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Normative facets of transitioning food systems

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Food systems are complex systems shaped by social, economic, political and environmental influences. The multi-level perspective (MLP), adopted from transition studies and examines system change as embedded in society, has been influential in food system studies. Yet its lack of normativity may limit its utility for guiding complex food system transitions. This paper proposes a conceptual framework that integrates normative directionality and interrelations of system transitions. The framework uses five analytical elements to identify system change dynamics: normative orientations, process drivers, emerging patterns, conflicts (trade-offs) and synergies. We interviewed Israeli food researchers and practitioners to examine normative orientations in Israel's transition to a sustainable food system, unpacking its normative contestations, normative gaps, multi-directionalities, and normative stalemates. This paper then identifies conflicts and synergies in a broader set of normative goals explored in the study, and harnesses them towards more holistic food policymaking.

KEYWORDS

food system transitions, normative orientations, multi-level perspective, synergies, trade-offs

1 Introduction

Food systems are complex, multi-dimensional and interlinked with other domains such as health and nutrition, environmental sustainability, political economy, society and culture, and science and technology (von Braun et al., 2021a; Berry et al., 2015). Transition frameworks that prioritize innovation-driven changes (El Bilali, 2019) and lack normative orientation (Turnheim et al., 2020) can be limited in addressing the multi-faceted characteristics of food systems and envisioning desired futures. Towards these two ends, this paper seeks to integrate normative directionality and interrelations of system transitions into a transition framework and examine these in a case study. As such, the research questions are: (1) How does identifying normative goals and conflicts inform holistic deliberation in food system transitions? (2) What insights can an analysis of key system elements—normative goals, drivers, patterns, and trade-offs—offer in navigating situated food system transitions?

To address these questions, this paper proposes a normative conceptual framework that integrates an adapted multi-level perspective (MLP) in transition studies, with systems theory. We identified system change dynamics using five analytical elements: normative orientation, process drivers, emerging patterns, conflicts (trade-offs) and synergies. These are applied to a case study of Israel's food system transitions to demonstrate an array of food system characteristics, challenges and policy implications that may resonate with other contexts around the world.

As a small open economy, Israel constantly navigates the balance between local food production, imports and food trade liberalization. Historically, it had a strong agricultural sector that is today still technologically advanced and productive but faces the challenge of maintaining its edge. Israel has a socially diverse demographic with various social groups faring differently in their nutritional security with marked disparities in their health outcomes

(Endeweld et al., 2021). As a small semi-arid country with more than half of its 21,145 km^2 land area desert, Israel needs to continually balance its land and water resources for a population growing at the highest rate among developed countries. The country is situated in a geo-political and environmental hotspot that compels constant preparedness for day-to-day challenges and emergencies. These considerations require food system transitions strategies in the context of ever-shifting local and geo-political circumstances. This also makes Israel a useful lab for food security studies (Griver and Fischhendler, 2021).

Through interviews with Israeli food and agricultural researchers and practitioners, we examine various facets of its food system: food security, economics, environmental, societal concerns of food, and political relations of food. We then unpack normative orientations—normative contestations, normative gaps, multi-directionalities, and normative stalemates—of Israel's food system transitions, before analysing conflicts and synergies to draw policy implications.

2 Literature review: normative orientations and interrelations in food system transitions

The food system is complex and multi-scalar, comprising a broad range of actors involved in interconnected activities (growing, harvesting, processing, distribution, consumption and disposal) across space. These activities are influenced by process drivers, leading to spatially and societally differentiated social, nutritional, economic, and environmental outcomes (von Braun et al., 2021a; Béné et al., 2019). Dynamic interactions occur within food systems' "internal" components such as food and agriculture economics (affordability, markets, supply and demand chains), environmental issues (sustainable production and consumption, food waste), food security (with dimensions of availability, accessibility, utilization, stability and sustainability [Berry et al., 2015]), and social concerns (cultural acceptability, nutrition and health equity). These interactions also engage with "external" systems such as the health, economic and governance, science and innovations, and ecology and climate systems (von Braun et al., 2021b; OECD, 2021).

Going beyond the positive (descriptive) analysis of a food system, von Braun et al. (2021b: 7) assert that system thinking in food enables the envisioning of normative "valued outcomes" including health, socio-economic livelihoods and environmental sustainability. Furthermore, a systems rationale overcomes fragmentary (silo) thinking and takes advantage of cross-sector learning (den Boer et al., 2021) and introduces alternative approaches to tackle environmental and equity impacts (Sage, 2013). Systems thinking also helps identify the diverse drivers and mechanisms of transitions and their interrelations, including marginalized stakeholders, to better include their needs and contributions (Dinesh et al., 2021). Finally, a systems approach affords a more holistic understanding of food systems that are embedded in socio-cultural values, norms and practices.

The multi-level perspective (MLP) (Geels, 2002, 2011, 2019) is an influential framework for processes (technological, institutional, networks and practices) of regime change in society, explaining the interactions within and across three analytical levels of "landscape," "regime" and "niches." In agri-food system transition research, the MLP is the most prominent transition framework by far (El Bilali, 2018). In food systems, niche-innovations may be technologically driven such as engineered high-yielding seeds, digital agriculture, ultra-processed foods, or alternative proteins; it may also be idea- or practice-driven such as organic farming, agroecology or urban agriculture. Gaitán-Cremaschi et al. (2018) differentiate the incremental and mainly technologically-driven innovations that feed the existing productivism paradigm, and the arguably more norm- and practice-driven innovations such as biodiversity-based agriculture or alternative food networks that potentially bring about more radical sustainability transitions. El Bilali (2019) suggests that the MLP may be more adept in technical-driven innovations rather than social innovations processes in the food system. Besides, while focusing on niches (thus innovation-driven transitions), MLP studies tend to overlook the landscape dimension and under-describe the regime as well as transition impacts (El Bilali, 2019).

While the MLP literature addresses multiple pathways and forces of change that build up towards regime changes (Geels, 2019), we suggest that the MLP has limitations explaining transdisciplinary and cross-system interactions with a confluence of multi-relational niches-innovations that often characterize food systems. Furthermore, transition research in general has not sufficiently addressed defining and assessing collective priorities for transition goals that have important implications for policymaking (Turnheim et al., 2020). Specific to the MLP, Dumont et al. (2020) assert that normative rules have not been sufficiently examined by the MLP, and thus may be limited in envisioning and guiding systemic transitions in food systems. In food system transitions literature, attention to normativity appears to be increasing as researchers emphasize "value outcomes" (von Braun et al., 2021b: 7). Dinesh et al. (2021: 2) consider that the "value orientation" of food system transitions is linked to transformative visions and goals such as "inclusive growth, social justice, resilience to climate change, biodiversity." Such goals are framed as public goods in the "mission-oriented" innovation approach, whose policies often address a specific interdisciplinary challenge rather than focussing on a single technological problem or discipline (Klerkx and Begemann, 2020; Wittmann et al., 2020).

While attention towards normative orientations in transition studies is growing, there is still much scope for conceptual development, empirical testing of concepts and operationalizing concepts in policymaking and evaluations, especially in transitions with multivalent and contested directionality. Analytical and normative engagement in the complexities of sustainable system innovations requires more explicit conceptual tools (Schlaile et al., 2017).

