

Can we agree some fundamentals of food system transformation?



**Final report from the
TUKFS Synergy Project**

Can we agree some fundamentals of food system transformation?

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Executive summary

This report summarises research from a Synergy Fund project that explored how stakeholders of the Transforming UK Food Systems (TUKFS) programme conceptualise food system failure, and whether there is agreement about the fundamentals of failure. Divergent opinions on the nature of food system failures can lead to differing proposed interventions and ultimately manifest as inertia to transformational change. This research considers alternative conceptualisations of failure from across the programme, and investigates whether an economic conceptualisation of market failure captures food system failings adequately. The project has used a mixed methods approach to engage with stakeholders from across the food system including policy, academia and third sector.

We provide an overview of the project activities, including (i) a questionnaire to gather project-level information from across TUKFS about their conceptualisations of food system failure, and (ii) a workshop to engage participants in an activity to understand mappings of market failures and interventions to drive deeper discussions about how we define failure and what is an appropriate intervention. The survey captured diverse conceptualisations of market failure from different projects, while the workshop gave space for discussions that critically examined the appropriateness of the market failure lens.

This report synthesises findings from both to provide a comprehensive perspective on food system failure in TUKFS.

Case studies of specific project conceptualisations revealed varied interpretations; some framed failures in terms of externalities, asymmetric information, or market power, while others questioned whether market failure was always the most relevant framework in light of social justice and equity considerations. Workshop activities encouraged participants to apply the economic (neoclassical) interpretation of market failure to their own projects, fostering dialogue on whether the problem was seen as a classic market failure (e.g., public goods under provision or information asymmetry) or a more systemic governance or equity issue (e.g., political constraints or regulatory failures).

This report makes visible the challenge of defining how, fundamentally, the food system is failing, and shares valuable insights for shaping cross-programme discussion of research and policy on food system transformation. We expect this synthesis to enable more nuanced discussions within the TUKFS programme by providing a common framing and language, ensuring that policy recommendations are informed by both theoretical understanding and practical realities.



Background

Food systems are increasingly required to achieve a socially and politically acceptable balance between productivity, and equitable human, animal and ecosystem health outcomes. There is consensus that they are failing to deliver on these objectives at a right balance, and a recent valuation estimated human and planetary health costs of food systems to be in excess of \$10 trillion per year globally¹. This has provided further evidence backing mounting calls for system transformation focused on both production and consumption, and the roles of private and public institutions that govern our access to food, and stewardship of natural resources on which food depends. However, there are divergent opinions on the nature of food system failures, which leads to differing proposed interventions, and ultimately manifests as inertia to transformational change.

We propose that the established economic framing of market failure is a common basis of

several TUKFS projects. If all markets are perfectly competitive, individuals act rationally, and there are no externalities, the market will allocate resources in a way where no one can be made better off without making someone else worse off (Pareto optimal): this is a perfect competitive equilibrium, but it relies on certain conditions being met (see Table 1). As detailed in Table 1, a perfectly competitive equilibrium can be impeded by an already skewed market, along with imperfect or incomplete market or information, and the presence of public goods, all of which cause the market to 'fail' to be perfectly competitive. These examples of market failure typically result in inefficient outcomes with a misallocation of resources that can make society worse off overall.

Several TUKFS projects share elements of this common problem of market failure either explicitly or implicitly. They may be addressing the consequences of a failure to account for the full cost of food (e.g., the presence of negative

Table 1 A summary of conditions that result in an uncompetitive market equilibrium

