



Communication Theories in Food Systems: A Conceptual Synthesis of Policy, Safety, Security, Sovereignty, and Digital Transformation

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ABSTRACT

This article aims to synthesize relevant communication theories and approaches to explain food system dynamics across the domains of policy, food safety, food security, food sovereignty, and digital transformation. The study employs an interpretive-narrative qualitative literature review – rather than a systematic one – involving a purposive search of reputable journal articles published between 2020 and 2026. The literature was analyzed thematically to identify communication mechanisms that recur across these domains. The synthesis reveals four primary mechanisms. First, agenda-setting, framing, and discourse determine the visibility and definition of food-related issues. Second, risk communication and trust shape information acceptance and protective actions regarding food safety. Third, the diffusion of innovations, networking, and participatory communication influence coordination, learning, and adaptive capacity in the context of food security. Fourth, advocacy and rights-based communication shape spaces for voice, representation, and power negotiations within food sovereignty. Digital transformation accelerates information circulation and creates opportunities for collaboration, yet simultaneously heightens risks associated with misinformation, access disparities, and the concentration of platform power. This article proposes an integrative framework for food system communication that positions meaning-making, trust, coordination-adoption, and voice-power as four interconnected functions. The key implication is the need for food communication strategies that are credible, participatory, contextual, adaptive, and equitable

INTRODUCTION

Contemporary food systems are shaped not only by production, distribution, consumption, and waste management but also by flows of information, narratives, knowledge, and communication dynamics connecting governments, producers, supply chain actors, scientists, the media, civil society organizations, and consumers. Consequently, food-related issues cannot be understood merely as technical-economic matters. How a problem is defined, who gains the legitimacy to speak, what information is deemed credible, and how the public is engaged all help determine policy direction and social responses. Research on food systems communication underscores that communication operates amidst intersecting power dynamics and crises; it can thus serve as both a vehicle for change and a site where inequalities are reproduced (Gordon, Hunt, and Dutta, 2022; Khan, 2022; Lind and Reeves, 2021).

The urgency of a communication-based approach is heightened as food systems confront multifaceted risks: supply chain disruptions, climate change, foodborne illnesses, price pressures, household food insecurity, and governance conflicts of interest. Experiences during the pandemic demonstrated that food system resilience is heavily influenced by connectivity, coordination capacity, community networks, and the quality of circulating information. Conversely, fragmented policy communication can hinder cross-sectoral integration, whereas communication fostered through spaces of co-production and collective trust can enhance coordination and policy legitimacy (Béné, 2020; De Schutter, Jacobs, and Clément, 2020; Vara-Sánchez et al., 2021; Clark and Jablonski, 2022).

Regarding food safety, communication determines whether scientific information about hazards translates into risk perceptions and proportionate protective actions. Recent literature indicates that public risk perception does not necessarily align with expert assessments and that source credibility is a crucial factor in message acceptance. Social media accelerates the speed and extends the reach of risk communication, yet it also creates an environment where misinformation, sensational narratives, and fear-mongering circulate more rapidly than evidence-based clarifications (Thomas and Feng, 2021; van der Vossen-Wijmenga et al., 2022; Kasza et al., 2022; Diekman, Ryan and Oliver, 2023).

In the realm of food resilience and sovereignty, communication serves a broader purpose than mere risk mitigation. Communication networks facilitate learning, innovation, mutual aid, and local organizing, while participatory communication can expand opportunities for smallholder farmers, women, Indigenous peoples, and vulnerable groups to influence decision-making. However, digitalization is not inherently emancipatory; while digital technologies can enhance access and connectivity, they can also exacerbate power asymmetries, deepen reliance on infrastructure and platforms, and marginalize groups with limited digital literacy or access (Prause, Hackfort and Lindgren, 2021; Levkoe, McLaughlin and Strutt, 2021; Qanti, Peralta and Zeng, 2022; Huambachano et al., 2022).