Taking up this call, for instance, is the literature on theory of modal aspects (Wigboldus et al., 2016; Wigboldus and Jochemsen, 2021; Gunton et al., 2025) that sought to complement the MLP by incorporating the notions of normativity, trade-offs and multiple transition processes in scaling change. Instead of seeing transitions as a single process of moving innovations from the niche to regime level, transitions are reframed as multiple processes of scaling innovations in a variety of sub-regimes (Wigboldus et al., 2016). The modal aspects framework integrates normativity by identifying misalignments between normative goals and the actual functioning and outcomes of a system as diagnostic signals to reconfigure system practices, including their potential trade-offs (Wigboldus et al., 2016).

Contemporary agrifood policy debates in Israel—such as integrating agricultural and energy farms, balancing the roles of the

state and civil society in funding and operating food banks, and tackling structural inequalities across demographic groups—also emerge in other global contexts. Navigating these issues requires contextualisation and critical examination of their multiple normative directions, trade-offs, and interconnections with other policy domains. Resonating with these key concepts raised, this paper seeks to contribute to integrative food system research, particularly shedding light on their pain points by unpacking the normative struggles, trade-offs and conflictual processes encountered in transitions.

3 A normative conceptual model for food system transitions

The proposed conceptual model for food system transitions combines elements of Geels' (2002, 2011, 2019) MLP framework and complex systems thinking (den Boer et al., 2021; Meter, 2019) that focus on interrelations within and across systems. The model, as presented in Figure 1 outlines the dynamics of multiple interventions and plural normative orientations of complex systems such as food systems.

This conceptual model retains the MLP notions of "landscape," "regime" and "niche," but dismantles their hierarchical relationship in preference for a flat ontology (Geels, 2011). The "landscape" refers broad factors such as demographics, social structure, and economic milieu, which are "external" to the food system. The landscape realm is also where interactions with other systems such as health and nutrition, economics and governance, science and innovation, and ecological systems can be examined (von Braun et al., 2021a; OECD, 2021). The "regime" refers to an existing dominant network of actors, technology, economic system, infrastructure, and cultural practices "internal" to the food system (such as agriculture, food security, food distribution and food welfare).

"Niches" refer to the new entrants of changing actors, technology, infrastructure, economic interventions, and socio-cultural practices. Beyond technological innovations, niches can be new or peripheral social paradigms and practices. As such, niches are represented as bands of multiple arrows with their set of culture, institutions and practices (not unlike the regime). Niches are transformation drivers that introduce new normative orientations (such as food justice and inclusive food governance in Figure 1) that reshape those of the existing regime. These societal goal-oriented transitions emphasize the need for active, deliberative and collaborative efforts across diverse institutions and actors. Different niches can exert change pressures on different aspects of the existing regime; niches may also develop in parallel and influence one another (Figure 1). Meynard et al. (2017) emphasize coupled innovations in connecting innovation dynamics in agri-food

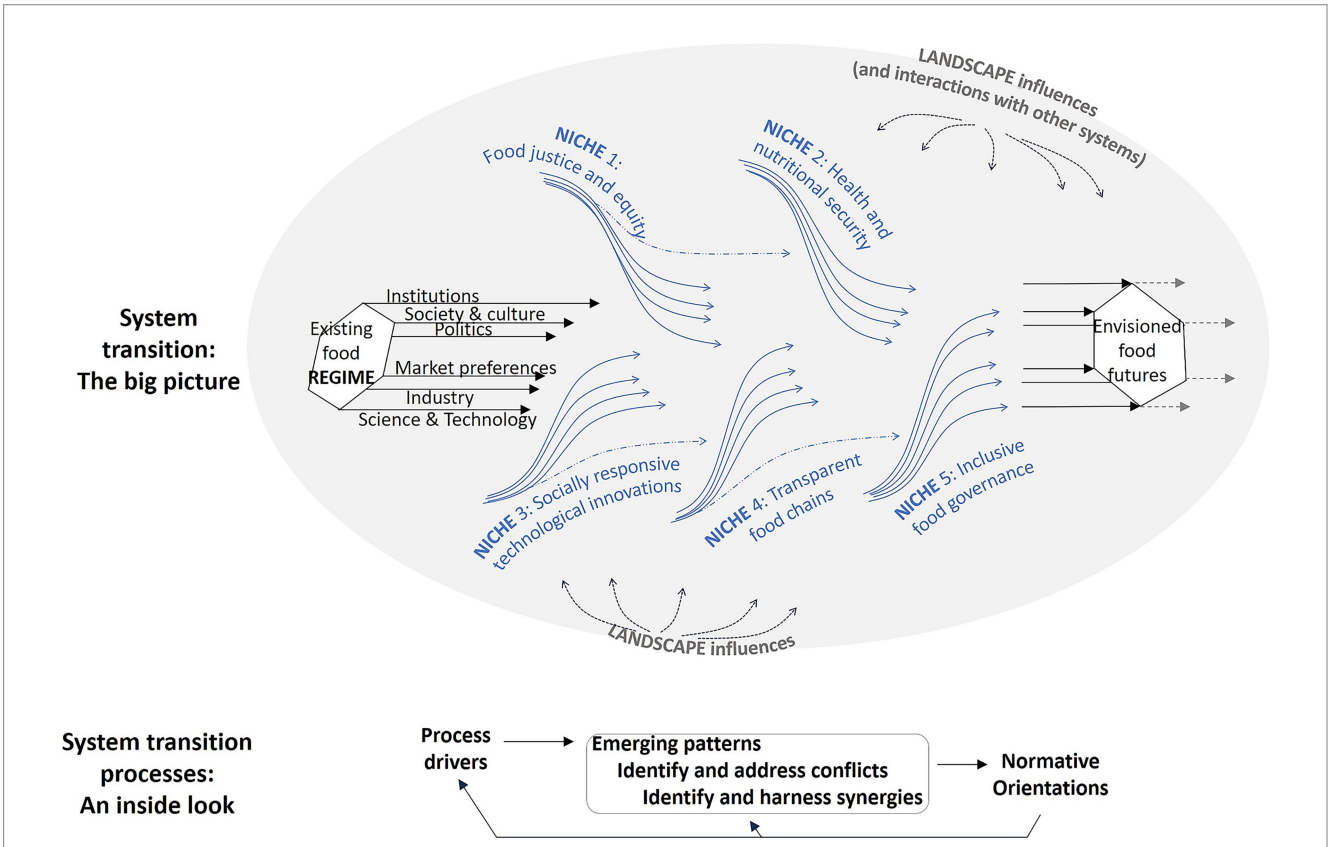

FIGURE 1
A normative model for food system transitions. This figure is inspired and modified from Geels' (2002, 2011, 2019) MLP framework. The figure shows the existing regime (in black) with its institutions, society, politics and industry. The regime is subject to broader landscape influences (in grey) of its context (grey oval in the background), and disrupted by new niches (in blue) of ideas, practices and technologies, before emerging in a stabilized future regime. The bottom of the diagram shows process drivers leading to emerging patterns, including conflicts and potential for synergies. Normative orientations (future goals) guide and shape emerging patterns, conflicts, synergies, and process drivers, thus forming an iterative loop.

systems by proactively designing and coordinating innovation development across domains or in different stages of the value chain. Coupled innovations can be a productive concept to operationalize in synergizing dual or multiple goals that we identify in the Israeli case.

