Sociology of Agriculture and Food

The International Journal of Sociology of Agriculture and Food

Volume 29 | Issue 1 | April 2023

Journal of the Research Committee on the Sociology of Agriculture and Food (RC40) of the International Sociological Association (ISA)

ISSN 0798-1759 (print) | 2524-1982 (online)

The International Journal of Sociology of Agriculture and Food

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Cover Design: Mr. Kevin Agblo, KEYBLO Creative Studios

The International Journal of Sociology of Agriculture and Food

Volume 29, Issue 1, April 2023

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The International Journal of Sociology of Agriculture and Food

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E. Wager and S. Kleinert (2011) Responsible research publication: international standards for authors. A position statement developed at the 2nd World Conference on Research Integrity, Singapore, July 22-24, 2010, in: T. Mayer and N. Steneck (eds) *Promoting Research Integrity in a Global Environment. Singapore: World Scientific Publishing,* pp. 309–316.

Abstracting and Indexing Information: *Agricola (USDA), CAB Abstracts, SocINDEX (EBSCO), Scopus*

The journal articles are included in the LOCKSS archival system.

Sustainable Consumption and Production: a political space for agri-food studies?

Paper first received: 23 April 2023; Accepted: 23 April 2023; Published in final form: 30 April 2023
http://doi.org/10.48416/ijsaf.v29i1.520

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Abstract

This editorial introduction discusses the science-policy interface at a global level focused on the linking of sustainable consumption and production. It examines how political spaces can offer opportunities for epistemic communities to enter into this space in order to advance the co-production of knowledge and politics on sustainable consumption and production. The editorial also introduces the innovative approach to book reviews that the journal has adopted.

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Introduction

In global discourse, the need to feed a growing population in a world of diminishing resources, has rapidly become a core societal challenge (Conway, 2012; FAO, 2012). The declaration of the Anthropocene and the speed of biodiversity loss (Hallmann et al., 2017) has brought concern over the ability of the planet to support Western dietary habits front and centre in neo-Malthusian debates over food security for growing urban centres (Bonneuil and Fressoz, 2013). But who is actually responsible for achieving sustainable consumption and production? Producers, who are tilling the earth with machines of variable complexity and are responsible for any toxins entering the soil and water; or those companies who make the chemicals and machines responsible for the impact of their products on the environment? What about the processors who purchase the produce from the farms and turn these into products that can be consumed by people, animals and machines? What then is the responsibility of aggregators and distributors, who collect, pack and transport the produce and products? Where is the responsibility of retailors and brands, which turn fresh and transformed products into consumables that are easily recognised by consumers? What role do consumers play when they decide to purchase something that has, through all of these steps, become a 'sustainable' product? Where is the responsibility of researchers and actors in the agricultural knowledge and innovation systems (AKIS) who are creating and sharing knowledge about what is or could be sustainable? Finally, what is the responsibility of a State, and its various administrations working at different levels of engagement, who is supposed to govern what sustainability ought to be across geo-political boundaries?

The creation of the sustainable development goals (SDGs), as a new form of governance (Kanie and Biermann, 2017), suggests that the issue is more complex: contemporary societal challenges are interdependent, they cut across scales of action and all societal actors have roles to play. Within the 17 indicators, SDG 12 - Responsible consumption and production - is viewed as the glue that brings all of the other SDGs together (Le Blanc, 2015); but, SDG 12 has a semantic problem that might well be ontological. First, the official title (and icon) of the goal is "Responsible consumption and production", while in the text of the original UN Declaration, the title is "ensure sustainable consumption and production patterns" (UN, 2015: 22). This creates epistemic confusion over what

is to be valued in consumption and production: is it the sustainability (of the patterns or specific sustainable practices) and/or the responsibility (of whom and for doing what, acting responsibly or ensuring the responsibility of others)? The epistemic confusion continues through the second part of the goal definition, which is: 'consumption and production', meaning both practices, but what links them together? To link them, the new concept must be knowable; to know it, scientists, practitioners and policy-makers want to measure it (Pintér et al., 2017; Dagiral et al., 2016). But how do you measure a missing space, the 'and' between two processes that are relatively stabilised (in large-scale production and retail systems), with their own definitions of sustainability and metrics to prove it (Constance et al., 2018)? Moreover, it matters who the people are that are defining, measuring and linking these concepts as they come from different socio-cultural and economic situations and rely upon different ways of knowing (Haraway, 1988) and valuing that cannot always be understood or reconciled (Blok, 2019).

Current debates at the science-policy interface

To understand what taking responsibility for sustainability means within the context of food system transformations, it is important to build on the definitions of actors who are making these changes in practice and policy. One important definition has been proposed by the 10 Year Framework of Programmes on Sustainable Production and Consumption (10YFP)[1], specifically through the Sustainable Food Systems Programme (SFSP), whose implementation is Indicator 12.1 of the 2030 Agenda. Set up as a multi-stakeholder, systems-based response to the multi-faceted challenges of malnutrition, biodiversity loss and climate change, this programme was co-led by two national governments (South Africa and Switzerland, then Costa Rica and Switzerland) and two international NGOs (WWF and Hivos[2]) and counts over 200 partners from government agencies, civil society organizations, research and technical institutions, private sector, UN agencies and other international organizations. Relying upon the technical expertise from among its partners, the SFSP holds global conferences every two years to report on project activities and engage with policy makers in the region of the conference (South Africa in 2017, Costa Rica in 2019, Thailand in 2020 (virtual) and Vietnam in 2023 (hybrid)).

One of the joint projects within the programme, led by UN Environment, is the writing, piloting and disseminating of a Framework for Collaborative Food Systems Transformation.[3] This approach clearly allocates responsibility to all types of organised actors in society and attempts to offer guidance on how to make food system change within multi-stakeholder processes. The proposed process remains, at this stage, based on literature and a few qualitative case studies of innovative institutions, but has not yet been put into action. The 4th Global Conference of the Sustainable Food Systems Programme "The Transformation We Need" took place between 24-27 April 2023 in Ha Noi, Viet Nam, convening over 350 on-site and 1000 virtual participants from a range of actor groups. This conference was meant to be a place where the transformations outlined in the common framework could be put into action. Unfortunately, this space created to debate sustainable production and consumption did not enable this to be achieved.

In 2021, the United Nations Secretary General held a Food Systems Summit (UNFSS) in New York, which was highly criticized and even boycotted by civil society organizations for having derailed ongoing collective efforts to advance negotiations on equitable, inclusive and agroecological transitions of food systems (Anderson et al., 2022; Canfield et al., 2021; Chandrasekaran et al., 2021; Covic et al., 2021; Haas, 2004; McMichael, 2021; Montenegro de Wit and Iles, 2021). The members of the OPN-SFSP leadership (3 co-leads) and Multi-stakeholder Advisory committee (23 members from five colleges) and include many of the actors who had raised concern about the UNFSS conference. Therefore, the preparations made for the 4th Global Conference attempted to redress some of the core problems with the UNFSS meeting, i.e., the co-optation of knowledge from small-scale farmers and indigenous populations, the domination of business-as-usual actors (e.g., AGRA) and national level government complacency about the food system transformation agenda.

These critiques had already been raised in the SFS Programme's 3rd global conference in 2020, therefore the conference's aim was to provide an overview of transformational actions, tools and initiatives to overcome key barriers and address the well-known bottlenecks faced by countries. At the same time, the OPN-SFSP members expressed need to further promote the food systems approach and inclusive governance. For this reason, there was a special portion of the conference dedicated sharing experiences and strengthening capacities among National Food Systems Convenors in preparation of the UNFSS's first Stocktaking Moment on 24-26 July 2023.

While the general agreement among attendees was that this conference was a success, thanks to the tireless work of the civil servants working in the Vietnamese Ministry of Agriculture and Rural Development, there was a general feeling among participants that there was a lot of talk about the transformation (in the singular) that we want, but very little about the transformations that are underway. A good example of this is found in the official press release:

> *The inaugural keynote speech by Estrella "Esther" Penunia, Secretary General of the Asian Farmer's Association for Sustainable Rural Development, sounded an ever-louder alarm indicating that not only are we nowhere near achieving the SDGs but that the multiple and interconnected crises of inequality, climate change, violent conflicts, and the*

[1] Recently renamed the One Planet Network (OPN-SFSP) http://www.oneplanetnetwork.org/

[2] Hivos did not renew its mandate in 2021 due to staff changes and the institutional effects of COVID.

[3] http://www.oneplanetnetwork.org/initiative/setting-table-our-children-improving-governance-food-systems-through-multi-stakeholder

> *pandemic and its consequences are increasing poverty and hunger across the globe. Ms. Penunia stressed that the key obstacles we face are a lack of policy coherence and coordination for the implementation of food systems transformation pathways, lack of stakeholder participation, especially the poor and marginalized, and a lack of political will to address power imbalances and provide adequate financing. The opening session further stressed that we face an implementation gap with regard to National Pathways for Food Systems Transformation and other key commitments, which needs to be urgently addressed at this critical time for people and planet. (One Planet Network Sustainable Food Systems Programme, 2023b)*

Indeed, one of the common remarks made by participants after the event was that the plenary speakers used all of the right talking points about the need for sustainable food systems and many claimed that they had indeed achieved sustainable consumption and production in their countries. But the session dedicated to the open and honest analysis of the national pathways showed clearly how far the discourse had strayed from the reality. Nonetheless, five "levers of change' were agreed upon by participants:

> *Global, regional, national, and sub-national inclusive governance to lay the foundation for applying a holistic/integrated approach towards sustainable and healthy food systems; Collaborative, multisectoral, integrated policies based on a holistic approach to advance the transformation we need: improving consumption and production patterns in our food systems; Mobilizing means of implementation, including science, finance, human rights and innovation; Monitoring and accountability frameworks to measure transformation, supported by metrics and data; and Research and innovation, including in collaboration with the private sector. (One Planet Network Sustainable Food Systems Programme, 2023a)*

As the debates progressed, it became clear that despite the references made to science and data there was barely any time dedicated to discuss what was behind these keywords. As Turnhout et al. (2021) have pointed out, current science-policy interfaces that deal with food systems are breaking down. Although collaboration among policymakers, scientists, and other actors is crucial for the successful operation of the science-policy interface, the demands for credibility and salience often conflict since generating credible knowledge requires time that political processes frequently cannot afford. Consequently, in practice, policymakers more often rely on existing knowledge to provide them with "usable knowledge" (Haas, 2004), a more understandable language to non-scientists without losing the core value of the scientific knowledge. In practice, this "usable knowledge" tends to result in a procedural system, notably guidelines or standards, as boundary objects. One need only look at the two volume special issue of this journal in 2013 to understand that this is not a new problem (Bain et al., 2013), but rather an classic issue of technopolitics in agrifood systems that is at least as old as is this journal.

Contents of the issue

This point is an excellent segue into the articles included in this first issue of IJSAF in 2023, which deals with questions of science and policy in current food systems. Śpiewak and Goszczyński (2023) examine the institutional diversity in alternative food networks in Poland and explore how well institutions deliver on their tasks. The diversity that they found among the networks that are linking consumption and production speak to the need for tailored knowledge and policy that is well grounded in the innovative production-consumption communities and has gained legitimacy from local public authorities. The importance of local level policy is also a finding of Kortetmäki (2023) who analyses food systems from the perspective of sustainability transitions and dietary transitions. She explores why it is so difficult to switch to local plant proteins in Finnish public catering. Her institutional analysis demonstrates that the underlying rationalities in public catering that are based on performance indicators, catering resources and dominant local perceptions of 'normal' dietary patterns. Here again, there seems to be a mismatch between rationalities governing production and consumption.

The third article in this issue deals with food security policy in South Africa following the COVID-19 pandemic. Manduna (2023) found that the policy measures implemented by the national government exacerbated pre-existing economic vulnerabilities. Thus, the hunger and food insecurity that was triggered by the pandemic was racialized, gendered and regionalized – in line with the structural legacies left by colonial and apartheid policies. A do-it-yourself approach to linking food production and consumption is proposed here as the only logical solution. This idea of logical solutions is the topic that is addressed by the fourth article in this special issue, which focuses on co-creation in city-level policy-making. van Dis et al. (2023) argue that while the opening up of a public space for social learning is important, it is insufficient for impacting the scientific outcome that is desired in mission-driven policy. The authors explain that continued engagement is fundamental to systems change, thus spaces for these science-policy dialogues must remain places on long term engagement. For this reason, there may still be hope for the OPN-SFSP, as this "ten year framework program" has now been engaging multiple stakeholders for more than twenty years and the possibility for more constructive dialogue might just be possible if it can extract itself from the UNFSS process and return to more community-rooted efforts.

We close this editorial with the introduction of the innovative new approach to book reviews that is launched with this issue of the journal. Our governing body – the Research Committee on the Sociology of Agriculture and Food (RC40) of the International Sociological Association – decided to launch a reading club in order to improve cross-continental debate about some of the most recent scientific studies in our field. IJSAF has agreed to publish a summary of this debate as a book review. We are truly excited about this new initiative as it allows us to give voice both to the author of the book and to the readers who are engaging with the topic in constructive ways. As you will see with the discussion of The Immaculate Conception of Data by Kelly Bronson, that is reviewed in this issue (Legun et al., 2023), the dialogic style of the presents the different points of view from scholars from around the world in a constructive way that does justice to the richness of the book.

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Alternative Food Networks from the Institutional Perspective

Paper first received: 13 May 2022; Accepted: 28 April 2023; Published in final form: 30 April 2023
https://doi.org/10.48416/ijsaf.v29i1.482

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Abstract

This article analyses the internal diversity and dynamics of Polish Alternative Food Networks (AFNs), using the concept of institutions and their impact on collective action as a theoretical tool. Emphasis is put on four dimensions of AFNs' internal diversity: meanings, association models, control mechanisms, and actions. The analysis is based on empirical material collected from nationwide qualitative studies conducted in six AFNs selected through purposive sampling. While adhering to a similar system of values focused on individual health, family and profit, the networks differ from one another in terms of the prevalent models of relationships, supervision, and activity. They appear to share certain motives and values in their market-oriented or own security-oriented actions and strategies, and show an inclination to use formal tools. In parallel, they reveal differences in their levels of focus on building internal relationships, which also emerge as the primary factor determining the potential and activity of the studied initiatives.

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DATA AVAILABILITY STATEMENT
The data presented in this study are available on request form the corresponding author. The data are not publicly available due to data management.

AUTHOR CONTRIBUTIONS
Conceptualisation: [RS]; Methodology: [RS&WG]; Formal analysis and investigation: [RS&WG]; Writing - original draft preparation: RS&WG]; Writing - review and editing: [RS&WG]; Funding acquisition: [WG&RS]; Resources: [WG&RS]; Supervision: [RS&WG].

ACKNOWLEDGEMENT
Work founded by the National Science Centre, Poland under grant agreement no. 2017/26/D/HS6/00869

The authors would like to thank Dominika Zwęglińska and Joanna Suchomska for help in carrying out the research. They thank Petr Jehlicka for model development

Introduction

Problems and tensions related to the industrialisation of global food systems evoke a variety of responses (Benton 2019; Isett & Miller 2017; SAPEA 2020). The growing complexity of the modern world includes both individual and collective actions aimed at working out an alternative to the prevalent food system (Tregear 2011; Zoll et al. 2018). In this regard, the term Alternative Food Networks (AFNs) denotes the collective actions of various forms that either complement or stand in opposition to the industrial food system as a concept (Corsi 2018; Forsell & Lankowski 2015; Ribeiro 2021). AFNs can be defined as a coalition of actors looking for alternative methods of allocating resources and changing the management in food distribution chains (Manganelli 2019). They engage in collective actions because they believe in their effectiveness in achieving individual or socialised goals (Olson 1965).

The aim of our article is to analyse the internal diversification of AFNs with a view to identifying how different institutional arrangements affect the organisation of the networks. Paradoxically, despite being recognised for their diversity (Goodman et al. 2013), AFNs tend to be studied through the prism of initiatives with a similar organisational framework (Michal-Villarreal et al. 2018). This may create the impression of uniformisation and reduced diversity among AFNs even though, by definition, they rely on local contexts and conditions. AFNs are also frequently considered in terms of normative functions and the role they could play in the transformation of the food system (e.g. Lohest et al. 2019; Pellicer-Sifres 2017). This paper focuses on the internal differentiation and complexity of AFNs. Specifically, it seeks to answer two questions:

- How do AFNs differ in terms of the operation and effectiveness of their institutions?
- How are the actions of the studied AFNs influenced by their internal institutional arrangements?

Institutions, defined as the rules that humans use in collective-action situations (Alston 2018; Ostrom 1986, 1993, 2005; Poteete et e al. 2009), have been analysed in the context of AFNs only occasionally (e.g. Duncan 2017; Manganelli 2019). This paper is intended to fill the lacuna in the present research literature and contribute to the ongoing discussion of AFNs operating in 'marginal areas' (Goszczyński eet al. 2019; Fendrychová & Jehlicka 2018; Sovova 2017; Jehlicka et al. 2021; Kopczyńska 2020), that is, in countries less frequently present in the debate on AFNs. In parallel, a new universal approach is proposed where AFNs are studied through the institutions formed and operating within the networks. Therefore, rather than analyse AFNs through their normative potential, our paper seeks to discuss new perspectives in the study of alternative food initiatives (Leitner 2020; Tragear 2011).

Institutions

AFNs: Institutional arrangements

The term 'alternative' in AFNs reflects the deliberate positioning and attempts to distinguish individual food-related practices from the prevalent agri-food regime. While operating in a variety of forms, AFNs have one thing in common: compared to long supply chains, they enable a more direct connection between producers and consumers, providing for new social relationships and institutional arrangements (Grivins et al. 2017). Originally, AFNs were frequently defined as 'alternative' largely because of the food they provided (Goodman et al. 2014; Poças Ribeiro et al. 2021). However, while food products of similar qualities e.g., fresh, local, and hand-made, are currently available in large retail chains, the essence of AFNs, at least at their very foundations, lies in the relationships and methods involved in building them (Corsi et al. 2018).

AFNs carry a promise (Grivins et al. 2017) of embedded ties between producers and buyers, whereby the act of purchase does not come down merely to the exchange of cash for goods. Given their lower levels of market embeddedness (marketness), AFNs seek 'groundedness' in social relationships, which translates into their greater interest in values other than those that are purely economic. As alternative initiatives differ in their approach to actors' engagement, values, motivation, and operational model (Duncan & Pascucci 2017; Zoll et al. 2018), generalisations about the rules, norms, and institutions established and developed within

individual networks cannot easily be made. AFNs can be classified based on the logic of operation and the characteristics of the network-organising institution (formal/informal, public/private, profit-based/non-profit) (Poças Ribeiro et al. 2021). Depending on the founding entity, the literature also divides AFNs into six types: consumer-led, third-sector-led, business platforms, farmer-led, public-led, and community-led. In terms of the theory of organisational relationships (Duncan & Pascucci 2017), AFNs can be labelled as isomorphic or polymorphic. While the former reflects the organisational forms preferred by the dominant food system, the latter organise themselves around the variously defined community and democratic relationships, adapting to the organisational forms of industrial networks, albeit only to a limited degree.

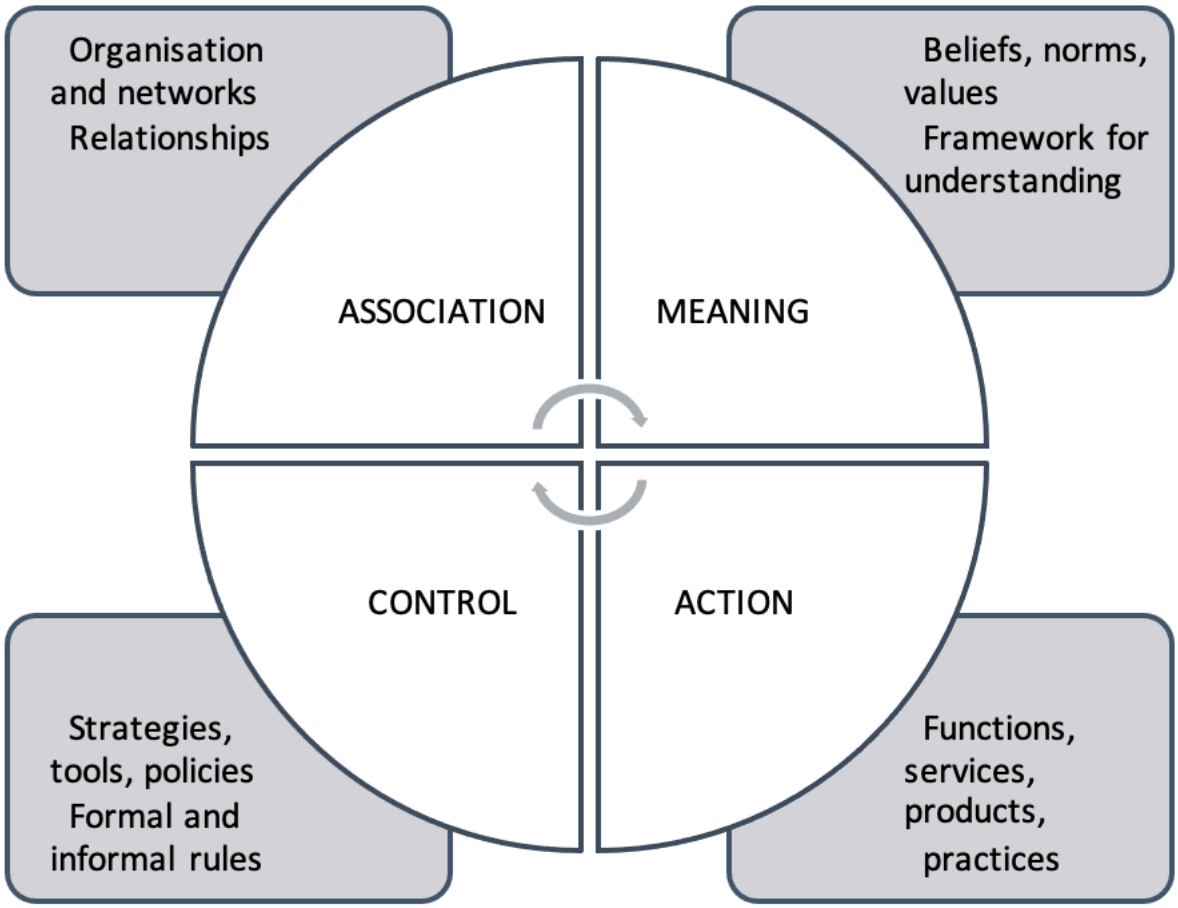
Regardless of the definition, AFNs have collaboration at their core, and institutions provide the mechanisms to enable this. Applicable in collective-action situations, institutions can be viewed as rules derived from cultural values, legal regulations, market conditions, and political and social processes (Healey 2006; Hodgson 2006). Successful institutions are those that provide for effective performance while reducing the free rider problem (Ostrom 2011). Institutions and collective actions are broad concepts that can be viewed from a variety of perspectives (Hagedorn 2008; Poteete et al. 2009). Researchers of alternative networks focus on different aspects such as rules determining collective actions (Dufeu et al. 2020), informal institutions based on norms, values and practices (Hodgson 2006), as well as context-shaped morality defining the values of collective actions (Grodzicki 2015). An analysis of AFNs can cover a variety of elements, including the norms that govern their actions, the applicable regulatory systems and infrastructure of institutions, as well as the values and motivations that drive their members (Lemeilleur&Sermege 2020). As a result, institutions are perceived here as complex and well-embedded constructs operating in certain political, economic, and social contexts (Whaley 2018).

The perspective proposed in this article focuses on AFNs and institutions as instruments of change (Vermeulen et al. 2008; Woodhill 2010). One of the functions of institutions is to promote and enhance cooperation, thereby generating collective benefits. Institutions create incentives, both negative and positive, for individuals and groups to act in a particular way (Woodhill 2010), which in turn contributes to the continued existence of institutions. Their functions tend to be self-reinforcing (Hindriks & Guala 2018). The proposed analytical framework should allow us to describe the shape and diversity of AFNs along with their characteristic potential for collective action. The problem is that there is no generally accepted framework for analysing institutions. When developing the foundation for our operationalisation concept, we opted for a modified version of Jim Woodhill's matrix (Figure 1), which he prepared as part of his work for the Institute of Development Studies (Woodhill 2010). It assumes that the development of innovative elements in a given system (capacity development) is possible only when its institutional (internal) arrangements are changed (Woodhill 2010), necessarily taking into account the applicable social norms, governance mechanisms and organisational processes. Importantly for our operationalisation model of institutions, this approach highlights the role that internal elements play in the development of the innovative potential of initiatives such as AFNs. In other words, the networks become important not only for their external form but also because of how they incorporate specific values and political and market mechanisms into their structure, combining them with the ways in which they organise their activities and the tools they use.

The four analysed areas—meanings, associations, control, and actions—correspond to the four basic functions of the institution and its arrangement:

1. Institutions as ways of making meaning of our lives and the social and natural world we inhabit.
2. Institutions as the associations we make to work together to achieve social, economic, and political objectives.
3. Institutions as the basis for control over what individuals and organisations should or can do.
4. Institutions as recurring actions carried out by individuals or organisations in their social, economic, and political life (Woodhill 2010).