Although literature on food policy communication, risk communication, digital communication, food resilience, and food sovereignty is expanding

rapidly, discussions often remain siloed within separate fields. Consequently, it is not always evident how distinct communication theories can be viewed as complementary mechanisms within a single food system. This article addresses this gap by offering a conceptual synthesis that links agenda-setting and framing, risk communication and trust, diffusion and networks, participation and advocacy, and the issue of digital power within a food system communication framework (Coulas, 2021; Knezevic, 2021; Gordon, Hunt, and Dutta, 2022).

Against this backdrop, the article poses two research questions. RQ1: How do communication theories and approaches explain meaning-making, risk perception, innovation adoption, participation, and power relations regarding food policy, food safety, food resilience, and food sovereignty? RQ2: How is digital transformation reshaping food communication practices, and what integrative principles are required to make food system communication more credible, participatory, adaptive, and equitable? The article aims to (1) map and synthesize the theoretical functions of communication across these four key domains of the food system and (2) formulate an integrative framework that can serve as an analytical foundation for research and the design of food communication in the digital era.

LITERATURE REVIEW

Communication as a Constitutive Process in Food Systems

The food system communication approach proceeds from the assumption that communication is neither neutral nor merely a matter of transmitting messages from sender to receiver. Communication helps shape the categories, interests, and problem boundaries that subsequently form the basis for collective action. From this perspective, terms such as 'food crisis,' 'local food,' 'healthy food,' or 'food sovereignty' carry policy implications because their meanings are negotiated through the discourses of institutions, media, communities, and markets. Studies on food communication, therefore, must consider who has the power to define problems, how knowledge gains authority, and which groups are represented or marginalized in public discourse (Gordon, Hunt and Dutta, 2022; Coulas, 2021; Khan, 2022; Barca, 2022; Dempsey, 2021).

The constitutive perspective also explains why food policy requires cross-boundary communication. Food systems are multi-actor arenas that simultaneously encompass goals related to health, the economy, the environment, farmer welfare, and justice. Policy research indicates that policy integration demands mechanisms capable of bridging the languages, indicators, and interests of different institutions, while co-production processes require spaces for interaction that foster trust and shared communication codes. Thus, the quality of food governance is closely linked to the communicative capacity of institutions to manage differences and establish coordination (Galli et al., 2020; Vara-Sánchez et al., 2021; Clark and Jablonski, 2022).

Agenda-Setting, Framing, and Policy Discourse

Agenda-setting theory focuses on the process of priority determination: issues that garner greater attention from the media, officials, organizations, or advocacy networks tend to secure a higher place on public and policy agendas.

Within food systems, this mechanism is relevant as actors compete to position issues such as food security, prices, nutrition, local agriculture, climate change, or producer welfare as urgent matters. However, visibility alone is insufficient; framing explains how the same issue can be defined through differing causes, victims, responsibilities, and solutions. Consequently, framing determines not only 'what' is discussed but also 'how' the public and policymakers perceive potential courses of action (Knezevic, 2021; Coulas, 2021; Rust et al., 2021).

Framing is particularly crucial in food sustainability communication, as messages can resonate differently depending on the audience's values, anxieties, product context, and perceived sense of control. Recent experimental studies demonstrate that message structure and the attribution of control can influence evaluations of sustainable food and "imperfect" food, as well as food waste reduction behaviors. Conceptually, these findings reinforce the argument that effective food communication requires alignment between the frame, audience characteristics, and the desired action, rather than merely increasing the volume of information (Lin, 2022; Weisstein, Meyer and Kershaw, 2024; Dai and Gong, 2024; Xiao et al., 2024).

Risk Communication, Trust, and Uncertainty

Risk communication views food safety as a matter of translating scientific evidence, uncertainty, probabilities, and consequences into messages that are both understandable and actionable. Modern risk communication models are moving away from one-way approaches that treat the public as passive recipients. The focus is shifting toward two-way communication, acknowledgment of audience perceptions and values, transparency regarding uncertainty, and stakeholder participation. In this context, the success of a message is measured not only by the accuracy of the information but also by the ability to build trust, enhance decision-making capacity, and prevent disproportionate responses (Kasza et al., 2022; Baba and Esfandiari, 2023; Zhu et al., 2022).