The proposed normative model shows the existing food regime (with its structure, institutions, networks, etc.) being disrupted by a diversity of niches. These niches can influence one another and are also shaped by landscape forces. The regime can be destabilized by new orientations, institutions, and actors of niches before stabilizing into a new regime. The new regime (aspirationally denoted as an "envisioned food future" in Figure 1) does not attain an end state but will continue to be challenged and shaped by new goals, landscape influences and new niches. A new regime, according to Holtz et al. (2008: 627), is "dynamically stable"—not static, but constantly changing with incremental changes. In policy studies, Baumgartner and Jones' (2009) Punctuated Equilibrium Theory (PET) offers the perspective that periods of stability are interrupted by bursts of instability in which regimes and institutions change as policy monopolies are undermined. Connecting the two fields, Kern and Rogge (2018), for instance, point to the potentially productive linkages examining socio-technical change in transition studies and policy processes in the PET.

3.1 Five analytical elements for examining system change dynamics

Food systems literature seeks to understand the structures, actors, interrelations (causalities and feedback loops), and mechanisms (internal and external process drivers) that drive system dynamics and create emerging patterns. The rationale, workings and critical evaluations of food systems and their elements of analysis have been widely covered in the literature (see Ericksen, 2008; Ingram, 2011; Allen and Prosperi, 2016; Zurek et al., 2018; Meter, 2019; Béné et al., 2019; Leeuwis et al., 2021; von Braun et al., 2021b).

Drawing from the food systems literature, we identified five elements of analysis, particularly incorporating normativity in systems thinking. Each element of analysis—normative orientations, process drivers, emerging patterns, and synergies and trade-offs—is a conceptual component that, taken together, underpins an analytical framework. System dynamics uses systemic thinking to identify linkages, interactions and transformation potentials which are otherwise lost in siloed thinking (Ericksen, 2008; Allen and Prosperi, 2016; Meter, 2019). This serves to identify how different facets of the system relate to each other internally within the food system and connect with other systems externally through complex, non-linear interactions and feedback mechanisms (Chapman et al., 2017; Zurek et al., 2018).

Normative orientations refer to valued outcomes and goals whether in the sub-system (niches) or a system-wide context (von Braun et al., 2021b). *Process drivers* refer to internal (consumption behaviour, food technology innovations, food policies, etc.) and external (demographic trends, urbanization, geopolitical situations, climate change events, etc.) forces (Béné et al., 2019; von Braun et al., 2021a). These drivers are reciprocally influenced by actors' interests, power relations, budgets, vested interests, and actions at local and global scales.

Analysing *emerging systemic patterns* helps in understanding the dynamics of network forming, reorganization of structure and scaling (Ericksen, 2008; Allen and Prosperi, 2016; Meter, 2019). These serve to identify and foresee opportunities, risks, externalities, and (unintended) consequences to enable planning or corrective actions (e.g., accounting for externalities).

The literature highlights the advantages of identifying competing and complementary interventions in the food system (Ingram, 2011; Foran et al., 2014). *Synergies* are created when interactions and collaborations bring about mutual or greater overall benefits. Conflicts in goals and processes of different facets of the food systems would require *trade-offs* (balancing and compromises), or a rethink of new solutions that are not necessarily based on a win-lose (zero-sum) balance. Identifying synergies and trade-offs within the food system or in relation to other systems can contribute towards more effective and integrated actions and innovations (Ericksen, 2008; Leeuwis et al., 2021).

4 Methodology

This paper presents the findings from in-depth interviews ($n = 17$) of food and agriculture researchers and practitioners in Israel. Table 1 shows the breakdown of the sectors and fields the respondents came from. This is part of a larger study comprising an online survey ($n = 50$) (Soh et al., 2024). also targeting Israeli food and agriculture experts.

The interview seeks to understand the interviewees' opinions on the state of Israel's food and agricultural system and its goals, challenges, potentials, and its transition trajectories. The interviews span a broad range of themes such as health and nutrition, food security, environmental sustainability, agriculture, technology, food and society, governance and policymaking. The agricultural reforms of 2022 and its implications—a subject of both popular and academic debates—was also discussed. The interview questions were semi-structured and framed broadly for flexibility. Prepared and

TABLE 1 Respondents.

	Interviews
Total number	17
Sector	
Public sector (government)	5
NGOs	6
Academia	6
Field	
Environment	3
Agriculture	5
Food, health and nutrition	3
Public policy and economics	5
Other social sciences and humanities	1
Gender	
Male	11
Female	6

spontaneous follow-up questions were tailored to each interviewee's expertise and to deepen the conversation on the subject matters they raise.

Respondents were sought based on the internet searches, researchers' contacts, and respondents' recommendations (snowballing). The interviews, carried out between February and June 2022 (prior to the Gaza war), were conducted in English, audio-recorded with permission (otherwise manual note-taking was done) and transcribed.

To analyse the interviews, a thematic analysis was performed to identify the key themes in Israel's food system transitions. We coded and organised the themes into five domains: food security, economic context of food, environmental concerns, societal concerns and geo-political relations. Food security includes themes like national food supply strategies, role of local farmers, the role of agrifood technologies, and state support in local agriculture. Food affordability, market consolidations, import liberalisation pertain to the economic context of food. Environmental impacts of agrifood activities, adaptations to climate change, and cross-sector environmental strategies surround environmental concerns. Societal concerns of food relate to themes of food poverty, food justice and equity, culturally-appropriate food and production methods. Finally, geo-political relations encompass issues of transboundary food trade, and regional collaborations for food security.

We then refined the conceptual model and analytical framework described in the previous section. Each domain is examined through the five analytical elements of normative orientations, process drivers, emerging patterns, conflicts (trade-offs) and synergies.

5 Process drivers and emerging patterns: landscape dynamics that shaped Israel's existing food system regime

5.1 Process drivers: food system dynamics embedded in the socio-political environment

The modern state of Israel was established with agriculture at the foundation of its socialist agrarian ethos. Agriculture enjoyed extensive state support and societal participation such that it transformed Israel's landscape, economy and social life (Tal, 2007). A public sector respondent framed agriculture's significance in nation-building such that, "agricultural land in Israel was our way for independence and food security… It was said, 'Wherever the plough went, that's where the border was'." However, since the mid-1980s, the narratives and role of agriculture begun to erode through several process drivers. Israel's land-use policy shifted dramatically due to the twin pressures of open space conservation and urban development to accommodate large influxes of immigrants, and Israel departed from its farmland protection stance held since the state's founding (Feitelson, 1999). Tal (2008) noted that with the rapid shift to the free market economy, agriculture has been relegated from its role as a national asset to become just another business sector.