Market Characteristic	Description
Already skewed market	Pre-existing distortions such as taxes affect market efficiency.
Imperfect (non-atomic) market	Market power leads to inefficiencies by allowing firms to influence prices and restrict competition (this can be on supply or demand-side, via monopoly or monopsony, respectively).
Incomplete (non-Arrow/Debreu) market	High transaction costs or missing markets prevent efficient allocation. Externalities (both negative and positive), where costs or benefits (respectively) are not reflected in prices, are often linked.
Imperfect information	Individuals lack the necessary data to make fully rational decisions (also leads to incomplete markets). Information asymmetry, where one party has more information than another, often contributes.
Incomplete information	Players lack full knowledge of others' strategies, limiting optimal decision-making (e.g., via coordination failures).
Public goods	Public goods are non-excludable and non-rivalrous, leading to free-riding and under-provision since it is unclear in a private market setting who should buy and sell them.



externalities such as environmental impacts), or power imbalances that affect prices or restrict competition between food system actors. There are options to correct failures via forms of voluntary, mandatory and market-based interventions (including market regulation), but these may be hampered by political constraints. It is currently unclear whether projects share a common view of the problem and whether interventions proposed across the projects can be unified under a common theoretical framework to allow for greater synergy within TUKFS. Agreement on fundamental failures could help the TUKFS programme (and future research programmes and agendas) to develop consistent messages about the potential for system transformation.

Workflow

A description of the project activities and workflow is defined in Table 2. The questionnaire was first circulated on 29th August 2024. The workshop was delivered on 7th January 2025.

This study followed a qualitative mixed methods approach and was carried out between May 2024 and January 2025. It included two phases of data collection:

- Phase 1: A project-level survey about conceptualisation of food system failure
- Phase 2: A workshop to drive deeper discussions about market failure and appropriate interventions

For the survey, we asked for one response per project, challenging respondents with a 14-question survey (Appendix A) that sought to address the following questions: (i) how is the concept of market or system failure conceptualised across TUKFS projects; (ii) what “failures” are projects challenging (locally/nationally/globally)?; (iii) what are the approaches to correction or remediation?; and (iv) to what extent are solutions credible (and harmonised) across TUKFS? The survey was approved by the Human Ethics and Research Committee (Reference: HERC_2024-071, R(D)SVS, University of Edinburgh) and delivered

Table 2 Project workflow

Activity	Description
Kick-off meeting	Discuss project details, aims and planning including timeline
Questionnaire	Gather project-level information from across TUKFS about conceptualisations of food system failure, particularly whether market failure adequately represented failings and interventions covered across TUKFS. We received responses from 9/14 active projects
Workshop	Introductory presentation (Jay Burns) followed by presentations from collaborators (Taro Takahashi & Martin White) about market failure and how it can be used as a conceptual framing in TUKFS. Attendees then engaged in an activity where they used a food system map to identify market failures and interventions, which drove deeper discussions about how we define failure and what is an appropriate intervention. The workshop was delivered during a parallel session of the TUKFS annual meeting in York, with 30 experts from policy, research and 3 rd sector in attendance
Report	Compile final report of project activities, findings and conclusions



in the 3rd quarter of 2024. The response rate was 64% for projects that were ongoing at the time of survey dissemination.

The workshop, included as part of the TUKFS annual meeting in York (6-7th January 2025), was used to further familiarise participants with the market failure concept, including presentations of case studies describing how it can be applied in the context of TUKFS projects (inset, below). Facilitators then encouraged deeper discussion around the market failure concept, with participants tasked to identify and map specific failures being addressed across TUKFS together with interventions that could

correct failures (Appendix B). The workshop was also approved by the Human Ethics and Research Committee (Reference: HERC_2024-173, R(D)SVS, University of Edinburgh). The workshop was delivered under the Chatham House Rule, where the identity and affiliation of attendees was not recorded, and specific comments were not attributed to individuals by note-takers. This encourages openness, honesty and a safe environment in which to share ideas. In total, 32 people attended the workshop (about 16% of attendees to the whole programme meeting), which was run in parallel to several other sessions.



Insights and findings

This section details the diverse understandings of market failure across different projects, as well as the strategies proposed to address these failures through selected case studies and a synthesis of survey responses. We also intertwine a synthesis of the workshop discussion and outcomes (inset, below right). The synthesis of survey responses and of the workshop discussion were both analysed using a directed content analysis that combined deductive and inductive approaches; we began with themes from the economic interpretation of market failure but remained open to discovering new themes in the data. These results provide a comprehensive exploration of how market failure is conceptualised within various TUKFS projects.