Trust serves as a bridge between information and action. When the public perceives a source as competent, transparent, and committed to public safety, recommendations are more likely to be accepted. Conversely, divergent perceptions between experts and consumers, past negative experiences, or conflicting messages can undermine institutional credibility. Therefore, risk communication requires consistency across channels, proportionate explanations, and an acknowledgment that risk perception is shaped by knowledge, experience, culture, and the nature of the hazard, rather than by technical data alone (Thomas and Feng, 2021; van der Vossen-Wijmenga et al., 2022; Zhang et al., 2022).

Diffusion of Innovation, Networks, and Digital Communication

The diffusion of innovation framework positions communication as the process enabling knowledge about an innovation to move through channels, time, and social systems until it is either adopted or rejected. Within food systems, this logic applies to the adoption of agricultural technologies, food safety methods, sustainability practices, and digital services. However, recent literature indicates that adoption depends not only on the attributes of the technology itself but also on trust, compatibility with local practices, the framing

of benefits and risks, and the networks that serve as reference points for users. Therefore, innovation communication must be examined alongside network theory and the social processes that determine who has access, who acts as an opinion leader, and who is left behind (Pfeiffer, Gabriel, and Gandorfer, 2021; Unay-Gailhard and Brennen, 2022; Huambachano et al., 2022).

Digitalization expands food communication networks through social media platforms, applications, e-commerce, agricultural data, and information infrastructure. Digital spaces enable real-time communication, the monitoring of public discourse, the mobilization of support, and the cross-regional dissemination of knowledge. However, digitalization also alters power structures within food systems, as data, algorithms, and platforms can be controlled by actors possessing greater resources. Consequently, digital communication theory needs to incorporate issues of access, literacy, data ownership, algorithmic visibility, and community capacity to produce their own narratives (Prause, Hackfort, and Lindgren, 2021; Jung, Tao, and Widmar, 2022; Diekman, Ryan, and Oliver, 2023).

Participatory Communication, Advocacy, and Power Relations

Participatory communication shifts the orientation from mere message delivery to the creation of a dialogue space where local knowledge and the experiences of affected groups can contribute to decision-making. Regarding food issues, this approach is relevant because effective policies often rely on the contextual knowledge of farmers, food workers, Indigenous communities, consumers, and local organizations. Meaningful participation differs from tokenistic consultation; it requires access to information, the ability to voice positions, opportunities to influence decisions, and accountability mechanisms (LeGreco, Palmer and Levithan, 2021; Levkoe, McLaughlin and Strutt, 2021; Qanti, Peralta and Zeng, 2022; Clause, 2021).

In the context of food sovereignty, participatory communication intersects with advocacy communication and critical perspectives on power. Issues concerning land, seeds, traditional knowledge, the right to determine food systems, and control over value chains cannot be explained merely as information gaps. Communication serves as a means to build collective identities, articulate demands, link movement networks, and negotiate legitimacy with both the state and the market. Agroecology and food sovereignty literature emphasize the importance of autonomy, farmer-to-farmer learning, and knowledge spaces that do not position local communities merely as passive recipients of policy (Loker and Francis, 2020; Guzmán Luna et al., 2022; Tilzey, 2024; de Mello et al., 2023).

Integrative Framework of Food System Communication Theory

Based on a conceptual synthesis, these theories can be integrated into four interconnected communication functions: meaning-making, trust-building, coordination-adoption, and voice-power. These four functions are not exclusive to any single food domain. Framing can influence risk perception; trust influences the adoption of innovations; networks determine who can participate; ...and power structures determine which frames gain visibility. Digital transformation operates as a cross-functional layer, as it can reinforce or weaken

each of these mechanisms (Gordon, Hunt and Dutta, 2022; Kasza et al., 2022; Prause, Hackfort and Lindgren, 2021).