Figure 1: Four dimensions of institutions (adapted)



Source: Vermeulen et al. 2008, Woodhill 2010 (modified)

This approach allows us to recognise non-formal rules and draw attention to the role of the social context and factors as incentives for actors to act in a specific way (Ostrom 1986, 2003, 2005; Poteete et al. 2009; Whaley 2018). The respective elements of the analytical framework interact with one another, and the shape of AFNs is forged at their intersection and through their relationships. The meaning that people attribute to a given phenomenon inspires them to take action. As a result, specific organisational arrangements are formed (association), which require the development of the corresponding regulatory mechanisms (control). The activity of every initiative (network) will depend on how these four elements are shaped and structured and how they coexist with and complement one another. At the same time, it should be emphasised that this is a flexible framework. Given their dynamic nature, institutions in alternative networks can be incomplete and characterised by different levels of control over daily occurrences, different (frequently overlapping) types of institutional order, and different interpretations of rules by different actors who are guided by distinctive values and may react to various rules differently (Niederle et al. 2020). The framework proposed for the analysis of alternative networks focuses on the diversity of individual elements and their combinations, their impact on the institutional order of AFNs, and the activity of the initiatives included in our study.

The operationalisation of the four dimensions of the institution is presented below in terms of AFNs and their activity.

1. Meanings: Their construction is based on beliefs and values represented by AFN members regarding the broadly defined food system. This article focuses on the values and motifs related to food and involvement in the network. AFN members share a critical view of the dominant food system and its anonymity (Jaklin et al. 2015). The value and the meaning behind the network's goods and actions are frequently founded on relationships (Renting & Marsden 2003; Sage 2003) which tend to be negotiated (Śpiewak 2016). The ideological foundations are derived from the language of the theory of sustainable development,

relocation, and resilience (Grivins 2017; Treager 2011). They highlight reduced environmental costs, efforts towards social and economic justice, and the sustainability and embeddedness of AFNs. The common denominator for most AFNs includes concepts such as locality, food quality, and trust (Ilbery et al. 2005; Thorsøe 2016; Whatmore et al. 2003). More radical AFNs refer to anarchist or anti-capitalist concepts (Jaklin 2015; Whatmore 2003 et al.). In view of the above, the debate on the goals and values of AFNs seems to revolve around the tension between idealism and pragmatism (Ribeiro 2021).

2. Association: An element of interest in this dimension is the organisational structure of the network with its formal and informal relationships among its actors, both individual and collective (Ribeiro 2021). The network's shape and potential depend partially on the combinations and models of relationships among actors and with the external world, development policies, or public stakeholders.
3. Control: This dimension prompts the exploration of the formal and informal rules and tools used to ensure the network's operation. Such regulations vary widely, depending on the network type, aims and objectives, and the context (Grivinis 2017). Duncan & Passcuci (2017) argue that, in terms of organisational relationships, AFNs can be divided into two types: isomorphic and polymorphic. The former opt for formalised mechanisms of control, such as adherence to formal standards, rules of participation, the use of quality labels and brands which, to a certain degree, reflect the prevalent food system institutions. The latter, described as socialised or informal AFNs, are organised around community values (shared values, knowledge). Hence, the organisational forms of polymorphic AFNs differ from those we know from the corporate food regime (Adler 2001; Duncan 2020).
4. Actions: This area covers a wide range of activities related to both AFNs' day-to-day operations and the pursuit of aims and objectives. These practices are sometimes described as innovative and alternative to conventional networks (Forsell & Lankowski 2017) or, on the contrary, as practices well-established in the dominant food system (Grivins et al. 2017).

These four dimensions can be related to Woodhill's concept (Woodhill 2010), corresponding to the social, organisational, political, and market-oriented aspects of AFNs' operations. Their analysis should allow us to identify connections between the respective elements of institutions, and to understand their impact on the shape and operation of AFNs.

The context of institutions within Polish AFNs

As noted above, institutions are rules of the game that are based on cultural values, legal principles, market conditions, and social and political processes. Food and food-related actions form a lens through which the most important social issues, such as power, work, health, social classes, economy, and past experiences, are reflected. Research shows that 'socialist modernisation, combined with mass industrialisation and urbanisation – and the subsequent transition from the centrally planned economy to a free market system – have defined the context for Polish AFNs for many years, resulting in a post-transformation model' (Goszczyński & Knieć 2011). The socialist economy, with shortage as its immanent feature, created a parallel informal food system based on the complex relationships of exchange, connections, and 'handling things' (Wedel 2007), all of which can be perceived as alternative practices (Klein et al. 2014).

Poland, like many Central and Eastern European (CEE) countries, underwent economic transformation from a centrally planned economy to a market economy in the late 1980s and early 1990s. In terms of consumption, it was a transition from a collectivist and, at the same time, shortage economy (Kornai 1980) to an economy of abundance characterised by highly individualised attitudes and aversion to anything collective. 'The novelty of the free market in food that suddenly provided consumers with plenty of variety and foreign brands, along with the convenience of supermarkets, made it natural for consumers from the former Soviet bloc to embrace the conventional food system as modern, attractive, and desirable' (Bilewicz & Śpiewak 2018). Currently, discount shops, supermarkets, and hypermarkets are the most popular places to shop, while open-air markets—once popular in socialism—are losing importance (Polacy na zakupach 2018). As the number of people involved in agricultural production continues to decrease (FDPA 2020), the tradition of informal food networks between the rural and urban areas is disappearing, resulting in a rising interest in larger shops

and therefore, long (global) food supply chains. However, not all researchers agree with this pessimistic vision. Some point to the tradition of informal short supply food chains still present in this part of Europe (Jehlicka 2021; Smith & Jehlicka 2013; Visser et al. 2019), describing them as a manifestation of an 'invisible' alternative (Goszczyński et al. 2021) or 'quiet sustainability' (Smith & Jehlicka 2013). As a result, the Polish foodscape stretches between commercial networks, typical of capitalism, and the invisible ones embedded in the past and either slowly fading or being reduced to short-supply niches. Another factor that influences the shape of AFNs in Poland is the structure of local agriculture, which was collectivised to a lesser extent than agriculture in other Soviet Bloc countries. This allowed smaller subsistence or semi-subsistence farms to survive the times of 'real socialism'. While the average size of farms in Poland continues to be lower than in most countries of the European Union (EU), large monoculture farming is on the rise (Halamska 2020).

The operation and durability of various forms of AFNs is also largely affected by social conditions. In Poland, social relationships are based on a tradition of bonding social capital, which is grounded in close social connections, frequently blood relations (Zarycki 2013). Family and family happiness are considered the most important values in life by as many as 80% of Poles (CBOS 2020), a statistic that has not changed for years, with health, peace, and tranquillity ranking second. On the one hand, this concern for health filters through Polish consumers' declared interest in purchasing food from sustainable food systems (although this is still niche), despite higher prices compared to conventional food products (Jędral et al. 2020). On the other hand, the need for convenience and saving time discourages people from looking for alternative ways to buy food.

The relatively low levels of bridging social capital in Poland translates into low levels of trust and faith in public institutions (European Social Survey 2020-2022), which hinders the development of collective action and the preservation of common goods, whether material or other. This fact is confirmed by a relatively low percentage of Poles joining civic organisations (CBOS 2020). The still vivid memory of forced collaboration on the conditions of real socialism, particularly in rural areas (Möllers et al. 2018), continues to fuel people's relative reluctance to engage in joint projects such as cooperatives. Consequently, the state apparatus of control continues to expand along with the formal institutions of agriculture and food trade. Not only is it over-represented in Poland, it is also characterised by an extremely bureaucratic approach to its functions (Śpiewak 2020).

The collision of postmodernity and the past is also visible in the shape and nature of Polish AFNs. While they derive their operational patterns from the practices of the past or from global examples, they must function in a society where strong family bonds do not necessarily translate into involvement in civic actions. This means they look alike but are not the same. Their relationships with the state are also difficult as the authorities may support certain food-related initiatives politically, but operationally they prefer to concentrate on control and production standards. Undoubtedly, as in any other country, the shape and characteristics of Polish society leave a mark on the operation of institutions within AFNs. This effect is clearly reflected in the diversity of Polish AFNs. Depending on whether they are predominantly structured on the global or local models of operation, they can be divided into three categories: imitations, mixed, and embedded (Goszczyński et al. 2019). The Polish foodscape offers examples of copied activities such as CSA or urban gardening, as well as daily and largely invisible practices related to allotments and food self-processing. This picture is further complemented with initiatives such as local tourism brands, amalgams of new organisational models, frequently mediated through the public sector, and more or less successful attempts at a shift towards tradition. In combination, they attest to the diversity and dynamics of Polish AFNs, both of which also emerge in the analysis of AFNs' institutional arrangements.

Methodology

Following the research procedure, the field studies were conducted in six non-randomly selected Polish AFNs. A heterogeneous algorithm was applied with the selected networks differing from one another in terms of:

- Location: The procedure of purposive sampling allowed us to select networks from all over Poland to

reflect regional diversity.
- Socio-economic characteristics: The selected networks represented both open initiatives—accessible to everyone—and more élite ones.
- The specificity of dominant actors: Our study makes a distinction between AFNs managed by consumers, activists linked to non-governmental organisations (NGOs), and those typical of producers.

This selection made it possible to reach highly diversified initiatives with different histories, types of actors' involvement, and institutional arrangements:

Table 1. Main characteristics of the analysed Polish AFNs

Case	Dominant actors	Socio-economic characteristics	Location	Description
Frymark Farmers' Market	Producers	Élite	Central Poland (region: Kuyavian-Pomeranian)	A market for foodies in the city of Bydgoszcz. It has evolved into the most prominent local market for high-quality food. It attracts the Bydgoszcz élite and members of the middle and creative class. The sellers include small local producers and larger corporate-run businesses of 'high-quality food'. The food sold relates both to rural traditions and urban health trends.
Allotments in Białystok	Mixed	Egalitarian	Eastern Poland (region: Podlaskie)	Rooted in the city landscape. Allotment holders include elderly people who have been cultivating the land for years. They are often former employees of local industries. The second group of owners are young people who have chosen this space mostly for pleasure. For older owners, cultivating the plot is one of the most significant practices around which their social life is oriented.
Kitchen Incubator in the Local Action Group 'Gościniec 4 Żywiołów' [hereinafter: LAG '4 Żywioły']	Producers	Egalitarian	Southern Poland (region: Lesser Poland)	A local NGO associated with the local action group. It was established to preserve local culinary traditions and promote rural areas. The incubator seeks to connect small producers with wealthier buyers (e.g. through food baskets).
The Healthy Bytów Purchase Group	Consumers	Egalitarian	Northern Poland (region: Pomeranian)	An initiative started by consumers who wish to have access to high-quality food in a small town. This is a bottom-up action under construction. The leaders established the operating procedures themselves, developed relationships among members, and set up a quality control system. Apart from ensuring access to food, the purchase group plays an essential social role, creating space for individuals excluded from traditional communities.
The Dobrze Consumer Cooperative	Consumers	Élite	Central Poland (region: Capital City of Warsaw)	One of the oldest Polish consumer cooperatives. An initiative relating to progressive and political values. The consumers/members are Warsaw residents. The initiative's activities are organised around two cooperative shops and additional actions such as workshops or field trips.
The Wine Makers' Association of the Vistula River Gorge in Małopolska	Producers	Élite	Southern Poland (region: Lesser Poland)	One of the first undertakings to expand the appeal of wine in Poland (on an unofficial basis). This is an association of wine makers from Central Poland, established to promote and enhance the competences of members and their products. One of the association's key projects is the Janowiec Wine Festival, a periodic event bringing together Polish wine lovers and local producers.

Source: Own study

A total of 75 low-structured individual in-depth interviews were conducted with regards to the motivation, values, history, actions, and perspectives associated with AFNs. The researchers used an open-ended approach (Kvale 2007) to encourage the respondents to talk about the role of food in their life. In each network, surveys were conducted with consumers, producers, and people forming the broadly defined institutional environment (e.g. local government).

Following the adopted analytical procedure, the interview transcripts were entered into the CAQDAS programme where they were subjected to text retrieval, code assignment, code clarification, code agreement between researchers, assignment of variables, and code-variables-text analysis. Semi-open (Lewins & Silver 2014) and iterative coding was applied in the following steps:

- Initial/deductive coding: Based on the theory of institutions, four descriptive codes – meanings, associations, control, actions – were assigned by one of our analysts.
- Pattern/inductive coding: The clarifying of the codes was performed by a team of two analysts who worked on the said four descriptive codes, omitting the ones that emerged rarely in the interviews. The analytical Level II coding resided in pattern coding (Miles & Huberman 1994). As the transcripts were read, new analytical categories were inductively assigned to each of the four principal codes. These categories were derived from the interpretation of phenomena identified in the transcripts.

The specific categories defined for the main codes and applied in the analysis included:

1. Meanings: Analysing the values and meanings characteristic of the studied AFNs, we decided to focus on the aspects most frequently indicated by the respondents—health, family, fear of risks related to modernity, business, and fashion—as well as the relatively rarely expressed concern for the natural environment.
2. Associations: In an attempt to account for a variety of AFNs, we identified four relationship types emerging at the intersection of aims/objectives and contexts: i) market-based, shaped by the processes of food production, sale, and purchase; ii) bureaucratic, based on the formal rules adopted by development programmes; iii) community-based, with contacts organised with the network and community; and iv) civic-based, with the network seeking to also establish relationships other than economic ones, with citizens not involved in its actions.
3. Control: Two types of AFN regulation mechanisms were distinguished. The first, formal, consisted primarily of codified and written rules, norms, and regulations. The second, informal, was based on ad-hoc rules agreed in daily, informal, face-to-face interactions.
4. Actions: Actions were divided into commodity-oriented or relationship-oriented. While the former included all the operations dedicated to sales chains, increased volumes and profits, etc., the latter revolved around communication, network development, building a community, and acting for the common good, including outside the network.

One limitation of our study may be the heterogeneous nature of the cases. We studied various examples of AFNs and there is a risk that the sample selection may have influenced the internal diversity of the initiatives. This was expected to be remedied by the operationalisation and codes prepared for the analysis of the four dimensions of institutions. Our objective was not to compare the different types of networks but to analyse the institutional arrangements that could be identified in AFNs' functioning and the effect they would have on the activity of the networks. In the research process, we relied on the general and analytical types of codes developed to reduce the significance of differences in the formal structure of the individual networks. In other words, our codes and analyses focused on the AFNs' differentiation due to their background, the relationships between consumers and producers, and the nature of general development policies or market impacts, rather than the particular categories dictated by the particularity of each network.

Given the nature of the study and the research questions, we opted for a schematic—quantitative and graphical—analysis of qualitative data. Each subcode category was analysed using a cross tabulation to compare the cases against the statistics for the subcodes. The routine procedures were further enriched with a narrative to present examples of the processes observed in the survey. The generalisations assumed throughout the study were of an analytical nature and resulted from the juxtaposition of data with the adopted operationalisation (Maxwell & Chmiel 2014). Our goal was to obtain the case transferability. As statistical and empirical generalisations cannot be made, we would like to establish whether the results of our study are transferable to other AFNs, including those operating outside of Poland.

Results

Meanings

The system of values and motives represented by the institutions within the studied AFNs did not entirely correspond to the image of progressive values emerging from the selected theoretical and research works (Goodman et al. 2014). Meanings referring to environmental protection, locality, sustainable development, and fair trade could only be found in a few interviews. The most prevalent values among producers and consumers were those related to business, fear of modernity, health, and passions.

Table 2: Main motivation of producers (N=188)

Meanings	CASES						
	LAG '4 Żywioły'	Allotments	Frymark Farmer, Market	Dobrze Coopera-tive	Wine Makers' Association	Healthy Bytów	Total
Tradition and patri-otism	0	11%	4%	0	3%	17%	7%
Family	22%	**27%**	21%	8%	14%	9%	16%
Health	0	**23%**	17%	25%	7%	13%	13%
Fashion and life-style	11%	5%	8%	0	21%	17%	12%
Fear of modernity	11%	17%	17%	**42%**	3%	**22%**	16%
Business	**44%**	11%	**29%**	25%	**28%**	13%	**26%**
Passion	12%	6%	4%	0	**24%**	9%	10%

Source: Own research, N – the number of coded fragments

Table 3: Main motivation of consumers (N=240)

Meanings	LAG '4 Żywioły'	Allot-ments	Frymark Farmers' Market	Dobrze Coopera-tive	Wine Makers' Association	Healthy Bytów	Total
Environment	21%	0%	20%	15%	0%	12%	15%
Civic values	0%	0%	11%	20%	0%	16%	13%
Health	14%	17%	20%	20%	33%	**28%**	**21%**
Fear of modernity	21%	0%	17%	20%	0%	16%	17%
Family	21%	**67%**	14%	18%	0%	12%	18%
Fashion and lifestyle	21%	17%	17%	8%	**67%**	16%	17%
Passion	12%	6%	4%	0	**24%**	9%	10%

Source: Own research, N – the number of coded fragments

The studied AFNs proved to be quite diversified with regard to the normative foundations of their institutions and actions. References to values related to locality, natural environment or sustainable development were very rare among producers. In the strongly embedded local and traditional initiative of the allotments, the respondents' references clearly oscillated between family and health. Producers associated with the LAG '4 Żywioły', established as part of the EU LEADER programme, evidently favoured the market economy values. Similar, albeit slightly differently articulated motives were represented by the Wine Makers' Association (business and lifestyle) and the Frymark Farmers' Market (business). Interestingly, producers linked with the Dobrze Cooperative and the slightly similar Healthy Bytów Purchase Group turned out to be somewhat different from their counterparts. Their reference system of values, meanings, and symbols revolved around the fear of modernity. In the case of consumers, we were surprised by the uneven distribution of codes referring to family values. Family references could be found in all AFNs excluding the Wine Makers' Association; however, they were particularly prevalent in the deeply embedded and highly traditional initiative of the allotments. For producers, too, the family was a landmark. In the case of this group, an additional element was their business orientation, complemented by the fear of modernity.

In this sense, activity in the AFN institutions is perceived as a possibility of ensuring the protection of one's own economic stability and health, and those of one's loved ones. This triad of symbols related to family, health, and fear is expressed even more among consumers. In fact, references to the civic values associated with lifestyle and natural environment were found only in networks representing a more progressive attitude, such as the Dobrze Cooperative and Healthy Bytów.

Our analysis of the meanings of institutional arrangements in Polish AFNs revealed that, above all, the fear of modernity and its risks is what brings actors together around these institutions as a common symbol. Industrial food is treated by respondents as artificial and therefore detrimental to health. This translates into attempts to keep their bodies and families safe in an increasingly complex world. What distinguishes producers from consumers is their evidently business-oriented attitude. To most of them, being active in an institution such as an AFN is primarily a possible means of additional income. This is hardly surprising, as AFNs attract smaller producers looking for a chance to survive in the market. However, it seems to us that such a strong business focus results in producers' limited activity within the network. In fact, in all the studied cases, this group was found to be involved mainly economically, which tended to cause an institutional imbalance. Without their network-building and integrational involvement, the need arises for a stronger role of consumers or leaders associated with NGOs. However, the value system of consumers is strongly oriented to their own and their families' well-being, which may hinder collective actions intended to serve other purposes. Even if values such as sustainable development, environmental protection, and citizenship do emerge, they are merely in addition to the dominant individualised narrative.

As a result, tension may be observed between the traditional, Polish or more broadly Eastern European symbols and practices of obtaining food, and patterns borrowed from initiatives developed primarily in the countries of the global North (Goszczyński et al. 2019). Traditional network institutions, such as allotments, function in a completely different manner. Their ingrained practices attract people who are evidently more attached to values such as family well-being and hobbies, rather than economic incentives which, in their case, are practically absent. Being involved in food production fills them with a sense of agency, helps organise time, and makes them engaged in the social infrastructure of the allotments. At the other end of the scale are the urban-middle-class-targeted and consumer-oriented networks such as the Dobrze Cooperative and Healthy Bytów. This is where references to sustainability appear (Smith & Jehlicka 2013) and where the most salient values related to individual safety are enriched with references to environmental protection, fair trade, and civic relationships. Between these two types, there is a highly diversified category of networks such as the Wine Makers' Association, LAG '4 Żywioły', or the Frymark Farmers' Market. In their case, the core system of the network's values is defined by leaders from business and NGOs. These AFNs are essentially focused on the economic development of producers, networks, and local areas. Since they are producer-oriented, they

do not assign an active role to consumers, other than shopping for food.

Associations

In the analysis of the next institutional element of AFNs, we have sought to define the general logic behind their work organisation, the nature of relationships among actors, and relationship-building models. As a result, four basic types of association were identified, based on references made in the interviews with respect to the market, the logic of public policies and bureaucracy, the narrowly defined network community, and the broadly defined idea of citizenship. The study revealed a significant diversity of networks.

Table 4: Association models identified in the AFNs (N=203)

Association model	LAG '4 Żywioły'	Allotments	Frymark Farmers' Market	Dobrze Cooperative	Wine Makers' Association	Healthy Bytów	Total
Civic-based	0%	0%	0%	48%	0%	44%	21%
Community-based	0%	40%	17%	24%	8%	39%	23%
Bureaucratic	50%	60%	0%	0%	31%	6%	19%
Market-based	50%	0%	83%	29%	62%	11%	37%

Source: Own research, N – the number of coded fragments

Depending on the network's genesis – a top-down initiative for the purposes of the EU programmes ('4 Żywioły'), public policies (allotments), producers' (Frymark Farmers' Market, Wine Makers' Association), or consumers' initiatives (Healthy Bytów, Dobrze Cooperative) – large differences became visible in the dominant association model. Typically, bureaucratic relationships and work organisation models prevailed in the LAG '4 Żywioły' where the activity and involvement of individual leaders was confronted with the specific requirements of the support programmes (LEADER, Norwegian Funds) and the members representing local governments. Their highly institutionalised approach to the network organisation and its internal relationships were further consolidated. On the one hand, this left much less space for spontaneity and autotelic interactions but, on the other hand, it made the network more transparent. The allotments proved to be a particularly interesting case with their formal legally prescribed organisation model entirely permeated by the spirit of community. As a mixed type of AFN, they relied on bureaucratic mechanisms which, however, were intertwined with the history and tradition of the community.

The study sample also revealed two typically market-oriented initiatives. The aim of both the Frymark Farmers' Market and the Wine Makers' Association is to create an economic space for local products. In the former initiative, producers organised in a way that prevented the competitive copying strategy and thus internal rivalry, which requires an organisational effort and efficient management by leaders to resolve disputes and uphold the rules of competition. Interestingly, although organised by two leaders whose main and clearly articulated objective was to find a market opening for the sale of their products, Frymark is also a bottom-up initiative that operates according to pre-agreed and negotiated bottom-up rules. This contributes to the network's greater durability and resilience in challenging times, such as location changes, periods of limited consumer interest, and the COVID-19 pandemic. Frymark's form of association stands in contrast to the latter and more formalised type, the Wine Makers' Association, whose organisational structure is much more bureaucratic and therefore dependent on hierarchical relationships within the Association.

A different picture of associations emerges in AFNs such as the Dobrze Cooperative and informal groups of

consumers such as Healthy Bytów. Concentrated in urban areas (a city and a town, respectively), they were developed around middle-class activists and people interested exclusively in buying food. With their market relationships pushed to the background, the networks prefer to rely on relationships with active consumers who share the general idea of citizenship and alternative forms of capitalism (Dobrze Cooperative) or a small community (Healthy Bytów). The latter seems to be a particularly interesting case. Established in a provincial town, it revolves around the activity of women from larger cities and representatives of the creative class. To them, the AFN is not only a place of access to fresh food but also one where they can build strong relationships and find their place in a new community. Along with allotments, this is another type of AFN with the strongest associations derived from the authentic grassroots passion of those involved. For example, researchers noted that the Bytów activists would meet at informal breakfasts to decide together about the future of the network and its actions. Accounting for all class-related and bureaucratic differences, their behaviour was most reminiscent of relationships observed among the allotment holders.

Despite references to citizenship and—to a certain extent—community, the associations in networks such as the Dobrze Cooperative function in an entirely different way. Relationships are more codified, the work organisation is better, and everyone has a role assigned to them according to a clear division into employees, activists, regular members, and buyers. Aware of the fact that such a strict codification can make their institution appear overtly constrained or rigid, the Cooperative's members approach the community with discount actions for local seniors and dedicated educational campaigns. In a sense, the typical association form of this case reveal a general dilemma faced by all developing AFNs. While increasing the efficiency which is necessary at a certain stage for the institution's development and survival, the codification and organisation of work leads to the loosening of the association, replacing strong direct relationships with more heterogeneous and more detached contacts.

Interestingly, the market-, community- and civic-based associations proved to be largely interconnected. The analytical procedure indicated that two diametrically different types of work organisation and relationships or, more generally, a model of association can be distinguished. The first is typical of networks operating in a highly bureaucratic environment of local government, EU programmes, and traditional and new public policies. This is where the initiatives that emerged with the third and fourth pillars of the Common Agricultural Policy (CAP) and the fashion for promoting local food in local development policies occupy a particular place (Goszczyński & Knieć 2011). The operation of their institutions was supported by partners with abundant resources (local governments, public institutions) but which enforced very formal relationships, methods of operation, and organisation. At the other extreme are the grassroots initiatives based on the activity of consumers or producers and characterised by lower levels of bureaucracy, greater organisational flexibility, and a focus on economic efficiency (producers' networks) or community and citizenship (consumer-oriented networks). Initiatives traditionally present in the Polish foodscape fall within the space between these two types: the allotments represent a combination of the bureaucratic logic and highly formalised institutions with the grassroots activity of the allotment holders.

To sum up this section, it is worth pointing out that while the meanings were similar for all the studied networks, they differed significantly in terms of association. The direction of actions, members' activity, work intensity, communication methods, and the impact on members seem to depend on the extent to which they originate from the actors or the specific norms and regulations. In other words, even the most modern public policy alone cannot breathe energy into bureaucratic initiatives.

Control

The next step in our analysis was to explore the dominant control mechanisms. The tools applied by the AFNs were divided into formal—regulations, rules, and written norms—and informal i.e., based on direct relationships among those involved.

