TITAN

Transparency solutions for transforming the food system

Deliverable 7.3 – Challenges for policymakers in enabling transparency for sustainable, healthy and safe food systems

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Executive Summary

This Deliverable reports on the findings of Task 7.3 (*Identification of challenges faced by policymakers*), which involved working with members of the policy community and wider policy networks to understand the challenges for public policy in enabling and promoting greater transparency in the food system. The research sought to understand how members of the policy community and wider policy networks:

1. envision and define food system transparency;
2. perceive the potential benefits and beneficiaries of enhanced food system transparency;
3. perceive the obstacles hindering greater food system transparency and strategies to overcome them;
4. view the opportunities and obstacles presented by digital transparency in the food system; and
5. view the role that public policy can play in promoting and enabling (digital) food system transparency.

The report is written in the context of a constantly shifting policy landscape. The research is driven by the European Green Deal and, particularly, by the EU's *Farm to Fork Strategy*, both of which established a trajectory towards systemic thinking – a holistic approach to the food system encompassing diverse sectors, actors and issues (e.g. health, food safety and environmental sustainability) – and a shift away from more linear and siloed approaches to food governance. More recent developments in the EU, such as the Omnibus Package and *Vision for Agriculture and Food* imply a shift away from the explicitly systemic approach and raise questions about the changing nature of transparency requirements.

The Deliverable reports on research that involved semi-structured interviews with policymakers and organisations that aim to influence policy, a focus group encompassing different levels of government in the EU, and an online survey covering similar groups.

The key findings are:

1. **Defining Transparent Food Systems:** Participants generally equated transparency with the availability and accessibility of accurate information. Key requirements included sharing verifiable data and effective communication. Participants questioned the amount of data that should be shared; perspectives ranged from full disclosure to targeted communication.
2. **Perceived Benefits of Transparency:** Most participants highlighted benefits for consumers, enabling informed decisions and driving change in consumption patterns. Other benefits included enhanced accountability and empowerment, while some participants emphasised the potential for benefits across the food system that go beyond specific supply chain stages.
3. **Obstacles to Greater Transparency:** Key obstacles included concerns about data confidentiality, a lack of standardisation in data collection, and the potential costs associated with implementing transparency measures.
4. **Digitalisation towards Transparency:** Digital technologies were seen as offering significant opportunities for improving transparency, particularly in relation to data exchange and processing. However, obstacles included cost, data security, and a lack of digital skills.
5. **Public Policy and Promotion of Transparency:** Participants emphasised the crucial role of policy in setting direction, promoting a systems approach, and establishing an enabling environment for collaboration and data-sharing. The continuing importance of addressing policy fragmentation was highlighted.

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1. Introduction

The European Green Deal is the central strategy of the European Union (EU) to transform European society with a modern, resource-efficient and competitive economy, while addressing climate and environmental challenges. The *Farm to Fork Strategy* follows the path traced by the European Green Deal, while responding to increased public awareness and the growing demand for a food system capable of providing healthy, sustainable and affordable food. All players in the food value chain are called upon to contribute to this goal thanks to recent technologies and recent discoveries in the sector. *Farm to Fork* aims at setting a global standard that can overturn the current paradigm consisting of air, water and soil pollution, loss of biodiversity, climate change and excessive consumption of natural resources.

For such a food system to flourish, consumers must have better access to healthy, sustainable and affordable food, with clear information about the integrity and true value of a food product. Enhancing transparency is an essential element in achieving this goal.

TITAN intends to leverage transparency and digital innovations in the food sector to pursue this paradigm shift: transforming the food system into a demand-driven economy that provides consumers with healthy and sustainable food. To achieve this goal, TITAN will provide a broad platform for the development of pre-identified technologies and pilots that will be selected during the project through an open call for proposals, also by facilitating the involvement of primary and secondary stakeholders in this process, analysing current policy to set up a set of recommendations and finally setting up an inventory to identify current digital innovations and future challenges.

Work Package 7 (WP7) - *Enabling policy solutions for transparent food supply chains* – examines how a more transparent food system may be enabled through policy solutions, while also considering how the emergence of new technologies might require new forms of policymaking. The work package aims to understand how the impact of policy tools and their implementation of transparency solutions may be felt differently at different points in the food system, and to promote approaches that ensure transparency will have a positive impact at each point.

1.1 Research objectives and approach

This Deliverable reports on the findings of Task 7.3 (*Identification of challenges faced by policymakers*), which involved working with members of the policy community and wider policy networks to understand the challenges for public policy in enabling and promoting greater transparency in the food system. Specifically, the research addressed the following questions:

1) How is food system transparency envisioned and defined by members of the policy community, and by wider policy networks?
2) What do members of the policy community and wider policy networks perceive to be the benefits of food system transparency, and who are perceived as the beneficiaries?
3) From the perspective of policy community members and wider policy networks, what are the primary obstacles hindering greater food system transparency, and what strategies can be employed to overcome them?
4) From the perspective of policy community members and wider policy networks, what opportunities does digital transparency offer in the food system, and what obstacles do they perceive?
5) What role can public policy play in the promotion and enablement of (digital) food system transparency?

The Task involved conducting in-depth semi-structured interviews with policymakers, and with organisations aiming to influence policy, along with a focus group that drew together different levels of government in the EU. These were accompanied by an online survey that gathered perspectives from a range of policymakers and stakeholders on the challenges posed, and opportunities presented, by transparency objectives in policy.

While the Task focused broadly on 'policymakers,' this is an ambiguous term, encompassing regulators, elected and unelected officials, different levels of government, and those who set, implement or enforce various forms of policy. Brown (2003) argues that it might be better to understand policymakers as focused on macro-level decisions, while regulators handle micro-level policy implementation and nuanced decisions. Besley and Coate (2003) similarly argue in relation to public policy that policymakers, often elected officials, set broad policy directions, while regulators, who may be appointed or elected, implement and enforce specific rules. This Deliverable focuses on public policy, but it should be noted that private policy, including standard-setting and monitoring, is increasingly important, ranging from the standards set by independent certification bodies (e.g. for organic food) to those of supply chain actors such as retailers (Lang and Heasman, 2015) and more broadly through, for instance, accounting standards (Mattli and Büthe, 2005).

In aiming to understand the challenges faced by policymakers around enabling and promoting more transparency in the food system, Task 7.3 incorporated the perspectives of those involved in the production of public policy, those involved in its implementation and enforcement, and those from wider networks who seek to influence the direction and nature of policy. This approach is grounded in the related concepts of **policy communities** and **policy networks**. These concepts have often been used in analysing the relationships between state and non-state actors in the policy process (Skogstad, 2007). Policy communities can be understood as stable, closed networks with limited membership, while policy networks are broader, more open structures (Jordan, 1990) – clusters of interdependent actors involved in public policymaking (Schneider, 1992).

1.2 How to read this document

This document should be read in conjunction with Deliverable 7.1 (Bear et al., 2023), which examined the interpretation and employment of the notion of 'transparency' in existing policy. It also provided a preliminary analysis of perspectives on transparency from food system actors, focusing in particular on the views and experiences of technology developers/providers associated with TITAN pilot projects. This document also provides a policy and regulatory context for the work conducted by WPs 2-6.

Following this introduction, the report provides an overview of recent policy that impacts on the nature, extent and role of food system transparency (Section 2), prior to a discussion of academic research on the role of policy in engendering such transparency (Section 3). The research methodology is outlined in Section 4, followed by an in-depth analysis and discussion of the interview and survey findings (Section 5). Section 6 summarises the key findings and includes a set of recommendations to inform future policy development.

2. Policy context

This section provides an overview of key policy developments in the EU with implications for food system transparency in relation to sustainability, health, nutrition and food safety. Its purpose is to provide a policy context for subsequent sections. Focusing on developments during 2024 and 2025, it should be read alongside Deliverable 7.1 (Bear et al., 2023), which provided an overview of earlier policy and provided an in-depth examination of its definition of, and vision for, transparency. The overview begins with the original policy drivers for the TITAN project: the **European Green Deal** and the associated ***Farm to Fork Strategy***. It explores related policies before outlining recent debate generated around future food-related policy by the post-Draghi Report focus on competitiveness and reduced regulatory burden (Draghi, 2024), as embodied in the **Omnibus Package** and ***Vision for Agriculture and Food***. It argues that these more recent developments represent a significant shift from the trajectory towards systemic thinking embodied in the *Farm to Fork Strategy* and hold important implications for the nature and role of transparency.

2.1 Towards systemic transparency: the European Green Deal

The *Farm to Fork Strategy* (European Commission, 2020b) was launched in 2020 and sets out a route towards a food system that is 'fair, healthy and environmentally-friendly' (European Commission, 2020b). It is a key action of the **European Green Deal**, a package of measures intended to enable the EU to achieve net zero by 2050 (European Commission, no date-b). The *Strategy* is especially notable for its promotion of a systemic approach, moving beyond a linear perspective on producer-consumer relationships to integrate a greater variety of actors from beyond the food supply chain and encouraging the movement away from a siloed approach (for instance, integrating concerns around competitiveness, health and sustainability).

The types of move embodied in the *Farm to Fork Strategy* are emblematic of a wider shift in food governance towards a **systems perspective**. Describing food and its production as a "system" has been prevalent in food policy literature since the 1970s, denoting the complexities involved in producing food (Holling, 2001; Folke et al, 2003; Ericksen, 2008; Gallie et al, 2020). A systemic approach rejects 'a reductionist and linear cause-and-effect modus operandi,' associated with a focus on supply value chains, and turns focus towards the 'effects of interactions throughout the food system' (Eliasson et al., 2022: 2411). By emphasising the complex interactions between production, processing, distribution and consumption, combined with their socio-economic and environmental impacts (van Berkum et al., 2018), it has been argued that the food systems approach offers a more holistic and interconnected perspective than alternative linear approaches (Ruben et al., 2018, Jackson, 2022). The FAO (2018) defines a food system as 'the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.' This definition emphasises the interlinkages between the food system and other systems, such as the energy or health system.

A key enabler of the *Strategy's* objectives is the better availability and use of data about the food system, allowing improved monitoring of performance against criteria, assessment against legally binding targets, enhancing the management of food fraud and providing clearer information to consumers. The Strategy promotes digital technologies as a means to 'empower consumers' (European Commission, 2020b: 14). It proposes a combination of legislative and 'non-legislative initiatives to improve transparency' (p.21). Further information on the *Farm to Fork Strategy* and related policy initiatives is provided in Deliverable 7.1 (Bear et al., 2023); that information is not

repeated here, but the remainder of this section provides updates on key Green Deal and *Farm to Fork* developments that have taken place since that last review.

One of the central proposed actions for the *Farm to Fork Strategy* was a legislative framework for **sustainable food systems**. The European Commission formally announced its intention to take this forward in its Work Programme for 2023, aiming to 'set up a comprehensive framework for sustainable food systems in the EU, to make sustainability central to all food-related policies' (European Commission, 2022a: 5). The Commission describes this proposal as 'one of the flagship initiatives of the *Farm to Fork Strategy*' (European Commission, no date-f). It aims to promote 'policy coherence at EU level and national level, mainstream sustainability in all food-related policies and strengthen the resilience of food systems' (ibid.). However, the proposal has yet to be taken forward and has been sidelined in the more recent *Vision for Agriculture and Food* (European Commission, 2025d) (which is discussed in detail later in this section).

The failure of the sustainable food systems legislation to move forward has also hindered the progress of associated proposals for a **Sustainability Labelling Framework**. This specifically aims to 'empower consumers to make informed and sustainable food choices' and covered 'the provision of consumer information relating to the nutritional, climate, environmental and social aspects of food products' (European Commission, no date-d). The Commissioner-designate for Agriculture stated in November 2024 that 'We have so many voluntary labels that are not harmonised. So I think we have to make a more streamlining exercise of what is out there and to see a little bit that we have more coherence' (Committee on Agriculture and Rural Development, 2024). However, no further announcements have been made about its potential future progress, and the more recent *Vision for Agriculture and Food* makes only brief reference to labelling.

Greater advances have been made in other areas associated with the Green Deal. The **Corporate Sustainability Due Diligence Directive** (CSDDD) came into force in July 2024. It aims to ensure that companies within the food industry embody responsible behaviour to conduct due diligence and report anomalies within the supply chain. It places significant emphasis on sustainability for transitioning into a just economy through corporate behaviour such as green procurement, decarbonisation strategies and reducing carbon emissions within the entire food supply chain of companies, both within and outside Europe. Another aspect of the Directive is to ensure human rights are not violated in the production and manufacturing of goods and services. The Directive's implementation has not been without controversy and debate. For example, concerns have been raised about the potential of the legislation to reduce the competitive edge of European companies, particularly through the complexity of operationalising and reporting the impact of their operations not only in Europe but internationally. The Directive also places emphasis on the financial sector and on responsible investment by companies, not only in terms of reducing carbon emissions but also ensuring that their business partners are not engaging in activities that contravene the Directive. In many instances, this has caused reluctance amongst companies to report shortcomings as it carries reputational risk. Finally, concerns have been raised about the approach to implementation by Member States, which could vary and, therefore, not lead to the intended harmonisation (Zerk, 2024).

The Green Deal has also led to an increased focus on food security as a priority area. Beyond the initiatives already discussed, this is especially prominent in the communication on **Safeguarding food security and reinforcing the resilience of food systems** (European Commission, 2022b). This was produced in response to the impact of the invasion of Ukraine on agricultural markets but emphasises the importance of addressing the impacts 'in ways that enhance the transition towards sustainable, resilient and fair food systems in the EU and globally' (p.2). The **EU Biodiversity Strategy** (European Commission, 2020a) similarly emphasises the connection between biodiversity and food security,

noting the role of biodiversity in enabling a supply of 'safe, sustainable, nutritious and affordable food' (p. 7). According to the EC's *Biodiversity Strategy Actions Tracker*, 50 of the Strategy's 104 actions have been completed, with another 44 in progress and 10 delayed (European Commission, 2025a).

One of the most controversial pieces of legislation to emerge from the Green Deal is the **Deforestation (EUDR) Regulation** (EU) 2023/1115. This aims to enhance traceability of supply chains involving products that are commonly associated with deforestation, including cattle, wood, cocoa, soy, palm oil, coffee, rubber, and their derived products, such as leather, chocolate, tyres, or furniture. Businesses that produce these commodities are required to evidence that they have not been grown or produced on deforested lands or contributed to deforestation in any form (European Commission, no date-g).

As countries outside the EU have different national legislations that may not be aligned to the EU regulations, this can potentially create significant challenges for companies (and SMEs specifically) in terms of implementing these regulations, as well as reporting accurately on sustainability and the working conditions of employees. This can create further complexities within the wider food system, leading to further delays in adopting best practices by the companies. The consequence of this has often involved under-reporting or non-transparent and inaccurate reporting of performance metrics by companies within the value-chain. To address these issues, EUDR further requires companies within Member States to incorporate traceability requirements (including geo-locations for the specific places where production took place) and to conduct due diligence to demonstrate conclusively that products are deforestation-free (European Commission, no date-g).

Although the Regulation was published in the EU's Official Journal in June 2024, concerns raised by large companies and key trading partners led to the postponement by one year of the Regulation's application date (now December 2025 for large companies and June 2026 for small and micro enterprises) (Council of the European Union, 2024b). The rationale for this delay is that it will allow all parties to transition to greener supply chains and develop the necessary processes required to implement the Regulation successfully (Catanoso, 2024). The delay has caused environmental advocacy groups and civil society organisations to protest, arguing that the delay in rolling out the regulation will offer an opportunity to industry and exporter nations to lobby for its further amendment and a weakening of its requirements (Catanoso, 2024).

A final key regulatory development in the past year that affects transparency requirements is the **Breakfast Directive** (Directive (EU) 2024/1438) which entered into force in June 2024. This amended four earlier Directives covering honey, fruit juices, jams and dehydrated preserved milk. The revisions affecting honey are of particular significance to TITAN because of new requirements introduced around origin labelling and associated 'harmonised methods of analysis to detect honey adulteration with sugar, a uniform methodology to trace the origin of honey and criteria to ascertain that honey is not overheated when sold to the final consumer' (European Commission, 2024a).

While progress in *Farm to Fork Strategy* priority areas has been variable, the *Strategy* has nonetheless successfully promoted data-sharing initiatives, notably for performance monitoring and benchmarking across the food system. This can be seen in three specific innovations launched during 2024. First, the **EU Agri-Food Chain Observatory** (established in July 2024) aims to:

> 'exchange information and discuss, based on available evidence and facts, on the structure of costs, margins and the distribution of added value in the supply chain. The Observatory's aim is to build trust between stakeholders and with public authorities, in particular the Commission' (European Commission, 2024c).

It is intended that the Observatory will contribute towards fairness in pricing and promote the long-term competitiveness of SMEs within the food and drinks sector (European Commission, 2025d).

Second, the **Farm Sustainability Data Network (FSDN)** was set up to collect farm-level data, with farmers participating on a voluntary basis. Building on approaches established through its previous incarnation as the Farm Accountancy Data Network, FSDN is being implemented through Regulation (EU) 2024/2746. Variables on which data will be collected include 'information on their environmental and social sustainability performance' in order to support 'sustainability analysis at both national and EU levels, helping policymakers take informed decisions for the Common Agricultural Policy (CAP) and more broadly for the policies affecting the agricultural sector' (European Commission, 2024d).