In the survey, respondents were asked to describe their project's conceptualisation of food system failure in terms of market failure definitions. One strong theme that emerged was externalities, which are linked to incomplete markets (Table 1) and occur when a transaction impacts third parties not involved in the production/consumption decision, thus leading to over-/under-production (in the case of negative/positive externalities, respectively). Respondents related this theme to environment (e.g., the environmental cost of food production not being reflected in prices) and health domains (e.g., diet-related diseases placing a burden on public healthcare):

“The project is ... set up to address the failure of the market to assess and address the social and environmental consequences of food systems” - SEFC

“The livestock sector is not operating at social optimum, if it were (e.g., by accounting for environmental and health externalities, together with political economic considerations like powerful lobbyists and influence on research and policy agendas) it would be smaller” – TRADE

Box 1 gives a more detailed case study on the TRADE project's work in relation to market failure, particularly externalities. This theme was also represented in workshop discussions where groups identified the need to internalise external social and environmental costs (or at least to make these costs transparent, which relates to the next theme).

Another major failure identified by projects was information asymmetry, which contributes to imperfect information (Table 1) and occurs when one party in a transaction has more or better information leading to suboptimal decisions by another party.



Box 1 **TRADE** case study

TRADE through a market failure lens

The TRADE project's premise is that the UK livestock sector is not operating at a socially optimal level. If externalities—such as environmental and health costs—were fully accounted for, alongside political-economic considerations like the influence of powerful industry actors, the sector would likely be smaller. However, the project also recognises that livestock systems have intrinsic value and are deeply embedded in social, political and economic structures. Market failures within the livestock system manifest in multiple ways. Externalities remain poorly quantified, and the open nature of global trade allows these impacts to be offshored. Information asymmetries exist, as consumers and policymakers lack complete data on the environmental and ethical consequences of livestock production and the potential for technological innovations. Power imbalances further distort the market, with large agribusinesses and retailers exerting significant influence over small producers and shaping research and policy agendas. These failures affect stakeholders at multiple levels: society faces prices and production levels that do not reflect true social costs, while policymakers struggle to justify interventions in the face of industry pressure and voter resistance. The geographic extent of these failures is both national (e.g., health impacts) and global (e.g., greenhouse gas emissions). A key objective of TRADE is to bridge the information gap for policymakers, providing them with robust evidence to design more effective market-based or mandatory interventions.

.Projects described information failures on the consumer-side, who were suggested as failed by a lack of public health messaging in the face of food industry innovation and marketing to distort consumer preferences:

“Consumer preferences appear to be predominantly shaped by the food industry innovation and marketing rather than by the provision of public health information and behavioural interventions” - Realigning UK Food Production and Trade for Transition to Healthy and Sustainable Diets

“We view unhealthy dietary patterns as reflecting prevalent consumer preferences (although they, in turn, may have been shaped by food industry innovation, marketing and lobbying efforts)” – SNEAK

“market participants can't access information required to make informed decisions (e.g., environment). But it isn't just an information deficit that is the problem, consumer preferences are distorted by (e.g.) advertising, leading to overconsumption of livestock products” - TRADE

The SEFC project provides an example of a programme designed to increase awareness of the importance of food issues to parents via innovations in child-care provision:

“Examples include a social enterprise children's nursery that has set up a Nursery Chef programme to train those providing food, and to bring food issues into the heart of the nursery provision. This then opens space for parents to become more aware” - SEFS



The SNEAK project identified imperfect information on the producer-side. SNEAK aimed to address this by providing a modelling service to producers (in this case, using a methodology to quantify the 'distance' between the current and optimal menu of a caterer to one of Bristol University's halls of residence) so that they can make voluntary, costless changes to their offerings that have socially desirable outcomes. Box 2 gives a more detailed case study on this work in relation to market failure. Workshop discussions also focussed on the impact of imperfect information for consumers and producers, for example in the context of ultra-processed foods and lack of information and labelling for consumers.