Table 5: Control model for the studied AFNs (N=203)

Control	LAG '4 Żywioły'	Allotments	Frymark Farmers' Market	Dobrze Co-operative	Wine Makers' Association	Healthy Bytów	Total
Informal rules	50%	33%	71%	30%	0%	55%	43%
Formal rules	50%	67%	29%	70%	100%	46%	57%

Source: Own research, N – the number of coded fragments

Each network stands for different types of principles and rules for supporting its actions. LAG '4 Żywioły' is financed under the EU LEADER programme, and therefore operates within a precisely defined formal framework instituted by extrinsic forces. This was reflected in the number of references made to formal rules, most of which were imposed from the outside rather than worked out within the network. '4 Żywioły' must comply with both the regulations of the LEADER programme and the innumerable restrictions regarding food processing and selling. However, the network is also deeply nested in the informal relationships of rural communities, as indicated by half the respondents' references pertaining to informal rules such as 'getting along to find a way' and 'spontaneously keeping the network afloat'. This AFN is largely based on a charismatic leader as the driving force behind the project. Given her extensive experience in leadership, the network receives the benefit of informal rules as a break from the formality of the programme-managing institutions and local governments, to ensure control and work organisation.

In contrast, the Wine Makers' Association represents a type whose durability depends solely on the pre-established formal rules. As a producers' initiative that is market-oriented (see associations), it clearly adheres to formal rules because its primary objective is to have its appellation acknowledged in administrative terms, with its products evaluated and recognised as luxury goods. The AFN members make significant investments in their vineyards, and they require precise rules and procedures of operation within the network to make sure that their money is used effectively and yields the expected return in the long term. As the Association's members, mostly men, are representatives of the middle or upper classes, with a business background, they are accustomed to procedures and formalities, which intensifies their propensity to formal conduct. Another producers' network, the Frymark Farmers' Market, offers even more indications of informal rules at play. As a leader-based network, it relies heavily on the experience and performance of two people and continues to operate largely because of their decisions, most of which are taken informally. The formal organisation takes over in the case of the entry of new member-producers and conflict situations.

Another interesting example is the Dobrze Consumer Cooperative. As a bottom-up and ideologically driven project based on social trust, it could be expected to prioritise informal actions. Nevertheless, our analysis shows that the network's operation depends more on formal rather than informal rules as shown, for example, by a list of obligatory documents (on-call regulations, rules of association, assortment criteria, etc.) enumerated on the Cooperative's website. The formal rules are given preference also because the Cooperative is interested in maintaining a flat organisational structure. To this end, a formal framework is needed that can be referred to when necessary. Some of the procedures result from the requirements that must be met by an institution employing (several) people full-time. Healthy Bytów, while similar in terms of organisation and ideology, features reversed proportions compared to the Cooperative, with the advantage of informal rules. This reversal in the frequency of references could be a function of time and scale. Although the dynamics of changes over time were not the subject of our study, the respondents indicated that with time, the Dobrze Cooperative had to grow 'layers of formal rules' as the number of its members increased. As Healthy Bytów, still in its infancy, is relatively small, there is little emphasis on formal rules to support the

network. Moreover, this AFN operates in a small town where informal rules and contacts make it easier to keep the network operational, compared to those in larger agglomerations such as the Dobrze Cooperative. Finally, allotments prove to be an interesting case. As part of a larger structure, the Polish Allotment Federation (Polski Związek Działkowców, PZD)—an institution that has existed for 120 years—this network is well-embedded both locally and institutionally, and has a powerful bureaucratic background. Nevertheless, it relies on informal rules that allow the studied AFN (as one of 5,000 allotment associations) to function efficiently. Most of its members are elderly people, representatives of the working class who live in the area and have both the time and knowledge to cultivate their allotment gardens. Their similar biographies and years of knowing one another gave rise to the informal customary institutions. However, their operation is regulated by a set of formal and precisely defined rules (e.g. regarding the size of buildings permitted on the plots) that have been in place for years.

Actions

The last element in the institutional analysis of the AFNs is actions undertaken within the network. Our focus was not on the activity of individual producers or consumers but on collective actions. Two types were distinguished: relations-oriented and commodity-oriented. The former described actions aimed at the development of internal relationships and were not directly related to the AFNs' sales or economic aspects. They included, for example, the preservation of tradition, environmental protection, fair trade, and sustainable development. The latter (commodity-oriented) were intended to increase the efficiency of sales, profit, and market availability of products. As such, they concentrated on the network and on food treated as a commodity in the producer-consumer market exchange. The studied AFNs proved to be largely diversified in this respect as well.

Table 6: Action model for cases (N=98)

	LAG '4 Żywioły'	Allotments	Frymark Farmers' Market	Dobrze Cooperative	Wine Makers' Association	Healthy Bytów	Total
Commodity-oriented	83%	20%	78%	54%	56%	33%	53%
Relations oriented	17%	80%	22%	46%	44%	67%	47%

Source: Own research, N – the number of coded fragments

Most commodity-oriented actions were found in the LAG '4 Żywioły'. As an institution established under the EU programmes, this AFN must comply with many formalities and clear the accounts for the grant provider. Therefore, it puts emphasis on the product, brand development, and actions that demonstrate measurable effectiveness. The network itself operates in an area with relatively few local food producers offering a limited choice of products. Perhaps this explains the network's focus on the kitchen incubator that is to transfer some of the production costs to the AFN. Economic activity is the primary expectation of both the incubator and the producers. However, the actions of the latter are highly individualised with own economic gain as a priority.

The differences between the Frymark Farmers' Market and the Wine Makers' Association are interesting. As producers' networks, both are focused on sales and development. On the one hand, the alternative actions of the latter revolve around producer and consumer education, winemaker training, and product promotion, with producers being aware of the delayed benefits of investing time and energy in the organisation of the Polish Wine Festival in Janowiec, an élite annual event targeted at wealthier consumers. On the other hand, Frymark was established as a place where small farmers, food processors, and organisers could make

money. Its community-based actions include, primarily, the organisation of weekly green markets, producer coordination, communication, conflict management, brand building, and brand promotion.

At the other extreme are the networks whose alternative actions are mostly community-based. This type of action is particularly visible in the case of allotments. People involved in this network are primarily interested in contact with nature, the joy of physical work on their small plots of land, and socialising with people who have similar needs. Material profit is of no significance. As a result, allotments have proved to be, by far, the most strongly embedded network following a familiar pattern of action and combining collective action with a sense of ownership which is so important to allotment holders. It is also an initiative that connects elderly people with similar backgrounds and approaches to recreational activities. The network is their way of having access not only to food but also to integration and a form of community. During the study, we had the opportunity to observe a relatively large event, a festive garden party dedicated to and celebrated within the community of allotment holders. It was one of the few examples of community-based actions free of any economic intentions.

Network-oriented actions also predominated in Healthy Bytów and the Dobrze Cooperative, whose members devote a lot of effort to contacting and selecting the producers and working with food, for example through culinary workshops. Both networks were found to be the most democratic, representing a flattened management structure that strongly emphasises community decision making, with food quality not necessarily confirmed by official certificates (e.g. organic label) but on a discretionary basis, through direct contact with producers and negotiations. However, community-based actions were more prevalent in Healthy Bytów than in the Dobrze Cooperative. As a small and relatively new network, the former is still at the development stage, still working out its rules. As mentioned above, it operates in a small town where people know one another, have more time than in a large city, and are more willing to spend time socialising and integrating. In contrast, the Cooperative is an interesting example of sustainability-oriented actions, representing a focus on both: network organisation and community actions. This dualism results from the Cooperative's size: unlike Healthy Bytów, it is a quite large organisation that employs people. It therefore requires a certain level of formal structure to maintain financial liquidity and an organisational system.

Summary and discussion

The results of our analysis of institutional arrangements in Polish AFNs were nothing short of a surprise to us. What we initially expected from the studied networks was a high level of similarity. This assumption proved true only in one institutional dimension: meanings. Despite certain differences, all AFNs operate within similar symbols and meanings, focusing on the individual wellbeing of producers and consumers. The values represented by the network actors are shared by all AFNs included in the study. Regardless of the network type, the dominant motives are individual and family health and safety, typical of Polish society and other societies in general (consumers), and economic gains due to new market opportunities that arise from active participation in alternative initiatives (producers). Polish AFNs also seem to share a vision of development that is essentially focused on keeping the network operational. This may be the result of a relatively short period of operation in most of the analysed cases.

This similarity notwithstanding, the studied networks differ profoundly in the organisation of actions, applicable rules, levels of formalisation, and relationship models. Depending on the nature of the network and its founders' motives (networks established for the purposes of support programmes in producers' or consumers' interests), AFNs differ in terms of the internal structure, flexibility of internal mechanisms, and commitment of their members. Initiatives closely connected to public funding seem to be particularly problematic as their relationships are largely governed by bureaucracy and strict (often formal) mechanisms of control. Initiatives related to urban consumers feature the highest levels of flexibility. Other interesting examples of the strongly embedded and highly traditional AFNs, combining sustainability with the bottom-up approach found in well-established institutions, include the allotments and food producers selling their

products directly at green markets.

The table below summarises the AFNs in terms of the prevalent category (with most references) in the respective institutional dimensions.

Table 7: The dominant types of institutional arrangements in the analysed AFNs

	Led by	Meanings	Association	Control	Actions
Wine Makers' Association	Producers	Business	Market	Formal	Mixed
Allotments	Mixed	Fear of modernity	Bureaucratic	Formal	Relations
LAG '4 Żywioły'	Officials	Business	Bureaucratic	Mixed	Commodity
Frymark Green Market	Producers	Business	Market	Informal	Commodity
Healthy Bytów	Consumers	Mixed	Civic	Informal	Relations
Dobrze Cooperative	Consumers	Fear of modernity	Civic	Formal	Relations

Source: Own study

As a result, what emerges in the operation of the studied AFNs as particular with regard to internal institutions is their different model of action and organisation. References to progressive values or horizontal forms of micro-democracy within networks are rare. Instead, AFNs tend to be based on individualised motives, management through leadership, and forms of action that are stretched between the past, transformation, and modernity. The formal model of control through public institutions or formalised actors such as NGOs or enterprises further completes this picture, with the latter having a significant effect on people engaged in AFNs and their potential to act. Three distinctive networks (Dobrze Cooperative, Healthy Bytów, and the Allotments) found it easier to initiate joint activities, owing to their focus on relationship-building actions. This finding is important because it shows that, despite differences, putting emphasis on the development of internal relationships (the very foundation of joint actions) can have a positive effect on the potential of the network. This can be achieved even in networks with similar, individualised values or operating in the conditions of unified, formal rules and policies or market impacts. To sum up, we believe that the key element to the institutional arrangements is for networks to focus their internal activities on building relationships among the actors involved. This is what allows AFNs to work together, while the external factors, particularly the financial ones, do not have a significant impact on their long-term existence.

The aims of this article were not limited only to Poland. In the study of the networks, a theoretical and methodological framework that differed slightly from the most common ones was proposed. Our analysis method, focused on studying institutions operating within AFNs, allowed us to look at these networks in a new way to see their functioning and appreciate their internal diversity. While our study offers some insight into the community types and the institutional organisation of Polish AFNs, a similar analysis of networks operating in other cultural contexts seems advisable to verify our research method and establish how universal or unique the institutional arrangements regulating the operation of AFNs are. In summary, our research is a voice in the debate on the relationship between AFNs' institutions—defined as rules used in collective-action situations—and the style of their actions, including those related to collective action. The question of the relationship between the types of studied networks and the actual potential of institutions within them requires further examination. For example, it would be relevant to look at how far they allow for the inclusion of those who are usually excluded, or the modification of consumption attitudes, and whether they truly provide for an organisational or operational alternative to the dominant food system regime. The function of institutions is to promote cooperation and thereby generate cooperative benefits. Therefore, achieving the goals of both producers and consumers, as well as the durability of the network, emerge as a measure against which one can assess how well the institutions analysed in this article deliver on their tasks.

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Why do local plant proteins not take off? Sustainability rationalities in public catering

Paper first received: 09 June 2022; Accepted: 22 April 2023; Published in final form: 30 April 2023
https://doi.org/10.48416/ijsaf.v29i1.487

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Abstract

This study examines the potential of local plant proteins in promoting sustainable dietary transition in public catering and, simultaneously, helping rural regions find sustainable livelihoods in the future. Environmental and health reasons call for a transition to more plant-based diets in Western countries. This poses a livelihood challenge for many rural/semi-rural regions that are currently livestock-dominated. Local plant protein crops could be a 'win-win' solution, both for promoting dietary transition and for supporting local rural economies – presently two conflicting objectives in regions where animal production prevails. This study is based on a development project in which local public catering actors undertook to increase the use of local plant proteins. It analyses public actors' rationalities that explain actions and inactions for sustainability transition and the positioning of plant proteins therein. Results demonstrate how the dominant catering rationalities, and mismatches between regime and niche actor rationalities, hinder the mainstreaming of local plant proteins. The discussion reflects upon ways to overcome these barriers.

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ACKNOLWEDGEMENTS

The author thanks Tiina Silvasti, Ville Tikka, Marileena Mäkelä, and the reviewers for valuable feedback and Emma Kynkäänniemi for all the discussions during the development project.

Introduction

Significant reductions in the climatic and land use impacts of modern food systems necessitate a transition to more plant-based diets and reduced meat consumption, which would also benefit public health (de Boer and Aiking 2019; Willett et al., 2019). Research has identified the prospects of and barriers to a dietary transition at the individual level (Niva, Vainio and Jallinoja 2017; Austgulen et al., 2018; Kaljonen et al., 2019). The ineffectiveness of steering consumers by information campaigns or soft nudging has created interest in the role of organisational (public) food system actors in promoting transition. Related research has been framed in terms both of sustainable procurement (e.g., Smith et al., 2016; Sonnino 2009) and of promoting environmentally sustainable diets via public catering (Florén, Amani and Davis 2017; Wahlen, Heiskanen and Aalto 2012; Colombo et al., 2020).

One unstudied aspect in this context lies in the tensions between different sustainability objectives, which may even suggest opposite transition pathways (Kortetmäki 2019) and are of concern to rural livelihoods. For example, local food is commonly perceived as evidently sustainable and just (e.g. Autio et al., 2013; Gottlieb and Joshi 2013). However, animal-based production predominates in many modern food systems, comprising nearly or approximately half of the value of agri-food based GDP in the European Union, the United States, and Australia. This situation generates tension between promoting sustainability by supporting the existing local production, and promoting a dietary transition. The latter reduces the consumption of products that presently form the cornerstone of regional food systems and may increase the use of non-local, even imported, foods (Kortetmäki 2019). Food chains constitute a significant building block in the development of rural areas struggling with the continued withdrawal of capital and decreased distribution of added value to primary producers (Marsden et al., 2000).

The production and use of local plant proteins could alleviate the tension and create 'win-win' solutions by providing a way to simultaneously promote local rural livelihoods and dietary transition. Local plant proteins could support values associated with locality and food justice, even food autonomy,[1] as well as potential for added value through short supply chains (Marsden et al., 2000), while promoting decarbonisation and public health (Willett et al., 2019; de Boer and Aiking 2019). This potential has turned attention to the prospects of 're-launching' the currently marginal domestic and local plant protein food crops in public catering (e.g., Balázs et al., 2021; Lascialfari et al., 2019; Magrini et al., 2021). Local plant proteins could help semi-/rural communities respond to food system regeneration demands in ways that benefit sustainable livelihoods and the viability of rural communities (cf. Marsden et al., 2000). However, unlocking such potential requires that lock-ins in local plant protein production and consumption be overcome (Balázs et al., 2021; Magrini et al., 2021; Paloviita 2021).

This research focuses on the role of public catering as a promising avenue for overcoming the aforementioned lock-ins (Paloviita 2021). Catering can create high-volume demand for new products and novel value chains, and transform eating practices by introducing sustainable choices and creating food environments that support change (Wahlen, Heiskanen and Aalto 2012; Colombo et al., 2020; Niva, Vainio and Jallinoja 2017). The focus on catering also answers to calls for examining the role of non-market actors in sustainability transitions and the spatial contexts of transitions (Lawhon and Murphy 2012), and understanding the public-private dynamics in food system transitions (Marsden 2013). Furthermore, results bear relevance beyond public catering. First, they can illuminate public-institutional rationalities for sustainability action more generally. Second, as public catering needs to justify its activities in ways that a majority of policymakers and taxpayers accept (Schedler 2003), their reasons 'mirror' the prevalent socio-cultural valuations and conventions of appropriateness in food practices. Third, the affordability standards of public catering reflect mainstream consumer viewpoints (the importance of price) better than the willing-to-pay niche consumers featured in

[1] While food autonomy discourse is active in various countries and is posited as central for sustainability and justice, discourses in Finland rarely refer to food autonomy. Instead, they stick to the (related) notions of self-sufficiency and supply security. The development project was carried out in 2018–2019. The war in Ukraine in 2022 might have influenced related views and articulations.

many transition studies. As one of the catering actors pointed out: a product that passes catering standards can triumph in mainstream markets too. Thus, study results are also valuable for understanding the potential of local plant proteins for dietary transition more generally.

Finland, where the case study is located, is a flagship country in public catering. Like Sweden, it has long served free, nutritionally wholesome and warm school meals (Peltola et al., 2020; Colombo et al., 2020). Finland provides free school meals for all pupils in basic education (aged 7–16) and upper secondary education: roughly c 900,000 meals overall every school day. Finnish public catering also handles a majority of pre-school, hospital, and elderly catering, and sells lunch for municipal workers. Lessons learned therein are highly relevant to large-scale catering generally, including private student and staff canteens (many of which are publicly subsidised) that similarly aim at providing low-cost yet satisfying and wholesome meals for the masses. Finland is representative of Western dietary patterns and modern food systems: animal-based production comprises almost half of the total production of the Finnish food industry (Finnish Food and Drink Industries Federation 2022).

Could local plant proteins provide 'win-win' solutions, promoting both local livelihoods and dietary transition simultaneously, in semi-/rural areas? This research aimed to understand the potential of local plant proteins in promoting dietary transition alongside sustainable local livelihood sources in the future.[2] It took place within the context of a development project that promoted food system sustainability in a Finnish semi-rural, livestock-dominated region. In the following section I introduce the theoretical-conceptual background for the study, the Weberian framework of institutional rationalities. This is followed by the project description, an explanation of the data and methods, and the presentation of the results. The main results show that the dominant regime rationalities create several barriers to the mainstreaming of local plant proteins and produce a diagnostic framing where sustainability is more a matter of geographical, rather than dietary, transition. Rationality mismatches, in turn, hamper successful interactions between local plant protein actors and public organisations. Finally, I reflect upon solutions to the identified barriers to local plant protein use.

Rationalities and sustainability transitions

Food system sustainability transitions are studied in the fast-evolving field of sustainability transition studies. In this field, transitions are often considered as resulting from multilevel interactions within and between the exogenous socio-techno-political factors, the regime (the mainstream institutional actors and practices), and innovative and radical niche actors (Geels and Schot 2007). Transitions can come about through multiple pathways (Geels 2014; Geels and Schot 2007). Incumbent regime actors may transform the system, while retaining their position, by changing their activities in response to exogenous criticism or policy changes, or by adopting novelties from the niche cumulatively, for economic or functional reasons. Incumbent regime actors may also get replaced because they lose their legitimacy due to the exogenous criticism or, in market conditions, by losing the competition to the emerging niche actors. Demands for food system transformations comprise a major exogenous pressure on the regime (mainstream) institutional actors (Marsden 2013, 295). Low-carbon transition studies show that actors' responses to transition pressures depend on how they perceive the problem; resistance in various forms is a common response (Geels 2014).

Dietary transition is a critical aspect of food system transition (de Boer and Aiking 2019; Willett et al., 2019), for which plant-based proteins represent the key niche (Morris et al., 2014; Lonkila and Kaljonen 2022). Research on food system sustainability transitions has focused primarily on global and national change mechanisms, and on alternative food networks as niches, while meso-scale change mechanisms have been understudied (Lamine et al., 2019). Yet understanding the responses of regime actors to transition pressures requires us to look at meso-scale actors at their level of operational environment, where the implementation

[2] Crop rotation with legumes was excluded from this study as irrelevant for dietary transition and public catering contexts, although it is relevant for agroecological transitions. Another excluded topic is the transformative capacity of current livestock producers who would not all benefit from dietary transition.

of sustainability actions materialises or fails (e.g., Lonkila and Kaljonen 2022; Lamine et al., 2019). Dietary transition marks a system-wide transition that will materialise only if it is implemented by various regime actors. Institutional catering represents one of the key regime actors as an established, relatively stable institution with specific regulations, professional networks, practices, and training systems.

Weberian rationalities and organisational change

Max Weber introduced rationalities when he sought to explain different development pathways and the distinct features of the life spheres of Western civilization as compared to others (Weber 1958; 2019; Kalberg 2011). Rationalities provide an analytical lens for understanding the regularities of institutional and organisational actors (Townley 2002; Fuenfschilling and Truffer 2014), including responses to transition pressures. Rationalities are regularities of thinking and ordering that aim at mastering reality and making particularised events and fragments of life into meaningful wholes to organise and justify action (Kalberg 2011:16–17).[3] Rationalities also determine what counts as 'proper' justification for actions (Watson 2003). Institutional rules and practices invent rationalities as institutional logics; thus, rationalities also influence the likelihood and contents of institutional actions for sustainability (Fuenfschilling and Truffer 2014).

Rationalities are rational only in relation to particular reference points or values (e.g., Weber 1946: 331–340, 544–554) that may appear as self-evident at present yet are mutable over time. Studying competing rationalities and their interplay illustrates how the dominant rationalities may become destabilised (Townley 2002: 164) and where the key opportunities for endogenous regime transitions reside.

Rationalities offer an interesting lens for analysing public actors in sustainability transitions. Public actors, using taxpayers' money, need constantly to justify their actions and use of public resources. To articulate acceptable reasons for their activities or for changing them, actors must consider the prevalent rules and assumptions in their society, in the regional and national contexts, while also demonstrating sensitivity to the emerging exogenous pressures. This forces public actors to navigate between competing objectives ('reflexive rationality', Alrøe et al., 2017).

Rationalities exist and are reproduced through social action. Weber (2019: 99ff) describes such action as comprising four ideal types (real-world actions rarely represent only one type): traditional; affective; value rational; and instrumentally rational. Traditional actions are guided by habituation, and affective actions by emotions, whereas the other two types of action are guided by value and purposive rationality. While tradition-related and affective factors are highly relevant for individuals' food choices (e.g., Niva, Vainio and Jallinoja 2017), public actors can hardly appeal to emotions or 'non-rational traditions'. In modern societies, public catering needs to justify its operations in terms of different rationalities. While the twofold distinction of value and instrumental rationalities (in the above-described action typology) has been commonly applied in research, it dismisses other aspects of rationality that are highly relevant for institutional actors. The fourfold account developed by Stephen Kalberg (2011) is thus more apt for analysing institutional actors. This fourfold typology has not been applied to food system studies before.

The four ideal types of Weberian rationalities (Kalberg 2011:18–26) are: practical; substantive; theoretical; and formal. Practical rationality (also means-end or instrumental rationality) refers to pragmatic actions dealing with the challenges of daily reality to meet goals with the most efficient means. Substantive or value rationality (hereafter value rationality) refers to constellations of normative values and belief systems, including conceptions of good and right. Theoretical rationality represents belief-cognitive and often abstracted knowledge about the reality. Formal rationality denotes the sphere of legal and bureaucratic, 'impersonal' rules that organise reality. Practical and value rationalities directly link to the Weberian types of action. Theoretical ratio-

[3] Weber did not systematise his account very clearly. Thus, I rely on Kalberg's more nuanced typology instead of a relatively common 'instrumental vs. value rationality' typology.

nalities link to action indirectly, as the study will demonstrate. Formal rationalities link to action both directly and indirectly. While rationalities are rational only in relation to certain (historical and contextual) reference points and are thereby mutable, they change neither easily nor quickly. This is because of their importance for mastering the shared understanding of the reality of the given society and historical time.

Data and methods

Case description and action research approach

This case study examines a 15-month development project (in 2018–2019) 'Protein Silicon Valley', funded by the Finnish Innovation Fund and managed by Emma Kynkäänniemi. The project was designed to promote regional food system sustainability and to nurture collaborative experimentation to find uses for local plant proteins.[4] It also sought to foster new business models such as collaborative product development between catering and food producers. Experiments included: testing local plant protein products in catering; developing related recipes in both public catering and large-scale catering education; and marketing products and raising awareness in the region.

The project engaged actors in primary production, small-scale processing, marketing, catering, restaurants, education, and retail. Experiments constituting the development project were planned in collaboration with them. The research process run in parallel was designed by the researcher; it involved actors as informants but not in more engaging ways, except for the focal actors who were also involved in reviewing rationality summaries (see Data collection and analysis).

The project was located in a Finnish region with c. 275,000 inhabitants and 23 municipal units: one bigger city (c. 150,000 residents) surrounded by predominantly rural or semi-rural (intermediate) municipalities with significant agricultural activity. The population demographics represent the Finnish average. The region's main economic activities comprise services and forestry-based industry. The number of farms is c. 2,500 and is declining, while farm sizes are increasing. Primary production accounts for 5 % of employment in the region (mostly outside the city area). Beef and dairy production generate over 80 % of agricultural income. Plant protein experiments engaged public catering in three municipalities (3,000–25,000 residents), as well as other actors from around the region.[5] The public catering actors engaged represented food services managed directly by the municipality. This is a typical management method in smaller municipalities whereas in bigger cities public corporations are common.