An NGO respondent described the decades-long unravelling of institutional support for agriculture (Russell et al., 2011), "the *moshavim* and *kibbutzim* (agricultural cooperatives) were the hallmarks of Israel at the beginning of the 20th century until the 80s brought a very deep change in the political view. Now the *kibbutzim* are still surviving but are completely cut off from the political power that they had." On more contemporary changes, an academic informant noted that "family farms are making way for larger farms and growing consolidation, the number of farmers is declining, and their average age is increasing. The government is not really supporting this agricultural sector to survive in the long run." Detractors, however, argue that agriculture, with its lobby power, had strongly resisted liberalization efforts. An academic respondent explained, "After 1985, [The Israeli Economic Stabilization Plan (Krampf, 2018)], the government started to open imports. First clothes, and then many other products, but all the vegetables and fruits were almost not touched for 25 years because the agriculture sector had very strong political power." He asserted that market liberalization for agricultural products is long overdue and contributes to an unrelenting increase in food prices today.

There have been attempts to diagnose problems across Israel's complex agricultural and food supply chains to analyse its pain points and possible corrective measures. Beyond the agriculture sector, a major issue has been the growing market consolidations of larger retailers and middlemen dominating the market (Ministry of Agriculture and Rural Development, 2022). Several respondents argued that market reforms should examine the power imbalance in the supply chains where farmers have much weaker bargaining powers than the retailers, and the latter is where greater competition should be introduced. One respondent asserted, "The big players have larger capital and greater political lobbying forces. Many of these are middleman retailers and some use practices that reduce farmers' income, while they make most of the money." Suggesting a mix of factors—insufficient competition, low levels of imports, and aggressive profit-maximising by large food corporations—Azarieva and Chernichovsky (2019) found that the cost of a healthy diet had become out of reach for low-income families.

On the environmental front, agriculture has at times been framed as a polluter, a consumer of natural resources and a threat to biodiversity. For Shuval (2013: 137), Israel's "overdeveloped agriculture" in the earlier years had deleterious effects on the country's natural water resources. Tal (2007: 249) concurred that farming had over-consumed scarce water resources and polluted the environment, noting that the environmental movement considers agriculture as an "ecological enemy." Yet he also noted that agricultural land preservation policies in the early years were instrumental in protecting vast open spaces threatened by desertification and development pressures. Arguably, stemming from its environmental risks and constraints, Israel invested efforts and made significant strides in water technologies, precision agriculture, biological pest control, climate-adaptive crops and an advanced research and development industry. A respondent posited that environmental challenges propelled the development of "a sophisticated agricultural sector with farmers at the frontier of the technology. So, we already are adept at dealing with climate situations that are not friendly to agriculture." These mixed narratives show that Israel agriculture has come to a crossroads where its relevance, role and policy strategies need to be re-evaluated, especially in the light of increasing occurrence and intensification of extreme weather events in the recent years affecting yields (Zelingher et al., 2019).

The global polycrisis events of the COVID pandemic, geo-political and climate instabilities affecting harvests and disrupting supply chains have provided impetus for import-reliant countries to re-evaluate the importance of local food production as exporting countries prioritized self-sufficiency (Ben Hassen and El Bilali, 2022). For Israel, a perception shift is explained by an NGO respondent, "Some years ago, there was a notion that Israel would never suffer from food insecurity at the national level. Moreover, Israel is a desert country but agriculture needs a lot of water, so there is no sense in growing food here and we will always have to import. The pandemic came and shook this notion. Today, food security is something that you hear much more of, with many debates in the *Knesset* [parliament], but we still lack a national food security strategy."

For Israel, the question of food security has also triggered wider discussions on the future of domestic agriculture, and shifts in the discourse over food security, for which different framings exist (Griver and Fischhendler, 2021). Living with an ongoing conflict and lacking stable relations with neighbouring countries, "food security" takes on the additional dimension of readiness for emergencies or crisis events from trade tensions to outbreaks of war that could affect food supply and distribution. While not an actual island, Israel has often been described as an "island economy" or "island state" (Razin and Charney, 2015)—terms also invoked by several respondents—implying conditions of isolation, vulnerability and a need for self-reliance. While the Abraham Accords have raised optimism about unravelling this island economy as trade relations between Israel and other Middle Eastern countries strengthened (Bank of Israel, 2023), the resilience of such trade relations and their variability across different neigbouring countries remains to be tested through crisis times, even as war rages in Gaza.

On the social dimension of food, longstanding drivers include Israel's high population growth rate, socioeconomic inequalities in food insecurity and disparities in health outcomes among different demographic groups. There are also issues of power imbalances in the food networks of various social groups, and the centre-periphery inequities especially for smallholding farmers. Inequities in health and access to healthy food in Israel affect particularly the minority groups, including the ultra-orthodox Jews, Arabs, Ethiopian Jews, and the Bedouin, who tend to be lower on the socio-economic ladder and are more affected by dietary shifts towards ultra-processed foods. Couching food insecurity within the socio-cultural backdrop of the Bedouins—a group very much at the geographical and social peripheries of Israel—reveal more complex dynamics underlying younger generations of Bedouins in their identity struggle between continuing the eroding nomadic and independent livelihoods of the older generations and assimilating into mainstream Israeli life. In this intergenerational lifestyle transition, younger Bedouins' adoption of modern dietary habits and their accompanying health outcomes are but one set of symptoms of their socio-economic malaise, as an NGO respondent explained:

> I've worked for many years within the Bedouin community, where there's a large identity issue, which is part of the undertow of such injustices. It's associated with larger unemployment and integration issues. They are perceived as hostile by many Israelis. These create barriers to getting decent jobs, which has implications for food security, access to food, poverty, obesity, and unhealthy patterns of consumption.

A public sector respondent relayed the existing structural inequities in the food distribution system for minority groups: "In general, governmental reforms reach the minorities last, specifically the Palestinian[1] citizens of Israel." He raised an example of the difficulties faced by minority food businesses in navigating the kosher food requirements in Israel's food system (cf. Amram, 2021):

> In Israel, a very large section of the Jewish people eats kosher food. This makes it a challenge for the Palestinian minority to distribute its own food. As a small producer, I need to be kosher to have my food placed in major retailers like Shufersal and Rami Levy [supermarket chains]. Restaurants are even more problematic because if the chef is not Jewish, and he does not have a certificate from the monopoly of the rabbinic institution, [then it would not qualify as kosher]. So, there are major problems with equality in food systems.

From the above multi-faceted process drivers, emerging patterns can be seen in Israel's food and agricultural system. These emerging patterns can help to take stock of current realities, assess and reshape current trajectories.

5.2 Emerging patterns: past and present trajectories shaping today's reality

Israel's agriculture has been experiencing diminishing economic importance, which today accounts for 1% of Israel's GDP and employs less than 1% of the population (Central Bureau of Statistics website, n.d.). At present, Israel imports over half of its food supply by calories (Kimhi, 2022) and some 98% of its cereal consumption, while faring better in vegetables and fruits (18.5%) and milk and dairy products (9.2%) (Central Bureau of Statistics, 2022: 19). The agricultural and food import liberalization reforms in 2022 set in motion the abolition of import tariffs for selected fruits and vegetable produce. This, however, provoked concerns about the reforms' implications and calls for a more holistic and long-term strategy for food policy.