Finally, the **EU Food System Monitoring Dashboard** was launched in November 2024. Through monitoring progress against a range of indicators, this aims to 'guide policy choices on aspects related to sustainable food systems' (Tóth et al., 2024: 9). The platform covers the key areas of sustainability referred to in the *Farm to Fork Strategy* but also extends beyond this. The Food System Monitoring Dashboard has informed recent assessment of progress against *Farm to Fork Strategy* targets. Assessing seven quantitative targets, two of these were identified as 'on track,' with the remaining five classified as 'acceleration needed' (European Commission: Joint Research Centre, 2025: 94). It identified 'lack of transparency' as an influence on consumer behaviour that 'complicate[s] efforts towards a more sustainable food system' (ibid.).

Informing many of the above developments is **Food 2030**, a 'research and innovation policy framework supporting the transition towards sustainable, healthy and inclusive food systems, that respect planetary boundaries' (European Commission, no date-c). Food 2030 promotes research that supports a systemic approach to transforming food systems. It works from the premise that research and innovation policy is fundamental to achieving this transformation.

2.2 Beyond the Green Deal? The *Vision for Agriculture and Food* and Omnibus Directives

Beyond the limited achievements against the ambition of the *Farm to Fork Strategy*, its objectives of achieving systemic thinking and food system transparency have been subject to significant challenges in early 2025. This section focuses on two related developments that represent a shift away from systems thinking and dilute requirements for environmental reporting in relation to food production, manufacturing and retail: 1) the publication of the **Vision for Agriculture and Food** (European Commission, 2025d); and 2) the proposal for new **Omnibus Directives** (Procedures 2025/0044/COD and 2025/0045/COD; see European Commission (2025c)).

The **Omnibus Directives** are part of the Better Regulation initiative that aims to ensure that laws are evidence-based, that there is transparency in decision-making and that the 'regulatory environment is simple, effective, efficient, coherent and correctly implemented' (European Commission, no date-a). Streamlining CSDDD, the Corporate Sustainability Reporting Directive (CSRD; (EU) 2022/2464) and the EU Taxonomy Regulation ((EU) 2020/852)[1] is intended to reduce the compliance burden of companies within the EU, while simultaneously increasing the competitive edge of the EU economy

[1] The **EU Taxonomy Regulation** 2020/852/EU is a classification system designed to 'direct investments to activities most needed for the transition to net zero and environmental sustainability' (European Commission, 2024b).

through streamlining its regulatory requirements. However, the Omnibus proposals are controversial and are the focus of considerable debate.

Central to this debate is the potential of the Omnibus Directives to undermine existing EU law, such as CSRD and CSDDD. Since both of those Directives focus on sustainability and accountability by large businesses, regulatory streamlining would result in such companies disclosing less information. The move is in line with the Budapest Declaration, which stated an objective to reduce 'reporting requirements by at least 25% in the first half of 2025' (Council of the European Union, 2024a: 2), citing 'new geopolitical realities, and economic and demographic challenges' as the driver. The proposed impact on the CSRD is that:

> 'The number of undertakings subject to mandatory sustainability reporting requirements would be reduced by about 80%, taking out of scope large undertakings with up to 1000 employees […] and listed SMEs' (European Commission, 2025b: 2).

Such changes have been subject to significant scrutiny, debate and critique. Some, for instance, have questioned the extent to which the proposals have followed the Better Regulation principles, with one MEP arguing that 'there was no public consultation on it' and that participants in early talks were 'mainly representatives of large companies…while the voices of civil society, trade unions and responsible companies virtually went unheard' (Andersson, 2025) Some have viewed the proposals positively. For instance, the Danish Government welcomed 'simplification for…businesses' and the opportunity to 'promote alignment around the most important, standardized sustainability metrics' (Danish Government, 2025: 1). The German Government had similarly argued that 'current sustainability reporting requirements are overly extensive' and that a reduction was needed 'to allow businesses to make the best use of their resources for the benefit of sustainable growth and innovation in the EU' (Wissing et al., 2024). In contrast, the Spanish Government warned of the risks of 'sending a dangerous signal of backtracking on our core European values and ambition,' arguing that the removal of 'certain existing obligations would not necessarily improve our competitiveness' (Muñoz and Caballero, 2025). The Strategic Public Policy Lead at the World Benchmarking Alliance, meanwhile, argued that the Omnibus proposals leave the CSDDD 'toothless' through reducing potential for enforcement (Gardiner, 2025). The argument for increasing competitiveness through reduced reporting burdens has also been questioned (e.g. Rasche, 2025). The Danish Government's proposals argue that such burdens can be reduced through a focus on automation of sustainability reporting, though such an argument downplays the potential costs associated with the digital transition.

Alongside the Omnibus proposals, the **Vision for Agriculture and Food** (European Commission, 2025d) (published in February 2025) adopts a similar focus on the competitiveness and resilience of the EU agri-food sector. Establishing a 'vision for Europe's agri-food system for 2040 and beyond' (p. 3), It represents a significant shift away from the *Farm to Fork Strategy* and makes no reference to the Green Deal. The focus of the new *Vision* is on the farming sector through greater support and reduced regulatory burden. The latter mirrors the Danish Government's proposals for the extension of the Omnibus package, arguing for the 'positive prospects for simplification' that 'new technologies' offer – for instance through using satellite technology to 'help reduce on-the-spot controls and reduce reporting obligations' (European Commission, 2025d: 16).

Despite the acknowledgement of reporting requirements, these are generally framed negatively in the *Vision* – as something to be overcome or reduced. As a result, its ambition is a '"collect once, use multiple times" principle' (European Commission, 2025d: 24). However, this principle is not accompanied by a vision for the purpose of reporting (apart from the example of voluntary farm-level

sustainability benchmarking). Relatedly, the *Vision* only mentions the term *transparency* six times: twice in relation to the EU Agrifood Chain Observatory; three times in relation to a new generational renewal strategy; and once in relation to the preparedness and risk-proofing of the agri-food sector – i.e., only in the context of prices and margins within the food supply chain.

Further, there is virtually no reference to a systems approach within the *Vision*. 'Food systems' are referred to several times, but in a generic sense that does not imply a holistic approach. The most explicit engagement with systemic thinking is through its proposal for a new **Food Dialogue**, which would involve actors such as 'consumers, primary producers, industry, retailers, public authorities and civil society' (European Commission, 2025d: 22-23). Despite the range of actors it proposes to involve in this Dialogue, the purpose of the exercise is framed strongly around consumer interests.

Commentators from civil society organisations such as WWF have pointed out that the new *Vision for Agriculture and Food* is vague and lacks clarity in terms of its pathway to transforming the EU's agrifood system. WWF argues that the Vision has taken:

> 'very timid steps towards creating fairer and more sustainable EU food supply chains. It includes a few positive elements, such as a commitment to a stronger enforcement of green legislation and financial incentives for farmers who go beyond existing environmental requirements. Yet, in trying to please everyone, the European Commission has failed to address critical issues, such as the necessary increase in environmental payments, as agreed in the Strategic Dialogue on the Future of EU Agriculture' (WWF, 2025).

International NGOs and green groups have criticised the Vision for being "shortsighted" and failing to address tangent policy actions to address systemic transformation of EU food and farming landscape, including actions related to climate change, biodiversity and related socio-environmental issues (e.g. Birdlife International, 2025).

Similar views have been expressed by the European Consumer Organisation (BEUC), which stated that the *Vision* falls short of meeting consumer needs in terms of access to healthy, sustainable and affordable food (BEUC, 2025). It is also critical of the *Vision*'s failure to address front-of-pack nutritional labelling (BEUC, 2025). In such ways, the *Vision* might be viewed as a very partial perspective on issues with, and approaches to transforming, the food system.

Other groups have highlighted positives. For instance, the International Union for Conservation of Nature (IUCN) has celebrated the potential role of nature-based solutions that the *Vision* notes and 'appreciates' the 'recognition of agriculture's role in addressing climate change, preserving soil health, water and air quality, and protecting and restoring biodiversity' (International Union for Conservation of Nature, 2025). In a similar vein, the Greek Bioeconomy Council has acknowledged the EU's strong stance in the *Vision* in supporting a bio-based agricultural economy to build a circular, resilient and sustainable future (Greek Bioeconomy Council, 2025). Despite such positives, the IUCN also calls for an approach that would acknowledge 'the shared responsibility of all supply chain actors in ensuring a just, fair and necessary sustainable transition' (International Union for Conservation of Nature, 2025). Although it stops short of calling for a return to systemic thinking, the IUCN's critique highlights the potential shortcomings of the overt focus on the farming sector.

2.3 Future policy developments

Beyond the key developments outlined in previous sections, further significant policy announcements with significant implications for food system transparency are anticipated during 2025.

First, it is anticipated that revision of the **EU Bioeconomy Strategy** will be completed by the end of 2025 (European Commission: Joint Research Centre, 2024). While extending considerably beyond the food system, the Strategy covers food and nutrition security and also broader sustainability-related topics such as mitigating climate change. The most recent progress update highlighted improvement on key food-related indicators, but noted that 'environmental and climate change indicator trends remain reasons for concern' (Korosuo et al., 2024: 71). The report emphasises the need for further development of appropriate indicators that will enable progress to be monitored effectively.

Second, agreement on the **Green Claims Directive** is expected in 2025. This aims to introduce criteria 'on how companies should prove their environmental claims and labels'; 'requirements for these claims and labels to be checked by an independent and accredited verifier'; and 'new rules on governance of environmental labelling schemes to ensure they are solid, transparent and reliable' (European Commission, no date-e).

Debate on both of these initiatives will now be framed by the renewed focus on competitiveness and reducing the regulatory burden on business.

2.4 Conclusion

Recent policy developments within the EU have generated mixed feelings. While considerable scepticism and ambivalence is noted amongst civil society organisations working on sustainability and environmental issues, some businesses and governments celebrate the potential to decrease the regulatory burden, particularly through reducing reporting requirements. Some argue that reducing reporting requirements could have the positive effect of targeting standardisation around the most important sustainability measures. Others argue that reduced reporting requirements merely limits the EU's ambitions around sustainability. The *Vision*, meanwhile, has been critiqued for its limited scope – ignoring, for example, labelling around nutrition. These combined developments have substantial consequences for the nature and role of transparency as a basis for transforming the food system. This ranges from the specific information required to be communicated to consumers, to the broader, less granular monitoring of how different parts of the food system are performing in relation to health, nutrition, and environmental sustainability.

While discussion continues around the proposed Green Claims Directive and related efforts to enhance food system transparency, the *Vision's* failure to reference either the Green Deal or *Farm to Fork Strategy* suggests a departure from the trajectory towards transparency embedded within systemic thinking. The combination of the Omnibus proposals to reduce reporting requirements and the *Vision*'s promotion of voluntary benchmarking over mandatory reporting, points to an important juncture in EU policy around food system transformation and the role of data and communication in driving this.

The next section provides an overview of the wider context for food system transparency, as discussed in academic literature from the social sciences.

3. Academic literature

A requirement for **greater transparency** has often been identified in academic research as a key factor in the transformation of food systems, particularly in relation to: governance and decision-making throughout (and about) the food system (e.g., Fesenfeld et al., 2023, Hebinck et al., 2021); the provenance of food (Manning, 2018); and pricing and the market (Molnár et al., 2013). Transparency is seen as a means to enhance accountability among food system actors (Swinburn et al., 2015) and to foster consumer trust (Wallace and Manning, 2020). These potential benefits are often emphasised as drivers for transitioning towards safer, more nutritious and sustainable food systems. This section begins by providing an overview of the relationship between transparency and food system transformation, before looking more specifically at the potential role of policy in enabling transparency. The review provided here builds on Deliverable 7.1 (Bear et al., 2023), which provided a summary of the conceptualisation of transparency in academic literature.

3.1 Transparency and food system transformation

Much of the literature around transparency in the food system has focused on benefits for **consumers**. While **market-led approaches** have been promoted widely – where, for instance, consumers change their purchasing behaviour on the basis of information they receive about the environmental and health impacts of particular products, leading in turn to a move towards 'quality' in the marketplace (Travaille et al., 2019) – a profusion of claims about food products, often accompanied by certification logos, can be confusing and lead to distrust and inertia (Rossi and Rivetti, 2023). Literature has, therefore, advocated greater **regulation of the claims** that can be made about products (Marcatajo, 2023) and has suggested various approaches both to making more information available to consumers about their purchases and to encouraging their engagement with this. While much of the public debate currently concerns the nature of, and requirement for, on-product **labelling**, others have suggested greater engagement with emerging technologies, such as provision of additional information via on-pack QR codes (Bashir, 2022). The focus on consumers is intended both to benefit them individually – through making healthier choices, for instance – while also driving change back through supply chains and the wider food system.

Alongside this concentration on consumers, literature increasingly points to benefits and responsibility around transparency at other points in the food system. Transparency around pricing and market-related data, for instance, can produce a more level playing field for business-related decisions. Potential beneficiaries include farmers through providing open access to data that they currently access through commercial platforms (Clapp, 2021). Others have highlighted the significance of '**midstream actors**' (Grabs et al., 2024: 527) in the food system in driving transformative change. For Grabs et al. (2024: 532), these actors are 'invaluable' because of their 'granular data on producer-level sustainability indicators' alongside their 'privileged position when it comes to understanding the upstream supply flows.' As a result, midstream actors might be especially resistant to calls for greater transparency – but equally could play a significant role in efforts to drive change throughout the food system. Greater access to data might also offer advantages for **regulators** in public authorities, particularly through providing an evidence base for assessing the success of their tools and interventions, and through helping to highlight areas for future prioritisation (Fanzo et al., 2021).

While often presented as something of a panacea, the promotion and production of greater transparency in the food system raises considerable **challenges**. Perhaps primary amongst these is a considerable lack of clarity around, and agreement over, what transparency is. This issue was covered in detail in TITAN Deliverable 7.1 (Bear et al., 2023), which highlighted significant inconsistencies in its use and definition in EU-level policy documents, along with a variety of interpretations by technology provider start-ups and by industry sector bodies. Although 'transparency' is often associated with

greater openness and accessibility of data, such definitions tend to ignore the complexity of power relations within the food system (Donaldson, 2022) – where, for instance, providing more widespread access to data can lead to greater costs that impact more on SMEs than on larger businesses. As outlined in Deliverable 7.1, providing access to greater quantities of data and information can obfuscate and bring opaqueness to the system.

Nonetheless, a considerable literature has developed around the potential of new **technological tools** – such as blockchain (Menon and Jain, 2021), AI (Camaréna, 2020) and the Internet of Things (Rogala et al., 2024) – to enhance supply chain and food system transparency (Astill et al., 2019). This literature has most frequently focused on technological possibilities, particularly around enhancing traceability and its robustness. Deliverable 3.4 (Zorer et al., 2024) provides further detail on the potential role of a wider range of digital technologies in addressing specific transparency challenges.

3.2 Policy for food system transparency

While transparency is often lauded as a route to transformative change in the food system, significant blockages remain. Primary among these is perhaps the **willingness** of food system actors to make their **corporate data** more widely available due to a lack of **trust** (Annosi et al., 2021), with concerns centring on 'challenges of data privacy and interoperability, unclear data governance, and mistrust of who will benefit from the shared data' (Sullivan et al., 2024: 2). A focus on the potential of **digitalisation** for enhanced transparency, on the other hand, raises particular issues for certain demographics, sectors and supply chain stages where, for instance, there is a lack of existing technological **skills** or where the **costs** of new technologies are perceived to outweigh their potential benefits (as is often the case for older farmers and for businesses (Sullivan et al., 2024).

Policy holds significant potential to improve food system transparency through targeted **incentives** and **requirements**. These **policy levers** can address collective problems in the public sphere. However, the existing academic literature inadequately explores the **role of public policy** in enhancing food system transparency. This section explores existing work in this area, highlighting key approaches towards enhancing food system transparency through policy interventions.

3.2.1 Identifying levers

Bhunnoo (2018: 4) argues that the initial stage of a systemic approach to food 'is identifying the problem, then working back into the food system as necessary to identify the causes, before developing policies to tackle these.' Such an approach may, initially, be informed by traceability. Karlsen et al. (2013) discuss ten drivers of traceability from an extensive literature search between 2001 and 2010. These are: legislation, food safety, quality, sustainability, welfare, certification, competitive advantages, chain communication, bio-terrorist threats and production optimisation. These levers can be used to improve transparency as the drivers of traceability provides the means to trace back to the origin of a food product. Deconinck et al. (2022) pointed out the need to reduce the evidence gaps within food systems using **Evidence Gap Maps**, innovative low-cost digital tools such as **food apps**, real time use of customer surveys to establish nutritional intake of customers and users as well as the use of **remote sensors** to investigate the impact on land, water and forests.

Other possible levers to address data gaps within the food system have been identified in the literature. Some focus on the use of **digital technology for accurate monitoring**, stressing though that there may be potential knock-on effects such as financial risks and burdens for small scale SMEs and farmers, as seen in North America and Canada (Rotz et al., 2019, Meemken et

al., 2024, Clapp, 2021). There is also an additional risk of creating scenarios where large corporate bodies have wielded greater influence and **power to prevent such data** from being made available externally, as an open resource (Clapp, 2021). Rotz et al. (2019) also noted similar patterns within the field of digital agriculture, where innovations in technology have been designed for the benefit of powerful and large-scale producers with implications for small-scale farmers in terms of data sharing.