The research approach was interpretive action research: a reflective and emergent form of research that utilises local knowledge and capacity-building to endorse transformations, and that focuses on how actors perceive, interpret, and react to events (Stringer 2013). Action research fits well for event-focused research that reveals the everyday frictions hindering sustainability transitions (Kaljonen et al., 2019). The development project determined the emergence of events that generated research data, which were then enriched with additional interviews. Action researcher is not a distant observer (Stringer 2013); I participated in experiments and collaborated closely with the project coordinator. This implies a dual role: being critical of the existing discourses, practices, and power relations, while encouraging the project goals. I reflected my role and its implications on the analysis throughout the project. The designated coordinator allowed me to focus on asking and wondering instead of facilitating action or initiating events: I was a 'curious sidekick'. The coordinator was also a key informant, and our discussions were influential to the analysis. She also read and commented this manuscript (but did not consider herself as a co-author). The inclusion of actors' voices in the research was strengthened by iterative reflection with the key actors and individual interviews, ensuring

[4] The project also aimed to increase the use of local freshwater fish. I excluded fish here because local, sustainable and safe freshwater fish are neither broadly available nor typically an option to agricultural actors.

[5] The project engaged five municipalities (and involved individuals from other municipalities) but not all tried plant proteins. Bigger city actors acted as informants but did not participate in the project that focused on semi-rural municipalities to address rural development and engage new actors. Most prior food sustainability experiments in the region had been urban.

that central actors from group meetings had a possibility to speak with their own voice. Iterative reflection also involved additional involvement of people who had shown interest in the research process. The focal plant protein actors and the most active catering personnel also commented my initial summaries of their rationalities to ensure that the summaries successfully captured their views.

Data collection and analysis

The data were collected from informants (Table 1) throughout the project events (Table 2). Events, totalling 33, included experiment planning meetings, funding application meetings, the experiments themselves (mainly in schools), and informal exchanges. They were complemented with thematic individual and focus group interviews. Of all these events, 24 were recorded (c. 30 hours) and transcribed verbatim. Field notes covered the whole project via on-the-spot and recollective reflection (c. 85 pages in total). Informants (N=42, Table 1) comprised two groups. Closest informants engaged directly in the project, while external informants were chosen to enrich data by broadening understanding about the context of research; for example, city-based informants were experienced in sustainability experiments. Engaged informants represented diverse categories yet, in practice, project meetings often became discussions with the catering and plant protein actors, project coordinator, and myself. Municipal officers drew back from the discussions after the initial steps and commented the experiments supportively but did not want to get actively involved. Thus, the analysis included diverse voices, although the voices of the catering and plant protein actors were emphasised.

Table 1. Informants.

Actor category	N	Comments
Informants who engaged in the development project		
Project coordinator	1	Collaborated closely with the researcher; mutual discussions influenced field notes.
Public catering personnel in managerial positions	6	
Public catering personnel in other positions	4	
Municipal officers	4	
Public catering educators	2	
Plant protein producers	3	All were also involved in supply chains (innovation, processing, marketing).
Plant protein actors who were not producers	4	Involved in product development, processing, marketing, and sales.
Non-municipal catering personnel, managerial positions	2	One private sector representative and one national public catering representative.
Informants who did not engage in the project (additional interviews)		
Catering managers and personnel from other cities with experience of similar projects	6	Participated in focus group interviews; one was interviewed individually.
Education sector actors	5	Actors' institutions run local food projects; interviewed in focus groups.
Students interested in sustainable proteins	5	Participated in two focus group interviews.
Two researchers from the author's department participated in three interview events (synergistic interviews) but were not included as informants.		

Table 2. Project events that generated research data.

	Event type	Informants (N)	Additional remarks
	Counting activity as a research event implies that at least the coordinator or the author was present; actors also continued project activities on their own.		
1	Start meeting with plant protein actors and previous regional food project coordinators	7	
2	Start meeting with (other) plant protein actors	2	Not recorded, informant wish
3	Focus group interview	2	Public catering
4	Planning meeting, municipality D	3	
5	Planning meeting, municipality B	3	
6	Planning meeting, municipality C	2	
7	Focus group interview	4	
8	Individual interview	1	City catering actor
9	Planning meeting with national catering actors	2	
10	Planning meeting on plant protein experiments and funding prospects	5	
11	Planning meeting, municipality A	4	
12	Planning meeting on plant protein development and funding applications	6	Not recorded (technical issues)
13	Sustainability education and plant protein-based lunch theme day in municipality C school	2	Not recorded (event type made field notes more feasible)
14	Planning meeting, municipality B	4	
15	Planning meeting, municipality A	1	
16	Recipe competition for faba bean use	1	Not recordable
17	Recipe development meeting with catering education personnel and plant protein actors	3	
18	Sustainability education and bean-based theme day, municipality A	2	Not recorded (event type made field notes more feasible)
19	Planning meeting with plant protein actors about production and product development	5	
20	Meeting between plant protein actors and development funders	4	Not recorded (informant wish)
21	Wrap-up with plant protein actors about the first half of the project	4	
22	Discussion with a plant protein farmer about topical issues	1	Not recorded (an unplanned phone call)
23	Discussion with a plant protein entrepreneur about marketing	1	Not recorded (an unplanned phone call)
24	Tasting event for school kids in the municipality B school	3*	*Catering students and teacher; children were not approached as research subjects

25	Planning meeting with plant protein actors, 'autumn kickstart'	5	
26	Meeting with municipality D actors, post-experiment reflections	2	Not recorded (informant wish)
27	Individual interview	1	Hemp food actor
28	Individual interview	1	Hemp food actor
29	Individual interview	1	Hemp food actor
30	Individual interview	1	Hemp food actor
31	Focus group interview	3	Public catering
32	Interview: Project end reflections	1	Faba bean actor
33	Interview: Project end reflections	3	Hemp food actor

Action research influences data generation but does not predetermine analytical methods. The analysis was done as abductive content analysis. This process began with content-driven thematic coding to allow the informants to speak, and the data were read with sensitivity to any topics raised by them. Coding followed the process described by Guest, MacQueen and Namey (2014) and yielded 72 codes. Then, in abductive content analysis, the codes were organised and grouped using the analytic framework of Weberian rationalities (Kalberg 2011). Abductive analysis allows for the emergence of categories and explanations, also from theory, which help to interpret the rich data and find linkages between different themes. The major themes unfolding were organised under four rationalities: formal (governance); practical (daily work); value-related; and theoretical (knowledge). Synthesis and grouping of the codes were utilised to see how different actors combined different rationalities, creating constellations of ideal types that illustrate how actors perceive the local plant proteins within the context of sustainability transitions. The comparison between ideal types and actors' ideal type constellations resembles a Weberian comparative approach generally yet deviates from the initial Weberian comparative-historical methodology. This is because I aim not to explain diversity in large-scale historical unfoldings but in how certain partial solutions to contemporary problems are perceived as more or less viable. My intention is thus modest compared to large-scale Weberian studies, yet the Weberian conceptual apparatuses have proved valuable in inquiries of this sort (e.g. Alrøe et al., 2017; Townley 2002).
The validity and reliability of the analysis was increased by using multiple data sources, complementing meetings-based data with semi-structured interviews, and asking key project participants to review the first rationality summaries (following Guest, MacQueen and Namey 2014) before further analysis. Finally, the project coordinator also commented this manuscript with a specific request to check whether my representation of the project events, arising tensions, and related discussions seemed appropriate.

Unfolding the project: constant positive interest but no take-off

The project aimed to kickstart the mainstreaming of local plant proteins in the regional food system. Faba bean and hemp were chosen as targeted crops because they were already cultivated in the region, even though they were still marginal newcomers: plant protein production was only emerging and there were no conventional crops or established producers.[6] The project begun with planning meetings with non-municipal actors and plant protein producers, followed by municipality visits that launched the co-planning and conducting of experiments with public catering. One of the hemp actors frequently joined municipal meetings, bringing along ever-evolving product samples. Faba bean actors, in contrast, wanted to do marketing on their own.

The atmosphere in meetings was generally positive and interested. Catering actors in three municipalities chose to work with plant proteins. In municipality A, three school classes (pupils aged 9–10) visited the bean producer to learn about farming, and school served chili con(/sin) carne with local beans the same day. Catering also tested hemp in several recipes and served hemp seeds as garnish. In municipality B, children aged 6–9 tasted three dishes with hemp, designed and prepared by mass catering students. In municipality C, pupils

[6] Pea was also cultivated, but for feed.

had food sustainability education (by the project coordinator) and the school served faba bean macaroni casserole the same day. In addition to these experiments, the coordinator promoted product awareness via the media, exhibitions, and a household recipe competition. Experiments ended in a positive spirit: hundreds of people had tasted local plant proteins and some even gave positive feedback. However, the subsequent discussions about scaling up product use were not conclusive and yielded no plans. During the two-year follow-up, local plant proteins showed no signs of entering the mainstream, neither in catering nor in retail. In the three municipalities, faba bean and hemp became used in a few vegetarian ('alternative') dishes and hemp seeds found their way to the garnish selection. Despite positive buzz, no take-off happened. Research results, illuminating why this was the case, are presented next and the main findings are summarised in Table 3.

Results

Formal rationalities: vagueness prevents action

Formal rationalities refer primarily to the regulative dimensions of action-guiding principles (Kalberg 2011). They set the limits for permissible ways to achieve ends by, for example, budget limitations and rules (related to competitive tendering and food safety), and by determining formal objectives for the legitimate use of public money. Formal rationalities surfaced in discussions as 'the backbone', the ultimate rationale, for justifying public in-/action for sustainability. They came from multiple sources. International regulations steer public procurement; local rules may add to, but not contradict, them. National statutes determine the purposes of school catering: to 'support learning, satisfaction with school, food competence and the development of a food sense … [and] children's coping skills and growth' (NNC 2017:9). Catering actors were strongly influenced by the last statutory purpose, to feed children, which is historically the first and primary objective of the school meal institution. National school meal recommendations advised a reduction of red meat and a daily vegetarian option for everyone, or one fully vegetarian day weekly (NNC 2017:35). Municipalities funded public catering and could provide additional sustainability objectives. Only two out of the region's 23 municipalities mentioned dietary transition-related goals in their strategic documents regarding public catering. Nine municipalities mentioned local food and eight mentioned food waste reduction. In project meetings, municipal officers frequently emphasised the benefits of local food procurement in the regional economy, and saw locality as the key to sustainability.

The flexibility of public catering regulations leaves room for the implementation of own visions (Grivins et al., 2018). However, this did not catalyse action. As catering actors adhered to an institutional hierarchy, the municipal interpretations of sustainability were the main influencer of the contents of sustainability work in catering – with the exception of two proactive catering managers who promoted self-determined objectives. Other catering managers longed for explicit formal support and feared changing practices without formal backing.

> *'I want clear guidelines, what is the leeway where we can play with the [product] price. I understand that our operations are budget funded. … I want to cover my back, so that nobody then comes to say that you should not have spent so much.' (Catering manager, municipality D)*[7]

Since the municipal objectives did not call for a dietary transition, but emphasised only locality and waste reduction – if any – sustainability measures, there was no formal framework that catering managers could refer to before taking significant actions to introduce plant proteins.

[7] In citations, letters distinguish municipalities from each other. Municipalities A-C engaged in plant protein experiments. Other municipalities had participants in focus group discussions or engaged in the development project's fish experiments.

Table 3. A summary of catering regime rationalities (ideal types) that drive or hinder dietary transition through the use of local plant proteins.

	Formal rationalities	Practical rationalities	Value rationalities	Theoretical rationalities
Exogenous factors that influence rationalities	Formal environmental action agreements; rural development agreements; performance indicators for public institutions	Effectiveness thinking, imposed by performance indicators, discourages risk-taking and influences diagnostic framing in catering institutions	Competing sustainability values leave room for competing sustainability interpretations; values related to rural development are focal in rural regions	Dominant discourses that reflect common perceptions of environmental impacts
Rationalities: pro geographical transition	Municipality strategies typically do not specify sustainability at all, or specify it as locality and food waste reduction	Achieving the main catering goal effectively favours risk-avoiding sustainability work that retains conventional dishes	Low-processed food is valued highly; values of honesty prevent overcoming prejudices by 'blind serving' plant-based dishes	Domestic and local meat are defined as environmentally sustainable; food waste is defined as very unsustainable
Rationalities: pro dietary transition	National recommendations suggest more plant-based foods in school	-	-	-
Particular mismatches that hamper plant protein use	-	The narrow or misinformed approach of niche actors to food prejudices and usability issues raised by catering actors	The buck-passing of responsibilities to promote transition proactively and to resolve emerging challenges	As definitions of food quality are widely diverse, product development and marketing do not appeal to mainstream interests

Practical rationalities: novelties are a risk for means-end effectiveness

Practical rationalities point out expedient ways to deal with daily challenges (Kalberg 2011) and significantly guide organisational action (Townley 1999). They help to achieve pre-determined ends effectively (instrumentally rational action), implying a certain default resistance to disruptions in routines (Kalberg 2011:19). Catering actors identified their pre-determined ends easily: getting children to eat school meals. Effectiveness refers to expedient ways to maintain or improve customer approval rates within the budgetary and human resource constraints, while responding to the requirements of formal rationalities (nutritional and legislative rules). Because public resources were often scarce, practical rationalities reflected expedient and cost-effective professionalism that was critical for achieving ends. Catering actors appealed to means-end-effectiveness as a reason for not using local plant proteins, arguing that trying prejudice-evoking novel foods could compromise customer approval or require far more resources (work) to ensure approval. This created a barrier to mainstreaming plant proteins, especially local products that do not even try to mimic meat.

> *'From all serving sites we are informed that this [vegetarian food] is eaten so little […] So you can say that again, that we must try to increase use of vegetarian food, but then… When the most important thing would be to get children to eat the food that is served.' (Catering manager, municipality B)*

Catering actors expressed frustration about children's prejudices stemming from both unfamiliarity and stigmas.[8] Adults, too, had prejudices. For example, one municipality officer commented that the recent faba bean dish was 'surprisingly good', implying the assumption that bean-based dishes are not that good.

[8] Unfamiliar products and dishes raise suspicion among some age groups that prefer familiarity. Familiar products, on the other hand, sometimes carry negative labels attached to the assumed properties or stereotypes about their eaters (Markowski and Roxburgh 2019; Peltola et al., 2020).

When value rationalities are present, prejudices are more difficult to address. Some catering actors believed (supported by anecdotal evidence from family occurrences) that many dishes would be liked if they were served without it being mentioned that they were plant-based. However, others considered this deceptive, in conflict with value rationalities, and therefore impracticable in public catering. The problem was wicked: honesty required prejudice-evoking prefixes to be added. City-based informants, however, considered prejudices as a challenge to be resolved. This altered the end guiding their means-end-effectiveness: rather than just getting children to eat, the objective was getting children to eat different foods – which was also one of the objectives in the school meal recommendations (NNC 2017).

Children had vegetarian favourite dishes too: vegetable pancakes/patties and some pureed vegetable soups. Because practical rationalities necessitate streamlined food preparation to keep costs low, building dietary transition on the already liked vegetarian dishes would not help local plant proteins. Only large-scale industrial processes can make pancakes and patties with sufficiently consistent quality and low costs.[9] Related to streamlined processes, catering experiments with local plant proteins were also confronted with mismatching perceptions of catering and plant protein actors regarding the convenience of local plant proteins (see the food quality section).[10] Ultra-processing could have been the solution but, apparently, was not a desired one.

Plant protein actors underrated prejudices as largely a result of unawareness, which in turn was resolved (in the reflections of plant protein actors) by making all potential customers aware of the new products. However, the witnessing of project events revealed other obstacles. The challenge was also exemplified by the case of stigmatised plant-based foods (Markowski and Roxburgh 2019). Yet the institutional catering educators who involved their students in creating new plant-based dishes reported that students were very excited about trying to make the new products sell. Time will tell whether the new generation of institutional catering personnel will make the difference by bringing their knowledge and enthusiasm to public catering.

Value rationalities: undesired solutions and buck-passing

Value rationalities are action-guiding principles based on values or value clusters (Kalberg 2011:21). Results illuminated connections between value and other rationalities. While values influence practical rationalities by determining the ends worth striving for, achieving value ideals is always restricted by the limitations and scarcity caused by formal rationalities. The analysis identified two themes where value considerations and tensions evoked reluctance to promote dietary transition and/or local plant proteins in public catering: food processing and responsibility attribution. In both cases, values justified the choice by public catering decision makers to steer away from certain activities that could promote dietary transition and the use of local plant proteins.

Children often approve ultra-processed meat alternatives and like plain beans much less. Their tastes reflect the broader trend of plant-based foods that mimic meat to promote convenient dietary transition (Tziva et al., 2020; Lonkila and Kaljonen 2022). Many catering actors expressed disvalue for ultra-processed foods. Disvalue stemmed both from signals from parents and from values of authenticity and 'real/good food', even if catering actors admitted that contemporary products were nutritionally adequate. Compared to ultra-processed alternatives, local plant proteins came in more valued forms, un-/low-processed (mainly crushed, shelled, or flaked). However, the un-/low-processed products had greater usability problems and risked customer disapproval. Responding to the pressure for dietary transition generates an unavoidable tension between the values of 'real/good food' and the criticality of getting children's approval; the former is compromised by ultra-processed plant proteins, and the latter by low-processed local plant proteins.

[9] Human resource (and infrastructural) constraints prevent public caterers from manufacturing patties, balls, or alike in their own kitchens. Operators in big cities often have different opportunities.

[10] Beans were characterised as very simple – 'just soak and boil' – and hemp as suitable almost anywhere and therefore easy and handy.

The allocation of responsibilities for transitions is also shaped by norms (Geels and Schot 2007), that is, value rationalities. For local plant proteins, resolving the identified obstacles to their use is critical. However, actors played buck-passing and tended to cast the transition initiatives and problem-solving onto others. Creating demand for new products was not seen as a task of public institutions:

> *'In the end, it is anyway the market sphere that drives it, as long as (laugh) something is bought …it does not pay off to produce a product that nobody buys.' (Catering manager, municipality A)*

Most interviewed catering actors hoped that others would create 'fool-proof' vegetarian recipes because they perceived recipe development as means-end-ineffective: it is inexpedient to invest time in work that does not directly contribute to feeding children. City catering actors, in contrast, had internalised a proactive role in resolving recipe challenges.[11] This was backed by the city's strategic documents that determined sustainability responsibilities to involve dietary transition supporting measures.

The lack of fool-proof recipes was also discussed with the plant protein actors. They acknowledged the problem but delegated its resolution to others, thus passing the buck so to speak. Some appealed to role norms, considering themselves as producers, not recipe consultants. Others reframed the problem by suggesting that solutions only require creative experimenting.

> *'Spaghetti, macaroni – mix these shelled seeds with them, or with rice. Like this flour, you can add it a bit and it turns out quite good, changes the colour. You just have to toss it a bit everywhere and see what happens (laugh)' (Hemp actor, introducing products to public catering actors)*

Catering actors, however, stated that they wanted precise and reliable recipes rather than partial solutions. The lack of 'fool-proof recipes' is a disadvantage for local products compared with ultra-processed products that are more easily applicable to conventional dishes owing to their meat-like characteristics. Un-/low-processed plant proteins would require new thinking.

Theoretical rationalities: defining quality and sustainability

Theoretical rationalities help make sense of the world by providing means for processing and applying factual information (Kalberg 2011:19). They also often ground indicators for organisational objectives (Townley 2002:169). In this respect, results revealed transition-hindering mismatches between the food quality definitions of public catering and plant protein actors. The dominant theoretical rationalities of catering actors also entrench sustainability perceptions where local plant proteins fail to stand out positively.

Food quality comprises all of the following: sensory attributes (texture, appearance, and taste); safety; nutritional value; functionality for preparation; stability (resistance to deterioration); healthiness; and psychological factors such as convenience (Giusti et al., 2008). For catering actors, the objective of getting children to eat made sensory qualities pivotal. They argued that nutritional quality was important only in relation to formal standards, and that national nutrition recommendations could be met with ordinary foods, by just taking care of the minimum thresholds of key nutrients and maximum thresholds of salt and saturated fats. Since catering actors perceived domestic food as 'almost organic' in purity (cf. Mikkola 2009), safety thresholds did not receive much attention.

Catering professionals stated frequently that only the food that is eaten nourishes, thus repeating their statutory objective. Any approval-risking compromise on sensory properties therefore meant a compromise in nutritional qualities. Additionally, functionality and stability are critical qualities for the lengthy cooking and heat storage processes. Several experiments with local plant proteins failed due to quality flaws in sensory properties, functionality, and stability.

Plant protein actors grounded quality definitions more in transformative values and psychological food quali-

[11] City actors were, however, reluctant to share their recipes. Contract renewal periods expose them to competition, their own recipes are an asset. This could be overcome by contracts that require or reward 'open access recipes'.

ties. They emphasised purity, freedom from pesticides and other harmful substances, and a maximum of nutrient contents ('the more the better') as quality attributes. Sensory properties were less important:

> *'I would say environmental and nutritional reasons are equally balanced, and then, well, the taste… Let me say that it comes after these, I have (laugh), for me the values make the food taste (laugh) good. If the food matches those values, it is food after all, eating is a psychological process, so, for me, I have never shunned the taste of hemp.' (Hemp actor, product developer)*

Results demonstrate mismatching food quality definitions that hinder local plant protein mainstreaming. Quality attributes valued by product developers are likely to increase price because developers perceive those attributes as worth investing and paying extra for. This worsens the price-quality ratio for users who do not value the same attributes. Emphasis on healthiness and psychological attributes at the cost of sensory and functionality qualities could compromise the product approval for catering.

Environmental sustainability was another topic subject to theoretical rationalities. This manifested in how the actors framed the sustainability challenges at hand. The main finding in this respect is that the studied catering actors framed sustainability mainly as a matter of geographical transition, not of dietary transition. Geographical transition refers to those changes that shift the origins, but not the type, of the procured food. Shifting from imported (and often mass-produced) meat towards domestic or local (and perhaps more sustainably produced) meat is a case in point. While such activities often improve sustainability, they do not sufficiently address the decarbonisation and health concerns that urge dietary transition (e.g., Willett et al., 2019).

In this study, public catering grounded environmental sustainability on three cornerstones: food miles, food origin, and food waste. Dominant cultural norms determined the reference points for comparison: meat was compared to other meat, not to plant proteins. Catering actors related sustainability largely to locality. Public catering actors contrasted domestic meat with Brazilian beef, which, as a reference point, depicted domestic meat as very sustainable. The rationalisation of sustainability via such comparisons benefitted the prevalent animal-based food regime and dietary patterns by portraying domestic and especially local meat as so 'green' that local plant proteins failed to stand out positively. Their 'win-win' potential was not identified because local meat was also perceived as providing the 'win-win' solution by responding to sustainability demands while promoting local rural livelihoods.

Food waste was a big concern for catering actors. They worried that introducing vegetarian dishes would increase waste and thereby undermine sustainability goals. Some had experienced, though, that waste increased only temporarily until consumption stabilised. Related empirical results in the literature vary (see Colombo et al., 2020 vs. Lombardini and Lankoski 2013). I was surprised that none of the actors distinguished waste impact categories, which could help overcome waste-related fears that hamper the use of plant-based products.

Discussion

Diverging rationality clusters

The research question was whether and why (or why not) local plant proteins could provide 'win-win' solutions for semi-/rural public catering actors to meet both the dietary and the livelihood-related sustainability objectives. Rationalities influence how regime actors interpret and respond to sustainability transition pressures, which in turn influence the prospects of local plant proteins being taken up. Public catering and plant protein actors were shown to have divergent rationality clusters. My results highlight three particular rationality clusters that hinder the promotion of dietary transition and local plant proteins via public catering: diagnostic framing; the dominant institutional logic of performance and risk aversion; and mismatches between the rationality clusters of regime and niche actors.

Diagnostic framing. Transition demands can generate differentiated diagnostics among regime actors regarding the problem framing and, consequently, appropriate solutions (Geels 2014). The studied semi-/rural municipal

and catering actors framed sustainability as a matter of geographical transition, rather than dietary transition. This framing is supported by the bundle of their dominant theoretical, practical, and value rationalities. It coheres with environmental impact perceptions that (over)emphasise transportation (shown also in Kause et al., 2019; Austgulen et al., 2018). The geographical transition framing is also means-end-effective for regime actors. It is more consistent (than dietary transition) with their dominant rationalities, which minimises the need to address conflicting rationalities (cf. Townley 2002). Geographical framing leaves intact dominant socio-cultural views where meat is nice, necessary, and normal (Piazza et al., 2015). Plant-based proteins are considered to be an inferior deviation, which also shows in the greater success of those plant protein companies that have made their products and marketing 'meat-like', suited to the values and rules of the existing regime (Lonkila and Kaljonen 2022).

For these reasons, geographical transition framing helps leave traditional and affective social actions untouched. Catering actors, whose primary objective is to feed children and foster feelings of security and care, rather than conflict and contestation, might feel this framing more fitting to their role. Geographical framing is also supportive to the predominant local livelihoods, whereas dietary transition suggests transforming ('curtailing') them, which might face local resistance and undermine the perceived legitimacy of catering activities. This links semi-/rural catering institutions to regional and rural development politics where concerns about livelihoods and 'keeping the countryside alive' influence institutional activities. While the diagnostic framing of plant protein actors was slightly different, they also highlighted the relocalisation of food systems, combined with the ideals of 'pure and healthy' food that is fairer to the environment and people. In other words, plant protein actors did not put the dietary transition framing at the forefront either.

Institutional logic of economic performance and risk aversion. The dominant institutional logic in the studied context is guided by economic performance and, consequently, risk aversion. Performance as economic effectiveness relates to achieving the institution-specific objectives as economically as possible. Catering performance indicators commonly include meal cost and resource loss (food waste), which encourage institutional actors to avoid risk-taking. Mainstreaming local plant proteins in public catering would require development work, experimenting, and risk-taking that goes against the dominant institutional logic. Revising the institutional logic would require the relevant actors to critically re-examine value rationalities and the implications of indicators.