Table 1. Integrative Framework of Communication Theory in Food Systems

Communication Functions	Theory/Approach	Key Mechanism	Dominant Domain	Digital Risks/Opportunities
Sense-making	Agenda-setting, framing, discourse	Determining visibility, problem definition, causal attribution, and solutions	Policy; sustainability	Rapid amplification; narrative competition; algorithmization of visibility
Trust	Risk communication	Translating hazards, uncertainty, and protective actions	Food safety	Real-time alerts; misinformation; erosion/reconstruction of trust
Coordination and adoption	Diffusion of innovations, networks	Disseminating knowledge, facilitating learning and adoption	Resilience; agricultural innovation	Wider networks; access and literacy gaps
Voice and power	Participatory approaches, advocacy, development communication	Expanding representation, negotiating rights, and building collective capacity	Food sovereignty	Mobilization and solidarity; platformization and power imbalances
Cross-functional integration	Food system communication	Connecting meaning, trust, coordination, and justice	Entire food system	Opportunities for cross-channel orchestration; need for data governance and accountability

Source: Author's synthesis based on a literature review

METHODOLOGY

This article employs an interpretive and narrative qualitative literature review rather than a systematic literature review. This approach was selected because the research objective was not to quantify effects or conduct a bibliometric mapping using rigid exclusion protocols, but rather to construct a conceptual synthesis of theoretical traditions spanning various domains of food studies. A narrative review is appropriate for broad, complex topics where the researcher needs to compare concepts, identify argumentative patterns, elucidate tensions between approaches, and develop a new interpretive framework – provided that the processes of literature selection and synthesis are described transparently (Sukhera, 2022a; Barry, Merkebu, and Varpio, 2022).

A purposive and iterative search for peer-reviewed journal articles – primarily published between 2020 and 2026 – was conducted via online academic databases and publisher websites. Keywords were combined from terms such as *food systems communication*, *food policy communication*, *risk communication*, *food safety*, *food security*, *food sovereignty*, *framing*, *participatory communication*, *digital agriculture*, *social media*, *food misinformation*, and *narrative/qualitative literature review*. Priority was given to sources that were (a) conceptually or empirically relevant to the research question, (b) from reputable, traceable academic journals, and (c) possessed a verifiable DOI or publisher address. This purposive strategy aligns with the nature of narrative reviews, which emphasize conceptual adequacy, depth of interpretation, and source traceability, rather than claiming to have gathered every existing publication (Hall, Gaved, and Sargent, 2021; Oermann and Knafl, 2021; Sukhera, 2022b).

Analysis was conducted through comparative reading and thematic coding. Each source was examined to identify the communication object, actors, theoretical mechanisms, media, described outcomes, and implications regarding power. The initial themes were subsequently compared across the policy domains of security, resilience, and food sovereignty, resulting in the formation of four synthetic categories: meaning-making, trust, coordination-adoption, and voice-power; digital transformation was analyzed as a cross-cutting factor. The final stage involved thematic integration to address RQ1 and RQ2 and to formulate a research agenda. This procedure aligns with the principles of qualitative synthesis, which require explicit links between the research question, evidence selection, interpretation, and conceptual argumentation (Carmona, Baxter, and Carroll, 2021; Barry, Merkebu, and Varpio, 2022).

RESULTS AND DISCUSSION

Food Policy Communication: Agenda, Framing, and Governance Coordination

Sintesis Literature indicates that food policy communication functions primarily as a mechanism for problem selection and definition. Policy actors do not enter the process with a uniform understanding of what constitutes a 'good' food system. Priorities may be defined in terms of public health, productivity, competitiveness, sustainability, resilience, farmers' rights, or equity. Dominant discursive frameworks influence the indicators used, the actors deemed relevant,

and the policy options considered viable. Thus, agenda-setting and framing explain the initial stages of policy formation: communication establishes a hierarchy of attention while providing a language that either enables coordination or reinforces fragmentation (Coulas, 2021; Knezevic, 2021; De Schutter, Jacobs and Clément, 2020).