Access to, and availability of, data between large corporations within the food industry is dependent upon powerful lobby-groups, as was seen in the US meat markets (Steier and Friedlander, 2021, Ammann et al., 2023). **Citizen-led food policy** offers a way to counter this type of concentration of power in large corporations. The study by Rotz et al (2019) found that this approach empowers farmers to adopt local technological solutions. They argued that 'a focus on digital innovation at the local level has the potential to influence broader policy shifts at the national and global scale, particularly in gaining support for digital infrastructure improvements' (p. 218). This method can, therefore, act as a powerful policy tool, scaling up infrastructural improvements while ensuring a grounding in local contexts.

In another instance, a **localised food policy programme** was used to ensure healthier food choices were made at the food procurement stage and transparency issues were addressed simultaneously (Farnsworth et al., 2018). The barriers to transparency that were identified related to complexities within the food system and the lack of institutional capacity, which prevented public institutions from making better food choices. This study showed that most food procurement programmes in LA focused on singular factors (such as health or environment) as their main objective for transparency, overlooking other significant factors or values such as social and animal welfare concerns (Farnsworth et al., 2018). The LA Food Policy Council's Good Food Purchasing Programme was used as a policy lever to address food system transparency issues by tackling the barriers to purchasing good food by consumers. The programme addressed the gaps by combining all the values or factors into an actionable plan (Farnsworth et al., 2018).

Trienekens et al. (2012) identified **three enablers** that can contribute to **upscaling transparency**: governance mechanisms; quality and safety standards; and information exchange. First, the availability of, and access to, accurate information is dependent on governance mechanisms that should be able to **create standards** and complement the operation of other supply chain mechanisms (Trienekens et al., 2012). **Open platforms, data and analytics** have an important role to play in providing access to information and enabling better communication between various supply chain stakeholders (EIT Food, 2024) to improve transparency. However, this depends on the 'trust' and 'willingness' of key actors to share information (Wiseman et al., 2019: 2) as digital technology and big data are the 'product of social interactions between people, institutional and regulatory settings, as well as the technology itself' (Jakku et al., 2019: 2). This was illustrated within the Australian agri-food sector, where small scale farmers were reluctant and sceptical about sharing their farm data with large companies as the element of mistrust and vulnerability was more prominent. Small farmers often remained powerless as large MNCs and created power imbalances between "**data contributors"** and **"data aggregators**" (Wiseman et al., 2019: 9). Transparency in such instances is likely to remain elusive and opaque as the element of trust is missing. Solutions to address such challenges include the smart farming technology, understanding advantages for farmers through benefit-sharing alongside legal and regulatory frameworks to protect small

producers with clear, transparent information within data licenses that are easy to comprehend (Wiseman et al., 2019).

The literature discussed thus far demonstrates that **transparency is a critical concern throughout the entire food system**, extending beyond consumers and large corporations. To ensure inclusivity and fairness, the literature argues that data sharing should be facilitated through accessible open data platforms. This requires encouraging data owners to voluntarily grant transparent licensing rights (De Beer, 2016). This approach ensures that small producers, farmers, nutrition data stakeholders and other food system actors actively participate in the collaborative decision-making process regarding data and resource sharing (De Beer, 2016, Wiseman et al., 2019).

3.2.2 Policy coherence for systemic transparency

While many levers may be pulled to enhance transparency, others have highlighted that a lack of policy coherence can, in itself, limit opportunities. For instance, Bazzan et al. (2023) identified the need for cross-sectoral policy integration through collaboration and co-ordination across several sectors as a bigger challenge to transparency. As food is situated at the intersection of health, nutrition, social, environmental and economic considerations, there is a need for coherent food policies that ensure that changes in one part of the system have positive impacts for other parts. However, cross-sectoral policies create trade-offs that are difficult to manage when different sectors use a siloed approach to policy-making (Schaub et al., 2022, Edwards et al., 2024, Candel and Pereira, 2017). Calibration of policy mixes can take place when policy goals are aligned. For instance, sustainable water management systems would involve aligning the policy goals with those of food, energy and water to ensure that policy calibrations would happen synergistically (Schaub et al., 2022).

Similar views were expressed by Blackstock et al. (2021) and Tosun and Lang (2017), who argued that there are inherent interdependencies between policy instruments and that using a hybrid approach can take cognizance of this fact. This was also noted within the *Farm to Fork Strategy* where agricultural policy integration required co-ordinated efforts between different sectors through the use of diverse policy instruments in a collaborative way (Bazzan et al., 2023). For instance, in the *Farm to Fork Strategy* a complex process of both substantial and procedural policy tools was involved (Bazzan et al., 2023). Substantial tools influenced regulations, created subsidies alongside labelling, administrative costs and taxes, while procedural tools affected processes and activities of actors necessary to coordinate and complete production, consumption and distribution processes (Capano and Howlett, 2020).

A systems approach to transparency needs a suitable **governance structure** 'that allows for steering and accelerating food systems transformation' (Fesenfeld et al., 2023: 826). De Schutter et al. (2020) propose a 'Common Food Policy' (previously promoted by the European Commission's Joint Research Centre) as a route towards systemic change and, in particular, healthier diets. The 2019 IPES-Food (International Panel of Experts on Sustainable Food Systems) include 'a European Commission vice president for sustainable food systems, a 'Head of Food in every Directorate General, and a Sustainable Food Taskforce under the European Political Strategy Centre (De Schutter, 2019). In parallel, the voices of grassroots actors would be channelled into EU decision-making via an EU Food Policy Council' (De Schutter et al., 2020: 7). However, as Fesenfeld et al. (2023) noted, establishing such a structure within the European Union alone is not sufficient, given the global and complex nature of food systems, so success within the EU is, in part, contingent on wider international shifts.

3.3 Conclusion

This section has demonstrated that enhanced food system transparency is a multifaceted challenge, extending considerably beyond consumer-focused labelling. Although market-driven approaches and technological innovations hold promise for increased traceability and information dissemination, they can be accompanied by exacerbated power imbalances (e.g. through concentrated ownership of data) and by new forms of opacity (whether through overload of, or difficulty in accessing, information). The literature highlights the important role of a systemic approach, necessitating a more holistic understanding of transparency's role in levelling the playing field for all stakeholders, from farmers to regulators. Technological solutions will not achieve this on their own; they need to be accompanied by, for instance, robust governance mechanisms and clear data standards.

The literature reviewed here has also highlighted the potential importance of policy interventions in realising the transformative potential of food system transparency. This requires grounding in policy coherence across sectors, along with carefully aligned policy goals. Key areas of work could focus on building trust amongst stakeholders – particularly in relation to data privacy concerns, and around the reliability of food-related information – and fostering an environment that facilitates collaboration between stakeholders across the food system, working towards common goals developed through inclusive approaches to governance, recognising diverse geographical and sectoral needs.

4. Research methodology

As outlined in Section 1, Task 7.3 aimed to address the following research questions:

1) How is food system transparency envisioned and defined by members of the policy community, and by wider policy networks?
2) What do members of the policy community and wider policy networks perceive to be the benefits of food system transparency, and who are perceived as the beneficiaries?
3) From the perspective of policy community members and wider policy networks, what are the primary obstacles hindering greater food system transparency, and what strategies can be employed to overcome them?
4) From the perspective of policy community members and wider policy networks, what opportunities does digital transparency offer in the food system, and what obstacles do they perceive?
5) What role can public policy play in the promotion and enablement of (digital) food system transparency?

A number of different methods were used to collect data. At the outset it was envisaged that an online survey and in-depth interviews would be conducted in order to draw out a broad range of perspectives from not only policymakers but also research think-tanks and civil society organisations. This section provides an overview of the methods employed.

4.1 Survey

A contact list of approximately 350 potential participants was compiled between December 2023 and January 2024. This list prioritized policymakers (defined broadly as individuals involved in the creation and implementation of policy) within the EU, at both European and national governmental levels. Organizations targeted included the European Commission, national government ministries and national government agencies. Key intergovernmental organizations (e.g., the UNFAO and Codex Alimentarius), along with representatives from the UK (and UK devolved administrations) government and associated food system agencies, were also included. The selection criteria focused on individuals engaged in food-related policy pertaining to sustainability, food safety and human health and nutrition. Participants were identified through online searches, focused initially on terms such as 'food policy officer' followed by the name of each EU Member State. Further contacts were identified through similar searches on LinkedIn. A smaller, secondary group, comprised of NGOs and civil society organizations, was also incorporated into the initial list in order to capture diverse perspectives on current and potential future policy approaches. Again, most of these were identified through online searches, using terms such as 'European food policy officer.'

Prior to the main survey distribution, a pilot survey was conducted, targeting the UK food policy community. The key objective of the pilot survey was to gather a broad range of perspectives from individuals with experience in policy development or implementation relating to enhancing transparency within the food system. The UK was selected due to its status as a key trading partner with the EU and also because of ongoing developments related to enhancing food system transparency (through the Food Data Transparency Partnership[2]; see UK Government (2023)). The secondary aim of the pilot was to evaluate the clarity of the question set and ensure its potential to generate high-quality data for the full survey.

[2] The Food Data Transparency Partnership was established by the UK Government following a recommendation in the *National Food Strategy* (Dimbleby, 2021) to introduce mandatory reporting across a range of areas. Its current focus is on metrics relating to food system carbon emissions and the healthiness of products sold by larger companies (UK Government, 2023).

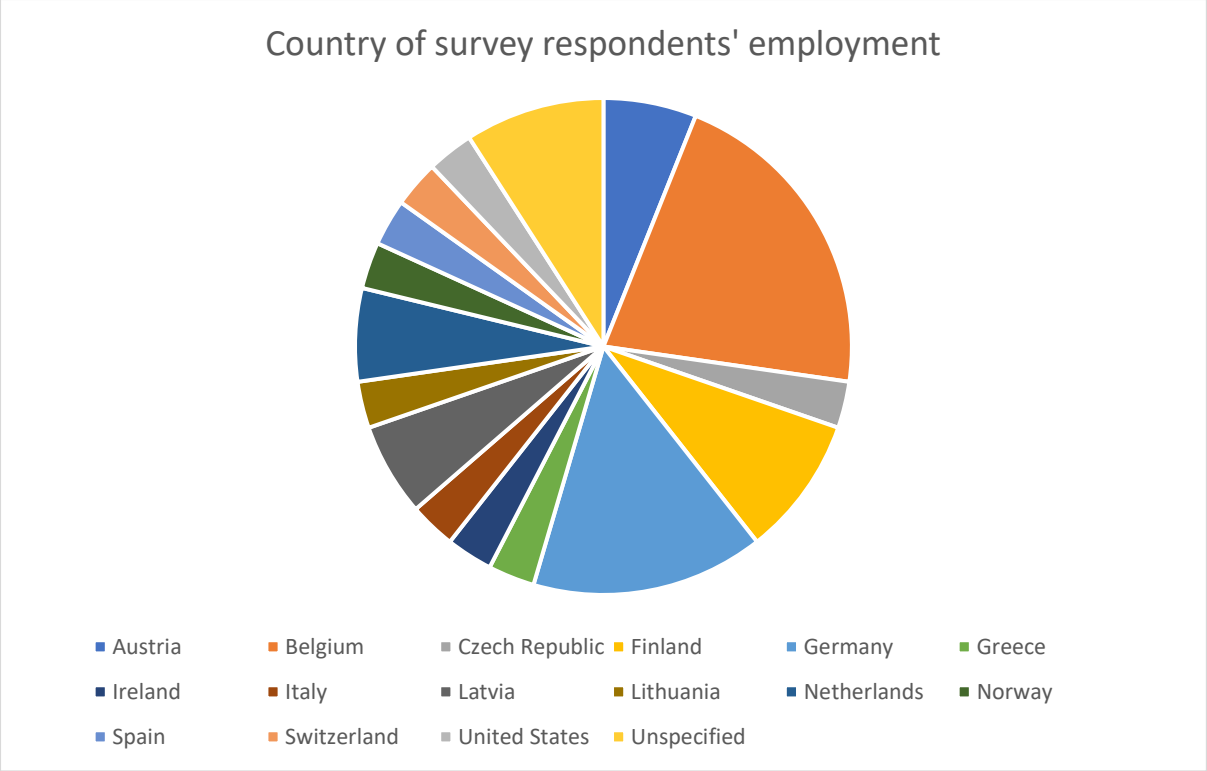

Figure 1: Country of survey respondents' employment

Developed using Jisc Online Surveys, in collaboration with TITAN partners at Queen's University Belfast, Delft Technical University and the University of Surrey, the pilot survey was launched on 18th March 2024 and closed on 27th May 2024. Initial invitations were sent through the survey tool to the professional email addresses of those on the distribution list. Building on previous research on approaches to surveying policymakers, the invitations were personalised with the names of potential participants (see Kroszka et al., 2023). Reminders were sent directly through the survey tool and final reminders to the majority of the distribution list were sent through LinkedIn. Of the 26 individuals invited to participate, only one responded. As a result, the questionnaire underwent significant revisions to improve its accessibility and ease of completion for participants. These revisions focused on reducing the overall length and simplifying question design, reducing the number of open-ended questions.

Following the pilot study, the full survey (presented in Appendix D) was launched on 28th May and remained open until 31st December 2024. Developed using Jisc Online Survey, the survey link was disseminated widely through various channels, including social media platforms such as LinkedIn and X, via TITAN Consortium partners and their networks, the Sustainable Food Systems Network (a platform established through Food 2030 for cooperation around sustainable food systems (Sustainable Food Systems Network, no date)), and at the Synergy Days event (a major annual conference focused on digital innovation in the European agri-food sector). Personalized invitations were sent to the majority of individuals on the initial contact list, excluding those from UK organizations. The survey link was also shared with participants of the interviews detailed in the following section. The initial end date of the survey was set to 31st October 2024 but was extended to the end of the year to optimise the response rate. A total of 33 responses were received (approximately 10% response rate). 45% of respondents identified as female and 39% as male (6% stated they preferred not to say, while 9% did not respond to the question about their gender). Figures 1 and 2 provide an overview of the location and nature of employment of respondents.

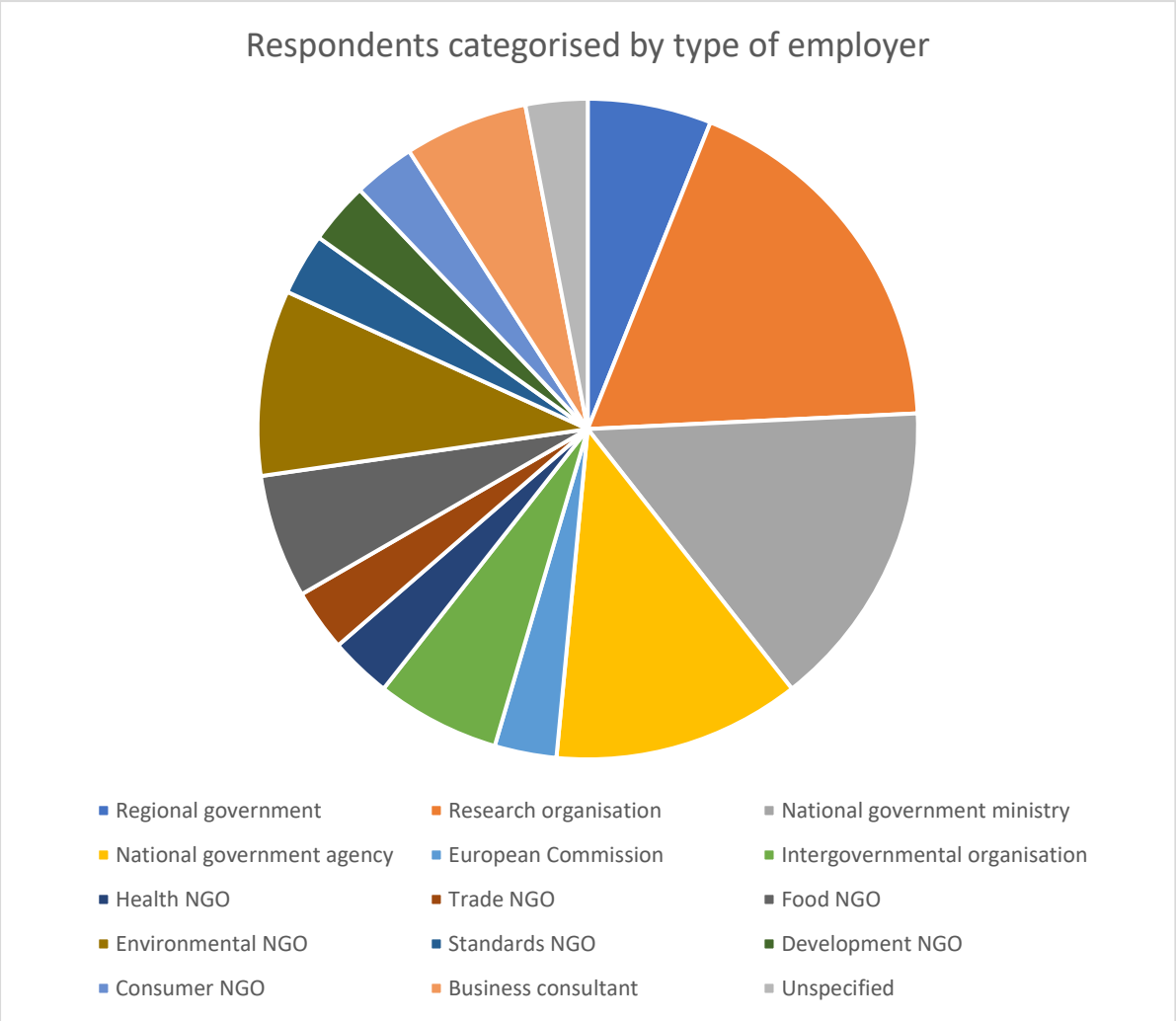

Figure 2: Survey respondents categorised by type of employer

4.2 Semi-structured interviews

A series of semi-structured interviews was conducted alongside the survey. Semi-structured interviews are a common qualitative social science research method, enabling in-depth exploration of experiences and perspectives of individual participants. They are structured around pre-determined questions but the order and wording of these can shift in relation to participants' responses. Similarly, their conversational approach means that topics beyond those initially envisaged may be explored; they enable participants to co-determine the structure and content (Clark et al., 2021).