Mismatches that hamper the regime-niche collaboration. Rationality mismatches between the regime and niche actors hamper the mainstreaming of plant proteins. To become a readily perceived sub-solution to transition pressures, plant proteins should appear as relatively compatible with the current regime rather than as a deviation from it (Lonkila and Kaljonen 2022). Diverging rationalities challenge the acceptance and legitimacy of the proposed solutions (Ingram et al., 2015; Kalberg 1980:1170). However, the rationality clusters of the studied plant protein actors differentiated these producers and products from the rationality clusters of local catering actors. Plant protein actors demonstrated divergent value rationalities, in both their action and their product promotion, which did not sell to the regime actors. Other mismatches concerned theoretical and practical rationalities: product quality and usability.

Mismatches are frictions that, from the customer's practical rationality viewpoint, might be best to avoid; it is easier to choose other routes to sustainability than collaboration with actors with highly divergent rationalities. As the more resourced and bigger party, the catering actors are in the position to decide whether regime-niche collaboration is worth the effort. Additionally, the marginal and newcomer position of the plant protein actors may have influenced regime-niche relations and collaboration prospects. The engagement of established, experienced plant protein actors could make some mismatches appear in a different light. Yet, in such cases, they may no longer demonstrate the critical challenge of niche mainstreaming.

Changing rationalities

As institutional theory has shown, changes in rationalities will influence institutional actors' perceptions and

actions (Alrøe et al., 2017; Fuenfschilling and Truffer 2014). The pace and likelihood of rationality changes varies. If the given regime is dominated by a relatively unified set of core rationalities, the resulting stability makes significant changes unlikely (Fuenfschilling & Truffer 2014: 775–776). The results of this study imply that semi-/rural public catering may have just such a relatively stable bundle of core rationalities, which lessens the likelihood of rapid transformative rationality changes.

Results show that the underlying rationalities in public catering trace back to the formal rationalities that determine the statutory objective of catering, performance indicators, and catering resources. Thus, significant changes in public catering will likely require formal rationalities to be revised. National and municipal regulation could clarify sustainability objectives and the importance of dietary transition, which geographical transition can complement but not replace. Formal objectives and performance indicators should be updated to encourage transition activities and experimenting instead of risk avoidance. For example, adjusting food waste amounts with a climatic emissions coefficient[12] would transform the incentives created by the indicator.

Updating actors' environmental knowledge is critical to address unawareness of the climatic impacts of foods, due to which the significance of dietary changes is commonly underestimated (Kause et al., 2019). Theoretical rationalities significantly influence what is known to be low-carbon and healthy, although balancing this knowledge with other rationalities is not self-evident and requires reflexivity (Alrøe et al., 2017). Improved communication about dietary transition for public health reasons (Mason and Lang 2017; Willett et al., 2019) could be valuable since promoting health is a statutory public catering objective.

Socio-cultural change in semi-/rural value rationalities is needed to erase the stigma of vegetarian dishes as 'alternative' and implicitly inferior to meat-including 'normal' dishes. Here the contrast to the urban context was significant: the city-based catering was already normalising vegetarian dishes by presenting them simply as a part of ordinary selection.

Limitations and topics for future research

The main limitation of this study is its semi-/rural focus. Interviews with the city-based informant suggested that urban catering rationalities might differ significantly from rural ones. The city catering had broader objectives, including educational and care-related ones that encouraged solutions which might not always immediately please the customer but were, in the long term, good for them. Urban actors were also happier to use the plant-based meat-like products that fit better in the current dietary regime and enjoy broader customer approval (Lonkila and Kaljonen 2022). We interviewed only a few urban informants and studying the differences between 'urban and rural rationalities' remains a topic for future research. The non-urban focus in this study does nevertheless make an important contribution to dietary transition research dominated by case studies on urban forerunners. Local plant proteins can be more utilisable in smaller semi-/rural catering units with modest demand volumes. This study moreover helps us to understand why dietary transition is slower outside of cities and what needs to be considered in promoting transitions in semi-/rural regions. It is important to create feasible rural development activities that align with the demands for reducing the role of livestock. After all, rural areas are those where agricultural transformations take place and where the challenge of future rural livelihoods is to be resolved.

The findings of this study highlight topics for future research on dietary transition, rationalities, and public catering. Mechanisms that invoke rationality changes in relatively stable and established institutions, such as public catering, should be understood better. Comparative studies between forerunners and non-adopters would help understand which factors promote or hinder change at the organisational level. The interplay between different rationality types would help to further understanding of the dynamics, and disintegration, of relatively sedimented institutional rationalities (cf. Fuenfschilling and Truffer 2014 on Australian urban water sector). Finally, understanding the ways of 'patching up' rationality mismatches between the regime and niche

[12] This would mean that food waste is measured by multiplying the amount of waste with its relative climatic impact (emissions per product-kg).

actors would be important.

Conclusion

This research examined the potential of local plant proteins in public catering to foster dietary transition and sustainable future rural livelihoods simultaneously. The constellation of formal, practical, value, and theoretical rationalities guides public catering actors and their responses to sustainability transition pressures. Rationalities were found to influence perceptions about the appropriateness of local plant proteins as one solution for promoting sustainability. Although local plant proteins could provide win-win solutions to meeting multiple sustainability objectives via public catering in semi-/rural regions, the dominant regime rationalities and rationality mismatches between regime and niche actors hamper this.

Formal rationalities discourage public catering to take sustainability measures that deviate from the dominant perceptions of normal dietary patterns: in other words, sustainability measures are primarily sought from the scope of actions that align with the normalised dietary patterns and do not involve risk-taking. Practical rationalities guide achieving the main objective of catering (making children eat) effectively, which discourages development work, risk-taking, and experimenting with plant-based products that first raise prejudices. In theoretical rationalities on environmental impacts, catering actors overemphasise transport and food waste, downplaying the significance of dietary changes and posing them even as a risk to sustainability (increased food waste). Thus, local plant proteins fail to stand out positively. Finally, diverging food quality definitions among catering and plant protein actors create mismatches in marketing, perceived price-quality ratio, and product development. If the road to mainstream plates is created by making plant proteins fit the dominant regime rules as Lonkila and Kaljonen (2022) suggest, local plant protein actors – if they aim at reaching the mainstream – should change their product development and marketing strategies. Whether this is feasible for small-scale local actors is another question.

The studied semi-/rural public catering actors embrace sustainability but frame it geographically, as a matter of locality. Making local plant proteins appear as a more feasible pro-sustainability solution requires the reframing of sustainability diagnostics in these contexts. This study suggests that changes necessitate strong support at the policy and institutional levels and improved knowledge dissemination. Intermediary actors, such as catering sustainability consultants, could be critical for patching mismatches and disseminating environmental knowledge as well as the 'recipes for success' to harness sustainability transition pressures for the benefit of climate and health, and for securing and promoting local rural livelihoods.

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The implications of the COVID-19 pandemic on South African food security: A paradigmatic turn for building back better

Paper first received: 31 October 2022; Accepted: 05 June 2023; Published in final form: 02 August 2023
https://doi.org/10.48416/ijsaf.v29i1.499

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Abstract

This paper explores the impact of the COVID-19 pandemic on South Africa's food security, as there is a yawning scholarly gap in this nascent area. In 2020, about 23.6% of South Africans experienced moderate to severe food insecurity, while 14.9% experienced severe food insecurity. Therefore, by applying the United Nations' Food Insecurity Experience Scale (FIES), this paper classifies victims of food insecurity into two groups: those who experienced moderate to severe food insecurity, and those who experienced severe food insecurity. To put the impact of this insecurity into perspective, I simultaneously present and discuss the country's food insecurity pre-pandemic and during the pandemic. Therefore, this desktop-based paper answers the following research question: How has the COVID-19 pandemic worsened the food insecurity crisis in South Africa, and what practical and resilient measures should the South African government adopt and implement to ensure sustainable food security? Findings have established that the pandemic and the measures implemented to contain it exacerbated pre-existing economic vulnerabilities and exposure among poor South Africans, particularly Black Africans. The pandemic-triggered hunger and food insecurity was thus racialised, gendered and regionalised, pointing to the structural inequalities that have characterised South Africa since colonialism and apartheid to the present day. Therefore, for sustainable and resilient food security and sovereignty, this paper recommends that Africa in general and South Africa in particular take a paradigmatic turn by designing an effective food insecurity crisis contingency plan. Doing this requires implementing a 'Do-it-Yourself Africa' approach in food production and distribution.

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Introduction

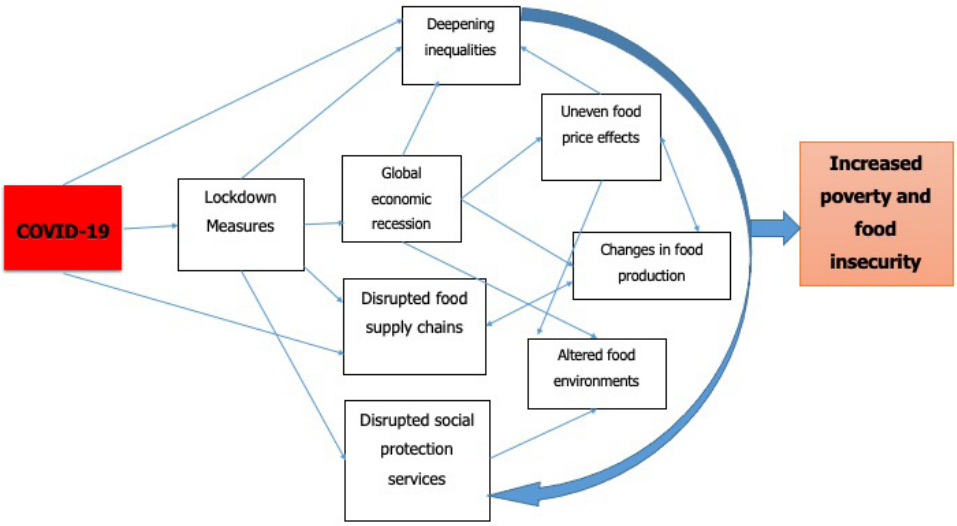
The COVID-19 pandemic, much like the current Russia-Ukraine war, has significantly disrupted the global commodity markets and the flow of international trade, resulting in severe disruptions of global food supply chains, nutrition and food security. This has worsened food insecurity across the globe (FAO, 2020). Furthermore, the pandemic and its attendant lockdowns have had multiple repercussions: massive disruptions to social protection programmes; widening inequality; uneven food prices in localised contexts; loss of income and livelihoods; and altered food environments (Klassen and Murphy, 2020; Clapp and Moseley, 2020; Laborde et al., 2020).

Commenting on this, McCandless (2021: 1) argues that "COVID-19 has brought the crisis to the doorstep of every country in the world, spotlighting political incoherence and failed policy visions, deep vulnerabilities of systems and institutions across sectors, and polarised state and societal relations. This is occurring in underdeveloped and developed countries alike. Consequently, the measures adopted and implemented to contain the spread of the virus unleashed new dynamics, whose spillover effects on food systems, food security and nutrition are enormous and deep."

The FAO, IFAD, WFP, UNICEF & WHO Report (2022) on the State of Food Security and Nutrition in the World revealed that COVID-19 lockdown-induced global economic slowdown resulted in 132 million undernourished people in the world in 2020. In Africa, where most of the world's undernourished people live (reaching more than 250 million following the pandemic), the COVID-19 pandemic exacerbated the food insecurity crisis many African countries had been experiencing due to climate change, perennial droughts, and conflict (and now the Russia-Ukraine war). Globally, these COVID-19 pandemic-triggered "crises have resulted in lower incomes and higher prices of some foods, putting food out of reach for many, and undermining the right to food and stalling efforts to meet Sustainable Development Goal (SDG) 2: Zero hunger" (FAO, 2020: 1).

The COVID-19 pandemic set food insecurity on a slippery slope, the worst effects of which are yet to come (Ghebreyesus, 2020; FAO, 2020; Khorsandi, 2020). In fact, all efforts to contain the virus and its spread through lockdowns created "conditions for a major disruption to food systems, giving rise to a dramatic increase in hunger" (FAO, 2020: 1). Figure 1.1 below illustrates how the virus and efforts adopted and implemented to contain the virus qualify the pandemic as a wicked and sticky public and social problem that worsened food insecurity and poverty.

Figure 1.1: The wickedness of the COVID-19 pandemic and its impact on food security



Source: Adapted from FAO (2020).

Fig 1:1 shows how the wickedness of the COVID-19 pandemic and the measures adopted to contain it worsened the food insecurity crisis globally, although with variegated qualitative and quantitative outcomes in different contexts. For example, the lockdowns seriously disrupted food supply chains and social protection services, and caused global economic and financial recession. In turn, these disruptions caused food inflation, altered food environments, and

deepened inequalities in food distribution, access and supply.

It is important to note that before the COVID-19 pandemic, about two billion people across the world experienced food insecurity at severe, moderate or moderate to severe levels, due to climate change, conflicts, perennial droughts, etc. (FAO, IFAD, WFP, UNICEF & WHO Report, 2021). In South Africa, on 15 March 2020, following the identification of the first case of COVID-19 earlier that month, President Cyril Ramaphosa, in terms of the National Disaster Act, 2002 (Act No. 57 of 2002), declared the virus as "a National Disaster and announced several extraordinary measures to combat this grave public health emergency" (Department of Labour Notice 215 of 2020: 4). The government then announced a full national lockdown, with Level 5 beginning on 27 March 2022, Level 4 on 1 May 2022, Level 3 on 1 June 2022, Level 2 on 18 August and Level 1 – that represented an almost complete removal of all the restrictions – on 21 September 2022 (COVID-19 South African Online Portal, 2022). Even though between late July and the end of August 2020, the rate of new infections dropped sharply, in September of the same year, South Africa was one of the COVID-19 global hotspots; it was ranked sixth globally, with the highest number of positively confirmed COVID-19 cases, and the highest in the continent.

South Africa is among the countries that identified COVID-19 early and adopted the strictest lockdown measures (i.e., Lockdown Level 5 that lasted for 35 days), by global comparison (Gustafsson & Deliwe, 2020). Yet the 2022 Statistics South Africa Report indicated that, due to the COVID-19 pandemic-induced lockdowns in 2020, over 38.5% of South Africans faced moderate to severe food insecurity challenges. The reason was that "economic activity virtually came to a standstill" during Lockdown Level 5 (Wills et al., 2020: 6). This was notwithstanding the fact that South Africa was touted as a country whose COVID-19 response measures were deemed to be science-based and transparent, and whose government coordination and communication with the public was considered effective. Anger over unresolved structural and enduring inequalities was widely cited as the major cause of the pandemic-induced selective food insecurity challenges.

The pandemic-induced lockdowns clearly worsened food shortages and fuelled runaway food inflation in the country, potentially causing social unrest like food riots reminiscent of the French food riots prior to the 1789 French Revolution and those in Tunisia before the 2011 Jasmine Revolution. The July 2021 protests, which started as demonstrations against the arrest of former president Jacob Zuma, and saw mostly food shops looted in KwaZulu Natal and Gauteng provinces, stands out as a case in point here (Gilili, 2021).

The food riots demonstrated clearly that the COVID-19 food relief programmes – for instance the R350 COVID-19 grant – failed to move the needle in addressing the pandemic-induced food insecurity crisis. The riots further damaged food storage, distribution and logistics networks, and disrupted the food supply chains, agricultural activities, and food distribution and sales. In so doing they pushed food prices up and left a critical mass of the population food insecure – with the poorest as the worst hit. Therefore, the pandemic and its attendant effects, like food riots, put Africa, notably South Africa, significantly off track to achieving the United Nations Sustainable Development Goal 2, (i.e., Zero Hunger target by 2030).

This paper examines how and why the COVID-19 pandemic triggered new overlapping and mutually reinforcing dynamics and trends in South Africa, that affected the 2020 HLPE Report's six dimensions of food security: access, agency, availability, sustainability, stability and utilisation.

Methodology

The main focus of this qualitative desktop research paper is to examine the impact and implications of the COVID-19 pandemic and its attendant lockdowns on South African food security. It is set to respond to the following research questions: (a) How has the COVID-19 pandemic affected\worsened the food insecurity crisis in South Africa?; and (b) What practical and resilient measures should the South African government adopt and implement to ensure sustainable food security?

This study relied on data collected using the document analysis method, such as the panel data from the findings of the following surveys: (a) the National Income Dynamics Study's Coronavirus Rapid Mobile Survey (NIDS-CRAM) Waves 1, 2, 3, 4 and 5, as well as some pre-COVID-19 pandemic waves of NIDS; (b) various NIDS-CRAM policy briefs and working papers; (c) the General Household Survey (2017–2020); (d) the South African Vulnerability Assessment Committee (SAVAC) 2020 survey; and (e) the Food Insecurity Experience Scale (FIES) survey. While most of the findings presented and discussed in this paper are mainly statistical, the reader should be reminded that the data was gathered using the documentary analysis method, making the study qualitative in nature and orientation. In this paper, as advised by Merriam (2002), combining the presentation and discussion of findings "ensures a logical and clear flow of the arguments to avoid unnecessary repetitions of the presented data while on the discussion stage" (Manduna, 2022: 147).

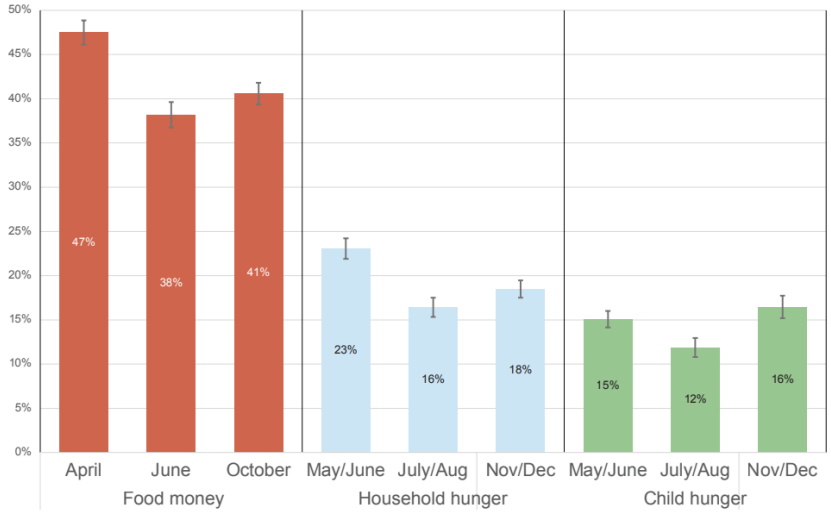
Findings and discussion

While COVID-19 is a respiratory disease with no known scientific evidence that food can be a vector of its transmission (FAO, 2020), the measures the South African government, and indeed many other governments globally, implemented to contain its transmission and spread significantly disrupted the food supply chains. In South Africa, evidence has shown that the food supply chain disruptions affected the quality, access, pricing and availability of food – with the disadvantaged populations bearing the brunt of it all. In this section, the paper presents and discusses the findings on the following three superordinate themes and their sub-themes: (a) hunger and food (in)security; (b) employment and income; and (c) social protection measures/services.

Hunger and food security situation following the COVID-19 pandemic

One theme that recurred throughout the findings was the direct relationship between the levels of the COVID-19 lockdowns, on the one hand, and hunger and food insecurity levels (of both adults and children) in South Africa, on the other. The hard lockdowns witnessed serious and high hunger levels, while the soft ones were associated with low and moderate hunger. This means that there were high levels of hunger during the initial days of the pandemic, which gradually subsided as time went by and the government relaxed the stringent lockdown measures. The findings of the NIDS-CRAM Waves 1, 2, 3 and 4 testify to these gradations in levels of hunger and food insecurity among South Africans during different lockdown levels, with the findings of Wave 1 showing high levels while those of Wave 4 show low levels. Figure 1.9 below reflects the nuances of all of these. Much like the two preceding themes, this theme also has the gender, regional, racialised and income level dimensions to it.

Figure 1.2: Lack of money for food, household hunger, and child hunger, during different stages of lockdowns



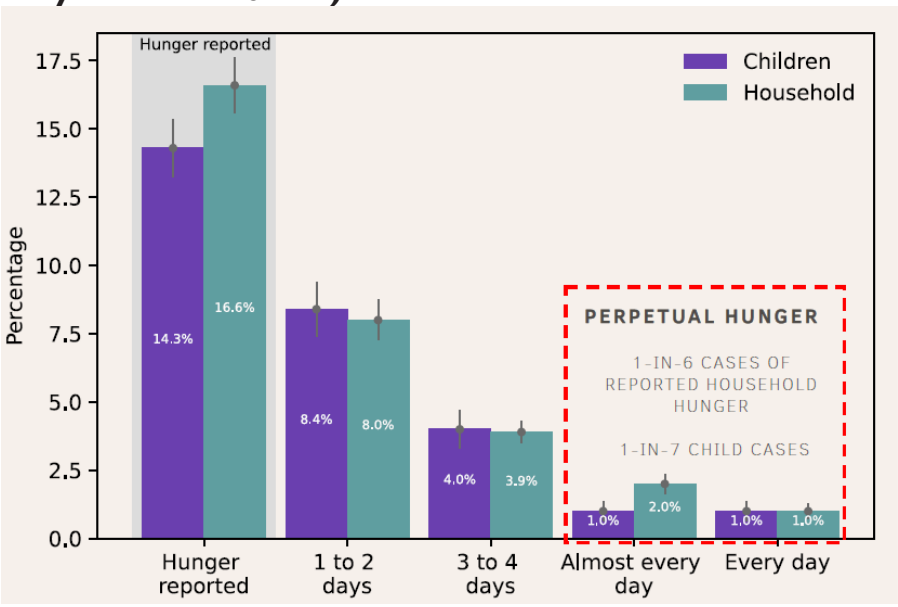
Source: van der Berg, Patel and Bridgman (2021) and NIDS-CRAM Wave 3 Synthesis Report (2021)

The diagram above shows differentiated food insecurity (i.e., household hunger, child hunger, and absence/presence of food money) throughout the lockdown periods.

Findings from the NIDS-CRAM Wave 1 Synthesis Report (2020) have shown that household and child hunger peaked during the first quarter of 2020 (i.e., during Alert Level 5 Lockdown). Close to 50% (i.e., 47%) of the NIDS-CRAM Wave 1 participants indicated that they ran out of money for food, 21% reported household hunger, and 15% child hunger in April 2020 (NIDS-CRAM Wave 1 Synthesis Report, 2020). These figures contrast starkly with 21% who ran out of money to buy food, 14% who reported household hunger, and 14% who reported child hunger in 2018 (General Household Survey, 2018). Nonetheless, it is important to note that grant-receiving families indicated high rates of food insecurity, with 53% reporting running out of money to buy food in April 2020, 24% reporting household hunger, and 15% reporting child hunger between May and June 2020 (Wills et al., 2020).

Wave 2 findings saw the percentage declining to 38% before rising to 41% in Wave 3, and then declining again to 39% in Wave 4, before finally declining to 35% in Wave 5 (van der Berg, Patel & Bridgman, 2021). During the second quarter of 2020, 15% of the NIDS-CRAM Wave 1 participants reported that one of their children had gone hungry in the past week, and 8% of the households with children indicated frequent hunger, which Cleary (2020) framed to mean three or more days per week. Between April and May 2021, NIDS-CRAM Wave participants reported 14% child hunger, indicating that child hunger remained extremely high during the pandemic.
Corroborating with these findings, Wittenberg and Branson (2021) revealed that about 10 million South Africans and roughly three million children faced moderate to severe hunger between April and May 2021. This reality presents hunger as a permanent feature in South Africa during the pandemic. Figure 1.9 below shows different levels of hunger reported during the four periods (i.e., when NIDS-CRAM Waves 1, 2, 3 and 4 surveys were conducted), that also reflected hunger as a permanent feature in South Africa during the pandemic. Commenting on this, van der Berg, Patel and Bridgman (2021: 10) reveals that "the results from Waves 3, 4 and 5, however, point to the fact that hunger and food insecurity in South Africa has settled at a permanently higher equilibrium level in comparison to pre-2020 levels."

Figure 1.3: Levels of hunger reported during the five periods (i.e. when the NIDS-CRAM Waves 1, 2, 3, 4 and 5 surveys were conducted)



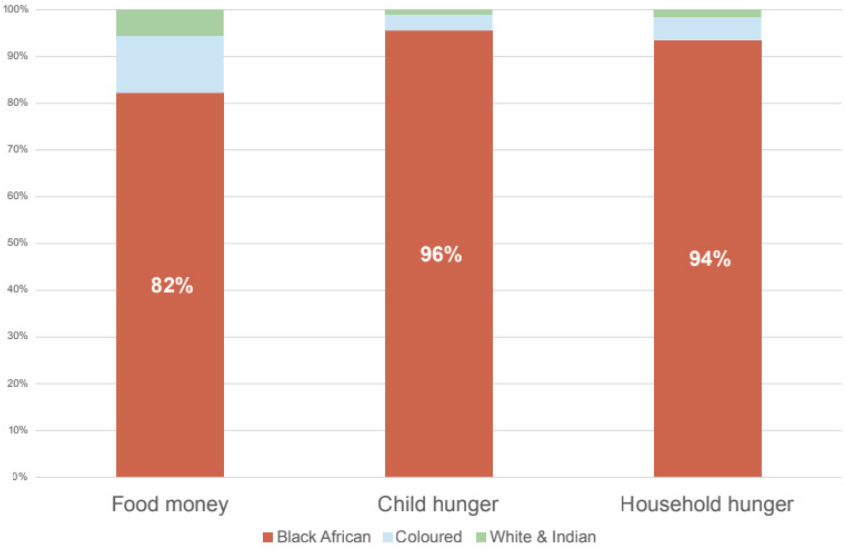
Source: Bridgman et al. (2020) using data from NIDS-CRAM Waves 1, 2, 3, 4 and 5 surveys

It should be noted, however, that the removal of the Child Support Grant (CSG) and Old Age Pension (OAP) top-ups by October 2020, and of the COVID SRD grant of R350 at the end of April 2021, significantly in-

creased hunger and food insecurity. The most disadvantaged groups – notably poor black women with children (NIDS-CRAM Wave 3 Synthesis Report, 2021) – were the hardest hit. Poor black women with children are the group that reported the highest rates of weekly hunger (NIDS-CRAM Wave 3 Synthesis Report, 2021; van der Berg, Patel and Bridgman, 2021). On top of the R440 per child CSG that recipients used to receive before the COVID-19 pandemic, the government had, until October 2020, added another R500 per caregiver. The addition went a long way in mitigating the hunger and food insecurity effects of the pandemic. Corroborating with these findings of the gendered reality of hunger and food insecurity in South Africa during the pandemic, the Statistics South Africa Report (2022: 22) revealed that "the female population is more likely to be affected by both moderate to severe and severe food insecurity compared to their male counterparts."