The triple hit of the COVID pandemic, the Russia–Ukraine war and its resulting supply chain disruptions, and poor harvests around the world due to extreme weather events have pushed almost one-fifth of Israel's population into food insecurity. The outbreak of war in 2023 has incrementally brought the proportion of food insecure to 21%, including the severely food insecure at 10% (Latet, 2024).

More granular data reveals stark variance in food insecurity for different socio-ethnic groups. A state survey found that food insecurity disproportionately impacts the Arab population with 42.4% of their households being food insecure (with one-fifth of households in severe insecurity), while the figure for Jewish households was 11.1% (Endeweld et al., 2021). State-provided social services are also severely lacking, with the civil society organisations filling the gap. An academic informant explained.

1 Referring to Arab Israelis rather than citizens of the Palestinian territories; likewise for the following quote.

> "I've looked at the numbers. The food banks, food pantries and welfare organizations put in roughly 2 billion shekels a year. The government, depending on how you do the accounting, puts in between 20 and 100 million shekels, feeding 10,000 people, compared to the need of about 1.5 million [persons]. The government is privatizing welfare even if the language used is one of a 'public-private partnership', 'charity' and 'social solidarity' and in so framing this positively, but in actual fact there is no adequate support. So that raises the discussion of whether or not food security is a right and an obligation of the state, or, a philanthropic moral issue without any binding legal requirements… That's a very complicated problem."

The process drivers and emerging patterns present just a selection of key issues faced in Israel's broad and complex food and agricultural system. The agriculture reforms of 2021, which some respondents say to be an expected occurrence in the long trajectory of market liberation, perhaps encapsulate the dominant contestations in Israel's food and agriculture system to which multiple other issues connect.

5.3 Dominant contestations at the forefront of Israel's food and agricultural reforms

Agricultural reforms in Israel were announced in July 2021 (went into effect in 2022) to reduce regulations and import tariffs on agricultural produce, increase market competition and lower the cost of food (Ministry of Finance, 2022). This reform prompted "for the first time in decades… a serious public discussion" on the role of Israel's domestic food production, the desirability of moving towards a greater reliance on global trade, and their impact on food security (Kimhi, 2022). We submit that the arguments surrounding the reforms represent the dominant contestations in Israel's food and agricultural system. They capture the tensions in the local narratives of economic liberalization versus protectionism and food security, efficient use of natural resources versus preserving agricultural capacities as a key capability, and enhancing food affordability versus building up a sustainable and healthy food basket.

Economic rationales seem to underpin the reforms as proponents argue for the urgent need to address food affordability, as market liberalization—abolishing food import regulations and taxes, and promoting more competition—appeared to be an efficient solution in the short term. In one instance, a veteran economist informant favoured the reforms for improving resource efficiency and allocation. He was involved in state land reallocation in the 1990s, much of which was taken from agricultural land, to house large numbers of new immigrants. Similarly, in the contemporary dilemma of bolstering domestic agriculture or relying on imports, he saw that the key resource problem was limited land. "We have a problem with land. We do not have a real problem with water. It was a problem [before desalination and recycling wastewater] but not now." As for domestic agricultural output, he opined that it was important to retain threshold capacity for food security of essential crops while liberalizing other agricultural sectors, "In some fields like electricity or water, we are really dependent on them and should reserve capacity. For food, it depends. We need some levels of wheat and rice, and we have it. But fresh food, like eggs and meat, fruits and vegetables—I do not think it's a very crucial factor in the discussion today. In a crisis like in a war, we can consume less for the short term. For the long term, we can change direction and grow again. [In contrast to hypothetical food security problems during crises], the potential gain for tackling cost-of-living for consumers with market liberalization is significant."

Opponents to the reforms or its partial aspects, however, see it as a step towards unravelling domestic agriculture and a threat to food security. An NGO respondent offered a contrary perspective on the reform's potential effects on food affordability "[historically] the more we went the way of [rich, industrialized nations], the prices skyrocketed. In the past we had many vegetables and fruit markets in many cities where the lower socio-economic population bought very cheap and healthy food. But now more than 50% of the vegetables and fruits are sold in the supermarkets, which are controlling a big part of the vegetable and fruit supply chains. They have a huge power over the farmers." She added, "While our NGO has collaborated with other public health NGOs to advocate for taxes on unhealthy food, resisted the powerful lobbies of food corporations and made important progress, the food system is still broken. It has been hard to stop the rise of obesity and diabetes especially for the low socio-economic groups."

Another NGO respondent argued that "agriculture is not just another sector of production. If we reduce agricultural production, it is something you cannot go back on… you would have lost the land to other uses, the farmers and the knowledge for cultivation, and even the next generation of farmers." Also, evident from the history of Israel's unravelling agriculture sector was the decline of institutional infrastructure such as land use policies, financial support, training and extension services that supported agriculture in earlier decades. Yet another NGO respondent argued that the economic rationale of these reforms did not account for broader considerations and the future of local agriculture as it "lacked data and planning for future scenarios, with the main goal to decrease consumers' prices… But they did not look at the risks of environmental crisis for the Israeli and global agriculture, and Israel's [constraints] as an island economy."

While probably not intended as such, the reforms had become a coalescing point where broader issues and varied discontentment in the food system (farmers, consumers, minority groups) entered the discussion. As such, it became an entry point for identifying obscured normative goals of a heterogenous public to be placed on the policy agenda. This also allows for exploring of different understanding of food security, enlarging its framing by incorporating a broader set of normative goals relevant to stakeholders, thus emphasising not only "security," but also human health and well-being, social equity, cultural relevance, animal welfare and environmental sustainability. The interviews surfaced complex and multi-directional normative contestations, discussed in the following section. There we see domestic agricultural policies intertwined with issues of economic rationality, allocation of scarce land and labour resources, environmental sustainability, national identity, food security, food affordability, health outcomes, and their equity implications.

6 Discussion

This section on incorporating normative orientations into food system transitions unpacks the normative contestations, normative gaps, multi-directionalities, and normative stalemates in the Israel

case study. Following that, we identify conflicts and synergies in a broadened set of normative goals as first steps towards more holistic food policymaking.

6.1 Normative contestations: from dominant to broad-based normative contests?

From the reforms, dominant normative contests came to the forefront and drove the discourse. These key politicized issues can seem two-dimensional, reductionist and politically combative. While Soh and Martens (2023) assert that high-recognition and high consensus issues dominate the societal agenda to potentially supplant other pertinent issues, we argue that highly contested issues, while risking stalemate, can similarly dominate societal discourse and crowd out other important concerns, some of which are examined under 'normative gaps'. The reforms have often been construed as a zero-sum game or a tussle between dominant issues of economic liberalization and maintaining state levers over the food and agriculture as strategic sectors; prioritising farmers versus consumers and cost-of-living concerns; and of ideologies versus practicalities.