Second, policy communication serves as an infrastructure for coordination. Food policy intersects with agriculture, trade, health, the environment, social protection, and local governance. Studies on inter-agency coordination show that linking mechanisms, boundary-spanning actors, and shared communication spaces can reduce administrative silos. At the city level, policy co-production requires building trust, acknowledging diverse forms of knowledge, and establishing mutually understood communication codes. These findings demonstrate that policy quality is inseparable from the design of its communication processes (Galli et al., 2020; Vara-Sánchez et al., 2021; Clark and Jablonski, 2022; Malan, 2021).

Third, policy communication shapes the relationship between evidence and legitimacy. Scientific data can strengthen policy, but evidence does not speak for itself; it must be selected, interpreted, and embedded in a narrative that stakeholders can understand. This creates a need for two-way communication, ensuring that scientific evidence is not used to shut down normative debates, but rather to clarify trade-offs and uncertainties. A food systems communication perspective requires that the voices of affected communities be integrated into the knowledge-generation process, rather than merely serving as targets for information dissemination after decisions have already been made (Lind and Reeves, 2021; Gordon, Hunt and Dutta, 2022; Springer et al., 2022).

From the perspective of RQ1, the policy realm highlights the key roles played by agenda-setting, framing, discourse, and participatory communication theories. These theories explain how food-related realities are constructed as policy issues, how coalitions build support, and how cross-institutional coordination is established. The practical implication is that policy communication strategies must be designed at the problem-formulation stage, rather than being tacked on at the end of the process as a dissemination activity. Communication that is transparent and deliberative – and capable of bridging the language used across different sectors – is more likely to yield coherent and legitimate policies (De Schutter, Jacobs and Clément, 2020; Coulas, 2021; Clark and Jablonski, 2022).

Food Safety Communication: Risk, Trust, and Protective Actions

In food safety, the central communication challenge lies in transforming information about hazards into an accurate understanding of risk. The public assesses hazards through a combination of knowledge, experience, trust, proximity, fear, and social information. Consequently, the disparity between expert assessments and public perceptions stems not merely from a 'lack of knowledge,' but from differing ways of comprehending risk. Effective risk communication approaches must articulate what is known and unknown, identify who is at risk, and outline realistic actions that can be taken (van der Vossen-Wijmenga et al., 2022; Baba and Esfandiari, 2023).

Trust serves as the link between the message and compliance. Studies conducted during the pandemic revealed that sources perceived as credible vary depending on the type of information, and that social media may command lower levels of trust than institutional sources for specific issues. Nevertheless, digital channels remain vital, as the public utilizes them to seek, evaluate, and share information. Therefore, food safety institutions must establish a digital presence that is consistent, rapid, and responsive, capable of addressing public inquiries without oversimplifying uncertainties (Thomas and Feng, 2021; Zhang et al., 2022; Zhu et al., 2021).

The literature also indicates a shift from one-way communication toward participation in risk governance. Consumer willingness to engage in risk communication is influenced by perceptions of threat, efficacy, attitudes, and norms. This implies that food safety messaging should allow the public to question the basis of recommendations, report issues, and understand the consequences of actions. Participation can improve problem detection and strengthen the legitimacy of decisions, provided institutions offer tangible feedback and avoid making participation merely symbolic (Zhu et al., 2022; Kasza et al., 2022).

In the digital era, the greatest challenge lies in balancing speed with accuracy. Emotionally charged or sensational food-related content can spread widely, whereas scientific corrections are often slower and less narratively compelling. Misinformation regarding food and nutrition can undermine support for evidence-based policies. Consequently, risk communication needs to incorporate conversation monitoring, pre-bunking (or early clarification), layered messaging tailored to audience literacy levels, and source transparency. This framework addresses RQ1 by demonstrating that risk communication theory explains perceptions and actions, while theories of trust and digital communication explain why accurate messages are not necessarily effective (Diekman, Ryan and Oliver, 2023; de Paula Matos et al., 2023; Qutteina et al., 2022; Han and Zhai, 2022).