Another prominent theme was power imbalance, particularly the dominance of large corporations in the food system. Imbalances of market power are a feature of imperfect markets (Table 1) and occur when one party exerts undue influence over another, leading to unfair practices (e.g., restricting competition, collusion, etc.) and price distortion (e.g., by creating artificial scarcity), including in the research domain:

“The livestock research agenda is often defined with input from large food- and agri-food business” - TRADE

This issue is compounded by increasing market concentration in the UK food system². Examples included supermarket tactics to circumvent anti-competitive codes and the dominance of global agri-food corporations:

“Retailers using brokers to impose low prices on suppliers to avoid powers of Groceries Code Adjudicator (GCA) who only has powers for direct suppliers to large retailers” – H3

“Large global corporations dominate the grain supply chain, which can lead to unfavourable prices for small-scale farmers. By fostering a community-based approach and encouraging local sourcing, the YGA helps empower farmers and create fairer market conditions” - FixOurFood

Box 2 SNEAK case study

SNEAK through a market failure lens

SNEAK's premise is that there are currently untapped ways to design daily/weekly/monthly menus at food outlets (without changing recipes) which: (i) do not affect producers' profit; (ii) do not affect consumers' utility; but (iii) improve environmental and health outcomes of society. Theoretically, this means that the current market equilibrium is already located within the core of a private (producers/consumers) economy but is socially suboptimal. Rather than correcting this suboptimality through price interventions, SNEAK's approach is to provide additional information to producers in the hope that they make voluntary changes - as doing so is costless to them (and socially desirable). Broadly speaking, SNEAK could be framed as a project to correct imperfect information that leads to market failures. However, the imperfectness here does not result in either (private) irrationality or power imbalances.



The latter quote (previous page) touches on efforts by FixOurFood to address power imbalance by fostering community-based solutions that prioritise fairer pricing and alternative distribution models. This sentiment is echoed by the SEFS project:

“Social enterprises are shown to address the power disparities and help people access sustainable and healthy food from alternative sources” - SEFS

The Mandala consortia project also identified a failure associated with barriers to entry within a market in one of its projects. The project is seeking to address unsustainable NHS hospital catering, with some evidence of oligopoly supply due to the small number of competitive firms with sufficient scale to deliver on substantial contracts which creates a substantive cost (barrier) to entry to this market. Box 3 gives a more detailed case study on this work in relation to market failure.

Existing market distortions were also identified by several projects (Table 1). The existence of fiscal and regulatory interventions suggests a recognition that markets alone are insufficient to shift production and consumption toward healthy and sustainable food systems. But financial support can lead to anti-competitive outcomes for sustainable alternatives (e.g., subsidies that support conventional farming inputs like synthetic fertiliser and fuel distort competition with regenerative or community-based food systems). The P2P project's response speaks of lobbying government to secure emerging markets in the UK with border adjustment mechanisms, despite this having potential to create global inefficiencies for sustainable food (and to potentially contravene WTO rules on trade):

“We have spoken to DEFRA about taxing rival non-UK produced products to ensure we can establish a UK market for UK grass-based food ingredients” – P2P

Box 3 Mandala case study

Mandala through a market failure lens

This in relation to one Mandala initiative, an intervention in an NHS hospital to make the food offer for patients more sustainable. The food is provided via a contract with a commercial catering company, which has contracts with many institutions in the UK and internationally. In this case, the 'market' can be viewed in two ways: (i) at the level of contracting a caterer to provide hospital food there are many aspects of market failure, including: a small number of competitive players with sufficient scale and economics of scale; homogeneous products; high barriers to entry; power and information asymmetry; and most likely significant transaction costs of changing supplier. This manifests as some companies dominating the market and holding long term (e.g. 25 year) contractual relationships. (ii) At the level of the interaction between the consumer (patient) and supplier (caterer), there is no competition (monopoly supplier), although patients' relatives can bring in food if they wish (although discouraged by the NHS). Patients can choose from a daily menu that has a 3 week rotation - so some choice. They can specify dietary preferences which will be met (e.g. Vegetarian). No money changes hands however and the only power the consumer has is to complain to the NHS trust if they don't like the food. However, patient satisfaction is taken very seriously by the trust and the caterer has to change their offer if it gets poor ratings.



