDA database⁸¹, and the OECD's Agricultural Policy Monitoring and Evaluation reports⁸² ≠ meant they could not be as easily merged into the inventory. And no equivalent source for environmental policies related to food could be found, though the OECD's Policy Instruments for the Environment (PINE) database⁸³ was used to identify levers relevant to food systems and cross-check the mapping.

The data set also relies heavily on known and implemented levers which have been cited in reports and papers, which by nature means there may be innovative and successful policy levers which are not in scope. This is also likely to have biased towards government-led interventions, which may be more likely to be documented.

Finally, as discussed under *Opportunities for Further Research and Analysis*, the usefulness of the toolbox could be improved if the current evidence of effectiveness of the different levers could be reviewed and coalesced.

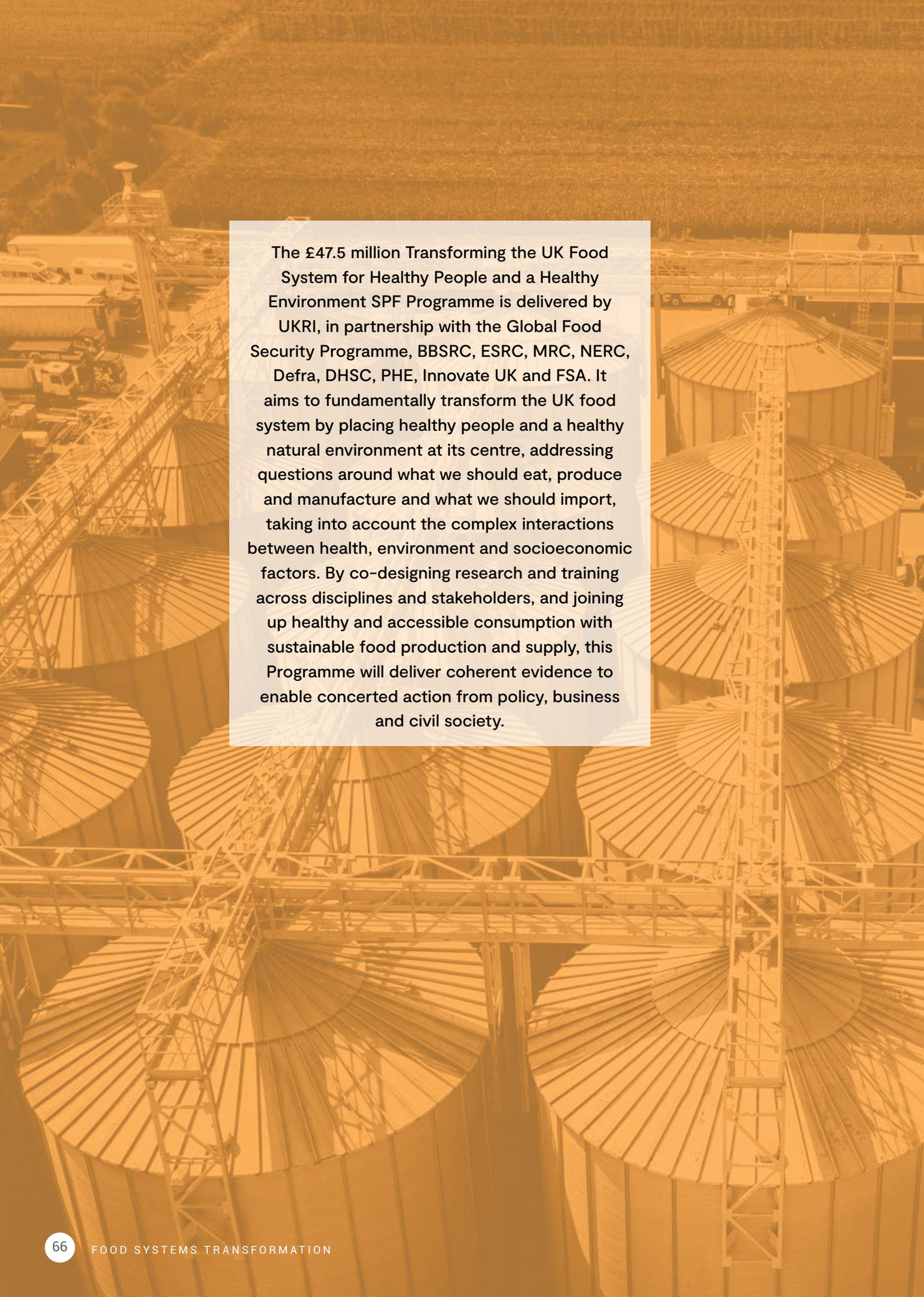
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The £47.5 million Transforming the UK Food System for Healthy People and a Healthy Environment SPF Programme is delivered by UKRI, in partnership with the Global Food Security Programme, BBSRC, ESRC, MRC, NERC, Defra, DHSC, PHE, Innovate UK and FSA. It aims to fundamentally transform the UK food system by placing healthy people and a healthy natural environment at its centre, addressing questions around what we should eat, produce and manufacture and what we should import, taking into account the complex interactions between health, environment and socioeconomic factors. By co-designing research and training across disciplines and stakeholders, and joining up healthy and accessible consumption with sustainable food production and supply, this Programme will deliver coherent evidence to enable concerted action from policy, business and civil society.

Acknowledgements

The authors would like to thank several people who reviewed the report and provided evidence which fed into the mapping, and insights into how to present the findings. These include: Koen Deconnick, Economist/Policy Analyst, and Elena Avery, a consultant, at the Trade and Agriculture Directorate of the Organisation for Economic Co-operation and Development (OECD); Olivia Placzek, a researcher at Bournemouth University, and consultant to the OECD; and Dolly Theis, a researcher at the Centre for Diet and Activity Research at the University of Cambridge.

Citation: Parsons, K., and Barling, D. (2021). *Food Systems Transformation: What is in the Policy Toolbox?* A Report for the UKRI Transforming the UK Food System Programme. Food Systems and Policy Research Group, University of Hertfordshire.