Communication and Food Security: Networks, Learning, and Adaptive Capacity

Food security relies on availability, access, utilization, and stability; however, food system resilience emphasizes the capacity of actors to absorb shocks, adapt, and transform. From a communication perspective, this capacity is shaped by connectivity: the speed at which information regarding disruptions travels, the ability of actors to coordinate responses, and the availability of alternative knowledge when routine practices are no longer sufficient. Studies on local resilience identify communication, community networks, local knowledge, and leadership as critical capacities for coping with shocks (Béné, 2020; Fox and Frye, 2021).

Digital communication expands opportunities for learning and coordination. Online platforms can connect producers to markets, disseminate agronomic information, engage the younger generation, and strengthen knowledge networks. Analyses of conversations regarding local food also demonstrate that online media can capture shifts in public attention toward food access and facilitate emergency communication. However, these benefits depend

on infrastructure access, literacy, trust, and the ability to translate information into practical decisions (Unay-Gailhard and Brennen, 2022; Jung, Tao and Widmar, 2022; Huambachano et al., 2022; Charilaou and Vijaykumar, 2021; Eskandari, 2022).

The role of communication in food security is also evident in local solidarity and organizing efforts. During crises, local organizations and community networks can serve as hubs for both information and aid distribution. Relational communication enables actors to identify needs, build trust, and tailor responses to local conditions. These findings extend diffusion of innovation theory: what spreads is not merely technology, but also situational knowledge, norms of assistance, adaptive practices, and novel ways of organizing resources (LeGreco, Palmer and Levithan, 2021; Fox and Frye, 2021; Levkoe, McLaughlin and Strutt, 2021).

However, digital resilience must be distinguished from mere digitalization. Platform dependency, data concentration, and uneven skill levels can create new vulnerabilities. Food regime analysis indicates that digitalization can reinforce the control dominant actors exert over value chains, while technology acceptance studies remind us that the benefits of innovation depend heavily on user perceptions and social legitimacy. Consequently, the answer to RQ1 regarding resilience is that network, diffusion, and participation theories explain adaptive capacity, yet they must be complemented by a critical perspective on the digital structures that govern access and control (Prause, Hackfort and Lindgren, 2021; Pfeiffer, Gabriel and Gandorfer, 2021).

Food Sovereignty Communication: Rights, Representation, and the Negotiation of Power

Food sovereignty places the right to determine food systems at the forefront. This perspective shifts the focus from the question of "food availability" to "who controls resources, knowledge, and decisions." Communication is central to this, as political rights require the capacity to speak out, build collective identities, preserve knowledge, and negotiate claims with the state and the market. Consequently, food sovereignty communication must be analyzed through participatory, advocacy, and critical communication theories that account for power imbalances (Loker and Francis, 2020; Tilzey, 2024).

Experiences within Indigenous food sovereignty networks demonstrate that relationships and networks can be mobilized to respond to crises while upholding sovereignty principles. In agroecological practice, participatory action research and mutual learning have the potential to strengthen smallholder autonomy, as knowledge is constructed through dialogue, experimentation, and collective organization. In this model, communication is not an external instrument for "educating" farmers but rather a process of co-producing knowledge that treats local experience as a legitimate epistemic source (Levkoe, McLaughlin, and Strutt, 2021; Guzmán Luna et al., 2022).

The dimension of representation also encompasses gender and groups whose voices are often marginalized. A study in West Java reveals that social norms influence perceptions regarding women's participation in agricultural decision-making. This finding is significant for communication theory because formal participation does not automatically equate to an equal distribution of

influence. Inclusive communication design must identify who is present, who speaks, who is trusted, and whether the contributions of specific groups actually alter decisions (Qanti, Peralta, and Zeng, 2022; Huambachano et al., 2022).

Digital media can amplify the reach of the food sovereignty movement and connect geographically distant communities, yet it also necessitates strategies to maintain context, narrative ownership, and data security. Studies of food-related social movements during the pandemic highlight the importance of networks and communication for solidarity, while analyses of digital politics warn of the potential for concentrated control. Consequently, communication sovereignty – the ability of communities to determine how their knowledge and identities are represented – merits recognition as an integral part of food sovereignty itself (de Mello et al., 2023; Prause, Hackfort and Lindgren, 2021; Gordon, Hunt and Dutta, 2022).