However, food system transformation will require appropriate governance, including reform of harmful subsidies and other price distorting mechanisms, and the promotion of cross-departmental and institutional cooperation:

“We see the transition to healthier and sustainable diets as being aided by fiscal and regulatory measures that may address the market failures ... environmental or health externalities, asymmetrical information, under-provision of public goods etc.” – Realigning UK Food Production and Trade for Transition to Healthy and Sustainable Diets

“Policies often rely on individuals to make behaviour changes rather than adopting a whole systems approach and are consequently ineffective and inequitable ... Wide-reaching food industry-facing policies which structurally alter the food environment and require less cognitive effort on behalf of individuals are therefore recommended” – FIO-Food

A point echoed in a list of failures provided by FixOurFood (together with a lack of effective regulation in school meal provision), was that a reliance on market mechanisms has led to a race to the bottom in food costs, with adverse impacts on quality:

“Failure to develop and implement ambitious and integrated food policy and governance that are coordinated across multiple levels and organisations. Failure to develop more inclusive forms of food policy ... Leaving the monitoring of quality to market forces means there is no robust or consistent process to ensure quality despite the consequences of poor diet on outcomes for children” - FixOurFood

Discussions in the workshop also identified issues with government response to food system challenges. For example, participants argued that despite much research on behavioural interventions to counter increasing obesity, a substantial focus on new pharmaceutical treatments suggests that solutions with business interests are favoured.

Throughout this project, the opportunity for researchers across TUKFS to engage with economic theory, particularly when guided by experts in the workshop, was welcomed as a useful exercise. Although many individuals did not appear to have a strong conceptual framing of food system failure before we challenged them to reflect on it:

“Whereas we did conceptualise Mandala as about addressing system failures that lead to external costs (to health, climate change, society) from the outset, we did not conceptualise this particular intervention as about system or market failure” - Mandala



“It does not use the market failure concept as a whole just the negative outcomes such as poor diets, degrading soils and biodiversity, high GHG emissions and supply chain disruptions” – H3

Some alternative conceptualisation of failure drew on concepts such as system traps, which occur when a system becomes stuck in a self-reinforcing cycle of problems due to feedback loops, policy inertia or incentives that are not aligned with societal goals. Others cited lock-ins that occur when the system becomes structurally dependent a specific model, supply chain or set of technologies, meaning transformation is difficult even if better alternatives exist. Lock-ins can also be driven by sunk costs (and the potential for asset stranding) and poor regulatory frameworks. However, system traps and lock-ins are deeply intertwined with market failures because they describe structural barriers that prevent markets from functioning efficiently for society. In some cases, they map directly onto market failure; for example, if the negative externalities of production lead to lower prices than socially optimal, it can be harder for alternatives (e.g., plant-based proteins) to compete.

In other responses, the problem of food system failure was viewed as a more systemic governance or equity issue that goes beyond the economic interpretation of market failure. These problems related more to equity and social justice issues that are not a priority outcome of a competitive equilibrium. There was also evidence of institutional voids and regulatory failures:

“Obesity prevalence is greater among those on lower incomes and the current UK food system, including government policies, does not effectively address this. Current behavioural approaches ... without the support of structural changes in the system, will widen the inequalities gap and increase obesity and food insecurity stigmas” – FIO-Food

“Lack of capacity and resources amongst local and regional government to build and maintain multi stakeholder coalitions for food systems change” - FixOurFood