Potential participants were drawn from the previously-mentioned contacts database. They were invited in batches between May and November 2024. The initial focus was on European Commission employees, including Heads of Units and policy officers working within Directorate Generals that covered the entire remit of the TITAN project. The focus was subsequently expanded to the wider policy network, including organisations with specific interest in the science-policy interface vis-à-vis food policy issues within the EU and from the international arena, along with representatives of intergovernmental organisations. Overall, approximately 100 people were invited between May and November 2024.

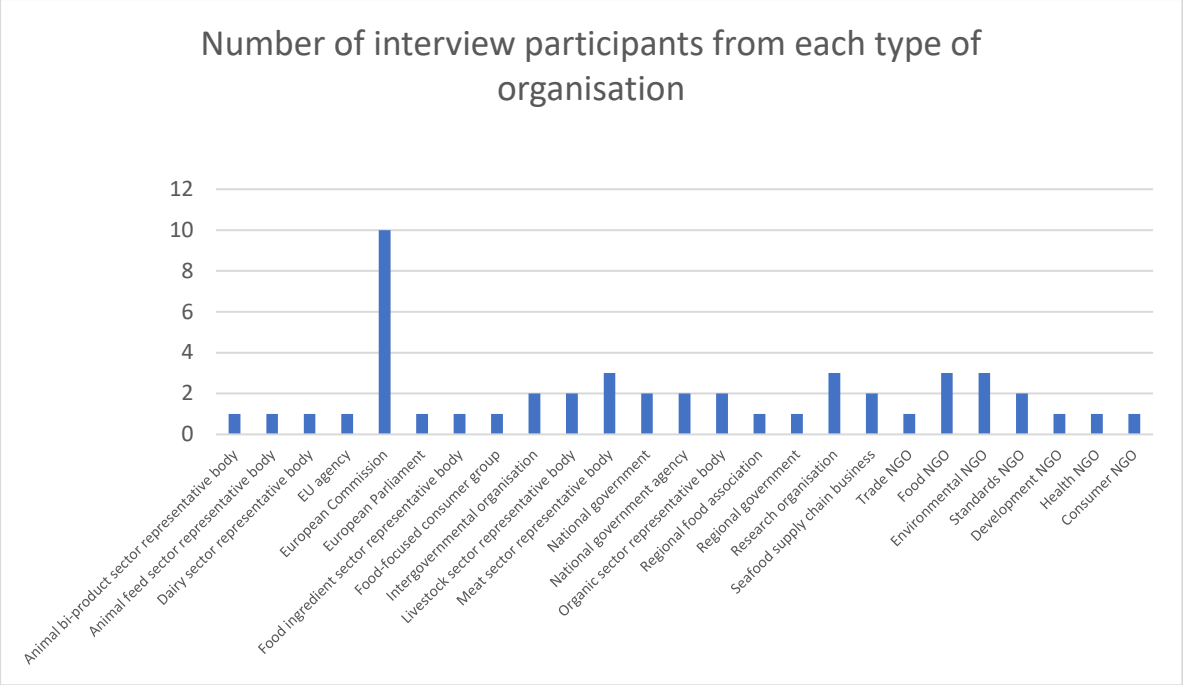

Figure 3: Number of interview participants from each type of organisation

A variety of means of approach was adopted. Most invitations were sent via email, but others were approached through LinkedIn. Beyond the initial contact database, further potential participants were identified through snowballing (for instance, where those who had been contacted suggested potential alternatives) and through contacting survey respondents who indicated they were willing to be interviewed. Additional participants were invited in person at the Synergy Days event in October 2024. Where no response to emails was received, reminders were sent.

26 interviews (involving 28 participants) were conducted online via Teams. Interviews generally lasted around 60 minutes. Illustrative topic guides, outlining the guiding questions and structure for each set of interviews, are provided in Appendices A and B.

Alongside these interviews, Deliverable 7.3 will continue to draw on 16 interviews (with 19 participants) with sector bodies, which were conducted in collaboration with TITAN partners from Wageningen University and TU Delft. These represent a broad range of stakeholders from different areas of the food industry and offer perspectives on the role played by policy in enhancing (or, indeed, constraining) possibilities for greater transparency. It is important to note that the questions asked to these food and supply chain stakeholders were different from those asked to policymakers and to issue-focused NGOs. Nonetheless, these interviews included elements relating to the definition and implementation of transparency tools, including the role of policy and regulation in enabling and/or constraining this.

Of the total 42 interviews analysed for this report, involving a total of 49 participants, 20 participants were female and 29 were male. All but one interview was conducted in English, with a translator being involved in one interview that was conducted in a combination of English and Italian.

All interviews were recorded after participants signed a consent to participate form. The recordings were transcribed and subsequently cleaned and uploaded for coding and analysis. Coding, involving the identification and comparison of key themes from interviews (as outlined in Section 5), was undertaken using NVivo14 software.

4.3 Focus group

In addition to the activities outlined above, a focus group was conducted in October 2024 at the Synergy Days event in Barcelona (see SmartAgriHubs, 2024). The objective of this focus group was similar to the interviews. However, an advantage of focus groups is the possibility for exchange of perspectives. In this instance, the benefit was to bring together representatives from different levels of government within the EU.

The focus group was advertised online in advance by the event organiser, using text prepared by CU researchers. An invitation was sent to specific event participants identified by the organiser as members of the policy community prior to the event. Initial take-up was low; to ensure appropriate participation, additional social networking was undertaken, along with in-person exchanges with Synergy Days participants. Further potential participants were invited when they were visiting the TITAN stand on the first day of the event, while others were invited through individual emails.

Five people participated in the focus group, representing three levels of government within the EU (one from the EC, three from a regional Ministry of agriculture and food and one from a national government). Three of the participants were female, and two were male. The discussion lasted 60 minutes. Participants completed consent forms prior to participating in the group. The focus group topic guide, outlining the guiding questions and structure, is provided in Appendix C. The focus group was recorded and professionally transcribed. It was analysed alongside the interviews, using NVivo14.

4.4 Ethical approval

Ethical approval for the survey research was received from the Cardiff University School of Geography and Planning Research Ethics Committee in February 2024. This approval also covered the interview and focus group work. Interviews and focus group research had originally been approved for a different Task by the Wageningen University Scientific Integrity Committee; the Cardiff research ethics committee accepted that the interviews and focus group involved in Task 7.3 involved only minor changes to those in Task 7.1 and approved these changes.

4.5 Participant names and quotations

In discussing the findings, Section 4 makes extensive use of quotations from interviews, the survey and the focus group. In line with ethical approval, participants' identities are protected. Each participant has, therefore, been allocated a number that is used alongside associated quotations in analysis and discussion. Generic descriptions of the type of organisation they are employed by are also provided (in line with the categories used in 2 and 3). References to survey responses are indicated by a number preceded by the letter S (e.g. 'Participant S13').

Quotations from the survey, interviews and focus group are presented verbatim. Any shortening – for clarity – is indicated by '[…]'. Significant pauses, or incomplete sentences, are indicated by '…'.

5. Research findings

This section presents the findings from the research conducted for Task 7.3. It integrates those data with the analysis of interviews from Task 7.2. The participants from Task 7.2 represent organisations such as sector representative bodies and NGOs; these form an important part of the policy network and, therefore, offer useful insights into the challenges for policymakers in enhancing food system transparency. The section integrates data collected across all methods in Task 7.3: an online survey, interviews and focus group (as outlined in Section 3). It is structured around the key themes that emerged through analysis.

5.1 Defining transparent food systems

Deliverable 7.1 demonstrated that 'transparency' is a heavily-used concept within European food-related policy but is generally, at best, defined poorly, and often not at all (Bear et al., 2023). That report identified ambiguity around the meaning of transparency as one of the key challenges for coherent policy on the topic. Exploring how the policy community and policy networks understand the term is, therefore, important in understanding the purpose they see it serving, and considering how it may be taken forward in future policy work. As a result, all interview, focus group and survey participants were asked for their interpretation or definition of a 'transparent food system'. We outline the key themes that emerged in this section. This provides an important basis for the remainder of the findings, which focus on obstacles and routes to transparent food systems.

5.1.1 Openness and accuracy

At the simplest level, participants frequently equated transparency to the **availability of information** about aspects of the food system. For instance, Participant 37 (European Commission) described transparency as 'the availability of the information to all players and stakeholders involved – so availability, accessibility.' Participant 58 (European Commission) emphasised the relationship between transparency and **openness**:

> 'just the open information about the product, about the way that it was produced, about the transaction that is involved between different parts of the supply chain, including consumers. So openness about this information and also a food system that is open about the health aspects or the sustainability aspects of its products, that is also open about, or as open as possible about, how the margins are distributed between the different parts of the supply chain. The system that is also picking up warnings early and sharing it openly with regards to food safety.'

Survey responses highlighted similar themes, drawing an association between transparency, openness and **accessibility**. For instance:

> 'characterized by open and accurate communication about the origins, production methods, and handling of food' (S9 – Trade NGO)

> 'all information on production, trade and possible market concentration should be openly accessible' (S10 - Researcher)

> 'A transparent food system is one where all stages of food production, processing, distribution, and consumption are open and accessible to everyone' (S18 – National government agency).

These ideas around openness and accessibility might be summed up as **the ability to see what would otherwise be hidden**:

> 'Transparency is the ability to see what today is not currently seen or reflected in the market price […] hidden elements should be removed' (Participant 56 - European Commission)
>
> '…when you don't see something, then you have developed perceptions of what is behind the curtain. If the curtain is pulled and then you see. Then you take away the perception, or at least perceptions can be minimized.' (Participant 38 - European Commission)
>
> 'Transparent food system would allow to see not just the real costs, but the hidden costs of what we consume and what we do' (Participant 63 - Development NGO).

These high-level characteristics of transparency – centring on an ethos of openness about, availability of, and accessibility to information about food products – are dependent on a series of more practical requirements. Participants identified these as the collection/collation of data, sharing of information, the verifiability of information, and the nature of communication.

These requirements could be viewed as rooted in **traceability**, involving the collection and collation of data about food products and their provenance. Five survey responses (S4 – Researcher; S9 – Trade NGO; S23 – National government ministry; S27 – Health NGO; S30 – Food NGO) explicitly referred to traceability in defining transparent food systems, while another six used similar descriptions such as 'when everyone can track information about food production in the food system' (S7 – National government ministry). For six survey respondents, this traceability or tracking would provide **information about how a product is made**, while two survey respondents emphasised the ability to determine the **impacts of a product** or purchase. This was summed by a participant from a development NGO:

> 'A transparent food system provides producers, consumers and all other affected parties the ability to understand the cause and consequence of the different consumption decisions. This includes: Understanding the cost of the products consumed, including their hidden environmental and social cost; Understanding the implications of a consumption decision for one's health; Understanding the power dynamics which influence production and consumption decision, such as market structure and food environment; Understanding inequities that are at work in the food system and that are reproduces [*sic*] through it' (S14; [interview participant 63]).

While traceability relates broadly to information about the provenance of a product, it also implies **accuracy** of information and 'verifiable practices' (Participant 67 - National government). **Harmonisation** of data collection, indicators and approaches to communication was highlighted as contributing to such accuracy:

> 'Companies publicly disclose their sourcing practices across an agreed and robust set of indicators' (S32 – Environmental NGO)
>
> 'it is important that harmonised tools are being used for data collection & especially for data sharing, to ensure that the transparency does not result in a data jungle' (S4 – Researcher).

For some, harmonisation and accuracy are rooted in **scientific research**. Participant 65 (European Commission), for example, referred to the grounding of EFSA opinions on food safety 'on science that is available,' while Participant 38 (European Commission) noted the importance of transparency about the science itself to ensure that 'measure are scientifically robust' (and, therefore, an appropriate basis for decision-making). In the survey, two employees of national government agencies wrote of the centrality of 'correct, objective information' (S1 – Regional government), and 'where all actors

across the food chain has [*sic*] accurate information about origin, composition and environmental and social impact of food' (S3 – National government agency).

5.1.2 Data sharing and communication

The potential for traceability and verifiability, however, is ultimately based on the availability of data. A number of participants, therefore, emphasised that a transparent food system requires a **willingness to share data freely**. For instance:

> 'A transparent food system is one in which all food system stakeholders share information and can access information on the implications of their production or consumption choices on health, climate and the environment and inclusion' (S2 – Food NGO)
>
> 'Transparency throughout the food system should facilitate data and information exchange' (S8 – National government agency)
>
> 'Partners work well together, share information' (S20 – Regional government).

For Participant 56 (Standards NGO), it is important that transparency 'looks from farm to fork' with 'disclosure over everything' and that 'data and measurement is coherent across the company's value chains.' This was sometimes about the importance of sharing information and data throughout the chain:

> 'All actors in the food value chain should be informed about the standards applied by other actors in the value chain. Information on compliance with legal standards by actors throughout the food value chain is openly available.' (S10 - Researcher)
>
> 'All the information are shared with all the stakeholders in the value chain' (S24 - Researcher).

Building on this theme, Participant 21 (Research organisation) emphasised that **data shared within value chains** could be used for other purposes across the wider food system:

> 'throughout this whole process from production to selling in this there lots of trade data collected and shared for commercial purposes. But this data can be used for other purposes as well, especially from the government perspective.'

While agreeing with this perspective, others highlighted the differing **implications of transparency across the food system**. Participant 58 (European Commission), for instance, discussed the relationship between retailers, producers and policymakers:

> 'the retailer can use, for example, the information when the demand will be highest for the specific product to his benefit. If he were to be fully transparent about strawberry sales or picking, then that information could be used by the other party to increase their price. […] Transparency, I think is not always in the interest of different actors, but from a policy perspective, from a societal perspective, you want to encourage people to be transparent about, for example, food safety threats.'

Other participants similarly emphasised that it would not be helpful to share *all* data freely. Referring to the Deforestation Regulation, one participant argued:

> 'sometimes if you would circulate all the information to everybody every time, after a while, you don't see the trees in the forest anymore. So it's too much. […] so this information transparency should be done when it's really needed' (Participant 52 - European Commission).

The nature of such **targeting** might relate to specific end goals. In connection to food safety, for example, Participant 52 (European Commission) argued that the necessary level of transparency is what would ensure 'that everybody can take the actions needed to ensure that the risk is put under control, eliminated and controlled'. Or, to put it another way, 'that those who need to know has access to the data'.

As such, 'transparency is not an objective in itself' (Participant 51 – EU Agency); 'it's a mean' (Participant 70 - Consumer NGO) - **a means to an end**. Participant 56 (Standards NGO) expanded on this, noting that it is possible to be:

> 'very transparent, but nothing is changing. Transparency isn't the last thing we need. We need accountability, so transparency is the step one, but it has to be consequential.'

Central to this potential for consequence is **communication**. As participants noted, collating information does not in itself equate to transparency. Participant 38 (European Commission), for instance, spoke of the need to 'strengthen the […] communication' about food safety risks; **being open is not sufficient**, as this in itself may not enable understanding. Similarly, Participant 61 (Food NGO) emphasised that transparency is 'not only gathering information but presenting it in a way which makes it possible for people to understand it.'

Although participants were asked to define, and reflect on, transparent food *systems*, most tended to focus on specific relationship within, or aspects of, the food system. Notably, therefore, in discussions around communication, participants tended to focus on the availability of information and data for **consumers**. For instance, S5 (National government agency) stated that 'For customers it is important to know how a food product is made,' while S28 (Consumer NGO [interview participant 70]) defined a transparent food system as one 'for which basic information related to environmental and socio economic costs of the food along its entire chain is fully disclosed and accessible to final consumer.'

Fewer respondents wrote explicitly about how they felt **consumers** should be provided with this information, but four highlighted **on-product labelling** as a key approach. For example:

> 'the information should be made available through for example easy to understand and harmonised labels (esp. for consumers)' (S4 - researcher)

> 'information is made available to consumers in an easily understandable format, e.g. through a label' (S33 - Environmental NGO [interview participant 68]).

Others were more specific about the nature of labelling, with one environmental NGO representative (S29) stating that labelling 'must be accompanied with a [*sic*] explanatory notice and be green-claim proofed to avoid any greenwashing'. A food NGO representative (S30) stated that on-pack labelling should involve 'no health or nutrition claims' and that nutrition-related information should involve 'Nutriscore front of pack label'.

5.1.3 Thematic focus

Implicit in the above is that transparency can relate to different thematic interests. Where particular impacts of food purchases were mentioned, for instance, these often related to **health and environmental impacts**, though with some mentions of **labour conditions**. Five survey respondents also referred to provision of information about **pricing and the market**. For example:

> 'A food system in which correct, objective information about prices, impact, production methods, origin, health etc. is as easily accessible as possible for everyone (consumers, producers, and everyone in between)' (S1 – Regional government)

> 'A system where the consumer knows the various members of the processing chain. It knows the country of origin of the food (or its ingredients), the farming system, by whom it has been processed, and ideally, how much each link in the chain contributes to the final price' (S16 – National government ministry)
>
> 'includes information on where products have come from, how they are stored, how much producers receive per unit in exchange for the product produced.' (S27 – Health NGO).