Challenges and Prospects of Food Communication in the Digital Era

Digital transformation has created a paradox in food communication. On one hand, social media and online platforms enable the real-time production, sharing of, and response to information. Conversational data can help institutions gauge public attention, while digital networks can mobilize aid, expand local markets, and disseminate innovations. On the other hand, platform architectures incentivize attention-grabbing content, which is not necessarily synonymous with the most accurate or equitable information. Consequently, credibility, literacy, and information governance have become integral components of food system resilience (Jung, Tao, and Widmar, 2022; Diekman, Ryan, and Oliver, 2023).

Misinformation is not the only issue. Digital communication also intersects with food marketing, the normalization of consumption behaviors, and the shaping of social norms. Exposure to food-related messages on social media can influence eating attitudes and behaviors, while digital advertising for unhealthy products poses public health challenges. Therefore, policies regarding digital food communication must address promotional regulations, sponsorship transparency, the protection of vulnerable groups, and the public's ability to distinguish scientific evidence from commercial messaging (Qutteina et al., 2022; de Paula Matos et al., 2023).

Regarding message design, digital opportunities lie in the ability to segment audiences and tailor message framing to their specific characteristics. Research on sustainability messaging indicates that framing and the perception of control can influence evaluations and behavioral intentions. However, personalization must be balanced with transparency to avoid devolving into manipulation. Effective digital strategies should clarify the source, purpose, and evidence behind a message, as well as actionable steps, while providing space for dialogue when uncertainty or value conflicts arise (Weisstein, Meyer, and Kershaw, 2024; Dai and Gong, 2024; Xiao et al., 2024; Lemmens, 2026; O'Donnell, Karabas, and Hill, 2022; Plohl, Weingarten, and Hartmann, 2024).

The next frontier lies in establishing food communication as a form of digital public infrastructure. This means that attention is directed not only at campaigns but also at information interoperability, access for vulnerable groups,

feedback mechanisms, crisis protocols, data protection, and algorithmic accountability. Such a framework can link risk communication, policy, innovation, and advocacy within a single ecosystem. Thus, digitalization becomes productive when it strengthens the capacity of actors to understand issues, trust processes, coordinate, and voice their interests – rather than merely accelerating the flow of messages (Prause, Hackfort and Lindgren, 2021; Gordon, Hunt and Dutta, 2022; Huambachano et al., 2022).

Analysis and Synthesis to Answer Research Questions

The answer to RQ1 can be summarized through four mechanisms. First, agenda-setting, framing, and discourse explain the construction of meaning: food issues become politically relevant when they gain visibility and when actors successfully link them to specific values, causes, responsibilities, and solutions. This mechanism is most evident in food policy but is also present in discussions of food safety, security, and sovereignty, as risk perceptions and definitions of a "resilient system" are invariably shaped by frames. Consequently, the analysis of food communication must examine not only message content but also the structures of meaning production and the distribution of attention (Coulas, 2021; Knezevic, 2021; Rust et al., 2021).

Second, risk communication and trust explain the transition from information to assessment and action. In the context of food safety, scientific accuracy is a necessary but insufficient condition; source credibility, the acknowledgment of uncertainty, appropriate language, and opportunities for interaction all influence audience responses. Trust mechanisms are equally relevant to policy and innovation: the public is less likely to accept technologies or regulations if decision-making processes are perceived as opaque or unresponsive (Kasza et al., 2022; Thomas and Feng, 2021; Baba and Esfandiari, 2023).

Third, diffusion, network, and participatory communication theories explain coordination and adoption. Food resilience improves when actors possess connectivity, can learn from networks, and are able to translate information into adaptive actions. However, diffusion should not be assumed to be linear, as adoption is influenced by social structures, access, norms, trust, and compatibility with local needs. Thus, effective innovation communication is relational: it bridges technical knowledge with user experience and provides mechanisms for feedback (Pfeiffer, Gabriel, and Gandorfer, 2021; Unay-Gailhard and Brennen, 2022; Béné, 2020).