As hunger and food insecurity during the pandemic was also a racialised phenomenon, child and household variants of hunger were more pronounced and prevalent among Black Africans. The fact that they used a significant percentage of their CSG to buy food was "a strong indicator of food insecurity" (NIDS-CRAM Wave 3 Synthesis Report, 2021: 3) among this social group. Hunger and food insecurity challenges among Black Africans was further exacerbated when the government phased out the primary variant of the COVID-19 social assistance, i.e., the R350 Social Relief of Distress (SRD) grant, at the end of January 2021. Figure 1.10 below shows the fine details of the extent to which Black Africans were disproportionately affected by hunger and food insecurity during the pandemic as compared to other races, such as whites, Indians and coloureds. The racialised and racial unevenness of hunger and food insecurity points to the racialised structural and perpetual inequalities that have been South Africa's distinctive feature since the initial days of colonialism and apartheid, to this day. Commenting on this, Statistics South Africa Report (2022: 22) revealed that "Black Africans followed by coloureds are still more prone to be affected by moderate to severe and severe food insecurity than Indians/Asians and whites."

Figure 1.4: The racial and regional unevenness of hunger and food insecurity

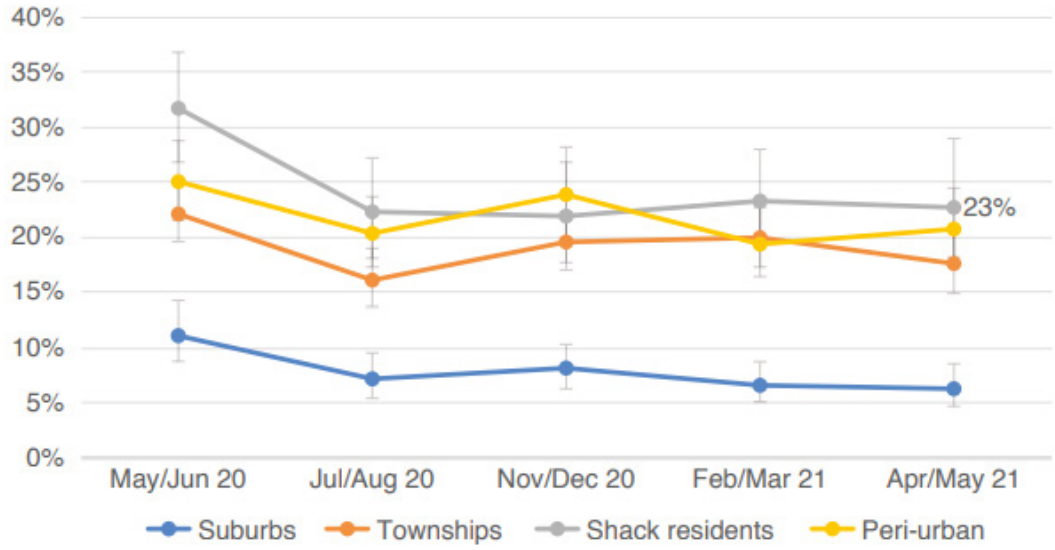


Source: van der Berg, Patel and Bridgman (2021)

The graph above shows the differentiated and racialised nature of the pandemic-induced food insecurity. Black Africans were the hardest hit: 82%, 96% and 94% of the population that suffered a lack of food money, along with child hunger and household hunger were Black.

The pandemic-triggered hunger and food insecurity were also regionalised, even in urban areas. As shown in Figure 1.11 below, shack and peri-urban residents were the hardest hit by hunger and food insecurity challenges during the pandemic compared to their counterparts in suburbs and townships. About 5.4 million people in South Africa live in shacks, that is, 9.5% of the country's population (NIDS-CRAM Wave 5 Synthesis Report, 2021). They all faced hunger and food insecurity challenges during the pandemic.

Figure 1.5: Percentages of urban participants who indicated that their family members went to bed hungry in the past week (i.e. one week before 08 July 2021)



Source: Visagie and Turok (2020) using NIDS-CRAM Waves 1-5 and NIDS-CRAM Wave 5 Synthesis Report (2021)

The graph above shows the differentiated and regionalised nature of the pandemic-induced food insecurity in South Africa's urban and peri-urban areas, with shacks and peri-urban dwellers being the hardest hit compared to their counterparts in suburbs and townships.

To further illustrate the regional unevenness of hunger and food insecurity in South Africa during the pandemic, Table 1.1 below shows the percentage of the population in each of the nine provinces affected by moderate to severe and severe food insecurity in September 2020.

Table 1.1: Percentage of the population per province affected by moderate to severe and severe food insecurity in South Africa in September 2020

Province	Percentage of moderate to severe	Percentage of severe food insecurity
Limpopo	28.9 (±2.7)	18.2 (±5.0)
KwaZulu Natal	26.4 (±2.1)	16.4 (±4.6)
Gauteng	24.5 (±3.1)	16.6 (±2.6)
Mpumalanga	23.5 (±5.6)	14.3 (±4.7)
Free State	21.8 (±4.3)	13.0 (±3.5)
North West	21.7 (±6.3)	12.9 (±4.9)
Western Cape	21.4 (±4.5)	13.7 (±3.5)
Northern Cape	17.6 (±5.1)	9.7 (±3.8)
Eastern Cape	16.6 (±5.5)	10.2 (±4.6)
South Africa (Average)	**23.6 (±1.8)**	**14.9 (±1.5)**

Source: Statistics South Africa Report (2022)

The table above shows the differentiated and regionalised nature of pandemic-induced food insecurity in South Africa's provinces. On the one hand, it is important to note that in 2020 the two poorest provinces (i.e., Northern Cape and Eastern Cape provinces) were less affected by moderate to severe food insecurity and severe food insecurity than the remaining seven provinces. On the other hand, one of the poorest provinces (i.e., Limpopo) and one of the wealthiest provinces (i.e., Kwazulu-Natal "were the worst affected provinces

by moderate to severe food insecurity and severe food insecurity in 2020" (Statistics South Africa Report, 2022: 9).
Overall, the pandemic worsened hunger and food insecurity crises in South Africa. The Statistics South Africa Report (2022: 8) pointed out that "23.6% of the South African population was affected by moderate to severe food insecurity, while 14.9% reported severe food insecurity in 2020. The high food insecurity levels were mainly driven by the impact of the COVID-19 pandemic. This indicates that the prevalence of food insecurity, particularly severe food insecurity, was higher in South Africa in 2020 compared to 2019.

Employment and income situation following the COVID-19 pandemic

The COVID-19 pandemic and its attendant containment measures caused unprecedented economic contraction globally, causing more than 170 countries to revise their economic growth rates downwards (IMF, 2020), with the World Bank (2020) predicting a 5.2% contraction of the global GDP in 2020. In Sub□Saharan Africa, the IMF (2020) projected a 2.8% economic contraction, "eroding much of the progress in economic development made over the last ten years on indicators such as poverty and inequality" (Ranchhod & Daniels, 2020: 3). Thus, South Africa was not spared the serious economic, political and social disruptions caused globally by the COVID-19 pandemic and lockdown measures adopted and implemented to contain its spread. In South Africa, originally projected to grow by 0.9 (ILO, 2020; Wills et al., 2020), the IMF (2020) projected an 8% economic contraction in 2020. This made the country's economy the hardest hit by the pandemic in Africa, possibly because South Africa was the continental hotspot of the virus at the time and one of the global hotspots. Corroborating with these findings, the UNDP (2020) projected that the COVID-19 pandemic and its attendant lockdowns were expected to decrease the country's GDP by a minimum of 5.1% and a maximum of 7.9%.

The stringent earliest lockdown measures hit the labour market hard, causing widespread business closures, job losses and underemployment. Concerning the employment situation, as a result of the lockdowns, between the first and second quarters of 2020, more than 2.2 million South Africans lost their jobs, in the process worsening the already high unemployment rates, i.e., up from 39% before COVID-19 to 42% by the second quarter of 2020 (Statistics South Africa, 2022; Devereux, 2021). The NIDS-CRAM Synthesis Report Wave 1 (2020: 3) put the number of people who lost their jobs between March and April at 3 million as "[t]he weighted NIDS-CRAM 2020 Wave 1 data identifies that 17 million people were employed in February 2020 but only 14 million people were employed in April 2020." Using the 95% confidence interval, according to this Report, between 2.5 and 3.6 million South Africans lost their jobs from February to April. Corroborating with this finding, Schotte and Rocco Zizzamia (2021: 4) estimated that "40 per cent of South Africans who had been employed in February 2020 were not actively employed during the Level 5 lockdown, with half of this decline in active employment appearing to be due to permanent lay-offs or business closures." This situation led to one in three (or 33%) of South African income earners losing their source of income between February and April 2020.

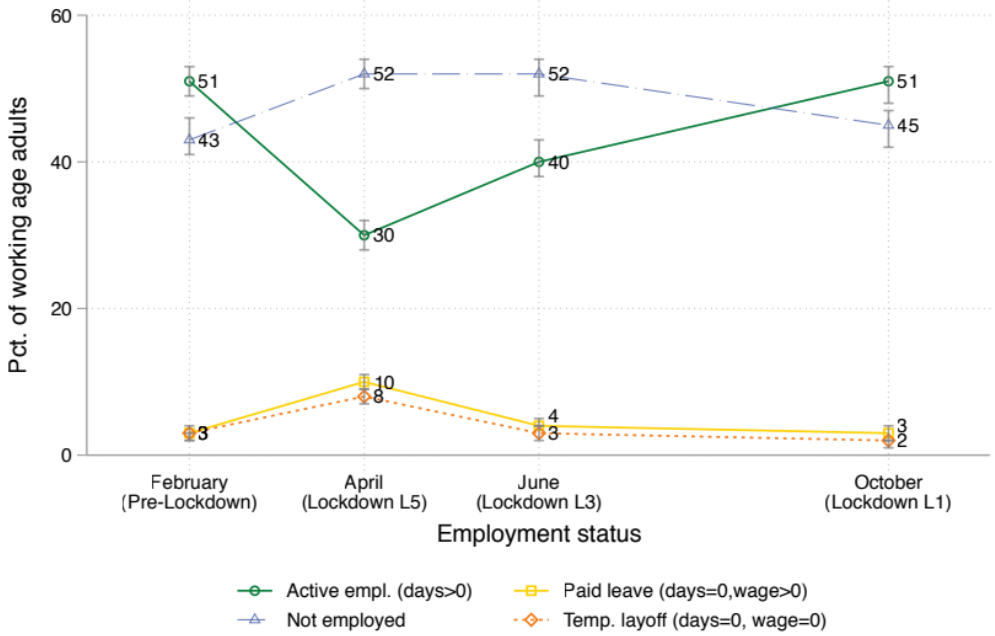
Bassier, Budlender and Zizzamia (2021) have noted however that a significant job market recovery that was almost close to its pre-lockdown level in February 2020 was witnessed in October 2020. The difference here is statistically insignificant as the October active employment point estimate is 0.15% lower than the February estimate. Figure 1.3 below shows the employment status of working South African adults aged between 18 and 64 years during the four periods, i.e., February pre-pandemic, (b) April Level 5 lockdown, (c) June Level 3 lockdown, and (d) October Level 1 lockdown. Figure 1.4 below shows the cross-sectional employment status in South Africa for NIDS-CRAM Waves 1-5.

The graph below (Figure 1.6) shows the adult employment status of the South African working population between the Level 5 lockdown and Level 1 lockdown. Active employees were the most affected compared to other groups, as the lockdown measures required them to stay home.

The following graph (Figure 1.7) shows that the differences in the percentages of unemployed and employed

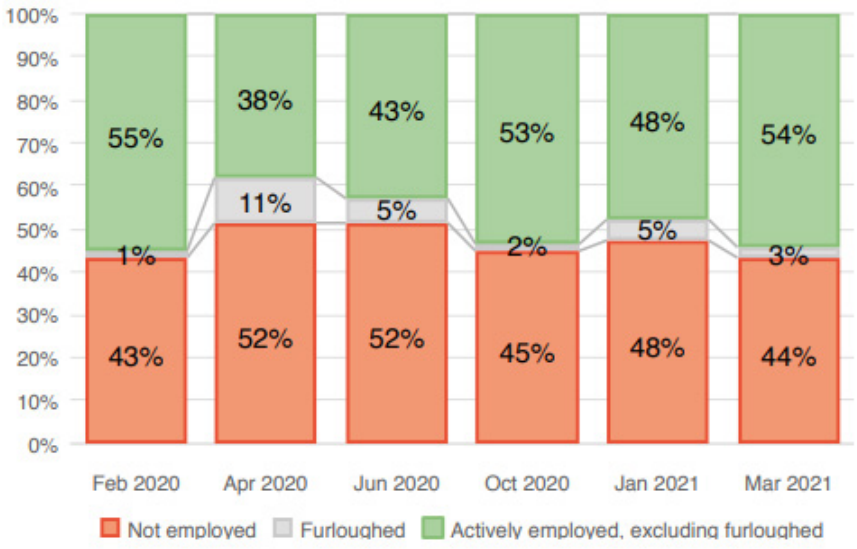
South Africans between February 2020 and March 2021 are largely due to those who were forced to leave their jobs and either asked to come for work or not.

Figure 1.6: Employment Status for Working-Age Adults (18-64 years) during the four periods



Source: Bassier et al. (2021)

Figure 1.7: The cross-sectional employment status in South Africa for NIDS-CRAM Waves 1-5



Source: Daniels et al. (2021) and NIDS-CRAM Wave 5 Synthesis Report (2021)

It should also be noted that an additional 1.5 million South Africans were temporarily laid off, with more than 40% failing to get their jobs back when the economy reopened (Devereux, 2021; Jain et al., 2020).

The disadvantaged groups, such as informal traders, women, manual workers, unskilled workers, and the poor in general, were the hardest hit as compared to their counterparts, the professionals, men and non-poor groups (The NIDS-CRAM Synthesis Report Wave 1, 2020; Devereux, 2021; Jain et al., 2020). Commenting on this, the following submissions from the researchers who contributed policy briefs and working papers from the NIDS-CRAM Wave 1 survey results are illuminating and illustrative:

> *In comparison with formal workers, those in the informal economy have been disproportionately impacted by the pandemic. A larger share of the informal economy (relative to formal employment) was locked out of employment during the month of April. Moreover, for the typical informal worker that was employed in both February and April the hours worked per week decreased by as much as 50%. Decreases in typical working hours were particularly large for women and workers in self-employment and for informal casual workers. Therefore, across several measures, informal workers, and particularly women, experienced substantial decreases in both the ability to work and in the hours that they spent in employment in April (Rogan & Skinner, 2020: 21).*

> *The adverse labour market effects of the pandemic and lockdown have been disproportionately borne by individuals in lower-income households. Although we estimate that overall employment decreased from February to April by about 2.8 million, employment loss for individuals who live in the poorest 20% of households accounts for more than a third (35%) of total employment loss (or over 970,000 fewer people employed). The percentage of individuals employed in the poorest 10% of households was 55% lower in April relative to February – the largest relative change across the distribution (Köhler & Bhorat, 2020: i).*

> *The overarching finding from this analysis is that the job losses were not uniformly distributed amongst the different groups. In particular, groups that have always been more vulnerable – such as women, African/Black, youth, and less educated groups – have been disproportionately negatively affected (Ranchhod & Daniels, 2020: 1).*

These disadvantaged groups, i.e., the low-income earners (mainly women), include about 650,000 farmworkers, notably the temporary, seasonal workers; one million domestic workers; vendors and hawkers; car guards; beggars; and service sector employees (Devereux, 2021). These findings reveal a significant effect of the COVID-19 pandemic and its attendant lockdown measures on household poverty in the country. It has been found that two-thirds of the South African population lost their primary source of household income during the initial lockdown (i.e., Level 5 lockdown from March to April 2020) (Wills et al., 2020). Further to this, evidence has shown that almost every second household in South Africa failed to obtain money for food during April 2020 (Schotte & Rocco Zizzamia, 2021; Wills et al., 2020). Levels 4 and 3 lockdowns, which saw a partial recovery in the country's labour markets when commercial activity recommenced, did not help much to ease the COVID-19-triggered food insecurity and poverty challenges. Only about half of the jobs lost during the Level 5 Lockdown were recovered by June 2020 (Jain et al. 2020b). This means that half of those previously employed and food secured before the COVID-19 pandemic remained jobless, and therefore food insecure.

Accordingly, the pandemic profoundly affected South Africa's food security and nutrition. In South Africa, like every part of the world, the pandemic seriously affected food systems, presenting an existential threat to people's capacities and capabilities to access food. "Food systems include all the activities that relate to the production, processing, distribution, preparation and consumption of food. The three constituent elements of food systems are: food supply chains, food environments, and consumer behavior" (FAO, 2020: 1). Consequently, the 2022 survey results of Statistics South Africa and the Human Sciences Research Council (HSRC) revealed that food insecurity, hunger and poverty increased significantly in the country after the government declared COVID-19 a national state of disaster and the ensuing lockdowns. For example, in 2019, 17.3% (i.e., about 10.1 million people) of the South African population experienced moderate to severe food insecurity, while 7.0% (i.e., about 4.1 million people) experienced severe food insecurity.

In 2020, the percentage of the population that experienced moderate to severe, or severe, food insecurity rose to 23.6% and 14.9%, respectively (Statistics South Africa Report, 2022). The findings from the HSRC survey have revealed that close to half (46% to be precise) of South Africans living in informal settlements would go to bed hungry during April 2020 (Devereux, 2021). Comparatively, at the national level, people who went to bed hungry during April increased from 28% in 2019 to 34% in 2020 (ibid).

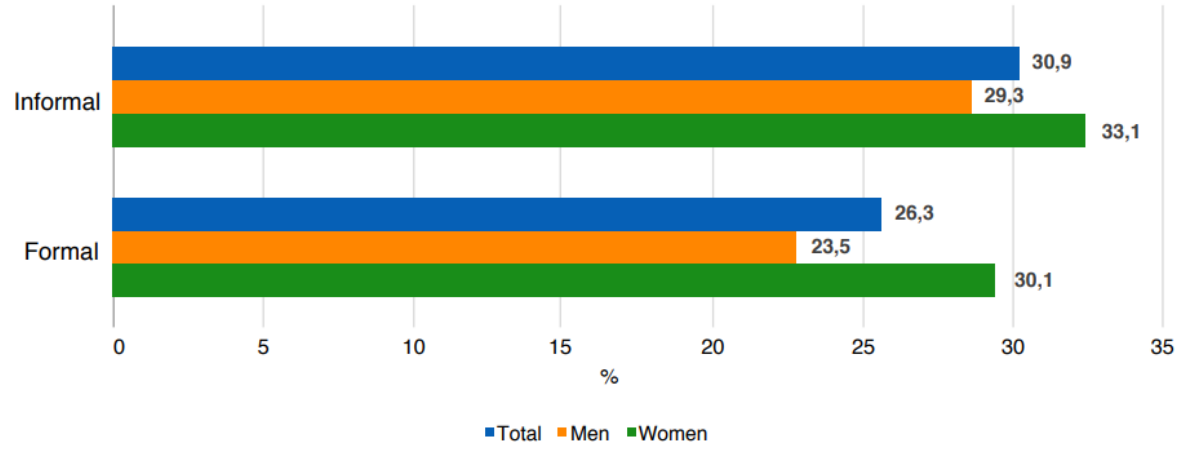
At this juncture, it is important to note that, in South Africa, food insecurity tends to follow the characteristics of uneven development: geographical/regional, income, racial, gender and scalar inequalities.

The gendered nature of the COVID-19 pandemic triggered food insecurity

Findings have shown that the COVID-19 pandemic has illuminated the gendered effects of pandemics. According to the findings from the NIDS-CRAM Survey Waves 1, 2, 3, 4 and 5, and Rogan and Skinner (2020), women were sitting at the intersection of challenges during the COVID-19 pandemic. For instance, NIDS-CRAM Wave 1 Synthesis Report (2020: 5) revealed that "women face a double disadvantage: of the approximately 3 million net job losses between February and April, women accounted for 2 million, or two-thirds of the total, even though in February they only accounted for less than half of the workforce (47%)." It is also important to note that close to half of all women employed in February and March were said to be working fewer or no hours in April. What further put women at a 'double disadvantage' or intersection of challenges during the pandemic was the fact that among the disadvantaged groups in the labour market (i.e., informal workers, Black Africans and less educated\unskilled workers), women disproportionately suffered the largest share of job losses.

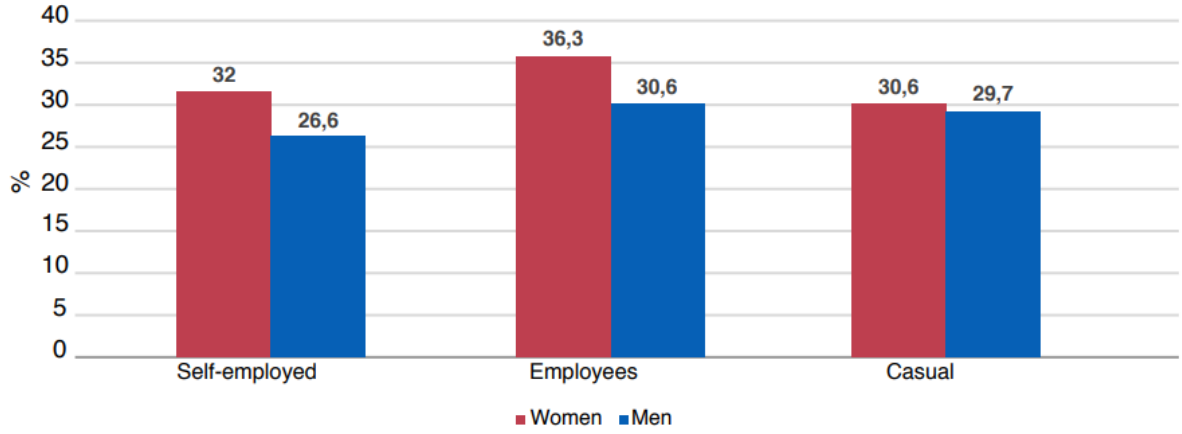
As shown in Figure 1.8 and Figure 1.9 below, women were also the hardest hit by job losses in both the formal and informal sectors.

Figure 1.8: Percentage of men and women who lost their jobs in informal and formal sectors by April 2020



Source: Rogan and Skinner (2020) and NIDS-CRAM Synthesis Report Wave 1 (2020)

Figure 1.9: Percentage of men and women who lost their jobs in the informal sector by April 2020, by sector of employment



Source: Rogan and Skinner (2020) and NIDS-CRAM Synthesis Report Wave 1 (2020)

The two graphs above show the gendered dimension of employment loss during the lockdown periods: wom-

en, in both the formal and informal sectors, were the most affected by job losses compared to their male counterparts. The reason is that women invariably occupy menial jobs requiring them to always be on site.

On average, moreover, informal workers lost 50% of their weekly working hours, with women being the hardest hit among them: a 49% loss as opposed to a 25% loss among men (Rogan & Skinner, 2020; NIDS-CRAM Synthesis Report Wave 1, 2020). Between February 2020 and April 2020, women in informal self-employment had their typical earnings reduced by close to 70% (NIDS-CRAM Synthesis Report Wave 1, 2020). About 37% of those in informal self-employment reported zero earnings in April 2020 (ibid). Overall, the gender gap in earnings in the informal economy widened noticeably between February and April" (Rogan & Skinner, 2020: 3).

The regional unevenness of job and income losses due to COVID-19

While the jobs and incomes of residents in all South African regions (i.e., metros, cities/towns, peri-urban and rural areas) were heavily affected by the pandemic, the rural areas were the hardest hit. Commenting on this, NIDS-CRAM Wave 2 Synthesis Report (2020: 4) revealed that "between February and April, all regions lost about one-fifth of their jobs; however, between April and June, metros and cities/towns started to recover while rural areas seemed to lag behind." The nuances and fine details of all this are illustrated in Figure 1.10 below, which shows that more job losses were witnessed in metros, followed by cities and rural areas which were the least affected, for the simple reason that there are fewer employment opportunities in the rural areas.

Figure 1.10: Regional unevenness of job losses due to COVID-19 in South Africa

Source: Visagie and Turok (2020) and NIDS-CRAM Wave 2 Synthesis Report (2020).

Findings have further shown that South Africans residing in the peri-urban and rural areas experienced a sustained high unemployment rate compared to their counterparts in the cities/towns and metros. By June 2020, the unemployment rate in rural areas stood at a staggering 52%, followed by cities/towns at 43% and then metros at 35% (NIDS-CRAM Wave 2 Synthesis Report, 2020). Furthermore, among the urban residents, those residing in the suburbs were less likely to be unemployed (i.e., 24% likely to be unemployed), while peri-urban residents were highly likely to be unemployed (i.e., 52%). "Put differently, 1-in-2 people in rural areas and peri-urban areas who want work, have work; compared to 2-in-3 people living in metro areas and 3-in-4 people living in suburbs" (NIDS-CRAM Wave 2 Synthesis Report, 2020: 4).