Some actors are increasingly calling for policy solutions that dismantle such facile framings. A key step towards this, arguably, is to assemble and clarify desired normative goals. An NGO respondent explained her position, "if the import reforms are accompanied by real efforts to strengthen Israeli agriculture and make it much more competitive, then I would not see it as a big problem." She suggested policy strategies to increase the sector's ability to compete, such as lowering the price of water, ensuring stable land tenure, and subsidizing infrastructural investments. She elaborated, "If sufficient support was given to local agriculture, you can lower tariffs or remove import ceilings, as local agriculture would be as competitive as that of Egypt, Spain or Italy. But if not, imports would be at the expense of local farming and would not end up enlarging the food supply." In this framing the normative ideals of both liberalizing the food economy towards higher efficiency, supply and affordability, and that of supporting domestic agricultural capabilities, livelihoods and supply can work hand-in-hand, instead of being conflictual. Probing the reforms can thus help to clarify issues and contradictions, and unravel their underlying concerns, societal inequality and grievances.

At times, goal contestations can stem from conflicts in prioritizing different time horizons. Some actors prioritize urgent solutions (such as to the cost-of-living crisis), while others recognize the need for long-term investments—such as capacity building—to realize longer-term goals. A civil service respondent inserted the time perspective in arguing for nurturing the competitive advantages enjoyed by the Israeli agricultural sector: "In Israel our farmers have been flexible in managing challenges, adapting to new crops, learning new techniques, and adopting new technologies. Yet, this reform is going to vastly change the economics. I think our farmers need time to adapt, and with capacity-building courses, more extension services, more research for new opportunities to grow different crops." An academic respondent resonated, "In my view this reform is in principle going in the right direction. Yet, the concern is whether it would drive many local small farmers out of business. It's good to expose local producers to competition from imports, but it should be more gradual and more targeted." He explained that instead of a blanket application across the agricultural sector, reforms should apply to specific crops based on their efficiency when produced locally compared to imported ones, such that those lacking in comparative advantage can be eliminated.

6.2 Normative gaps: surfacing under-recognized issues

The expert interviews effectively brought up normative goals—issues concerning public benefit and collective challenges that researchers and practitioners grapple with—that have not been sufficiently captured on the policy agenda.

Figure 1 suggests that niches often embody normative facets—goal-driven priorities that push for change in or to the regime. At times, some of these normative goals may be obscured, and policy champions play the role of identifying normative gaps to develop a maturing discourse. In the Israeli case, food policy champions are often found in its vibrant NGO scene advocating a range of important food policy gaps. For one NGO respondent, food as a strategic and long-term concern for public policy has been too low on the agenda, "I think the missing narrative is treating food as an issue that the state should take care of … We [referring to existing thinking in the Israeli society] do not think that the state should worry about providing food for its citizens or make long-term plans regarding food. We do not have even a ministry or authority that takes care of it. We do not have a strategy. Nothing."

In this gap, civil society and NGOs engage the government on policy issues or work independently to fill the spaces where policy reach falls short. An NGO respondent explained, "NGOs that work with or vis-a-vis the government like *Yesodot* or the Israeli Forum for Sustainable Nutrition seek dialogues with the government and campaign for food and nutrition policy. Other organizations such as *HaShomer HaChadash* mainly work directly with the farmers, helping them with volunteers, outreach programmes and guarding farms." Another NGO informant asserted, "[You can examine] the impact of NGOs, because as we know, countries often do not supply the right policies and so, food systems are broken everywhere… Our NGO is unique as a professionals-based NGO working on multiple dimensions of the food system, and we are the only one in Israel which does not take a penny that can put us in conflicts of interest. We have environmental experts, agroecologists, specialists in health, nutritionists, experts in law and farming. We are now very active in the Knesset [parliament]. In debates, we run position statements. We also have monthly meetings where each time we talk about one aspect of the food system with leading researchers."

Various respondents spoke on previously absent issues that entered food discourses due to the championing efforts of NGOs. One such is the incorporation of food system transformation into the environmental agenda—something which an NGO respondent regards as having been outside the purview of the policy and even marginalized by other environmental NGOs. Another under-recognized issue that will have long-term social and public health effects is the large disparities in health outcomes that especially impact the low socio-economic population and ethnic minorities. An NGO informant explained, "We see higher obesity rates in the [Jewish] religious sector and Arab sector, and lower socioeconomic status communities are suffering more from diet-related diseases. Yet, there're no policies to make healthy foods accessible for these

communities. So, we see this kind of injustice happening around the world replicated in Israel where people who have less money are more exposed to unhealthy foods and lack access to healthy foods."

Connected with food justice issues is the concept of food sovereignty, which concerns peoples' right to produce, distribute and consume healthy and culturally appropriate food grown in ecologically sustainable ways, and their right to determine their own food and agricultural system (via Campesina website, n.d.). While food sovereignty has been gaining ground and even formally adopted into law in select countries, this discourse has yet to take shape within Israel proper, where minority groups' food-growing practices, dietary lifestyles and preferences have often been constrained. An NGO informant opined, "It's a term that is less pronounced in Israel. It is not at the forefront of advocacy. I do not see such a discourse within the minorities, and I think those advocating it are organizations like ours or more privileged parts of the society. I do not hear voices from the Arab sectors, I do not see farming organizations talking about food sovereignty, at least not in this early context."

Normative gaps often occur when key stakeholders are not included in discourses and policymaking. An academic related that in her research on the climate resilience of agricultural stakeholders and their practices to combat, mitigate, adapt to climate change, she found that "the most really glaring issue is that farmers are not included in decision-making. They're the ones who produce the food, who struggle on the ground with the impacts of climate change, yet nobody's consulting or guiding them. There's just such a disconnect between what is happening on the high [policy] level and what is happening on the ground."

6.3 Multi-directionalities: a normative-driven emergence

The transitions model in Figure 1 expresses the multiple goals of food systems, championed by different niches by way of actors, organisations and movements that propel transformations towards desired outcomes of socially-responsive food systems. From the interviews and the wider literature, we found a broad array of desired food system outcomes for Israel. This includes food security in the face of a growing population and diminishing resources (land, labour, water); adaptation to climate change; addressing nutritional security and food poverty; food affordability; and broader socio-cultural challenges. There is also a need to improve the economic efficiency and competitiveness of the agrifood sector while addressing growing market consolidations and corporate power. Israel also needs to revitalise its cooperatives-based local agriculture to enhance their agricultural capabilities and farmers' livelihoods. Finally, the strength of the agrifood sector is connected to its ability to maintain an edge in the agri-tech industry.

To some respondents, the many-faceted challenges of food and agricultural systems can only be addressed by simultaneous push in multiple directions towards holistic transformation. For one NGO informant, the political arena of food needs to be a space for a broad spectrum of actors, including those on the margins, to work on all dimensions of food with a multidisciplinary approach. For him, "the push towards transformative change needs approaches on a holistic level, an understanding that everything is tied together." It should incorporate different food movements including food rescue and distribution to the needy, environmental sustainability, nutrition and health advocacy. Reflecting on the role of technology, he noted that it can be regarded as an easier bypass to systemic and multi-directional change, especially as Israel has been known as a "start-up nation":

> "I think Israel has a large role to play on a global scale in terms of technology and food security. Yet, this narrative is infiltrating into mainstream policies as if it is the only solution for food system transformation. For example, instead of tackling the big meat industries and reducing meat consumption using a range of policies, more and more policymakers talk about alternative protein as it's easier… It's a win–win for the government to get a return on investments in technology. But relying on technology to transform the food system is really far from the truth. Technology is part of system transformation, but it's certainly not a silver bullet."