“An oligopoly of large food retailers with revolving staff and shared business practices focused on price and little government oversight” – H3

Admittedly, there was some confusion amongst participants in both phases of the workflow around the concept of market failure. Specifically, many used the term to describe markets failing in a general sense—e.g., failing to achieve good health or environmental outcomes— rather than a specific way, such as failing to be perfectly competitive, similar to the poorly defined concept of food system failure. This was reflected in discussions at the workshop:

“Market failure to achieve optimal outcome OR failure of market to do what we want it to do!” – Workshop group 3 post-it note



In this respect, we found a nuanced view of market failure, not always in full agreement with economics textbooks, where the concept is used selectively to describe specific challenges related to environmental and health externalities, market power, information asymmetry and public health messaging but not applied as a blanket explanation for entire projects.

Our findings in context

Private success but excessive power and external costs.

Our food system has been shaped by a history of successful innovation and advancements in production and distribution that have improved overall productivity and caloric availability of food. Economies of scale wielded by national and transnational corporations have allowed many to increase market share and aggregate profitability for their shareholders. On the other hand, scale economies mean that the average consumer has access to an increasingly wide variety of foodstuffs and generally spends a decreasing proportion of their income on food³.

Nonetheless, this largely private corporate success has come at the expense of a considerable level of environmental and social cost. These societal costs can arise when food production and consumption lead to damages that are external to private transactions: costs that are not reflected in prices but are borne by society (a classic example of a negative externality are emissions embedded in foodstuffs and associated with climate breakdown, though positive externalities with public good⁴ properties are also possible).

However, societal costs may be unknown to market participants due to a lack of information about the impact of production and consumption choices, or because preferences and resultant purchasing decisions are distorted by successful advertising (for example, the consumption of energy dense foods that lead to higher rates of non-communicable disease, decreasing quality of life and increasing pressure on health services). In many cases, large food companies have successfully wielded power⁵ to fend off the regulation of activities that lead to societal costs (for example, by embedding themselves in innovation agendas and helping to shape research, policy and governance frameworks). Conversely, the generation of public goods (e.g. biodiversity) that may already have been undermined by the actions and choices of producers and consumers is further complicated by uncertainty around who should pay to improve goods and services that essentially benefit everyone.

System or market correction?

We found a focus on pragmatic or weak sustainability conceptualisations that can be accommodated within neoclassical (or standard) economic theory⁶ drawing on the branches of welfare economics and the theory of the firm. The former tells us that a divergence between private and social costs can imply an external cost borne by wider society. In other words, food producers and consumers may not pay the full (or true) production costs. In theory there are different ways to correct this market failure by internalising these external costs,



many of which are acknowledged by TUKFS projects, including fiscal and regulatory interventions (Table 3 summarises some of the combined interventions to address forms of market failure from across TUKFS). By getting the prices right, societies can get onto a sustainable pathway that is hopefully within any planetary guardrails. Though this does imply a reliance on effective governance of the market, notably that conditions of a well-functioning market are prioritised. Additionally, an efficient market is considered desirable because it allocates resources optimally (i.e. to those who value them most to maximise their returns), but efficiency alone does not guarantee fairness or social justice, which is a substantial concern for the UK food system.

When a government or funder provides public funding to the agri-food sector, it implies that

current market outcomes are problematic, either due to market failures (as discussed) or because even an efficient market does not align with broader societal goals. In the latter case, even if markets were functioning efficiently, the resulting distribution of resources might still be inequitable and hence undesirable. Returning to the concept of a Pareto optimal outcome that was introduced earlier in this report, meaning no one can be made better off without making someone else worse off, could still lead to wealth disparities and food insecurity. In such cases, public funding is not just about correcting inefficiencies but also about ensuring equity, fairness, and social justice and sustaining values such as food sovereignty, security and resilience, and supporting local food systems and small-scale suppliers that are identified throughout TUKFS.