In relation to such topics, one participant noted the importance of having clear definitions not only of transparency itself but the topics it addresses:

> 'if we are speaking about transparency, I think at least in my interpretation, I think that's a little bit of lack of transparency from the part of the legislation, because if you're, if you don't define what exactly what is a sustainable and healthy diet, what is a healthy diet, what are processed foods, what are ultra processed foods, you cannot really have a discussion' (Participant 34 - Livestock sector representative body).

Other participants highlighted that transparency should extend beyond food itself to encompass wider **decision-making processes across the food system**. For instance:

> 'Food system where decisions and actions made at all levels are made open and available to everyone' (S19 - National government ministry)
>
> 'One which mitigates information asymmetries, particularly between food manufacturers and consumers, related to the safety and sustainability of food within the system. One which is characterised by participatory decision-making at all stages in risk management, including initial problem formulation' (S 26 - Intergovernmental organisation [interview participant 57]).

5.2 The perceived benefits of transparency about food systems

The previous section outlined some key underpinning principles for transparency that were identified by research participants. While these served to establish a generic ethos for food system transparency, it was noted that the definition – or operational nature – of transparency might necessarily vary depending on the end goal. This section, therefore, focuses on goals and associated benefits identified by participants.

5.2.1 Consumers, informed decisions and enabling change

While some participants felt that transparency within and around food systems is intrinsically positive, others focused on specific potential purposes and benefits. Most participants highlighted benefits for **consumers**:

> 'at least consumers should be also, you know aware before eating or when eating, when buying, when shopping, what they're buying' (Participant 56 - European Commission)
>
> 'one of the benefits or potential benefits that we see in transparency is to further help, especially consumers to make purchasing decisions that are more sustainable' (Participant 60 - European Commission)
>
> 'If I'm a consumer, then I might want to know about attributes that relate to my values. And have enough information to make a decision about what I eat based on my values or whatever my preferences might be' (Participant 67 - National government).

The final quotation points to the potential purpose of transparency as **enabling informed decisions** by consumers. As Participant 76 (European Commission) explained:

> 'with this data, they can then make better informed decisions and support the specific products that… that are more aligned to their principles, their values and things of food consumption.'

Another participant spoke of the specific role of policy and regulation in bringing about 'more transparency on the way food is produced,' suggesting that it could create an 'ecosystem that will empower more the consumers to make more informed choices' (Participant 56 (European Commission)).

While beneficial in itself, the ability to make informed decisions was viewed as important for its role in enabling change:

> 'we want, of course, citizens to benefit from it, to change their consumption pattern by means of a more transparent food system' (Participant 66 - European Commission).

However, other participants discussed the different levels of information that were useful to provide to consumers. Participant 70 (Consumer NGO) argued, in line with previous participants, that 'the overall aim at the retailing system is to provide consumers with a set of information that helps them to make an informed choice.' For him, though, the constitution of being 'informed' is complex and contestable:

> 'Transparent […] can go from nutritional characteristic to labour implied in different stages, to environmental performances, all the social aspects or economic aspects. So you want rich transparency by setting one information, or by providing and releasing one information. If you want to really give the consumer the tools for an informed choice, then the information that you have to provide are much more complex.'

Another participant noted the difference in complexity between sectors. Speaking of the potential for greater transparency around pricing, they suggested that for meat supply chains it is 'much more difficult to see where the margin goes to. But the apple is an excellent example where it's easy' (Participant 62 - Regional government).

This closely relates to questions over the amount of information to share with consumers. While greater transparency was generally seen to benefit consumers, some participants again warned of the potential to increase opacity with the **provision of too much information**:

> 'So on one hand, yes, we need transparency on all forms, but at the same time it can, as everything, lead to an excess of information and fatigue as well' (Participant 38 - European Commission).

An alternative perspective was offered by other participants, who argued, in the specific context of food safety, that transparency within the food system is beneficial for consumers but not through their active engagement with, or even awareness of, additional information about products:

> 'if you go to the supermarket, you expect that the food which is… when you buy it's safe – you don't make every time a consideration. So, finally the consumer for me is the… but he will probably not know the benefits of transparency. Is just is expecting when he buy' (Participant 52 - European Commission)

> 'the average consumer might not think about it, but it's a benefit for them by having the possibility to limit food safety issues to as much as possible' (Participant 40 - Intergovernmental organisation).

Their argument is that the availability of appropriate data to those governing and regulating the food system should enable consumers to **trust the system**. A related perspective was provided by Participant 33 (Dairy sector representative body), who argued that 'There must be an effort from the consumer if the consumer wants to know'. This participant felt that consumers should be able to find the information that would help them to make informed decisions, but that there are limits on the amount of work individual companies can do to enable this. Consumers could benefit from information, in other words, but need to be prepared to conduct their own work to find it.

5.2.2 Accountability, empowerment and responsibility

In defining transparency, the 'ability to see' was highlighted as an important aspect. Participants suggested that a key rationale for needing to be able to see aspects of the food system that would otherwise be hidden related to **accountability**. For example, two survey respondents noted:

> 'A transparent food system involves regulatory measures and standards that are consistently enforced holding all stakeholders accountable, providing assurance to consumers that the food they consume is safe, healthy, and ethically produced.' (S9 – Trade NGO)
>
> 'Transparency in the food system helps build trust, ensures accountability, and promotes sustainable and ethical practices' (S18 – National government agency).

An alternative perspective was offered by Participant 58 (European Commission), who argued that one of 'the key benefits is that you make people accountable'. He went on to explain:

> 'our diets currently are unsustainable and need to move to a more sustainable, healthy diet overall. And to inform people about the health and the sustainability of their diets, it's something that is giving agency to consumers and makes them to a certain extent accountable.'

In one sense, this relates closely to the theme of **empowerment**, which was identified by some participants as a key purpose for transparency. For instance:

> 'to inform people about the health and the sustainability of their diets, it's something that is making giving agency to consumers and makes them to a certain extent accountable' (Participant 58 - European Commission).

However, while empowerment of consumers might be viewed as intrinsically positive, one participant warned that transparency about products should not equate to consumer **responsibility**. Participant 63 (Development NGO) argued that transparency is about:

> 'Making not just the information available and making it available in a fair and affordable way for all the people that are involved, not just that is important, but also to act on it. So I think if we have that information, we should also use it in things like true cost accounting to then actually be able to deal on it on a public scale and not just load this responsibility on the consumers.'

A systemic approach to transparency, in other words, does not merely pass responsibility for the impacts of food up the supply chain to consumers; it can be **redistributive** by enabling multiple actors to share responsibility for positive action.

5.2.3 Systemic benefits

The idea that transparency could have a redistributive impact on responsibility would, logically, extend beyond consumers across the whole food system. Some – albeit a small minority of – participants referred to the systemic benefits of greater transparency, extending both through and beyond the supply or value chains. For example:

> 'every stakeholder will, in my opinion, would benefit from increased transparency, even the food industry, but they don't realize. […] the government or the public agencies who are in charge of the policy making, but also enforcement authorities, police, customs controls – they would of course benefit, because if they have access to whatever transaction in the food chain, they could better monitor where are the criminals, or where are the problems, the non-compliances, as we call them in technical terms, where the non-compliances are taking place. The consumers would be more protected because we can identify better rogue food business operators within the food maze.' (Participant 37 - European Commission)

> 'anyone would benefit from it itself, because even coming from an industry point of view, having more traceability and more transparency in terms of data mean also more understanding of the core business models. So I see this as a win, win, win situation where even the consumers in terms of knowing fully the traceability of the ingredients, linking them to food security and safety' (Participant 55 - Environmental NGO).

Transparency, in that sense, has **multiple audiences** and beneficiaries. While the most-frequently mentioned beneficiaries of transparency are consumers, the same participant highlighted the potential to address data inequality throughout the supply chain:

> 'assessing information is something that is crucial for at every part of the food supply chain, but a little bit, maybe regarding context wise for farmers and the ones that are at the lower end of the of the supply chain itself, not only because they have to, they are the ones that have to make daily decisions and not to be able to provide like the context or even the scale and the potential impact of their own action is something that is counterproductive at the end. So we need to make sure that they are provided with the right data and the right options fitting these data' (Participant 55 - Environmental NGO).

A similar contention was made by Participant 56 (European Commission), who argued that 'the weakest actors would benefit a lot from more transparency.' When asked who the weakest actors were, the participant explained:

> 'farmers, but also small operators in the value chain because actually the issue is that we have an increased concentration of market power and it has been growing more and more. In future, the sustainability transition might accelerate even more this concentration of power because of cost investment needed for the transition that would help the biggest companies to take a more advantage from this transition.'

Participant 55 (Environmental NGO) also noted, however, that for benefits to be shared throughout the food system, 'everyone must play by the rules and everyone must contribute as well'. This theme will be returned to in Section 4.5.3.

Although participants generally focused on the immediate TITAN themes of sustainability, public health and nutrition and food safety, some noted the potential impacts of market, pricing and cost transparency and their importance across the food system. In discussing **true cost accounting,** for instance, Participant 68 (Environmental NGO) spoke of the role of greater transparency in revealing 'that we have unfair trading practices' in the 'middle chain and the relationship between food processors, retailers and farmers.' Benefits of transparency, in this way, can extend beyond the ability to see hidden elements of production (and beyond traceability's focus on provenance and verifiability) to encompass the nature of the supply chain and food system itself. The same participant highlighted the potential impact of true cost accounting on future **investment** decisions:

> 'if we go to food processing companies, what they are trying to do right now is to look at the true costs of their activities and to be transparent about that. And that, of course, is an incentive for investors then to invest in the companies that actually produce benefits for society' (Participant 68 - Environmental NGO).

In general, therefore, when participants moved beyond discussion of specific relationships that could benefit from increased transparency, their focus tended to remain on the **food supply chain** itself. Clearly, a significant change of mindset will be required to fully realise the systemic benefits of transparency.

5.2.4 Benefits for policymakers and regulators

The systemic benefits of transparency extend to those involved in public policy. For policymakers, for example, the benefits could be seen not only through assessing the success of existing policy but in **identifying future target areas**:

> 'It would be good, let's say, from public retailers that they collect a lot of data through their online shopping and so on. If we have access to that data, we can be more targeted of course in regulatory approaches, but that is a venture challenge for us. We cannot get access to that data' (Participant 38 - European Commission).

Greater levels of transparency can also enable policymakers to **make decisions on the basis of greater evidence**:

> 'talking in the field of data in agriculture, it is especially important, transparency, well, with… of course with a balance, but I think it's really important because data is information, and with information we have power and the power to make the decisions, and well, I guess with balance, I think transparency is crucial in this sector' (Participant 79 - Regional government).

However, the potential benefits of transparency for policymakers and regulators extend beyond the ability to monitor the food system more accurately and holistically. Participant 38 (European Commission) outlined three key benefits of transparency for policymakers and regulators, focusing on trust in both regulators and the wider food system:

> 'First of all from a regulator's point of view, you build your trust with your addressees at the same time you also position yourself as a reliable regulator, very important as trustworthy, as somebody that has nothing to hide and explain the process.
>
> At the same time, from the public perspective, if you're regulators and the decision making process or what is happening, everything that the regulatory processes are transparent, then you can follow, you tend to trust and have that accessibility and most important you are more likely to accept the result or understand the reasons behind a certain decision or policy choice.
>
> Which is also beneficial for the regulators that it increases the acceptance of the measures that hand and therefore compliance, and therefore you know the overall let's say if our objective is to not only to ensure the safety of food products, but also to convince people that our products are safe, then yeah, we have achieved our goal.'

Similarly, Participant 51 (EU agency) argued that there are:

> 'a lot of advantages and benefits for this transparency. Number one is the credibility of the process. If you are able to see how things have been done, you can judge yourself whether you want to believe on the process, or not.'

In this sense, transparency around policy and regulatory decision-making are seen as important not only for the credibility of the decisions themselves, and the associated policy community, but by association for the wider food system. Others commented on this theme in relation to the perception in other countries of food products from the EU in relation to food safety:

> 'in 3rd country markets where […] products are considered, you know of a high safety level and therefore quality. Although I would distinguish between safety and quality, but in their eyes, because […] the safety standard is so high automatically, there is a quality element that subconsciously comes along' (Participant 38 - European Commission).

The establishment of an open and credible process around food safety issues, in other words, can be beneficial in trading with third country markets. Another similarly commented that:

> 'the European Union on the regulatory framework that we have is in a very good path to ensure this credibility of the food safety system and we have to remind ourselves as well that I mean, Europe is very well known for having the most protective system of food safety in the world' (Participant 51 – EU agency).

In this way, policy and regulation can play a role not only in determining the nature of, and requiring, transparency, but in **enhancing the benefits of transparency**. For instance, an NGO employee commented:

> 'A transparent food system involves regulatory measures and standards that are consistently enforced holding all stakeholders accountable, providing assurance to consumers that the food they consume is safe, healthy, and ethically produced' (S9 - Trade NGO).

Regulatory measures and standards, in other words, can enhance transparency by creating greater consistency of reporting and a more level playing field for supply chain actors. This was also discussed in relation to the role of private certification companies in setting standards. One participant felt that the 'proliferation of certification and audit protocols and schemes' is 'not efficient and…it has a lot of unproductive costs' (Participant 29 (Animal bi-product sector representative body)) and referred to his organisation's work in bringing 'together all these certification and audit schemes…hammering out together the elements for data traceability.' Ideally, though, he 'would like that [traceability] is pushed forward by the authority, by public authorities, and not by audit and certification bodies;' simplification and standardisation can produce a more consistent and powerful message, and public policy has a potentially important role to play in engendering this.

5.3 Obstacles to greater transparency about food systems

5.3.1 Data, communication and cost

Despite recognising multiple benefits of greater transparency, participants identified a number of potential obstacles to realising that objective. The most frequently mentioned obstacles related to **concerns around sharing data**. These often referred to **confidentiality**:

> 'The food industry does not want to disclose their information with the government […] with the public institutions for competition reasons for private reasons' (Participant 37 - European Commission)

> 'you have the other party where they still think that we are too conservative and too protective of industry and you have industry telling us that we are very much oriented to civil society and transparency, damaging competition for them. So that is the type of conciliation in a way that we need to be doing from the regulatory perspective' (Participant 51 – EU agency).

The second quote refers specifically to finding a balance between confidentiality and data sharing. Participant 58 (European Commission) similarly noted that 'the willingness to share data is very, it's a big hurdle'. He felt that, for supply chain actors, 'the cost is obvious, but the benefit is not always', so **making the potential benefits clearer** to businesses would be key to increasing their willingness to be open in future. For Participant 56 (European Commission), this might also be viewed as finding 'a good balance between what is privacy and what constitutes a public interest'.

One policymaker referred to the specific example of 'asking retailers to provide data on their sales to understand consumers' behaviour on certain marketing practices;' this approach had not been successful because of 'confidentiality reasons, because it's a business opportunity behind if they are telling us how they manage their own business' (Participant 56 - European Commission).

While commercial sensitivity was sometimes cited as a concern here, other concerns were raised. These included the possibility of **misinterpretation**. For instance, Participant 23 (Meat sector representative body) suggested that:

> 'anytime you share data you need to be careful that data cannot be misunderstood and this is a cost. This is a constraint. This is a constraint because from time to time you also, there is also reluctancy from companies themselves to share that and to provide data with you because they are afraid you use data communicating to public authority that do not understand exactly what is behind.'

He gave the example of changes in the use of medicine for livestock animals, stating that if he had:

> 'communicated a data or reduction of the use of medicine and some days after it was taken as the those kind of – "supply chain are saving money, not using medicine, so the animals are exposed to zoonosis".

Once data are shared, in other words, they are not accompanied by a spokesperson so are open to new interpretations, which may not align with the understandings of those who were involved in their production.

While willingness to share data is a clear stumbling block in the path to transparency, participants also identified a **lack of standardisation** in approaches to data collection as a significant issue:

> 'A lot of data originates, of course, with agriculture and at the level of agriculture, data capture is not what it could be or systems are not integrated sufficiently. The same I hear also from equipment manufacturers and those that supply the machinery for food production, and not always are these […] machines the data that they generate is not always shared efficiently with other stages. Also, if data capture is there but sometimes it does not flow through because there's lack of connectivity, lack of willingness to share, lack of standards to share and so those are' (Participant 58 - European Commission)
>
> 'Well, I think when it comes to challenges, one is […] to have access to data. And harmonizing different data sources' (Participant 66 – European Commission)
>
> 'even though they will share such data, still it's very difficult to combine all this data in a single database' (Participant 37 - European Commission).

Participant 77 (National government ministry) noted that such lack of standardisation is not just between sectors or technology manufacturers but between different levels and places of government:

> 'I would also say interoperability is one of the key challenges so far, but of the challenge there, we as… as a government of a federal state, we cannot make… like, most of the data is basically

> being made available by the different regions, and they have their own systems and also the… the way how they collect data and they have their own standards and their own interfaces and… so, they… it's difficult then to transfer data or make like one system to increase the transparency because we don't have the responsibility basically to decide for all of them on how data is collected.'