Contextualising food system strategies for Israel would involve tying together multiple strands of its challenges, the historical and current characteristics of its food production, and its desired outcomes. Applying this to rethinking its domestic food production strategy would mean connecting multiple aspects: the geographical aspects of local food growing and distribution, leveraging its economic network of small to mid-sized producers and incentivizing climate-resilient farming practices. An NGO respondent opined that having many smaller-scale producers scattered throughout the country offers a more resilient system, as attested by international studies (Ricciardi et al., 2021). He noted that "a key strength of Israel's agriculture sector is the competition between many small cooperative farms as opposed to few large farms with a lot of economic and political power. Secondly, with agriculture mostly located in the peripheries, spread all over the country, in a pandemic or when war breaks out on one of our borders, we have a more secure system" as spatial access to food would not be compromised. Instead of relegating Israel's famed kibbutzim and moshavim (agricultural cooperative system) to only to its successful bygones, this respondent pointed to Europe's efforts in promoting its cooperative agriculture (The European Commission, 2021) and argued that reinvigorating Israel's cooperatives, emphasizing their agility, efficiency and relevance for today, as a key pathway for strengthening its food system.

Finally, embracing multi-directionalities broadens the scope for new ideas, practices, and actors to get involved to open new pathways, at times in alternative and surprising ways, in food system change. NGOs play an important role in driving food social innovations (Rossi, 2017). An NGO respondent working on agriculture education that aspires towards a socio-ecological movement shared, "In the last few years, I see a change happening: young people are coming back to agriculture because they want to connect to food and do eco-agriculture, even in small parcels of 4 dunams. My eco-agriculture courses are full every year; I just opened an eco-agriculture course for people with disabilities to develop their sense of belonging and self-worth… This year I made a large project for 10,000 students, some of whom from the Haredi [ultra-orthodox] sector—female students as they do not have to study the Torah all day long. They visit the farms, of female farmers of course, to see chickens and tractors. I teach about healthy eating and climate change—things going on in real life that many of them are seeing for the first time. [These are our efforts] to bridge the gap."

6.4 Normative stalemate/vacuum: rupture and recalibration?

The war that began with Hamas' attack on October 7th 2023 may upend some of the normative goals of the Israeli food and food-related trade, particularly with regard to collaborations with the Palestinians and Arab countries. The interviews, carried out before the war, were infused with cautious optimism from respondents who spoke on strengthening food relations between Israel, the Palestinians and Arab countries. Perhaps bolstered by the Abraham Accords in 2020, respondents shared perspectives on constructing potential directionalities in regional food collaborations.

Respondents spoke about transboundary food trade and sharing of knowledge and technology. An NGO respondent recounted that resulting from the peace agreements with Egypt (1979) and Jordan (1994), Israel trained many of their farmers in the 1980s and 90s. In recent years, trade relations with the Persian Gulf increased, including in food-tech and agri-tech. A public sector respondent spoke about an increased import of fruits and vegetables from Jordan, Turkey, and especially Egypt, as a substantial food production and exporting country. The food relations exchange is framed such that neighbouring countries have abundant land and labour for food production, while Israel lacking these, has a wealth of knowledge and techniques in water efficiency in dry climate agriculture, thus presenting opportunities for collaborations.

Couched in the broader environmental peacebuilding efforts between Israel and its neighbours in water allotment, waste treatment, and pollution control to address and manage transboundary resources and shared environmental concerns (Sommer and Fassbender, 2024), regional food security is increasingly regarded as a pertinent addition. As past agreements laid the basis for economic development, and incentives and positive externalities of peace (Feitelson and Levy, 2006), food collaborations are negotiated around shared geographical and environmental challenges of extreme warming climates, water scarcity and unpredictable harvests. These reflect the desire for shared endeavours as practical solutions to food security while reaping a potential bonus in consolidating regional stability. An NGO respondent remarked that playing to each other's advantage is beneficial for "creating mutual dependency—it would force us to have better relations."

Transboundary relations have included the cross-border flows of food and labour and management of shared resources such as aquifers, which in themselves have been infused with issues of power asymmetry and inequity, most evidently with the Palestinian territories. On food relations, a civil servant noted the longstanding interdependencies, such as Israel's dependence on Palestinian labour, including farm workers, and Palestine's reliance on Israel for products that they hardly produce, such as milk. The Palestinian economy has been highly reliant on Israel with some 88% of Palestinian exports and 56% of imports traded with Israel (ITA, 2023). The informant noted that Palestine is a specific market for Israeli producers to send lower quality produce less preferred by Israeli consumers, to prevent the lowering of prices within Israel.

Despite being very unequal trading partners, Dobers et al. (2018) suggest that the robust food trade between Israel and Palestine reflects extensive interdependence, which could foster reconciliation. A respondent, however, cognizant that relations with Palestine were likely the most volatile element in Israel's relations with its neighbours, asserted that developing food relations was commendable yet was not without its risks. Commenting on an existing trade partner, he noted, "We could have an arrangement where they supply us fruits and vegetables and we can give them more water. Yet, if something happens with the Palestinians, they will shut it off. Is there potential [for collaborations]? Yes. Should we do it? Yes. Can we count on it? No." This view is supported by another academic respondent, "So if you think about potential imports to Israel, there are three sources I think, Turkey and Jordan and Egypt [as they are cost-effective and land transport from the latter two is possible]. Yet it is risky to rely on imports because of the instability [of our relationship]." These sentiments partly became a reality when in May 2024 Turkey imposed a total and immediate trade ban with Israel, citing the worsening humanitarian situation in Gaza.

"Is there any way that food security could not only be a wedge to draw people apart but also to bring them together?" an academic respondent pondered aloud as he remarked on a joint food security strategy with Israel that Jordan called for, through a regional grain reserve from which participating nations in need could draw (JNS, 2022). On this proposal, an NGO respondent opined, "When we have collaborations, we'll have much better relations and peace is more likely to be stable … And I do not think we can be an 'island' with food when everyone around us is lacking food [in the context of intensifying climate challenges in the Middle East]." The academic respondent cautiously added that such arrangements do not preclude creating "their own political geopolitical strategic liabilities." Food and energy from Russia have been used as political leverage and reprisal in their war with Ukraine. In the war in Gaza, ongoing at the time of writing, Israel used weaponized food when it imposed a strict blockade of food and humanitarian aid in March 2025, thereby dramatically worsening Gazans food insecurity.

The Gaza war thus may present a case of a rupture—an exceptional or catastrophic occurrence bringing about a normative stalemate or vacuum—in past formulations of directionality where prior normative orientations on regional collaborations are likely brought to suspension in a chasm of uncertainty during the war. Such a vacuum would take time to recover, recalibrate or even entirely reformulate, sans other urgent imperatives or new actors or institutional interventions that can reprioritize them (Berry et al., 2025).