Table 3 Market failures and interventions

Market failures	Intervention type	Example
Power imbalances	Market reform and regulation and deregulation for competition	Competition and Market Authority market investigations
	Nationalisation and or privatisation	
Externalities & public goods	Voluntary	Industry led initiatives on compliance and information provision ⁷ .
	Mandatory	Sector specific regulation and obligatory practical compliance.
	Market-based	Taxes, subsidies and other market-based instruments.
Information asymmetry	Information-based	Labelling/disclosure
Externalities, information asymmetries and power imbalances	Behavioural	Nudges and default choice configurations

In this case, we may think about a strong sustainability⁸ conceptualisation, which does not easily admit the notion of any within-system externality (because the system is closed, so all costs are internal) or its convenient correction (because of the irreversibility of damage). Here, a broadly defined safe operating space is used to set limits on our exploitation of the environment, social values and natural resources⁹. From this perspective, any environmental or societal degradation, stemming from any aspect of our existence including the food system, pushes us closer to these boundaries. Accordingly, societies must reduce and change patterns of consumption and production to avoid boundary transgression (e.g., environmental boundaries linked to emissions or social boundaries linked to equity and access).



The main challenge is then how to manage and ensure fairness in these reductions: who should cut back, where, and when? Of course, such mandates seem unlikely, hence the focus across TUKFS on conceptualisations of failure that align with weak sustainability.

Conclusion

When a government or funder provides public funding to the agri-food sector, it implies that current market outcomes are problematic, either due to market failures or because even an efficient market does not align with broader societal goals. In this research, we found that many TUKFS projects and individuals did not appear to have a strong conceptual framing of food system failure before we challenged them to reflect on it. This may be hampering the ability of projects to situate their own work within a common definition of food system failure, and further to relate to, and collaborate with, other projects who may have ostensibly different interventions but may share common ground in the problem and solution space. A shared understanding of food system failure can foster better opportunities for collaboration, cross-programme understandings of failure, and how to tackle required transformation in a more joined-up way.

Our results illustrate a nuanced view of market failure in TUKFS, where the concept is used selectively to describe specific challenges related to environmental and health externalities, market power, information asymmetry and public health messaging but not applied as a foundational explanation for entire projects. However, we also found some misunderstandings in the interpretation of

market failure and of more general food system failure that may be due to - for example - equity reasons or lacking support for local producers.. This distinction is important in terms of the type of interventions and policies that may be considered, and how to evaluate them.

Across TUKFS, market failure can be used as a key conceptual tool to explain systemic dysfunctions in the food system and thus to structure interventions. Whether through policy advocacy, fiscal measures, or alternative business models, this project has demonstrated market-based and non-market strategies to address (broadly and diversely defined) market failures across TUKFS can be interpreted with a common framing and language to allow greater discussion between projects, including to identify gaps in the coverage for future research agendas.

It is possible to improve cross-programme dialogue with a common framing of the most important problems facing food systems. We found evidence that the market failure lens captures many aspects of a desirable food system (though not without exception). TUKFS or subsequent food system initiatives could improve the synergy of funded projects by requiring that proposals outline the theoretical framing of food system failure with reference, or in counterpoint to established theory. This would lead to more clarity on feasibility (technically, economically, behaviourally, politically) and compatibility of potential interventions to correct dysfunctionalities and foster consistent messaging about the potential for system transformation.



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³Though food insecurity is increasing in the UK: <https://commonslibrary.parliament.uk/who-is-experiencing-food-insecurity-in-the-uk/>

⁴Public goods are non-excludable (and non-rivalrous), which often means that they are undersupplied because, i.e., producers cannot capture much of the benefit.

⁵Clapp, J. The problem with growing corporate concentration and power in the global food system. *Nat Food* 2, 404–408 (2021). <https://doi.org/10.1038/s43016-021-00297-7>

⁶Largely formulated prior to any notion of a binding planetary boundary.