Similarly, standardisation of **labelling practices** was viewed as a significant obstacle by one participant:

> 'There's a lot of different systems in a labelling systems in different Member States that are national or even regional or local, and when you come to sustainability labelling, there's no harmonized standard. You know, you can have a little green frog or you can have this label or that label, but nobody really knows what it means. So I think what's missing is in the harmonized product labelling that includes a harmonized approach to how healthy or not a product is and to the sustainability of a product' (Participant 39 – European Commission).

While agreeing about the potential for benefits across the food system, Participant 70 (Consumer NGO) warned of the associated **costs**:

> 'any adding cost, it's something that anybody, any economic operator wants to avoid. That's for sure. It's benefiting the consumer, the only one benefiting, and eventually – and *eventually* – it can be benefit for economic operators as well.'

In other words, while acknowledging the potential benefits to food system actors, this participant highlighted the upfront costs of transparency; the rewards may be far from immediate and the timescales for deriving value from transparency may vary for different actors. Participant 63 (Development NGO) expanded on the second point, arguing that the 'cost of transparency':

> 'can affect different actors differently. So the classical example I guess would be that a smallholder farmer would have [to work] that much harder to apply the same standards to enforce traceability than compared to like a bigger company […] where this fixed cost is maybe less pronounced.'

Although most discussion focused on issues associated with data collection, data sharing and communication as key obstacles affecting the potential for transparency, Participant 58 (European Commission) highlighted a structural issue regarding **fragmentation** within the food system:

> 'if you want to share information across communities that normally don't meet each other. Or you want to connect business supply chain people with more other disciplines like IT people. Then it takes quite a long time before you can connect these people, so the building of the partnerships across disciplines or between different parts of the supply chain is a hurdle.'

5.4 Digitalisation towards transparency in food systems

Digitalisation has been promoted widely as a route to achieving greater transparency in the food system (see Myshko et al., 2024, Astill et al., 2019). Task 7.3, therefore, explored participants' perspectives on digitisation towards transparency. These are discussed in this section, firstly through exploring the opportunities offered by digital technologies, and subsequently through reviewing their perspectives on actual and potential obstacles.

5.4.1 Opportunities offered by digitalisation

Innovations in digital technologies were commonly viewed as playing a potentially significant role in improving the transparency of food systems. The potential broad benefits were summed up by Participant 66 (European Commission):

> 'It's a big enabler, big enabler. When you look at the Food 2030 pathway on a data and digital transformation, it really identifies kind of digital innovation as the one solution to enhanced traceability, transparency and everything that comes along with that. So process control, assessment, risk prediction, risk communication also. But also reducing administrative burdens, especially for SMEs.'

Others identified a particularly significant benefit as relating to the efficiency or **ease of information exchange**:

> 'it's all about exchanging data, it's all about exchange systems and this is also one of the issues […] – the compatibility of the different systems that they can work together' (Participant 52 - European Commission).

This ability to exchange data easily in relation to food safety is, for Participant 39 (European Commission), embodied in existing systems, such as TRACES (the EC online platform for animal and plant health certification). For those involved in policymaking and regulation, however, the key benefit of emerging technologies, such as AI, is the ability to **process larger volumes, and more diverse sources, of data**:

> 'there are Digital applications now that can help us manage and process massive data in a more effective way that we did before. And perhaps that's the future for EU regulators to see how artificial intelligence can help us do better work' (Participant 38 - European Commission).

One participant referred to the increasing quantity of data passed through the iRASFF system (the EC's Rapid Alert System for Food and Feed) and its associated need to be 'continuously revised' to keep up with the volume and nature of data:

> 'there's more and more information so it means that the system, the IT system, has to absorb all this information and this has to be done quite smoothly. So, it means that information comes in, it gets assessed, it's validated and then circulated. So, it means that the system as such has to cope with quite a lot of information, not only the information, but also attachment documents. Everything is circulated through the system, so it means that the system has to cope with these with these. With these huge amount of data' (Participant 52 - European Commission).

Alongside the ability to process greater quantities of data from existing sources, another participant highlighted the **diversity of data** that AI would enable to be incorporated in early warning systems for food safety:

> 'for example, the scanning of social media to find. And early warnings of food poisoning. This kind of things can help identifying issues within the food system quicker. […] So, I think early warning systems, what even predictive systems based on transparent information can help supply chain actors' (Participant 58 - European Commission).

In this way, existing systems may be augmented through the linking of different datasets by AI:

> 'I think internally one of the things we need is […] AI tool to look at information across systems. So to be able to take information from the volume of import, from the rapid alert system, from TRACES, from other sources through poisoning outbreaks and ECDC [European Centre

> for Disease Prevention and Control] and give you a concise summary of risk based on different information' (Participant 39 - European Commission).

On one side, therefore, digitisation is leading to a proliferation of data that is becoming increasingly difficult to manage and analyse. Conversely, new digital technologies, such as AI, can potentially offer a solution. However, while the benefits of working with larger volumes of data were emphasized, one participant noted that such volumes are not in themselves a panacea:

> 'it's important that the huge data set we have through the transparency, through the information exchange at different levels of the chain, at least that this information is used to the best, it's not to have just the data, but we can use it to the best' (Participant 52 - European Commission).

Others noted the potential of **predictive AI** in identifying priority areas for future policy work:

> 'I think there is a role for predictive analytics to help us identify what the next candidate case studies might be. If we have enough information on issues in the food chain that can help us identify where there are significant or consistent issues and we can then look to see the extent to which implementation of Codex standards might help to solve them' (Participant 57 - Intergovernmental organisation).

The examples above focus on the potential benefits of digital technologies for transparency to those regulating the food system. However, others highlighted potential benefits across the food system. Consumers were, again, a particular focus for discussion. One participant highlighted the potential of **AI-powered chatbots**, stating he could:

> 'see a future where consumer preferences are met with characteristics of products and processes so that what you get offered is more in line with what your values and what your preferences are' (Participant 58 - European Commission).

Such chatbots would represent a route to consumer empowerment, as discussed in Section 4.2.3. Other participants suggested that increased use of digital technologies in the food supply chain could benefit consumers through **easier access to traceability data**:

> 'IT systems […] which enhance the traceability and provide, could potentially also provide information to the to the final consumer' (Participant 39 – European Commission)

> 'nowadays if you can scan a QR code on a label, you can do that or if you have an app from a food safety authority in an Member State that can give you notifications about recalls for something that is unsafe to eat' (Participant 37 - European Commission).

While ultimately benefiting consumers, another participant emphasised the benefits of such data throughout the supply chain, discussing the use of RFiD tags on livestock animals and the tracking of animal welfare certification from the farm to consumers:

> 'when they are in the slaughterhouse, you know this cow comes from farm X and was treated with the certification of welfare B. And so basically the intention […] with this is when the consumer is buying the meat that it's possible that he knows exactly from where this meat comes from and which standards they applied in that animal' (Participant 81 – Livestock sector representative body).

More generally, some participants suggested that digitalisation could be a way of **reducing the cost of data collection**, either for regulatory purposes or (for instance) at the farm level for guiding practice:

> ‘of course it has all the potentialities to offer, I would say, even to reduce the cost, probably against paper documents’ (Participant 70 - Consumer NGO)

> ‘it's really dependent on how it's done, which effects is that, but it can reduce the cost of having that transparency hopefully and I think therefore it's really important that can enable us to create transparency in areas where this is currently just not doable or not cost efficient’ (Participant 63 - Development NGO).

The second participant highlighted in particular the potential impact on small coffee producers in simplifying the tracing of beans from individual farmers.

Regardless of costs, another participant argued that engagement with digitalisation is necessary for continued market access:

> ‘if you don't use the all the digital equipment or the all the possibilities offered today by all kind of technologies, you will not stay in business too long’ (Participant 33 - Dairy sector representative body).

However, despite the overall positivity about the future role of digital technologies in enabling transparency, Participant 51 (EU agency) argued that this should not shift the focus away from bigger goals:

> ‘at the end the tool is a tool. Is the people that is, of course, the big step change on transparency. It is an approach. Transparency and engagement is an attitude – is not as something that the tool would be doing.’

In other words, digital technologies can serve a useful role, but they are only tools; **a means to an end rather than an end in themselves**. One participant spoke of this in relation to the ‘twin green and digital transition’, noting that:

> ‘I see that digital solutions that enable data sharing and collecting open-source data are advancing, but are they really supporting also the green transition?’ (Participant 58 - European Commission).

In many ways, this discussion mirrors the literature discussed in Section 2 in that digital tools offer many opportunities for enhanced collection, analysis and communication of food system data. However, there is a danger of viewing such technologies as a panacea. For instance, provision of information does not guarantee consumer interest and lack of standard requirements can reduce benefits to regulators and policymakers.

5.4.2 Obstacles to digitalisation as a route to greater transparency in the food system

Participants identified a range of obstacles to using digitalisation as a route to greater food system transparency. Some of these aligned with the wider challenges to transparency that they had identified – for instance, cost, data security and confidentiality and harmonization of data collection/communication.

In discussing **cost**, Participant 38 (European Commission) used the example of application dossiers submitted to EFSA, which have migrated from paper-based to electronic formats:

> ‘it has to be electronic, but I can tell you also that business operators were not particularly happy. They liked very much the old-fashioned way. […] you know you print it, you send it by post, or to do that electronically, upload and then identify which part you want confidential and how you claim confidentiality. They claim that, for example, it’s a lot of additional work,

> administrative burden, data, data, data. So when you introduce a digital tool, first of all you have to build up your case that there is a general interest that requires the adoption of that digital tool and that any benefits that way, the cost or the administrative burden or that the administrative burden is mitigated.'

In other words, the collection and collation of data can be a **perceived or actual burden for businesses** regardless of the format, but introducing a new digital approach can accentuate this. That cost may also be felt by the consumer, who might not perceive immediate benefits of added traceability, for instance:

> 'the challenge is it costs money and there's competition for an organic apple that costs slightly less, that hasn't got the traceability. And I just picked an example off the off the shelf so to speak. If it's cheaper not to have an IT traceability system, then people will buy the apple that's 22 pence cheaper' (Participant 39 – European Commission).

Participant 77 (National government ministry) similarly warned of impacts of technological requirements on prices across the value chain, noting that a requirement for certain technologies to be 'implemented by the agricultural machinery sector' would be passed 'to the consumer so that it would be, for example, raising the prices for their tractors.'

Such costs would be passed through the value chain and could be felt differently by different **scales of business** and in **different parts of the world**. Referring to the former, Participant 20 (Research organisation) spoke of the potential for increasing transparency through application of technologies that 'can assure the safety of the data and also simplify the gathering of information' but warned that:

> 'I'm sure that with bigger companies it is already a reality, but we need to have the small producers to adopt these technologies. So identify what is the technology can help, and help them to implement those technologies. Otherwise, they will not reach any transparency in their food supply chain.'

Speaking of differential impacts around the world, Participant 57 (Intergovernmental organisation) warned of the need for technological requirements to be accompanied by 'investment and support for infrastructure development and implementation in low- and middle-income countries' – something that, he said, could be supported by 'agencies such as UNIDO [the UN Industrial Development Office] or […] the World Bank.'

Alongside costs, participants identified the lack of an **enabling environment** as a potential obstacle. This could relate to physical **infrastructure**, such as the availability of broadband internet (Participant 66 – European Commission), but especially to poor digital **skills**:

> 'especially capacity building. If you look at digital skills in Europe, I mean we're below to what we want to reach and I think that's where it starts of course' (Participant 66 – European Commission)

> 'One of the things has obviously helped is the legislation on traceability in in the food chain that we have in Europe, which has helped and hence a lot of the systems within the food chain. So exchanging between producers, but I think ultimately the only way we're going to get better information to the consumer is if the consumer demands it or asks for it or is prepared to pay for it' (Participant 39 – European Commission).

Similarly, Participant 34 (Livestock sector representative body) highlighted joint concerns around digital skills and costs:

> 'for some it's more the education – you know the older you get, the harder it is for you to adopt these new technologies. And then for the younger, although they might seem affordable, sometimes it's just too much for them to invest in some of these new technologies.'

Participant 20 (Research organisation) agreed that education is important but emphasised that this would only have a positive impact if young farmers are convinced that 'if they use the system [it] could be also helpful for their farm management'. Referring to a different part of the supply chain – cheesemakers – 'they say "I don't want to add"; they have so many things to do'. Regardless of the financial cost, in other words, food system actors can perceive new technologies as a **burden on their time** so need to see a clear value in their adoption. Digitalisation, in other words, could accentuate some of the wider disparities around impacts of transparency measures outlined in Section 4.2.4.

Further questions were raised about the influence of particular **data providers** within the food system. For instance, Participant 63 (Development NGO) warned:

> 'if transparency is provided, then it's important who is the provider and that not everybody gets dependent on a few sources for this transparency – and these actors that provide transparency may be a data company or whatever that has an oversized influence.'

Such differing impacts were further outlined in relation to **data sharing agreements**:

> 'there are contractual arrangements in terms of data sharing between the different operators and this contract a few specific so we don't have as a European organization any regard on what's the way it is it is managed by companies. That's part of the business choice. The only thing that we have is indeed this code of conduct for data sharing but what happens then, it's really their decision to be part or not of a system' (Participant 33 - Dairy sector representative body).

5.5 Public policy and the promotion of food system transparency

The previous sections have provided an overview of the nature and potential role of transparency in the food system, along with a discussion of potential obstacles to its promotion and implementation. These obstacles present a range of challenges for policymakers, which are outlined in this section to provide a basis for recommendations in the conclusion of this report.

5.5.1 Beyond silos: towards a systems approach to transparency

A number of participants spoke of the important role policy can play in **setting a direction** and opening a conversation, **shifting the focus of debate**. Discussing the *Farm to Fork Strategy*, Participant 58 (European Commission) suggested that it has been successful not only because:

> 'it came up with many concrete proposals on how to advance transparency but it has outlined the importance of transparency and it has indicated the areas where transparency could be beneficial, for example with regards to the sustainability and the healthy diets. So although it didn't come up with all the solutions on how to achieve it, it set the direction that was not necessarily there before.'

Amongst the challenges posed by the *Farm to Fork Strategy*, the most frequently identified by research participants was the move beyond siloed thinking and towards a **systems approach**. One participant felt that this, indeed, was the sole positive impact of *Farm to Fork*:

> 'the effects of the *Farm to Fork Strategy* are still – the only positive effect I see of the farm to fork today is that we are talking about food systems in Europe. It is bringing people together and that's basically the first effect' (Participant 56 - European Commission).

The siloed nature of both policy and the food system it attempts to influence was highlighted in a number of areas. A first type of siloing involves the lack of **connection between different areas of activity**. In one instance, for example, the possibility of a One Health approach was discussed, moving beyond the food supply chain to encompass livestock health and welfare and human health:

> 'it's a connected health – we call it that. […] people work in silos and like you know we're running after issues, especially we're talking about health, we're talking about public health because animal is part of public health, animal health' (Participant 34 - Livestock sector representative body).

In this case, the participant was frustrated that public health and animal health had been treated widely as separate issues, ignoring the implications of animal health that extend across and beyond the food system.

A second type involved **policy fragmentation at different levels of government**:

> 'a lot of parts of the food system have been left either more to at the national level or have been addressed in very specific ways. In terms of regulation and policy measures, so the end result is a very siloed and fragmented policy landscape that does not make for effectiveness or particularly good impact because what you have is policy incoherence, conflicting policy measures and contradictory approaches' (Participant 50 - Environmental NGO).

This could relate to the implementation of EC Directives within Member States, but also to additional regional and national approaches as well as disparities between the European Union and non-Member States.

A final form of fragmentation and siloing related to the **structure of the European Commission**; as Participant 68 (Environmental NGO) commented, 'at the Commission level, it's all very siloed'. One participant stated that he 'would abolish all these ministries, departments that are looking only at certain issues and I will bring them together' (Participant 56 - European Commission). He went on to give the example of education and its role in developing 'more responsible consumers in future'. He argued that bringing together interests around agriculture, education, health and environment (for instance) in a single Directorate General would build 'more common views on how to work together and not just a doc because now it's most a document.' His final comment referred to the disjuncture between policy and practice where, for instance, the *Farm to Fork Strategy* presents an idealised systemic approach that has yet to be reflected in the structure of the Commission. Participant 55 (Environmental NGO), therefore, argued for a need to 'break the silos and to create synergy within the institutions themselves;' existing governance structures do not promote the types of systems thinking that their associated policies promote. While these participants were discussing wider policy developments, these observations have significant implications for transparency, particularly in relation to developing benchmarks and data requirements from a more holistic perspective that takes account (for instance) of environmental and social impacts concurrently.

5.5.2 Mandatory vs voluntary approaches

As noted above, some argued that the most important role of policy was to open a conversation, which could influence the direction of actors across the food system. Such a perspective relates to the broader distinction between mandatory and voluntary approaches as routes to transparency,

which was discussed by many participants. Because of the close relationship between transparency and the availability and accessibility of data, much of this discussion focused on the potential role of policy in encouraging or requiring the sharing of data.

Central to this discussion was the question of whether businesses in the food system would be willing to share data without a legislated requirement. Participant 56 (European Commission) argued that 'you cannot leave everything to the market as government,' suggesting that the role of policymakers is 'to come up with the legislation that could create a good **enabling framework**':

> 'You need to also make sure that there is a framework that is enabling the uptake of this technologies. One big issue is about data ownership, data use and this is something that you can solve with the with a proper legislation in place. Otherwise, farmers will never buy in these solutions because they're afraid how data will be used by whom. With owning the data and this kind of thing. I am convinced that the policymakers, you know, the institutions, can give a big contribution in this area' (Participant 56 - European Commission).