7 Policy implications

7.1 Reducing policy contradictions, and improving policy synergies

The Israel case study reveals the complexity of its food system embedded in social, political, economic and environmental terrains. Towards addressing multiple complex and highly interconnected issues, we argue that the first steps lie in identifying normative directionalities, contradictions in policy, and synergies that have yet to be recognized before embarking on other intervention steps in systems studies.

7.2 Trade-offs and contradictions: identifying conflicts and pain points

We highlight two kinds of contradictions. The first is outdated (or misguided) policies no longer supported by research; the second is policies or advocacy positions that contradict because of conflicting goals. Some of such goals may make sense when viewed in isolation

within a domain, but bring about conflicts with other goals when holistically considered in a systems context. This second category is arguably more difficult to tackle, and much social contention or policy contradiction arises from it in the Israel study, as seen in the following examples.

In Israel in recent decades, environmental protection and agriculture are at times pitted against each other as political loggerheads because of competing land demands and the environmental degradation caused by unsustainable farming practices. The opposing positions that environmental and agricultural advocates adopt can stymie farmers' willingness to adopt more environmentally sensitive practices and technologies if they perceive that these efforts and investments would not be appreciated by opposers who have written off the value of agriculture.

Many current regulations in Israel contradict the goals of healthy and sustainable diets. For instance, despite guidelines on nutritional food based on the Mediterranean diet, including the promotion of whole grains, it is the less healthy options such as white bread and butter that are subsidized by the state. While these guidelines promote a plant-dominant diet both from public health and environmental sustainability perspectives, the reforms propose a lowering of taxes for imported red meat. Beyond these specific policy impediments to a healthy and sustainable food system should be a recognition that food affordability and quality nutrition represent a key trade-off in nutritional security. Food affordability can be easily reduced to a one-dimensional indicator achieved through an easier route of supplying energy using ultra-processed food with cheap calories of little nutritional value. Yet, this can come at a substantial cost to public health. Similarly, economically efficient agricultural production methods—industrial farming emphasizing fertilizers and antibiotics use–often conflict with environmental sustainability and health outcomes. Quality nutrition, such as the Mediterranean diet (Dernini et al., 2016)—today being the costlier option, however—requires investment into healthy food production.

An inherent contradiction lies between market liberalization in food production and the bolstering of domestic agriculture—both of which were purported goals of the reforms. Other factors requiring careful consideration to balance both goals include supply chain issues—such as the power held by middlemen retailers, and the consolidation of large players with disproportionate influence in the food system. Attention needs to be paid to building the capacity and competitiveness of local farmers, particularly small-scale producers who need time, investment, and sustained financial, policy, and institutional support to improve their efficiency.

7.3 Turning policy contradictions into synergies?

Resonating with Meynard et al.'s (2017) coupled innovations, we proposed turning policy contradictions towards addressing multiple normative goals by seeking synergies across two or more domains. This requires reflective attention to feedback loops, spillover effects and unintended consequences of a single policy action. Proactively, this would involve examining how goals may align across different domains and taking integrated and phased actions instead of uncoordinated and *ad hoc* ones, as well as prioritising longer-term perspectives over shorter-term gains.

For Israel, policy synergies can be gained by shifting focus onto the longer-term, strategic role of food and agriculture and their potential contribution to multiple policy domains: cost-of-living, food security, health and nutrition, climate change, and collaborative relations with neighbouring countries (Soh et al., 2025; Adler et al., 2021; Amdur, 2020). A leading policy preference that emerged in the interviews is for a national food system strategic plan. Respondents call for an integrated public policy for a more optimal balance between local production and food imports that considers affordability and sustainable production. One way to achieve such dual goals can be by identifying sets of strategic or essential food crops to be locally produced while maintaining a flexible and diversified strategy for food imports. The selection of the core basket of local produce would be based on multiple goals of enhancing food security, shifting to healthy and sustainable production and consumption, and enhancing competitive and economic advantages.

Taking a holistic view, a sustainable food system strategy should be integrated into the environmental plan for Israel. Sustainable food production and consumption practices and technologies can be developed with the twin goals of enhancing agricultural development and environmental health. To close the gap between economic efficiencies and environmental-positive production, sustainable food production practices and technologies should be pursued. Goals, indicators, and strategies can be combined, for instance, by tackling food waste as part of the national waste reduction plan. In the intersection of land use and agriculture, possible synergies include integrative land use for urban agriculture and the partial development of farmlands for recreational and educational purposes. Greater transparency and rights in land tenure would allow farmers to securely invest in agriculture production, technologies and infrastructure.

Priorities should be established for trade-offs in policy decisions. For instance, between food affordability and quality nutrition, the latter should be accorded more attention for the public health 'dividends' and savings (Pretty et al., 2015), even though food affordability has often been regarded as a more urgent policy issue in Israel. Policies need to find the balance between universal strategies, such as focusing on overall food supply and food affordability, which tend to be uncontroversial and less complex, and targeted strategies for at-risk populations which may be more urgent or effective yet more complicated and politically fraught. Strategic plans with sufficient time horizons are necessary to prioritize multiple goals and minimize situations where the fulfilment of one prevents progress on the others.

8 Conclusion

The Israel case study unpacks the formulations and ruptures of normativity through an analysis of its normative contestations, normative gaps, multi-directionality and normative stalemates/vacuums. The proposed agriculture reforms in Israel can be perceived as a normative pull in one direction. Yet its singular purpose to liberalize the food and agriculture system had the converse ripple effect of invigorating societal deliberations and bringing multi-directionality into the discourse, accompanied by normative contestations and the probing of normative gaps. While Israel is peculiar as a case study, the normative framings—particularly multi-directionality, normative contestations and

normative gaps—universally underpin complex (food) systems that simultaneously address food security, cost-of-living, health and nutrition, environmental sustainability and climate change risks.

This paper has reconceptualized a normative transitions model and framework for analysing complex systems with multiple interactions across domains. The model's normative orientations call for a greater recognition of broad normative goals across the food system to support planning and action for transitions towards valued future outcomes. This affords the normative transitions model greater utility, encompassing but also going beyond its descriptive and analytical capabilities. While historical analytical transition models tend to focus on "What is the success story of this innovation?," a normative model questions "How can purposeful outcomes be achieved?" And thus, "How can food system transitions be guided towards desired futures?" While this paper demonstrates the use of the model and framework through the case of Israel's food system transitions, it can be applied to social sciences analyses of other complex systems such as transportation, health and energy systems. The proposed model supports broad, cross-system analysis to identify challenges, policy gaps, and trade-offs, from which goals, synergies and policy approaches could emerge. This can be the basis for societal and policy deliberations towards the next steps in crafting strategic directions and policy interventions.

Data availability statement

The datasets presented in this article are not readily available because the participants provided written informed consent to participate in this study. Data consist of interview transcripts and interviewees' data which are confidential. Requests to access the datasets should be directed to Emily Soh, emily.y.soh@gmail.com.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

ES: Investigation, Conceptualization, Writing – review & editing, Project administration, Formal analysis, Methodology, Writing – original draft, Data curation. EF: Conceptualization, Formal analysis, Writing – review & editing, Supervision. EB: Writing – review & editing, Supervision.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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