Fourth, advocacy communication and critical perspectives explain the voice of power. In the context of food sovereignty, the central question is not merely whether information is available, but whether affected groups possess the capacity to influence how issues are framed and decisions are made. Meaningful participation requires a redistribution of opportunities to speak, the recognition of local knowledge, and mechanisms ensuring that these voices have tangible consequences. These dimensions highlight that food system communication always entails normative aspects: the choice of channels, language, data, and indicators can either strengthen or undermine the position of specific groups

(Levkoe, McLaughlin and Strutt, 2021; Guzmán Luna et al., 2022; Qanti, Peralta and Zeng, 2022; Tilzey, 2024).

RQ2 is addressed by viewing digital transformation as both an amplifier and a disruptor of these four mechanisms. Digitalization accelerates agenda-setting, expands the reach of risk communication, broadens adoption networks, and opens up spaces for advocacy; yet, it can also accelerate the spread of misinformation, erode trust, exclude groups lacking access, and concentrate power in the hands of platforms and data owners. Consequently, the proposed integrative framework establishes five normative principles as guidelines: evidence-based credibility, meaningful participation, sensitivity to socio-cultural contexts, adaptability across channels and crises, and equity regarding access, representation, and data governance. These principles unify food communication objectives that have historically been discussed in isolation (Diekman, Ryan and Oliver, 2023; Jung, Tao and Widmar, 2022; Prause, Hackfort and Lindgren, 2021; Gordon, Hunt and Dutta, 2022).

CONCLUSIONS AND RECOMMENDATIONS

This article demonstrates that communication is a structural component of food systems, rather than an add-on function applied after policies or technical interventions have been designed. A synthesis of the literature identifies four functions that consistently emerge across domains: meaning-making through agenda-setting, framing, and discourse; trust-building through risk communication; coordination and adoption through diffusion, networking, and learning; and voice and power through participation and advocacy. These four functions are interdependent; consequently, an analysis relying on a single theory risks overlooking the connections between these mechanisms.

In food policy, communication determines how problems are defined, priorities are established, and cross-sectoral coordination is achieved. Regarding food safety, communication shapes how evidence, uncertainty, and recommendations are translated into perceptions and protective actions. In the context of food security, communication fosters the connectivity that enables actors to share knowledge, adapt, and organize responses to shocks. Regarding food sovereignty, communication concerns the right to represent experiences, preserve local knowledge, and influence decisions that determine access to and control over resources.

Digital transformation amplifies all these functions, yet it does not always yield better outcomes. While speed, scalability, and networking capabilities can strengthen coordination and participation, factors such as algorithmic logic, misinformation, covert marketing, literacy gaps, and data concentration can create new vulnerabilities. Therefore, digital food communication strategies must be evaluated not merely by reach and engagement, but by the quality of evidence, trust, access distribution, spaces for deliberation, and the impact on the standing of vulnerable groups.

This article's conceptual contribution is an integrative framework linking meaning, trust, coordination and adoption, and voice and power, with digitalization serving as a cross-cutting layer. This framework can be used to

analyze food safety campaigns, policy-making processes, agricultural technology adoption, crisis communication, and food sovereignty movements in a more consistent manner. In practical terms, food communication design must adhere to the principles of credibility, participation, contextuality, adaptability, and equity; this ensures that communication goes beyond mere message dissemination to genuinely strengthen food system capacity.

FURTHER STUDY

Future research needs to test this framework empirically and comparatively. Mixed-method studies could assess the relationships among framing, trust, network structures, and participation regarding food-related decisions across different contexts; experiments could compare the effects of various frames and message sources; digital network analysis could map the flow of misinformation and identify key connecting actors; and participatory research could examine how communication design influences the distribution of voices at the community level. Other critical agenda items include artificial intelligence-driven food communication, algorithmic transparency, the governance of farmers' data, the urban-rural divide, and the specific Indonesian context—characterized by socio-cultural diversity and unique farming system structures. Through such empirical testing, the integrative framework can evolve from a conceptual synthesis into an explanatory model that is more measurable and policy-relevant.

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