Corroborating with these findings of the regionalised nature of the pandemic-triggered unemployment, the Statistics South Africa Report (2022) revealed that in 2020 the provincial unemployment differentials were staggering. The rural provinces recorded high rates while urban provinces recorded relatively low rates. For example, the following are the provincial percentages of households with no members who were employed in 2020: Limpopo (47.8%), Eastern Cape (47.3%), Free State (45.3%), North West (43.0%), Mpumalanga (38.5%), Northern Cape (34.5%), KwaZulu Natal (33.4%), Gauteng (24.3%) and Western Cape (24.0%) (Statistics South Africa Report, 2022). This makes the last two provinces the only ones with unemployment rates below

the national average of 34.1% during the pandemic. Hence, the rural provinces were the hardest hit by food insecurity and hunger during the pandemic due to their high unemployment rates.

Social protection responses and COVID-19-induced food insecurity

Following the COVID-19-triggered lockdowns, South Africa was one of the first countries to introduce social protection services targeting vulnerable populations and businesses (McCandless, 2021). The government announced a COVID-19 stimulus package of R500 billion ($US30 billion) in April 2020. The sole purpose of the package was to augment SASSA's existing social safety nets that were already catering for the monthly food and other basic services of about 11.3 million South Africans. At this stage, it is important to note that "pre-lockdown, over 60% of people in South Africa and 80% in rural areas were living in a grant-receiving household" (Wills et al., 2020: 28).

The government introduced a raft of protection services ranging from well-designed stimulus packages, grants and safety nets. To cushion these vulnerable groups from the heavy blow delivered by the COVID-19 pandemic, on 26 March 2020, in cognisance of the president's declaration of COVID-19 as a National Disaster and in terms of Regulation 10(8) of the National Disaster Act, the Minister of Employment and Labour, Thembelani Waltermade Nxes, introduced a social insurance scheme called the COVID-19 Temporary Employee/Employer Relief Scheme (TERS) (Department of Labour Notice 215, 2020). Administered through the contribution-based Unemployment Insurance Fund (UIF), this scheme was created to cater for employees who had been laid off due to COVID-19 lockdowns and whose employers were practically and economically incapable of paying them their salaries during the period of National Disaster. Commenting on this, Department of Labour Notice 215 (2020: 7) submitted the following:

> *Should an employer as a direct result of Covid-19 pandemic close its operations for a 3 (three) months or lesser period and suffer financial distress, the company shall qualify for a Covid19 Temporary Relief Benefit. The benefit shall be de- linked from the UIF's normal benefits and therefore the normal rule that for every 4 (four) days worked, the employee accumulates a one day credit and the maximum credit days payable is 365 for every 4 (four) years will not apply. The benefits will only pay for the cost of salary for the employees during the temporary closure of the business operations.*

The Minister of Employment and Labour capped the TERS salary benefits per employee to a maximum amount of R17712.00 per month. Under the UI Act, employees were paid these salary benefits based on the income replacement rate sliding scale of 38% to 60% (Department of Labour Notice 215, 2020).

On 21 April 2020, close to a month after the TERS were introduced, the government introduced a raft of social assistance measures. The sole purpose of the measures was to provide relief to families who were not beneficiaries of any employment-related insurance schemes. For example, one of the social assistance measures was the swift introduction of the Special COVID-19 Social Relief of Distress Grant (SRDG) of R350 per month. This new social grant was introduced in May 2020 to cushion vulnerable unemployed groups who were not the beneficiaries of any other grant or UIF, and it was terminated in March 2022. According to the Department of Social Development Report (2021: i),

> *The criteria for the grant were: South African citizens, permanent residents or refugees registered with Home Affairs; resident within the borders of the Republic of South Africa; above the age of 18; unemployed; not receiving any income; not receiving any social grant; not receiving any unemployment insurance benefit (UIF) and does not qualify to receive UIF; not receiving a stipend from the National Student Financial Aid Scheme(NSFAS); not receiving any other government COVID-19 response support; and not a resident in a government-funded or subsidised institution.*

The Report further revealed that many beneficiaries of the SRDG used it to buy food "as reported by 93.3% of surveyed applicants" (ibid: iii). According to the findings of the Report, the South African Social Security Agency (SASSA) received 9,537,077 applications between May 2020 and November 2020 and, after removing duplicate applications, saw 6,449,916 (67.6%) approved. Notably, the two most populous provinces, i.e., Gauteng and KwaZulu Natal, recorded the highest numbers of applications: 21.4% and 21.1%, respectively.

The NIDS-CRAM Wave 2 Synthesis Report (2020) indicated that, of about 11.3 million South Africans who applied for the SRDG grant, nearly two-fifth were successful. Significantly, "for every individual who lived in quintile 5 households and received the grant in June, nearly four who lived in quintile 1 households received it" (NIDS-CRAM Wave 2 Synthesis Report, 2020: 11).

The gendered nature of the social responses campaign

Also illuminated by the findings of the Report is the gendered reality of how the social grant was distributed. More men benefited from the SRDG than women: 67.9% of the beneficiaries or 4,379,331 approved applications were men, as opposed to 32.1% or 2,070,585 women (Department of Social Development Report, 2021). Still on this reality of gender unevenness of social grants distribution, the Department of Social Development (2021, para. 4) went on to say that "the top-up of social grants, the Child Support Grant (CSG), primary caregiver allowance and Special COVID-19 SRD grant translated to unequal treatment of men and women." Youths (i.e., those aged between 18 and 34) constituted the majority of SRDG applicants who received the grant: 69.5%. Black Africans accounted for 82.8% of all beneficiaries, with Coloureds constituting only 10.6% (Department of Social Development Report, 2021).

This reality speaks of the gendered, racialised and age-specific COVID-19 pandemic-triggered hunger, food insecurity and poverty in South Africa, that percolated into the country's structural inequality differentials and distinctiveness. The grant top-ups went a long way in easing the brutal hunger and food insecurity crises among poor South Africans. The Child Support Grant (CSG) was increased by R300 for one month in May 2020, followed by another increase of R500 per month for three months (i.e., June to October 2020), and all other existing social grants (e.g., disability grant and the old age pension) were increased by R250 per month until October 2020 (Statistics South Africa Report, 2022).

As established by Bassier et al. (2020), about 64% of South Africa's informal workers lived in a household that received a CSG, making this group the biggest beneficiary of the CSG as it represented the poorest of the poor that were targeted by this grant. However, the fact of increasing the CSG per caregiver, and not per child, did not achieve the intended aim of addressing hunger and food insecurity crises (The Institute for Economic Justice, 2020a & 2020b). The reason was that doing so meant that "almost one-third less support to the poorest people, and an additional 2 million people below the food poverty line" (Rogan & Skinner, 2020: 10).

Findings have established that the social protection measures introduced by the South African government played a significant role in mitigating the impact of hunger and food insecurity during and after the lockdowns. The evidence from a survey conducted by the Department of Social Development in 2021 when assessing the extent to which the COVID-19 grants assisted the beneficiaries is pertinent and illuminating in this regard: "When asked if the Special COVID-19 SRD grant made a positive difference in their lives and those of members of their household, roughly 80% confirmed that the grant made a positive difference in their lives and those of their household" (Department of Social Development Report, 2021: iii).

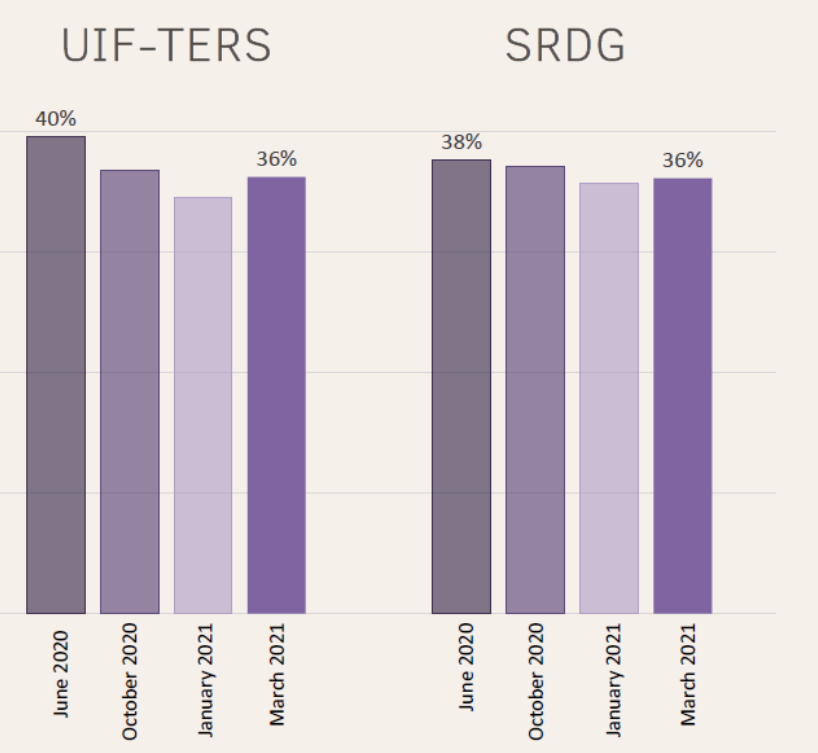
It was therefore against this background that, according to the Department of Social Development (2021), 88.14% of the SRDG recipients (and 73.85% of those whose SRDG applications were rejected) agreed that the means test should not be the criterion to determine the beneficiaries of such grants. The fact that, of late, the cost of living in South Africa is high and that the country is home to a significant number of poor people was mentioned by many participants (i.e., 77.10% of the SRDG recipients and 76.06% of those whose SRDR applications were refused) as cogent and convincing reasons for everyone who applied for such grants to get them (Department of Social Development Report, 2021).

Gendered and regional unevenness of the SRDG grants distribution

Findings have established that there was apparent gendered and regional unevenness in the SRDG grants distribution. While women constituted 58% of net job losses during the pandemic – making them more vul-

nerable and food insecure than their men counterparts –, women accounted for only 34% and 41% of the SRDG grant recipients and UIF/UIF-TERS beneficiaries, respectively (NIDS-CRAM Wave 2 Synthesis Report, 2020). Furthermore, findings have shown that although women constituted 47% of South African workers in February 2020, between February and June, they still constituted 58% of net job losses. Yet women accounted for only 41% and 34% of those who benefited from the UIF/UIF-TERS and SRDG grant in June, respectively (Rogan & Skinner, 2020). Findings have furthermore shown that by the end of June 2020, 67% of the 2.7 million recipients of the Special COVID-19 Grant were men (ibid). As shown in Figure 1.11 below, while women accounted for many of the unemployed people and furloughed workers as a result of the COVID-19 pandemic, they received less social support in the form of grants than did their men counterparts.

Figure 1.11: Percentage of women who received UIF-TERS and SRG COVID-19 grants



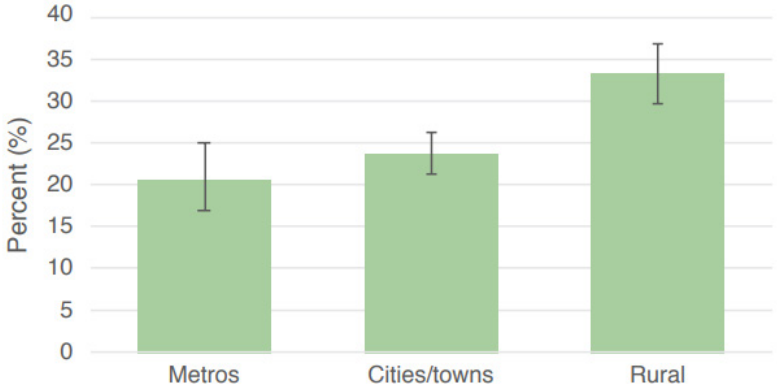
Source: Casale and Shepherd (2021) using data from NIDS-CRAM Waves 2, 3, 4 and 5

The graph shows the gendered dimension of the distribution of the COVID-19 grants (i.e., the UIF-TERS and SRG) throughout the lockdown period, with women receiving less than 50% of the grants. Significantly, findings have also established a glaring regional unevenness in the distribution of these COVID-19 grants. For example, rural dwellers disproportionately benefitted more from the COVID-19 grants than did the inhabitants of peri-urban areas, metros and cities/towns. "Nearly three out of five rural participants (59%) lived in households receiving social grants in June 2020, compared with less than half in cities/towns (47%) and one in three in the metros (32%)" (NIDS-CRAM Wave 2 Synthesis Report, 2020: 10). The reason for this regional unevenness in grant distribution is worth noting here: as most rural dwellers were unemployed, they had no other means of survival when lockdowns were instituted.

When the pandemic hit, the government therefore saw it fit to prioritise these rural communities to compensate for the lack of a strong and vibrant local economic fabric offering employment opportunities. Within the cities/towns there were also regional differentials regarding these COVID-19 grants, as township and peri-urban residents were more likely to benefit from these grants than their counterparts in the suburbs. Findings from the NIDS-CRAM Wave 2 Synthesis Report (2020) have established the following: 54%, 45%, 40% and 26% of peri-urban, townships, shack and suburban, respectively, residents received these grants. Figure 1.12 below illustrates the regional unevenness of the COVID-19 grants distribution in South Africa. From the findings, it can be deduced that the government had to concentrate the grants among the more vulnerable

and exposed groups.

Figure 1.12: Regional unevenness of COVID-19 grant distribution



Source: Visagie and Turok (2020) and NIDS-CRAM Wave 2 Synthesis Report (2020)

The graphs above show the geographical unevenness of COVID-19 grant distribution, with the rural areas receiving almost double what the Metros received. This is because a large percentage of social grant recipients are rural residents, due to their economic marginalisation. As the COVID-19 grants were also means-tested, the findings have revealed a massive under coverage of these grants, to the extent that some of those who were left out of the beneficiary equation were the most deserving as they were among the poorest of the poor. For example, about 1,758,000 applicants for the Special COVID grant were mistakenly rejected (Rogan & Skinner, 2020), making them face the brunt of hunger and food insecurity challenges before their applications were finally accepted and their money paid in full later. Furthermore, by June 2020, "a total of nearly 6.5 million individuals were eligible for the COVID-19 grant but did not report receipt, and half of these individuals (3.1 million) live in the poorest third of households" (NIDS-CRAM Wave 2 Synthesis Report, 2020: 11). This sad reality put many of the deserving poor people at the intersection of precarity and vulnerability; first, most of them were not employed before February 2020; second, lockdowns shut down all the avenues they used to sustain their livelihoods; third, despite being part of the deserving population, the under coverage of these grants left them out; and fourth; the government could descend on them with a heavy hand whenever they tried to go out and hustle, for violation of the COVID-19 lockdown measures. Ultimately, this reality created a 'precarious normality' among these vulnerable and exposed groups as food insecurity worsened without any help from the government.

The situation was further worsened by grand corruption, mismanagement and fraud cases that characterised the COVID-19 grants and their distribution. For example, food parcels meant for vulnerable groups were reported to have gone missing, and contracts to supply food were doled out to friends and relatives of politically exposed persons (PEPs) (Chutel, 2020). Furthermore, some food parcels allocated to cater for unemployment insurance were said to have been pocketed by political cronies (Chutel, 2020). While bemoaning corruption relating to the distribution of the COVID-19 stimulus package of R500 billion in a letter addressed to the African National Congress (ANC), the governing party he leads, President Cyril Ramaphosa said the following: "This is an unforgivable betrayal for the millions of South Africans who are being negatively affected by the impact of COVID-19, experiencing hunger daily, hopelessness, and joblessness" (Mogoatlhe, 2020, para. 10). This was against the background of media reports (e.g., Oliver 2020 and Mogoatlhe, 2020) that close to R450 billion of the R500 billion COVID-19 stimulus package had disappeared into thin air of corruption. Agreeing with above analysis, Wills et al. (2020: 14) argues that there was "politicisation, corruption and lack of coordination in food distribution."

Conclusion and recommendations

This paper examines the impact and implications of the COVID-19 pandemic and its attendant lockdowns

on South African food security. It argues that the pandemic and the measures adopted and implemented to contain it exacerbated the economic vulnerabilities and exposures that preceded the pandemic among poor South Africans, particularly Black Africans. In the end, the pandemic-triggered hunger and food insecurity were racialised, gendered, regionalised and wealth/income specific, pointing to the structural and persistent inequalities and inequities that have characterised South Africa since colonialism and apartheid to the present day. The findings of this desktop research are presented and discussed in three superordinate themes and sub-themes. The superordinate themes are: (a) hunger and food security following the COVID-19 pandemic; (b) employment and incomes following the COVID-19 pandemic; and (c) the impact of the social protection responses on the COVID-19-induced food insecurity.

The COVID-19 pandemic-triggered economic and social vulnerabilities sustained severe poverty, hunger and food insecurity crises in South Africa, notably among those in the economic and social margins of the society. The massive disruptions of the pandemic, which made it difficult for the wheels of the economy to turn smoothly, manifested in unprecedented job losses and business closures. This compromised households' income-generating activities in the short to medium and longer terms.

This paper furthermore argues that several challenges concerning the distribution and management of the COVID-19 grants had a net effect of worsening hunger and food insecurity among many South Africans. These challenges include massive under coverage of these COVID-19 grants which saw many poor South Africans left out of the beneficiary equation. Grand corruption, mismanagement and fraud cases that characterised the COVID-19 grants and their distribution and management are some of these challenges that make the government's concerted efforts to address hunger and food insecurity in the country during the pandemic elusive and untenable. This paper argues that plugging these holes will go a long way in making these grants impactful in the fight against hunger and food insecurity during pandemics.

The study concludes that the pandemic worsened economic vulnerabilities and exposure as it disrupted the labour market, shut down businesses, and led to massive job and income losses, which in turn led to deepened hunger and food insecurity challenges, notably among the poor. What further worsened the situation is the fact that the lockdowns, especially Level 5 Lockdown, undermined people's coping and resilience mechanisms to confront and mitigate the impact of the hunger and food insecurity challenges brought forth by the pandemic.

This paper therefore recommends that to build back better the disrupted food systems and prepare for future pandemics, the South African government should take a paradigmatic turn in the country's food production, distribution and supply. In other words, the paper recommends that the government adopt and implement a '*Do-it-Yourself Africa (#DTYAfrica)*' approach in food production, distribution and supply. To this end, the paper recommends that the South African government firmly capitalise on and embrace the African Development Bank's $US1.5 billion African Emergency Food Production Facility that provides fertilisers and agricultural seeds to 20 million farmers growing wheat, rice, maize and soybeans, across the continent. The facility was introduced in light of Africa's lack of food sovereignty revealed by the food insecurity triggered by the Russian-Ukrainian war. Like many regions of the world, Africa overly depends on Ukraine and Russia for wheat, vegetable oil, blended fertiliser and potash (The African Development Bank Group, 2022a & 2022b). This is because these two countries alone produce 20% of the world's potash, close to 50% of its blended fertiliser, and 30% of the global wheat supply (The African Development Bank Group, 2022a). Russia's invasion of Ukraine had a corresponding effect of fertiliser prices rising over fourfold and wheat by over 50% (The African Development Bank Group, 2022b).

Thus, "the African Development Bank Group's African Emergency Food Production Facility is a short-term intervention to raise the production of wheat, maize, rice and soybean to compensate for the supply deficit due to the war in Ukraine. The plan will result in the production of 37.6 million tonnes of these staple food crops, an increase of about 30% in local production" (The African Development Bank Group, 2022a: 1). It is therefore against this background that as the Bank's US$1.5 billion facility is projected to support the pro-

duction of 37.6 million tonnes of food, valued at about US$11.5 billion, South Africa must capitalise on this facility to strengthen its initiatives of building back better the food systems disrupted by both the COVID-19 pandemic and the Russian-Ukrainian war.

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A Discussion of *The Immaculate Conception of Data* by Kelly Bronson

Paper first received: 13 March 2023; Accepted: 07 April 2023; Published in final form: 19 August 2023
https://doi.org/10.48416/ijsaf.v29i1.511

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Abstract

On November 14th and 17th, 2022, the RC-40 book club held meetings to discuss *The Immaculate Conception of Data* by Kelly Bronson. The meetings attracted diverse attendance across multiple continents and included scholars from a range of career stages. Everyone who participated is listed here as an author, as their comments form the core body of this review. We are offering a different kind of book review by presenting edited and organized excerpts of our conversation as the main text of the review.

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On November 14th and 17th, 2022, the RC-40 book club held meetings to discuss *The Immaculate Conception of Data* by Kelly Bronson.[1]

Introduction to the RC-40 Book Club

The RC-40 book club has an open membership, whereby anyone with interests in the sociology of food and agriculture can join regardless of membership in the RC40. Members vote on books to read and attend the meetings on an open and voluntary basis. We hold two meetings to accommodate the different time zones of participants, who attend online from multiple continents. Membership includes people from a range of different career stages and institutions, and this was reflected as well in participation in the meetings that form the basis for this review. Our discussions have a loose format, focusing mainly on the ways the text progresses our knowledge and conversations about issues central to the sociology of agriculture and food, as well as how the text might inform our teaching and research. We record the meetings, transcribe them using AI software, and then, when possible, transform them into a book review by grouping comments, editing them, and in some cases, combining comments when multiple participants articulate different aspects of a point particularly well. Volunteers from the book club engage in this editing and writing process. This review is the first output of this process.

The format of the review is not accidental. We have chosen to adopt a conversational structure, heavily relying on comments from participants. These comments respond to each other and progress as a conversation. However, they also have dynamic and non-linear aspects whereby new ideas do not necessarily move towards a singular reading or ultimate conclusive point about the text. Comments are grouped into themes that emerged across the meetings. This structure is chosen to bring out interconnected, collaborative, and contrasting engagements with the text from the diverse perspectives of participants. We are experimenting with this format in the hopes that it can reflect how texts are read within academic communities, while also providing a provocative and practically useful review. Everyone who participated in the meetings is listed here as an author, as their comments form the core body of this review. We do not attribute comments to particular participants, in part because comments may have been edited and combined with others across the two meetings, and in part to represent the collaborative nature of our discussions.

The Discussion

While we have refrained from restructuring comments into a more traditional review format, our conversations did generate some overarching insights and themes. We have titled them: 'purity and politics', 'immateriality and capitalism', and 'other places, production systems, and post-colonial contexts?'. The rest of the article is thus presented along these themes and we conclude with the main take away message for the RC-40 community.

Purity and politics

A major contribution of *The Immaculate Conception of Data* to our work on digitalization in agriculture, and indeed, digitalization in society more broadly, is the central tenet of the book: that data are often conceptualized and discursively constructed as an unmediated representation of reality, generated without context and intention. The result is that the power structures implicit in data are invisible. Bronson effectively, and convincingly, describes how this characterization of data is mobilized by both agri-businesses trying to profit from datafication, and those movements trying to challenge the data privatization being mobilized by big business. Our group also appreciated how well-placed these insights about data were within a larger historical trajectory of industrial agriculture, and we acknowledged the potential for the text to be of great value in

[1] Bronson K (2022) *The Immaculate Conception of Data: Agribusiness, Activists, and Their Shared Politics of the Future.* McGill-Queen's University Press. xiv + 224 pp. IBSN-10 0228011213, IBSN-13: 9780228011217

helping us to situate dynamics of digitalization in a larger context. We found Bronson's depiction of data's immateriality and promissory fantasies to be analytically provocative. Our discussion segments below illustrate the key ways in which we found this concept of the immaculate conception of data to be generative and to progress discussions about technology in food and farming in our research domains.

> *I love the discussion about purity. I suspect she's right, the people she's interviewing are trying to conceive of data as raw, that it's pure, you know, it's what's seen on the ground. And that having algorithms process the data seemingly removes human bias. This is what makes big data historically distinct. The data could be bad; it could be impure data. But Google will sift it all, right? And that creates a new kind of product.*

> *One of the most important insights I found was the confluence Bronson identifies between agribusiness and activists in their commitments to data as the driver of improvement. Even though we think about them as being opposed, with resistance to big business from groups like Farm Hack, you can also see underlying logics that end up being similar. These two fields of actors, which differ in their ambitions for the use of data, share the same simplified vision of data and so on. And I think that for Farm Hack, and these members of the GOAT network, the message is that they're sharing the same utopia, the same statistical utopia and political utopia, and that might be a warning—they might use different technologies, and activists don't have the same economic power as the big corporations, but they're sharing the idea that agriculture can be data-driven. The use of this logic obscures the political nature of data, and can end up amplifying the power of big business.*

> *But I think that reflects a select group of activists. Really, I mean, the universe of alternative foodies, alternative agricultural movements who are like, "yay, data!" is pretty limited. I think there are many others that would be much more skeptical of the data, and of thinking of data as a solution. The book may help us to think through the ways that this approach to data may be reproduced by many different actors, but it is not really an in-depth analysis of food activists engaged with digitalization more generally.*

> *She does recognize some common patterns in the discourses around data by those who are engaged in a more optimistic view. She lays this out by using their words, to say: "well, we basically don't know what we're doing. We have all this ability, and all this possibility with running these numbers and gathering them, but we really don't know what we're going to do with it". It's a lot of hyperbolic talk. And within this hype, there is a real lack of any evidence or concrete insights about what the actual material consequences will be, nor acknowledgement about existing infrastructures that would make this useful or not useful. The book helps us see that there is a lot of hype around these technologies, but actually they often aren't delivering any sort of material outcome. In many cases, people aren't participating enough to actually generate meaningful data. Despite this, these companies are still talking about amassing data, even though due to the way that the data have been generated, it's kind of meaningless, even within their own parameters. It cannot possibly do the thing that they want it to do without broader uptake and use. So, they're just hoarding empty, meaningless data.*

The above discussion illustrates some key cornerstones of our discussion about what the book illuminates about the novelty of digital agriculture, as opposed to previous forms of technological transformation. Large data sets and algorithms generate a sense that these technologies produce unbiased or pure empirical observations at an aggregate level. The seeming purity of the data allows actors and infrastructures that generate the data to be largely invisible. Even when things like ownership of data is challenged by activist groups, the social conditions of data production can escape critique, as data maintain a mystique of neutrality. Not all activist groups take up datafication in this way, as one of our comments highlights, but Bronson uses the particular activist groups of her research to demonstrate how the unique features of data produce a unique context for technological politics. In particular, the hyperbolic promises that can accompany new data-intensive technologies are often immaterial and hard to observe directly, making it difficult to meaningfully and critically engage with them.