Others pointed to particular types of data that could potentially be used towards societal benefit but are currently held privately. For example, Participant 58 (European Commission) discussed consumption data held by retailers:

> 'I think that in food systems, regulatory action will be needed to open up what I call data monopolies that could be of societal benefit, but that are being closed for the moment because they are proprietary.'

How such data might be shared and used was a point of contention. Participant 33 (Dairy sector representative body), for instance, argued for a 'minimal approach in terms of legislation,' stating that 'preserving the interest of the data owner is the priority' and that 'there should be consent from the data owner for what is being done with the data'.

At the opposite end of the spectrum, Participant 63 (Development NGO) felt that industry required a greater push, arguing that approaches such as 'stakeholder platforms' (where businesses could voluntarily share data about their products) would be insufficient: 'because people […] would of course have an incentive not to join that without being forced to do that.' He suggested that there are precedents for such inaction, such as 'nutrition labelling and everything else that this is not happening just because companies say that they want to do that.'

Others forcefully spoke of the need for mandatory measures not only around **disclosure of data** but also to ensure **standardisation**:

> 'transparency needs to be mandatory, needs to be in line with an international standards and there needs to be no optionality around what companies choose to disclose. They need to disclose everything, or if they don't disclose on a particular point, explain why, which to the point is a sector may not be relevant to a sector' (Participant 59 - Standards NGO).

Survey respondents similarly wrote about the importance of having an 'agreed and robust set of indicators' (S32 – Environmental NGO) against which to measure business practices and of having 'clear rules for everybody who is involved in these systems' (S11 – National government ministry) – though these responses were not explicit about who should be responsible for establishing such rules.

The issue of standardisation relates closely to that of **interoperability**. Participant 82 (Organic sector representative body) highlighted this issue in relation to the wider siloed approach to food system transformation. Speaking specifically about the availability of food system-related data in Italy, he commented:

> 'The main problem now is that they have a lot of data in different silos in several different silos and they are in difficulty to manage this data, to try to, to take knowledge from this data. A lot of application, a lot of solution but a very low level of knowledge because they are not integrated so that the main goal for the next years in Italy is interoperability and data sharing inside and to have knowledge from through all these data.'

Another participant expanded on this topic, arguing that a role for policy is to 'build a common taxonomy of terms that then inform the development of different standards' (Participant 67 - National government). His argument was that standards tend to be developed in relation to specific issues, leading to fragmentation and repetition. A more constructive approach, he suggested, would be that 'they should be interoperable like you should be able to use one thing and it will meet your needs across different purposes.'

The argument for standardisation potentially dilutes the possibility for transparency data as a basis for competitive advantage (Participant 59 - Standards NGO), but this participant argued that there is a need for a 'legal baseline to force people to do things' to prevent a 'gap between the leaders and the laggards' from widening. The Deforestation Regulation (EUDR) was highlighted as a good example of such legislation. Participant 29 (Animal bi-product sector representative body) argued that this ensures that:

> 'information becomes transparently available to everybody. That's fine, that's good, that's very good. Because it empowers all these other activist organizations or animal activist organization or environmental activist organization to have a kind of bounty system. They will then track the industries and say look, give me information because they have to provide information.'

In that sense, legislation provides an initial 'incentive' and can 'push the industry [to the] next steps' (Participant 39 – European Commission)

A contrasting perspective was offered by Participant 38 (European Commission), who warned against policymakers being 'excessive in [their] reaction' to any lack of transparency:

> 'we see that business operators are motivated, they realize they need that they need to offer that data even on a voluntary basis because then the measures will not be harsh.'

Here, the implicit threat of more stringent **regulation** and reporting requirements could encourage actors to work together to find a mutually acceptable **non-mandatory approach**. This implies a greater **partnership** between food system actors and regulators, where there is a mutual understanding of potential societal benefits of data sharing accompanied by acceptance of the need for confidentiality around some commercially sensitive aspects.

Others warned of the difficulty (and importance) of appropriate **enforcement** of regulation. While advocating the role of legislation, Participant 56 (European Commission) also warned that 'we need to legislate less and better':

> 'we cannot come with a bunch of regulatory initiatives that are over floating on Member States because they don't have the capacity to manage all this legislation. And then if you make a legislation and it's not enforced, what's the point to make a legislation?'

Other participants concurred with this perspective. Participant 59 (Standards NGO), for example, stated that 'A policy is only as good as its enforcement. He went on to say:

> 'So OECD, they've got specific due diligence around the agricultural sector and other things with the UN guiding principles etc, they're all lovely documents. They actually read really well and say exactly what they want to say, but they're completely unenforceable.'

For this participant, enforcement would have tangible consequences for individuals who were complicit in noncompliance:

> 'Head of legal walks into a boardroom, talks about how the annual report is going to be finalized and will have to, as part of his job, tell the directors: "Just so you know, if this isn't done properly, one potential penalty is jail time," and that just wakes people up a little. And so that's basically that, that threat of enforcement.'

Finally, participants discussed the **speed of regulatory impact**. One aspect of this – as seen recently in especially high profile in the delayed implementation of the Deforestation Regulation – is the readiness of industry:

> 'regulatory pressure can have a positive impact. But also a negative impact. And it depends, all depends on how prepared and how readily ready the industry is in order to implement what is being requested' (Participant 29 - Animal bi-product sector representative body).

There is an important balance to achieve, in other words, between efficient policymaking that enables rapid implementation and introducing requirements too speedily leading to economic damage and poor enforcement. Others questioned whether regulation was always the best approach to achieving swift action. For instance, Participant 56 (European Commission) discussed the slow passage of the Green Claims Directive:

> 'now the Green Claims is still being discussed by the Council and the Parliament. So it's not even enforced with it. Then there will be a transition phase plus enforcement. So before 2-3 years we will not see any effect.'

Given the potential difficulties in speed and enforcement, others highlighted alternative approaches to collecting data that enable the monitoring of progress against policy objectives. One, for instance, used the Farm Accountancy Data Network (FADN) as an example:

> 'one key aspect is probably also in how far you make policies mandatory in a way, like if it's implemented by the government as a law. And yeah, sometimes it's… it's other policies, like for example, the FADN. I mean, it's not for every farm, like there's a couple of farms were involved, so I think this is […] important' (Participant 77 - National government ministry).

Another focus group participant similarly felt that the FADN – and its successor, the Farm Sustainability Data Network (FSDN) – had an important role to play in showing 'how the farms are performing from different point of views: economic sustainability, the environmental point of view of sustainability etc.' (Participant 76 - European Commission). Another participant noted that a wider development is underway, with the forthcoming implementation of the EU Food System Monitoring system, which will include 'a dashboard…and data that is harmonised…to assess KPIs for the whole food system' (Participant 66 - European Commission)

For these participants, such an approach was a useful compromise as it enabled the collection of in-depth data while taking away the bureaucratic – and potentially costly and difficult to enforce – requirements of mandatory data sharing. However, as Participant 76 (European Commission) commented, 'the question is from which perspective do we want to tackle transparency?' For

instance, the transparency requirements for food safety can be very different for those relating to environmental sustainability.

6. Conclusion and recommendations

This report has highlighted the complexities of achieving greater food system transparency, emphasizing the challenges policymakers face in creating an enabling environment for a more sustainable, safe and nutritious food future. This final section outlines the key findings from the report and provides initial recommendations for policymakers and for further research.

While policymakers face a wide range of challenges in promoting and enabling greater food system transparency, the report argues that the first step towards this is a clear definition of 'transparency.' The research has shown that participants were in broad agreement about the ethos that underpins transparency: openness, reliability of information and clear communication. However, it has also illustrated the differing views about each aspect of this ethos. For instance, 'openness' can refer to releasing all data related to a product or could be targeted to specific purposes and aspects of data. While participants promoted 'accessibility' of food-related information, their visions for this ranged from clear labelling of products for consumers to provision of easy-to-access data for regulators. Transparency was also seen to differ between areas of concern. For instance, some participants argued that it should not be necessary for consumers to access additional information to know that their food is safe; they should be able to trust the regulatory system to protect them. In contrast, some nutritional and environmental decisions in relation to food can relate to individual choices, where consumers would benefit from greater access to trustworthy information.

As argued in Deliverable 7.1 (Bear et al., 2023), therefore, it will be difficult to promote greater food system transparency without a clearly-defined vision of what transparency consists of and what purpose it should serve. The report argues that this is currently absent from policy discourse, which tends to be more focused on specific practical objectives (e.g., clearer front-of-pack labelling) than on embedding a defined ethos of transparency across food-related policy. However, a single definition of transparency may not help; because of the different requirements of actors across the food system, and of food safety in comparison to sustainability, multiple definitions may be required; as Participant 70 (Consumer NGO) put it, 'there is not a single transparency'. The key requirement, therefore, is to provide a context-specific definition rather than assume that particular actions will follow a general call for transparency.

Recommendation 1: Policy promoting transparency as a tool for food system transformation should provide a clear definition of transparency and should define the purpose it is intended to serve.

The majority of participants in this study approached transparency either from the perspective of particular relationships (e.g., those involving retailers and consumers or producers and regulators) or from a supply chain perspective. This is in marked contrast to the food systems approach that characterises the trajectory of policy discourse around the Green Deal and *Farm to Fork Strategy*. Nonetheless, the drive towards reduced regulatory burden on businesses and simplification of reporting requirements conversely highlights the benefits of a more joined-up approach to data-sharing and transparency in the food system. The EC's '"collect once, use multiple times" principle' (European Commission, 2025d: 24), for instance, implies the need for careful coordination across areas of data collection for monitoring; even if recent policy has moved away from an explicit engagement with systemic thinking, such an approach will be of inherent benefit to the drive for greater efficiency. A systems approach to transparency will not only promote greater efficiency but would account explicitly for differential impacts of regulatory requirements for actors across the food system.

Beyond this, discussion of the ability of transparency to empower actors across the food system points to a particular challenge for future policy in this area: how to lever greater transparency to redistribute

responsibility across the food system. A similar issue was highlighted in Deliverable 7.1, which noted that advice contributing to the *Farm to Fork Strategy* had advocated that the 'strong influence of food processing and retail sectors have on producer and consumer choices warrants a greater focus of sustainability policies and initiatives' (European Commission Directorate-General for Research and Innovation - Group of Chief Scientific Advisors, 2020: 38). While that advice referred to food policy more broadly, the research underpinning this report suggests that transparency within the food system has an important role to play in moving away from the premise that food system transformation can be delivered by market-led approaches relying on well-informed consumers.

Recommendation 2: Policymakers should adopt a systems approach to transparency concerns, ensuring that transparency initiatives benefit actors across the food system, maximise the benefits for multiple sectors and areas of concern (e.g., sustainability, health, safety), and enhance collaboration amongst public institutions.

Achieving such a goal is dependent on dialogue between areas of interest and alignment over targets. Policy has an important role to play in such dialogue, establishing an enabling environment and steering conversation, as well as through regulatory approaches to data-sharing requirements. It also has a significant role to play in enabling interoperability – both between different areas of the food system, and between data providers – through enabling dialogue and agreement about the terms that underpin data requirements.

Recommendation 3: Policymakers should play a central role in building a common taxonomy of terms to inform the development of standards and regulatory requirements for data collection and sharing, improving interoperability.

Interoperability, and agreement over appropriate forms of transparency, can only be brought about through an inclusive and collaborative approach, understanding the requirements of, and impacts on, heterogeneous actors across the food system. As outlined in the report, data sharing that benefits one actor may be viewed as detrimental by another. In engendering such dialogue, policymakers can play an important role in clearly defining the purpose and goals of transparency (Recommendation 1) and in directing dialogue for societal benefit.

Recommendation 4: Policymakers should ensure that diverse food system actors, including businesses and civil society organisations, are engaged in dialogue around enhanced transparency, taking account of differential impacts but directing collaboration towards societal benefit.

The ongoing focus on the 'twin' digital and green transition encourages exploration of the possibilities offered by emerging technologies for food system transformation. This report has highlighted some such possibilities, particularly with reference to the collation and analysis of larger quantities of data and the use of new forms of data. However, as some participants noted, new technologies are not a panacea for greater transparency; their outputs may obfuscate if not employed appropriately. New technologies may also impact differentially, whether in relation to the costs of uptake or the skills and infrastructure required to engage with them. Participants warned of the possibility of concentrating power in the food system in organisations that own data; policymakers have a responsibility to ensure that data ownership is appropriately regulated and used towards societal benefit.

Recommendation 5: Future policy promoting food system transparency should continue to identify potential advantages of digitalisation but must assess its differential impacts across the food system.

There is a significant ongoing tension between voluntary and mandatory approaches to enhancing food system transparency, as evidenced by the post-Budapest Declaration discourse and the *Vision for Agriculture and Food*. The report has provided examples of data-sharing initiatives – such as the EU Food System Monitoring Dashboard – that enable easier benchmarking of activities across different areas of the food system. These are to be welcomed, especially for the greater coordination they represent and the possibility they offer for more standardised reporting and operating beyond silos. However, such approaches are not a substitute for mandatory reporting that drives systemic change. The potential weakening of reporting requirements represented by current discussion around the Omnibus package is a step backwards in the path towards greater transparency, reducing the data available to regulators to assess progress towards targets and to consumers to make informed decisions about their purchases.

Recommendation 6: Future policy should carefully balance business concerns around regulatory burden with the benefits of regulatory requirements for monitoring and data collection for society.

Emerging technologies, such as AI, have an important role to play in reducing a perceived or actual burden, particularly for large businesses, through automating data collection and reporting and through enhanced accessibility of such data. However, as noted previously, such benefits need to be weighed against costs for different actors, and it is vital that technological engagement is driven by food policy priorities, rather than vice versa.

Overall, this report has shown that the achievement of food system transparency requires a systemic approach, demands clear definitions and should be built on collaborative engagement across all stakeholders. The development of future policy should carefully balance regulatory needs with technological opportunities, ensuring equitable data access and usage. Ultimately, building trust, aligning goals, and developing an enabling environment are essential for a sustainable, healthy and safe food future.

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Appendix A: Topic guide for interviews with organisations involved in developing/implementing public policy (e.g. EC/intergovernmental organisations)

Warm-up/background questions

1. How long have you worked in the organization?
2. What is your role in the organisation? How long have you held this role? What other roles have you held in this organization?
3. What was your career route to the current role? Do you have a background in policy/regulation?
4. What do you consider to be your area of expertise?
5. Have you been involved in the design/formulation/implementation of policy/regulation designed to enhance the transparency of the food system? *[Ask for specific examples – any specific sectors? Specific areas of policy – e.g. environmental sustainability, health and nutrition, food safety? Aimed at specific points in the supply chain – e.g. producers, manufacturers, retailers, consumers? What of those outside supply chains – e.g. technology providers, regulators? What scales – e.g. EU, national government, international etc?]*
    - *If the answer is 'no', find out more about their experience of policy/regulation design/formulation/implementation, especially in relation to the food system*

Defining transparency

6. How would you define 'transparency' in relation to the food system? What are the key attributes of a transparent food system?
7. Would you say that your definition of 'transparency' would be accepted by other stakeholders across the food system? From your experience, can you think of any instances – e.g. from policy, regulation or from other stakeholders – where interpretations of 'transparency' might not align with yours?

Policy, regulation and transparency

8. From your perspective as someone involved in the design/formulation/implementation of policy/regulation, what are the key benefits of enhancing food system transparency? Who might benefit from greater transparency? *[encourage to think across the food system – actors in the food supply chain, but also beyond this, including regulators etc]*
9. From your perspective as someone involved in the design/formulation/implementation of policy/regulation, what are the key challenges in enhancing food system transparency? *[Specifically, what are the challenges for using policy/regulation to enhance transparency?]*
10. What challenges have you experienced in developing policies to enhance the transparency of the food system?
11. What challenges have you experienced in implementing/rolling out policies to enhance the transparency of the food system?
12. Does your role involve monitoring/regulating any aspect of the food system? Which aspects of the food system do you monitor/regulate?
13. For what purposes do you monitor/regulate these aspects of the food system? *[e.g. 'Food safety'; 'Health and nutrition'; 'Environmental sustainability'?]*
14. How do you evaluate the impact of your policies? What methods do you use?
15. What types of data/information do you draw on in this monitoring/regulation? Do you have access to all the information/data you need? What other types of data would help you? Is the data you access of sufficient quality? What improvements could be made to the data? Do you have sufficient access to appropriate data? What improvements could be made to the accessibility of the data?

16. What challenges do you experience in this monitoring/regulation? *[prompt e.g. on availability of data, standardisation/consistency of data, quantity of data (too much, too little), cost of data, expertise]*
17. Does this monitoring involve any digital technologies? *[e.g. Artificial Intelligence, Blockchain, Internet of Things]*
18. Would any (other) digital technologies enhance your ability to monitor aspects of the food system? Or could the digital technologies you are already using be employed in better ways? How? *[Encourage to expand on their potential role – e.g. standardisation, rigour, quantity of data, ease of access, automation etc]*
19. Which, if any, policies or regulations have been successful at enhancing food system transparency? These could be from the EU, from an EU Member State, or from a different part of the world. *[Need to get into EC policy and regulation in particular here – prompts could include the Green Claims Directive, the Farm Sustainability Data Network, the Farm Sustainability Data Network, the Corporate Sustainability Due Diligence Directive, Farm to Fork Strategy, Green Deal etc]*
20. Why do you feel these were successful? How would you judge their success for stakeholders at different stages of the food supply chain, and for stakeholders beyond the supply chain (e.g. technology providers)? Are there any ways in which they could have been more successful? What problems have there been with them? In relation to enhancing food system transparency, how might they have been improved?
21. What could be done to build on these existing policies/regulations in further enhancing food system transparency?
22. Which, if any, policies or regulations have attempted to enhance food system transparency but have been unsuccessful in doing so? Have any EU/national government policies constrained transparency of the food system? *[Focus on EU but could be from other parts of the world, or from individual countries]*
23. Why do you feel they were unsuccessful?