⁷Though voluntary interventions have historically failed due to poor alignment between commercial and other goals, see White, M., Aguirre, E., Finegood, D.T., Holmes, C., Sacks, G. and Smith, R., 2020. What role should the commercial food system play in promoting health through better diet?. *bmj*, 368. DOI: <https://doi.org/10.1136/bmj.m545>

⁸Conceptualisation of strong and weak sustainability turns both on the presence of a planetary boundary and on competing views of capital substitutability. For the latter see for example Pearce, D. W., & Atkinson, G. D. (1993). Capital Theory and the Measurement of Sustainable Development: An Indicator of “Weak” Sustainability. *Ecological Economics*, 8, 103-108. [http://dx.doi.org/10.1016/0921-8009\(93\)90039-9](http://dx.doi.org/10.1016/0921-8009(93)90039-9)

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Appendix A Questionnaire

Research objective	#	Question
How is the concept of market or system failure conceptualised across TUKFS projects?	1	Does your project use the concept of market failure to conceptualise food system failures? If so, please give more detail about your project's conceptualisation. If not, please describe what other theory your project draws on?
Unless otherwise stated, please answer the following questions according to your definition of failure, which may be market failure or some other conceptualisation given in Q1.		
What "failures" are projects challenging (locally/nationally/globally)?	2	What failure(s) can be identified that are addressed by your project and how does the failure manifest? Please refer to definitions in Annex Tables 1.
	3	If you have used an alternative conceptualisation of failure to market failure, can you also identify any market failures addressed by your project and how they manifest, referring to the definitions in Annex Tables 1.
	4	Please describe the stakeholders who are impacted by the failure (directly & indirectly) including the geographic extent (local, national, global).
	5	What has your project found out about the balance of power and influence among different actors within the food system relevant to your project? Please indicate if this is anecdotal or formally assessed.
What are the approaches to correction or remediation?	6	Related to your project, what are the current market conditions that are not adequately addressing the needs or preferences of stakeholders within the food system? Please refer to definitions in Annex Tables 2.
	7	Are these conditions currently monitored? If not, how can they be monitored? In either case, please describe.
	8	Briefly describe your project's proposed intervention(s) (this doesn't have to be explicit in your project proposal, it also may have evolved as your project has progressed). Please refer to definitions in Annex Table 3, if relevant.
	9	In what ways will your project address or adapt the market conditions outlined in Q6 & Q7 to achieve its intended outcomes?
To what extent are solutions credible (and harmonised) across TUKFS	10	How might the successful mitigation of failures identified by your project (in Q2) contribute to a better food system?
	11	If your project's proposed intervention(s) is implemented, can you think through any consequences – positive and negative? Including how implementation might affect the food system more broadly, for example, through cascading impacts. Please describe.
	12	What challenges, barriers and lock-ins do you anticipate in implementing your project's interventions, and how could they be overcome?
	13	From your experience with the TUKFS programme so far, what intervention(s) of other projects may offer synergistic opportunities with your project. Please describe.
	14	From your experience with the TUKFS programme so far, what intervention(s) of other projects may trade off with your project. Please describe.



Appendix B Workshop activity sheet

Can we agree some fundamentals of food system transformation?

Several TUKFS projects share elements of a common problem related to a **failure to account for the full cost of food** (e.g., environmental impacts), or **power imbalances between food system actors**. There are options to **correct failures** via forms of **voluntary, mandatory and market-based interventions** but it is currently unclear whether projects share a common view of this problem and whether interventions proposed across the projects are compatible. **Agreement on fundamental failures, feasible interventions and trade-offs could help the TUKFS programme to develop consistent messages about the potential for system transformation.**

- Using your own project as a starting point, locate areas of the food system where your project is active and, **using the market failure concept, identify and map specific failures being addressed.**
- **Identify other failures in the system** not covered by your project or the projects of other participants.
- Using a different colour sticky note, **map interventions that could correct the identified failures** (some interventions may be relevant to many projects).