Immateriality and capitalism

The notion of promises is linked to another theme of the text and our discussion: the possibilities for resistance to digital agriculture within the context of capitalist expansion and transformation in agricultural

production. As the comments below highlight, we considered how the ontologies of data and tech make resistance difficult, while also becoming a space for capitalist accumulation. This leads to the observation that the relations and new venues for investment are a more profound outcome of these technologies than material changes to agricultural practice, a pattern long observed by sociologists studying capitalism's incursion into agriculture.

These things do get locked in the ontologies in which these technologies get made. They get produced, and they get spread around. They start restructuring biological and social worlds. And so, at what point can we intervene? I like that the book is showing us why resistance is so difficult. Along these lines, I think the book also does a really nice job of providing some tools for resistance. It shows that all these narratives around data revolutions and the way people are talking about it are so abstract and imaginary and fantastical. This generates a question for resistance: is there any epistemological ontological dimension of data, of algorithms or data processing etc. that prevents digitalization from being a tool that can be used by more progressive and alternative advocates of food systems?

What Kelly Bronson doesn't say, is that while the groups promoting big-ag and resisting it might share the same commitment to algorithmic ways of knowing and improving agriculture, they differ on what data they value, and how they value data. The value of data, or what data values, is relational.

To bring us back to agriculture, one place Bronson did not go, but that might be interesting, is also to look at digital agriculture as a way to expand corporate capitalism beyond the physical dimensions of the field. So, also, to ask how far can these technologies go in order to create new added value that is not bounded by physical limits. To what extent is this just enabling the expansion of financial capital investments in a totally fictitious way, unmoored by any materiality?

This is perhaps something that differs about data. In agriculture, you need treatments that can address the biology of plants and animals. I mean, biotech purports to provide treatments that deal with the biology or biological risks of food production in less intensive or less damaging ways. And so that's what agriculture "needs" in terms of being better, even if we don't agree with it. Data can maybe give you information about that. It can maybe tell you what you ought to do, or ought to not do, but it doesn't actually treat the crops.

What kind of thing is data? And that's something that strikes me as potentially a little bit different from seeds or other types of agricultural technologies. It is derived from some elements of reality, but it's not quite the same as experiential embodied reality or material input. It's a different type of thing and requires these infrastructures in order to make it meaningful. Does this make it a distinct type of object within our capitalist economy and an opportunity for endless expansion?

Bronson starts the book talking about selling the future, and maybe that's where the money is coming from. It's an imaginary future where we won't have enough food resources to feed our population, and this future makes data valuable. But what is actually being fixed or addressed? Or what is the solution that's offered by all of this datafication? This question got me thinking about the digital frontier, and discussions about this new landscape that data provide, as a type of new spatial fix, right? There's this glut of data being produced that Bronson talks about in the conclusion. And so there are these entire industries and technologies being manufactured around the overproduction of data. With so much data being produced that then needs to be mined, and refined, you get entire institutions arising to address the issue of overproduction. So, it really doesn't look to the problem of agriculture. It looks to fixing the problem of mass production of data.

That's a really interesting way of thinking about how big data becomes important. Because the promise of big data is, if you have these huge volumes of data, it's going to generate insights beyond any individual's brain power. I think that's slightly different than what Kelly's calling the Immaculate Conception, which is the pretense that there's no human idea of what goes into that data. I think a lot of it's just like, "we have volumes of data, how can we make volumes of data a solution?" But what's the value all this data can bring, relative to how much investment is going into data? Because for farmer decision making, they might be orienting to a lot of specifics related to their farm, and then it's not necessarily going to improve their profitability. How does it improve the profitability of the techies that are selling it? That's not really clear, unless they can sell it on to others saying that "we're collecting data that we can then monetize", but the jig's almost up on that too. So it really is an overproduction problem that may reach its own kind of limits and profitability.

> *The value of data depends on who, what relations, interests it serves. It is valuable for those who benefit from it the most. Data are produced, sold, exchanged. Market exchanges do not only obey prices (economic value), but also symbolic (reputation) and political value (the ability to influence public policies, public decisions, etc.). These are dimensions at stakes with data. They might allow, at least temporarily, for establishing or holding a position, however, they are not based on the investment returns of corporations, but rather on the investments they are capable of. The term "promise capitalism" fits well.*

> *And to bring it back to the opportunity to use the book for critique, I like the idea that data is relational: it connects different interests, and offers a new venue (or at least a promise of return on investment) for perpetuating them. Paying attention to data as relational is a way to bring agency back in. Rather than imbue data with agency, which is what the ICT is about, and what Bronson warns scholars against, one should connect data to agents' interests.*

To summarize, the book illustrates how the seemingly immaterial and objective aspects of data obscure the power relations that generate data and are advanced by their accumulation and use. In doing so, the book enables us, as readers, some ways to critique data by offering some language, conceptual tools, and empirical basis to see the tangible effects of hyperbolic talk and claims of accurate neutrality.

Other places, production systems, and post-colonial contexts?

We also noted lingering questions and topics outside the scope of the book. In particular, we wondered about the extent to which the findings of the book were specific to a North American context, and how its insights might be interpreted across a broader geography. By placing data intensive technologies within a historical context, there was an opportunity to see how these technologies are consistent with the mantras of the green revolution and its colonial tendencies, but Bronson does not explicitly engage with links between the immaculate conception of data and imperialism. Given the globalist agenda often associated with agri-tech, we saw this as an important direction for future work. Considering the relations between data and colonialism, the valuation and privatization of knowledge are blatantly linked to infrastructures of data extraction and processing; a connection that Bronson touched upon, but did not fully explore or interrogate.

> *One thing she doesn't talk about is how this story plays out in non-western settings. Take Vandana Shiva's critique of monocultures of the mind, where she has a critique of bio piracy and intellectual theft of traditional knowledge. That is a very different sense of ownership. I feel like it's dancing in the background of some of the literature that Bronson mentions in this book, but she could have centered it more. That's one of the unfortunate things about the Immaculate Conception of Data. She's really engaging with debates among Western people about data and agriculture, and so open-source versus proprietary data is a very well-worn story there. But, just as in the GM food debate, you have the additional layer of Western ideas of ownership and intellectual property versus, say, the idea that knowledge is generated locally. And that is different from what the activists featured in the book are talking about. The Bill and Melinda Gates Foundation, for example, supports the Alliance for a Green Revolution in Africa, which imposes methods, including digitalization, rejected by a majority of West African farmers, some of whom cultivate sweet potatoes and sorghum, traditionally grown because they are adapted to the climate.*

> *When colonialists looked at farmers in colonies, like in India, they often said that 'we need to teach these farmers what scientific agriculture looks like, and what productive agricultural looks like'. Bronson compares this discourse to the agri-tech companies today, where they define the problem in terms of data deficit; that is, farmers do not have enough information, and the information that they have is not good enough. So, there is a lack at the center of this discourse, which is portrayed by these companies as people either lacking certain skills or certain information, and the idea that data will provide them with these skills. So, the idea that farmers lack something or that farm workers lack something echoes the colonial project.*

> *It really is about different ways of relating to land (…) What these technologies can do if they are made based on these extractivist logics, which is what is happening with big data: you're trying to extract as much as you can. This contrasts to the Maori [Indigenous New Zealanders] worldview, as we've been looking at in our own research. In our work we find that if it's your data, like if it comes from you, if it comes from the plant that you're in relationship with, if it comes from your land, you have to follow a guardianship model. It's not an extractive model. I think that's an interesting way to think about the logics. I think most of the people in Bronson's book are Westerners who have a specific way of thinking about their relationship to land, which*

seems to be guided by an extractivist logic.

Yes, the book is a little bit partial because it engages mainly with one part of the world where of course this kind of dynamic is much more pronounced. Especially now that there is a tendency to export this digital revolution to the Global South, then we have to think about how it confronts Indigenous knowledge, Indigenous ontologies, and completely different ways of relating with nature. So then again, my question, which is basically a research question that I have, is: could we imagine a Maori community taking these digital technologies and reshaping them in such a way that it can be compatible with a Maori ontology? Or is there something fundamental about framing information as data, as tiny bits of information, that we then aggregate and collect and reprocess, that is fundamentally incompatible with this model?

In short, the conceptualization around the *Immaculate Conception of Data* is situated in a North American context, and may be unique to it. This is a limitation of the text, and we agreed that empirical work on the politics of data in agriculture outside of North America and Europe, and taking a post- or anti-colonial lens, is essential for better understanding these technologies in the future.

We also wondered how the context of smallholder farming and more diversified forms of agriculture might shape the conversation about big data in different ways. Much of the work on the datafication of agriculture is particularly applicable to industrial scale production and arable crops like corn and wheat. Is the conception of data so immaculate in these more diverse contexts? Is the politics of generation, control, and access of data so easily obscured? We considered how the insights from Bronson's research might apply to these contexts, and thought the promissory elements of data-driven agriculture, paired with issues of access and applicability, generates different kinds of questions about big data.

The big concern to me is how can smallholders access this technology and how will it benefit them. The reality, for example, in Brazil and USA, is different. And for small farmers, it's different between Brazil and the USA and other parts of the world. I have two questions about this; if it is safe for small farmers to use these data? And if it is safe, how can small farmers use this for their benefit in reality? There's a real difficulty in actually demonstrating what are going be the material consequences for smallholders, if they go to all this trouble to learn new apps, to learn coding, to do all these other things. Is it going to be worth the investment of time, learning, resources? How will it really impact smallholder farming? The promise is sitting there but we don't know.

But it's also not useful for a farmer whose profit margins aren't about finding that little teeny squeeze of efficiency, which is true for a commodity crop farmer as opposed to a specialty crop farmer. So, I think that there is a real limit to what this data can do beyond commodity crop farming.

Conclusions

In conclusion, the concept of the "immaculate conception of data" gives us the tools we need to confront this current expansion of data-based technologies in agriculture. It helps us to identify what is the same about datafication in relation to historical trajectories of agricultural transformation, and particularly how datafication supports the reproduction of capitalist relations and the continued expansion of agribusiness. It also helps us to see what is distinct: data is immaterial but characterized as objective, and its promises are inherently future-oriented, giving it an air of unquestionable inevitability and functional anti-politics. The empirics of the book are situated in a particular place and cultural-economic context, and in some areas, we wondered if the analysis could have been extended if the geography of the case and global relations of datafication were interrogated in more depth. Nonetheless, Bronson's text lays important groundwork for enabling these analyses to happen.

To sum up, the following quote from our discussion captures well our general conclusion:

I think that there are places where Bronson didn't go far enough in her critique, and obviously, yes, we're seeing some kind of history repeating itself. But I also think there's a real chance here for Bronson's book, for this idea of the Immaculate Conception of Data, to capture the epistemic closure that is occurring with datafication. And I think what Bronson's book gives us are some tools to maybe crack that open a little bit. It demonstrates some of the steps involved in cracking open this closure to allow for reality-based knowledge as opposed to a promissory note of what will happen if you just follow us, and believe us.

Social Learning from Co-creation: Cities on an environmental mission

Paper first received: 30 April 2023; Accepted: 31 December 2023; Published in final form: 07 April 2024
https://doi.org/10.48416/ijsaf.v29i1.604

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Abstract

In innovation studies, and particularly those dedicated to agricultural and environmental innovations, there has been a robust stream of research focused on understanding how multi-stakeholder groups learn from their experiences in order to implement and scale-up system innovations. This stream of research has been referred to as social learning and has focused on how groups of multiple stakeholders are able to move system innovations from protected niches into broader scale application within society. Social learning scholars mention the importance of reflexivity when learning contexts are characterised by diverse values, interests and knowledge, such as is found in co-creation processes that include actors from the quadruple helix. Other scholars argue that while the learning process itself is important, it is insufficient for transformational change – particularly when the desired change is at the societal level. A vision of actors from the quadruple helix as givers of meaning to problems, new technologies, social innovations and potential societal impact is thus required. In this short commentary, we reflect upon the linkages between visions, problem formulation and social learning when co-creation is used as a means to stimulate collective work among multiple stakeholders. We reflect upon the promises and the limits of co-creation and the social learning that it catalyses, in the context of environmental missions.

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Acknowledgements
The authors thank Roxane Bibard and Mélanie Marcel for the productive discussions and collaboration in the development of the impact assessment toolkits that were used in this project. The authors also thank all of the partners, cities and participants of the MOSAIC project for their contributions to these reflections.

Funding
MOSAIC (Mission-Oriented SwafS to Advance Innovation through Co-creation) received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 101006382 - H2020-SwafS-2018-2020 / H2020-SwafS-2020-1.

Introduction

In 2021, the European Union announced the launch of the "climate neutral and smart cities by 2030" mission as a new way of orienting research and innovation in the Horizon Europe funding program. This mission-driven policy is the most recent attempt by policy makers to orient the investment in research and innovation towards resolving what have been labelled the "grand societal challenges" (Randles et al., 2016). Often painted as wicked or "super-wicked" problems (Levin et al., 2012), these societal challenges need a loosening-up of rules and relations that guide actions and practices. Simultaneously, ways of thinking, of problem setting and solving (Wanzenböck et al, 2020), of managing resources and people, and of planning, need to be reconsidered because they are in many ways part of the problem to begin with (Beck et al., 1994). Thus, an emerging scientific consensus argues that addressing these grand challenges implies the need for systems transformation and requires social, economic and technological changes (von Schomberg, 2013; Cagnin et al., 2012; Kuhlmann and Rip, 2014). Such approaches involve new policy rationales and innovation approaches and consequently new approaches for assessing the impact of research and innovation.

It is within this specific context that the MOSAIC project was conceived and carried out. The broad aim of the MOSAIC project is to envision, study and test co-creation processes targeted at supporting a meaningful participation of quadruple-helix stakeholders (i.e., public, private, civic and research sectors). Thus, one of the added values of the MOSAIC process is that the research work involved citizens in finding creative solutions to climate-neutral and smart cities mission objectives. According to our working hypothesis, this type of inclusive process can improve the innovation capacity and build directionality of innovation ecosystems from the bottom-up. The ability to steer innovation processes in the desired direction is fundamental to how societal missions can be achieved (Jenssen et al., 2021).

In this short commentary, we explore how this hypothesis took form and played out as part of an effort to introduce formative evaluation (Molas-Gallart et al., 2021) into a co-creation process (Torfing et al. 2019). We refer to the approach that was used as "co-creation for impacts." We reflect upon what was possible to achieve in such a short period of time and we conclude by linking these learnings to the debates in the sociology of agriculture and food that have focused on city-driven system innovation.

Co-creation as a public space for learning how to innovate for societal impacts

The notion of co-creation first emerged in management sciences as a means to explain the knowledge flow process between stakeholders as partners of the value creation efforts of private companies (Von Hippel, 2005). Co-creation thus became known as the "pro-active strategy for enabling firms to create value through co-opting consumer competences" Durugbo and Pawar, 2014: 4373). When described as a process, authors model it as a set of activities for fulfilling customer needs based on agreements and constraints that are defined by customer, supplier and encounter domains. Here, the key actor that was included outside of the private sector was the infamous "user" of the technologies, products or services developed by the private actor.

In the twenty years since these approaches were first introduced into the private sector, citizen-led initiatives and non-governmental organisations began to employ the term to refer to the social innovations that they were introducing (Klein et al., 2014). Here social innovations, and the use of co-creation processes, were providing goods and services for needs that were not being met by private or public sector actors. In food and agriculture, we can trace this to the emergence of community supported agriculture and solidarity purchasing groups (Chiffoleau and Loconto, 2018) and other forms of prosumption whereby consumers become active producers of value (Podda et al. 2018; 2021).

More recently, there has been a movement towards more participatory approaches in public sector management, whereby citizen councils (Copus, 2008; Lowndes et al., 2001), participatory budgeting (Sintomer et al. 2008) and citizen participation became more widespread, particularly in Europe and Latin America. We have seen this clearly in food systems whereby Food Policy Councils began to emerge to shape city-level planning

for achieving food security and often food sovereignty in urban centres (Blay-Palmer, 2009; Friedmann, 2007). Torfing et al. (2019) commented on the increased use of co-creation by public actors, particularly city-level governments, in their policy processes. They claim that the public sector is "being transformed from a legal authority and a service provider to an arena of co-creation" (p. 795).

Torfing et al. (2019) argue that, in public processes, the flurry of co-creation activities will only be effective if a series of systemic changes are simultaneously introduced. It is in this context the MOSAIC project experimented with the idea to use co-creation activities to help cities envision, plan and implement a city-level mission. In that matter, co-creation included science, policy, industry and civil society actors (i.e., the quadruple helix). The co-creation process itself was set up as three phases that included: 1) challenge definition and stakeholder recruitment (3-4 months); 2) the Gathering (1-2 months); and 3) ideation and prototyping (5-6 months) (Mazzonetto 2023). The innovation here was to situate a co-creation process within the EU mission-oriented programme operated by cities to deliver 100 climate-neutral cities by 2030 (Robinson et al., 2020; Manzoli et al., 2024).

However, the mission-oriented context introduced a number of issues that complicated the situation. First, focusing on a societal mission already means that the goal of a co-creation process is pre-determined to a certain extent. In addition to this, each city interpreted this mission by identifying a specific challenge that they felt needed urgent solutions. This challenge identification happened before the co-creation process started, which meant that while the mission outlined an end goal (i.e., carbon neutrality), the challenges were locally defined as differently as making mobility more sustainable in one particular part of one city and communicating air quality so citizens can make informed decisions about their health in the other. Second, the commitment of a city government to deliver on an externally determined goal means that they are willing to take only limited risks as compared to their normal practices. This means that both the orientation of stakeholders' contributions and the clarity of their own local level vision of intended impacts were quite conservative. Finally, the inclusion of the cities in the EU mission, meant that the co-creation process had to follow the EU timeline. In order for the project to ensure that the cities kept to that timeline, a very tight schedule for the three phases was introduced. For example, only two months were dedicated to phase 3. This did not genuinely allow for deviations, detours or radical imagination.

In order to understand how such processes can thus create societal impacts, we must turn to what has been learned from mission-oriented innovation policy (Robinson and Mazzucato, 2019). For instance, directing research (and innovation) towards a societal mission requires a different understanding and means of assessing the societal impact of research (Matt et al., 2023). As participatory approaches take different knowledges and perspectives into account in dynamic processes, counterfactual controlled impact assessment is not a feasible option. In addition, ex post impact assessment could be useful over time. When cities work on a tight schedule, understanding what knowledge and solutions to prioritize to produce the expected impacts is more useful.

Thus, we introduced formative evaluation within the MOSAIC co-creation process as a way to evaluate real-time impacts as part of a learning process whereby the quadruple helix stakeholders learn from each other (van Drooge and Spaapen, 2022). Formative evaluation is an approach that has its roots in impact evaluation of research and innovation policy programmes (Molas-Gallart et al., 2021). We consequently developed with the project partners, a two-pronged approach that enabled them to (re)direct co-creation participants' problem definition and solutions development towards the specific mission outlined by the city conveners. The drawing of an impact pathway (Matt et al, 2023) was used as the core tool to orient participants and guide their anticipatory actions.

In an ideal process, reflexive revisions of this impact pathway should enable the participants to check their progress towards their goal. If there are deviations, then corrective actions could be taken to either get back on their original trajectory or to establish a new trajectory and revise the networked pathway. While the process unfolded over the period of less than one year, unfortunately, a rushed schedule for activity implementation meant that the formative evaluation exercises were "added on" to a time intensive process that

lasted only 5 months. This resulted in insufficient time being spent on the reflexive and anticipatory activities. However, based on this imperfect implementation, which is actually quite common in reality, we have been able to analyse our experience and offer insights to improve these practices in the future.

Social learning is not (yet) societal impact

In innovation studies, there has been a robust stream of research focused on understanding how multi-stakeholder groups learn from their experiences in order to implement and scale-up system innovations. This stream of research has been referred to as social learning (Gertler and Wolf, 2002) and has focused on how groups of multiple stakeholders are able to move system innovations from protected niches into broader scale application within society. The positive connection between the quality of co-creation processes and social learning has been recognised (Galan et al., 2023). Social learning scholars mention the importance of reflexivity when learning contexts are characterised by diverse values, interests and knowledge (Bos and Brown, 2012; Wals et al., 2004), such as is found in co-creation processes that include actors from the quadruple helix. Specifically, "social learning requires reflection and reflexivity throughout the entire process, if only to monitor change and progress throughout" (Wals, 2007). Reflexivity is thus defined as group's "ability to interact with and affect the institutional setting in which it operates and can be recognised as the emergence of new (semi-coordinated) practices of participants in the initiative as well as their wider networks, and as new associated rules and discourse enabling and constraining these practices" (Beers and van Mierlo, 2017: 418). Such learning therefore takes place in a situation of actors collaborating within and across social networks, in an ever-changing environment. The associated learning processes are fraught with uncertainties, value differences and a diversity of time horizons.

The co-creation activities carried out during the MOSAIC project can thus be characterised as situations that encouraged social learning as part of an approach seeking to define and resolve problems encountered by cities as they seek to become climate neutral. As such, identifying the potential and actual contribution of co-creation activities is important to evaluate whether the investment in co-creation is paying off (and who is gaining from them) and to better design and implement further co-creation activities.

However, other scholars argue that while the learning process itself is important, it is insufficient for transformational change – particularly when the desired change is society-wide (Korten, 2018). The actors in the quadruple helix must also build a vision that gives meaning to the problems, the new technologies, the social innovations and the potential societal impact. This vision, which they acquire collectively during the co-creation process, transforms individual learning into collective learning. The passage from ideas to prototypes, then to actions and impacts is the result of this learning. It is supposed to happen when knowledge (the what), actions (the how) and relationships (the who) become consubstantially intertwined (Beers et al., 2016). It is important to note that this definition yields a rather straightforward distinction between learning outcomes and the real-world actions that possibly follow. However, the question of the impact that such social learning has in terms of system innovation and eventually societal impact remains unanswered in this literature.

Thus, the challenge that the MOSAIC team faced was to develop methods able to improve our understanding of the impact generating mechanisms in the present, in order to assess a broader set of societal impacts in the future. We posit that impacts on complex innovation ecosystems are difficult to trace back to individual sources (they are often a combination of many activities) (Matt et al., 2017; Bozeman and Sarewitz, 2011). However, much work on "impact assessment" of projects is focused on the production of evaluation indicators of individual projects. Hence, the MOSAIC team incorporated a mix of complementary approaches (combining qualitative and quantitative evaluation methods, achieving a multi-objective evaluation, and evaluating impacts at various levels of aggregation) in order to examine the learning outcomes of co-creation activities at individual and collective levels, and contributions to the future impacts of co-creation on a city's capacity to achieve a mission.

We first learned that participation in a co-creation process – where local government is honestly looking for solutions that will help them to reach their mission – does have positive effects on the capacities of individuals to network and to learn new skills from each other. Collective learning was also achieved in one city where the government was able to breakdown their silos and collaborate across departments. For example, creating a plan and actions to achieve the carbon neutral city mission requires collaboration from at least the transport, health, environment and citizen engagement departments. Indeed, the greatest challenge to achieving cities' missions likely lies in this internal silo breaking and not necessarily in mastering the quadruple helix participation. This is a point that definitely requires more research.

We also learned that while important, social learning does not by default lead to impacts – particularly not societal impacts. While the quadruple helix groups learned to work together during the effectively 5-month implementation of the MOSAIC co-creation process, which is important if co-creation for impacts is to be used for the entire period of the mission, it is not clear if this engagement will be maintained. Indeed, while some solutions were found rather quickly to very tightly defined objectives, this was mostly because most solutions were already existing in the city – even if they were not necessarily in the exact same form as the co-created prototypes. One can only assume that additional challenges and obstacles will emerge along the city's trajectory. Without maintaining an engaged co-creation for impacts approach over time, and opening up opportunities to change or exchange the existing solutions and the impact pathways themselves, it will be difficult to achieve the originally envisioned impacts. The recognition of this limitation is important for researchers, public, private and civic actors alike.

Conclusions

In this short commentary, we have presented a co-creation for impacts approach that was introduced in Europe as a means to accompany cities to achieve the mission of carbon neutrality. The major lesson that we have drawn from this experience is that while the participatory exercise did open a public space for social learning, there is still significant work to be done to impact the carbon emissions.

The lessons that we draw from this exercise are important for the sociology of agriculture and food because of the major role that food and agriculture play in both city planning and in mission-oriented innovation policy. Agriculture and the environment are frequently the focus of mission-driven policies where ambitious targets are set to achieve, for example: 30% Organic by 2030, 0 pesticides by 2050, or 0 imported deforestation by 2025. The experiences of food policy councils – that are now networked together under the Milan Urban Food Policy Pact since 2015 – demonstrate that continued engagement is fundamental to systems change. They also demonstrate, and our experience confirms, that breaking down silos in local government is very important to strengthening an innovation ecosystem. However, we cannot simply stop at group level social learning if we are seeking system level change. This means that we cannot stop at air quality or mobility if we are seeking climate neutrality. We must also find new problem definitions for agri-food systems and likewise co-create new solutions that build upon, but go beyond what are already circulating in our cities.

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