24. What types of policy measure could best facilitate the adoption of digital tools that would encourage or incentivise greater transparency in the food system? [*prompt if necessary: e.g. regulation, grants, codes of practice*]
25. What obstacles might hinder the adoption of digital tools that would enhance transparency in the food system? What could be done to avoid or remove these obstacles?

26. Is there anything else that we haven't covered that you would like to add?

27. Do you have any questions about the research?

28. Survey – names/link???
29. Other interview contacts

Appendix B: Topic guide for interviews with organisations that attempt to influence policy (e.g. NGOs)

Warm-up/background questions

1. How long have you worked in the organization?
2. What is your role in the organisation? How long have you held this role? What other roles have you held in this organization?
3. What was your career route to the current role? Do you have a background in policy/regulation?
4. What do you consider to be your area of expertise?
5. Have you been involved in the design/formulation/implementation of policy/regulation designed to enhance the transparency of the food system? *[Asking this to get a sense of experience – do they have experience of working in the sort of area they're trying to influence?] [Ask for specific examples – any specific sectors? Specific areas of policy – e.g. environmental sustainability, health and nutrition, food safety? Aimed at specific points in the supply chain – e.g. producers, manufacturers, retailers, consumers? What of those outside supply chains – e.g. technology providers, regulators? What scales – e.g. EU, national government, international etc?]*
    - *If the answer is 'no', find out more about their experience of policy/regulation design/formulation/implementation, especially in relation to the food system*

Defining transparency

6. How would you define 'transparency' in relation to the food system? What are the key attributes of a transparent food system?
7. Would you say that your definition of 'transparency' would be accepted by other stakeholders across the food system? From your experience, can you think of any instances – e.g. from policy, regulation or from other stakeholders – where interpretations of 'transparency' might not align with yours?
8. How would you define 'traceability' in relation to the food system? What are the key requirements for/attributes of traceability in the food system?

Policy, regulation and transparency

9. What work has your organisation been involved with around enhancing food system transparency? *[Look into this online before interview and develop additional questions/prompts around prominent examples]*
10. Why has your organisation had this focus on food system transparency? Why has this been prioritised? *[or not]*
11. What would you say are the key benefits, if any, of enhancing food system transparency? Who might benefit from greater transparency? *[encourage to think across the food system – actors in the food supply chain, but also beyond this, including regulators etc]*

12. What are the key challenges in enhancing food system transparency?
13. What role do you feel policy should play in enhancing food system transparency?
14. What are the challenges for using policy/regulation to enhance transparency?
15. Have you attempted to influence policy/regulation around food system transparency? Can you give some examples? What routes did you take in attempting to influence these areas? What challenges did you experience in attempting to influence these policies?
16. Are there areas where you feel your attempts to influence policy development were successful? If so, why do you feel these examples were successes? What were the outcomes?
17. Which, if any, policies or regulations have been successful at enhancing food system transparency? These could be from the EU, from an EU Member State, or from a different part of the world. *[Need to get into EC policy and regulation in particular here – prompts could include the Green Claims Directive, the Corporate Sustainability Due Diligence Directive, Farm to Fork Strategy, Green Deal etc]*
18. Why do you feel these were successful? How would you judge their success for stakeholders at different stages of the food supply chain, and for stakeholders beyond the supply chain (e.g. technology providers)? Are there any ways in which they could have been more successful? What problems have there been with them? In relation to enhancing food system transparency, how might they have been improved?
19. What could be done to build on these existing policies/regulations in further enhancing food system transparency?
20. Which, if any, policies or regulations have attempted to enhance food system transparency but have been unsuccessful in doing so? Have any EU/national government policies constrained transparency of the food system? *[Focus on EU but could be from other parts of the world, or from individual countries]*
21. Why do you feel they were unsuccessful?
22. Does your organisation monitor any aspect of the food system? *['monitoring' in the loosest sense – trying to get at whether they systematically track/observe any aspect of the food system, and what sources/data they use for this]* Which aspects of the food system do you monitor?
23. For what purposes do you monitor these aspects of the food system? *[e.g. 'Food safety'; 'Health and nutrition'; 'Environmental sustainability'?]*
24. What types of data/information do you draw on in this monitoring? Do you have access to all the information/data you need? What other types of data would help you? Is the data you access of sufficient quality? What improvements could be made to the data? Do you have sufficient access to appropriate data? What improvements could be made to the accessibility of the data? *[e.g. open access, government data, food industry/private sources etc]*
25. What challenges do you experience in this monitoring? *[prompt e.g. on availability of data, standardisation/consistency of data, quantity of data (too much, too little), cost of data, expertise]*

26. Does this monitoring involve any digital technologies? *[e.g. Artificial Intelligence, Blockchain, Internet of Things]*

27. Would any (other) digital technologies enhance your ability to monitor aspects of the food system? Or could the digital technologies you are already using be employed in better ways? How? *[Encourage to expand on their potential role – e.g. standardisation, rigour, quantity of data, ease of access, automation etc]*

28. What role should digital tools and technologies play in enhancing food system transparency? *[Ask them to give specific examples of the types of technology; if necessary, prompt with AI, Blockchain and Internet of Things] How might the impact of these tools affect stakeholders in different ways [e.g. at different stages of the supply chain]?*

29. Do you see any disadvantages to a focus on digital technologies as a central tool for enhancing food system transparency? *[Ask to explain. Prompt about e.g. different stages of the supply chain, costs involved, issues around data sharing/confidentiality etc]*

30. What types of policy measure could best facilitate the adoption of digital tools that would encourage or incentivise greater transparency in the food system? [*prompt if necessary: e.g. regulation, grants, codes of practice*]

31. What obstacles might hinder the adoption of digital tools that would enhance transparency in the food system? What could be done to avoid or remove these obstacles?

32. Is there anything else that we haven't covered that you would like to add?

33. Do you have any questions about the research?

Appendix C: Topic guide for focus group

Defining and prioritising transparency

One of the things we're looking at is how different people and policies define, or think about, what a transparent food system actually is. What do we mean when we talk about 'transparency'?

1. How would you define 'transparency' in relation to the food system? What are the key attributes of a transparent food system?
   [*does everyone agree with each other? If not, ask why*]
2. Which relationships do you feel might benefit most from greater transparency in the food system? [*e.g. producer-consumer; producer-retailer; government-producer; regulator-supply chain actors; producers-supply chain actors etc – look for specific examples*]
3. What needs to change? What needs to be done differently to achieve a transparent food system? [*how to address the specific areas identified through the previous questions? focus on changes in policy and regulation; prompt around differential impacts – who would benefit from suggested changes?*]

Policy, regulation and transparency

4. Is there a single policy initiative/tool that could have a transformative impact on food system transparency? [*Examples and reasons*]
   - Which, if any, policies or regulations have been successful at enhancing food system transparency? Examples of existing/current policies/regulations? [*These could be from the EU, from an EU Member State, or from a different part of the world. Need to get into EC policy and regulation in particular here – prompts could include the Green Claims Directive, the Farm Sustainability Data Network, the Corporate Sustainability Due Diligence Directive, Farm to Fork Strategy, Green Deal etc]*
     1. Why do you feel these were successful?
   - Which, if any, policies or regulations have attempted to enhance food system transparency but have been unsuccessful in doing so? Have any EU/national government policies constrained transparency of the food system? *[Focus on EU but could be from other parts of the world, or from individual countries]*
     1. Why do you feel they were unsuccessful?
5. From your perspectives as people involved in the design/formulation/implementation of policy/regulation, what are the challenges in using policy/regulation to enhance transparency? [*e.g. compliance; gaps in data sharing; poor understanding of regulation; lack of access to robust and up-to-date data for regulators. If possible, would be useful to get into voluntary vs mandatory approaches, digital vs analogue etc – and especially on differential impacts through the food system – cost and technological literacy of farmers, commercial confidentiality issues for retailers etc – actual examples*]

6. How well are policy/regulation keeping up with technological developments/opportunities relating to digitisation? [*e.g. around data sharing issues, possibilities for greater monitoring, automation of monitoring etc.*]
7. What types of policy measure could best facilitate the adoption of digital tools that would encourage or promote greater transparency in the food system? [*prompt if necessary: e.g. regulation, grants, incentives, codes of practice*]

8. For those of you involved in monitoring and regulating the food system, do you have access to sufficient data about the food system? What other types of data would help you?
    - What challenges do you experience in this monitoring/regulation? *[prompt e.g. on availability of data, standardisation/consistency of data, quantity of data (too much, too little), cost of data, expertise]*

Closing

9. Any other comments or questions before we close?

Appendix D: Final version of online survey

Enhancing food system transparency: the role of policy and regulation

Introduction

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Why should you participate in this survey?

'TITAN' - a Horizon Europe-funded research project on Transparency solutions for transforming the food system - is conducting a survey to investigate the role of policy and regulation in promoting greater transparency in the food system.

We would like to hear from those with experience of developing or implementing policy around food safety, environmental sustainability, and/or health and nutrition, as well as from those whose work aims to influence these policy areas.

A key output from the project will be a policy roadmap, which will be presented to the European Commission and shared widely with national governments and agencies. **Your participation in this survey will ensure the relevance and currency of the policy roadmap.**

Completing the questionnaire should only take around 5 minutes.

Who we are

The TITAN project is funded by the European Union's Horizon Europe research and innovation programme (Grant Agreement ID 101060739) and UK Research and Innovation (UKRI grant numbers 10042327, 10040501 and 10042327).

Within TITAN, Cardiff University is leading a work package that investigates how policy and regulation may enable, promote or constrain greater food system transparency. This work is led by Dr Christopher Bear, working alongside Dr Ananya Mukherjee and partners from the University of Surrey, Queen's University Belfast, and Delft Technical University.

Further information

Full Participant Information (version 2, dated 7th June 2024) is available here. If you have trouble accessing this, or would like a paper copy, please email mukherjeea5@cardiff.ac.uk.

Consent to participate

By continuing with this survey you confirm that:

- You have read the Participant Information Sheet (version 1, dated 22nd January 2024);
- You have understood the information sheet, have had the opportunity to ask questions, and that these have been answered satisfactorily;
- You understand that your participation is voluntary and you are free to withdraw at any time (by emailing bearck@cardiff.ac.uk) without giving a reason and without any adverse consequences.
- You understand that if you withdraw, information about you that has already been obtained may be kept by the TITAN project.
- You consent to the processing of your personal information (name, along with an opportunity to provide email address) for the purposes explained to you.
- You understand that such information will be held in accordance with all applicable data protection legislation and in strict confidence, unless disclosure is required by law or professional obligation
- You understand who will have access to personal information provided, how the data will be stored and what will happen to the data at the end of the research project.
- You understand that after the research project, anonymised data may be made publicly available via a data repository and may be used for purposes not related to this research project.
- You understand that it will not be possible to identify you from this data that is seen and used by other researchers, for ethically approved research projects, on the understanding that confidentiality will be maintained.
- You understand that anonymised excerpts and/or verbatim quotes from your questionnaire responses may be used as part of research publication.
- You understand how the findings and results of the research project will be written up and published.
- You agree to take part in this research project.

By providing my name and email address below, I confirm that I have read the statements above and am happy to participate in the research. (Please note that your name and email address are collected solely for the purpose of consent; these will not be associated with any answers you provide.)

1. Name *

2. Email address *

example@example.com

Section 1: Defining food system transparency

A common policy aim is to enhance the transparency of the food system. This survey asks questions about your perspectives on, and experiences of, policy and regulation that can affect the transparency of the food system.

Please answer questions on the basis of your own knowledge and experience; you do not need to represent an official perspective of your organisation.

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3. How would you define a transparent food system?

Your answer has to have at least 0 words and at most 400 words

0 / 400 words

Section 2: Prioritising relationships for a more transparent food system

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4. Which relationships do you feel might benefit most from greater transparency in the food system?

Clear selected

	No benefit	Low benefit	Moderate benefit	High benefit	Not sure
Producer-consumer	○	○	○	○	○
Producer-retailer	○	○	○	○	○
Government-producer	○	○	○	○	○
Government-retailer	○	○	○	○	○
Government-consumer	○	○	○	○	○
Retailer-consumer	○	○	○	○	○
Producers-supply chain actors (e.g. manufacturers, distributors)	○	○	○	○	○
Producers-finance industry	○	○	○	○	○
Manufacturers-finance industry	○	○	○	○	○
International traders-supply chain actors (e.g. manufacturers, distributors)	○	○	○	○	○

5. Would any other relationships in the food system, beyond those listed above, benefit from greater transparency?

Section 3: Constraints on the promotion of transparent food systems by policy and regulation

6. Public policy and regulation have often been promoted as key routes to developing more transparent food systems. What are the key factors that may limit their success?

Clear selected

	Significantly limiting	Moderately limiting	Slightly limiting	Not at all limiting	Unsure
Difficulty of enforcing compliance with regulation	○	○	○	○	○
Poor understanding of regulation in private companies	○	○	○	○	○
Lack of financial incentivisation for private companies	○	○	○	○	○
Gaps in data-sharing between supply chain stages	○	○	○	○	○
Gaps in data-sharing between different supply chains	○	○	○	○	○
Unequal access to data across the food system	○	○	○	○	○
Data-sharing is a risk for commercial organisations in the food supply chain	○	○	○	○	○
Lack of mandatory standards across the food supply chain	○	○	○	○	○
Influence of commercial organisations constrains policy ambitions	○	○	○	○	○
Poor understanding of potential advantages of sharing information between organisations across the food system	○	○	○	○	○
Regulators do not have sufficient access to robust and up-to-date data	○	○	○	○	○

7. Are there any other factors, beyond those listed above, that may limit the success of public policy and regulation as routes to developing more transparent food systems?

Section 4: The role of digital technologies in enhancing food system transparency

8. Which relationships, if any, in the food system could benefit from greater use of digital technologies (e.g. Internet of Things, blockchain, artificial intelligence) for the purpose of enhancing transparency?

Clear selected

	No benefit	Low benefit	Moderate benefit	High benefit	Not sure
Producer-consumer	○	○	○	○	○
Producer-retailer	○	○	○	○	○
Government-producer	○	○	○	○	○
Government-retailer	○	○	○	○	○
Government-consumer	○	○	○	○	○
Retailer-consumer	○	○	○	○	○
Producers-supply chain actors (e.g. manufacturers, distributors)	○	○	○	○	○
Producers-finance industry	○	○	○	○	○
Manufacturers-finance industry	○	○	○	○	○
International traders-supply chain actors (e.g. manufacturers, distributors)	○	○	○	○	○

9. Please name any other relationships in the food system, beyond those listed above, that could benefit from greater use of digital technologies.

10. What types of policy measure could best increase the adoption of digital tools for the purpose of enhancing transparency in the food system?

Clear selected

	Results in no increase	Results in slight increase	Results in moderate increase	Results in significant increase	Not sure
Regulation	○	○	○	○	○
Grants to enable investment in digital technologies	○	○	○	○	○
Loans to enable investment in digital technologies	○	○	○	○	○
Procurement requirements	○	○	○	○	○
Preference given in public procurement to companies that have adopted digital tools for food system transparency	○	○	○	○	○
Voluntary standards for product labelling	○	○	○	○	○
Mandatory standards for product labelling	○	○	○	○	○
Tax breaks linked to digitalisation	○	○	○	○	○
Awards to recognise innovation in digital tools for food system transparency	○	○	○	○	○

11. Please state any other types of policy measure, beyond those listed above, that could increase the adoption of digital tools for the purpose of enhancing transparency in the food system.

12. What might hinder policy and regulation from facilitating the adoption of digital tools aimed at enhancing transparency in the food system?

Clear selected

	Significant hindrance	Moderate hindrance	Slight hindrance	No hindrance	Not sure
Unwillingness to adopt digital technology among older generations	○	○	○	○	○
Regulatory barriers	○	○	○	○	○
Reliance on previous methods of non-digital certification schemes	○	○	○	○	○
Economic costs of adopting new technology	○	○	○	○	○
Poor understanding of regulations on digital compliance	○	○	○	○	○
Difficulty of enforcing compliance	○	○	○	○	○

13. Please state any other factors, beyond those listed above, that might hinder policy and regulation from facilitating the adoption of digital tools aimed at enhancing transparency in the food system.

Section 5: About you

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14. Which organisation do you work for?

15. In which country is your organisation?

Please select an option

16. What is your role in the organisation?

17. How long have you worked in this organisation?

Please select an option

18. What is your gender?

Please select an option

Section 6: Next steps

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20. Alongside this survey, the TITAN research team will also be conducting online interviews with policymakers, regulators, and those aiming to influence food-related policies, to explore topics in greater depth. Interviews will take around an hour and will be arranged at a time that is convenient for participants.
The interviews will be key to our development of policy recommendations that will be made to the European Commission.
Would you be interested in participating in an interview?

- ◯ Yes
- ◯ No

22. Would you like to receive a copy of key outputs that results from this research?

- ◯ Yes
- ◯ No