Agriculture and Human Values
https://doi.org/10.1007/s10460-024-10593-0

The rise of multi-stakeholderism, the power of ultra-processed food corporations, and the implications for global food governance: a network analysis

Scott Slater[1] · **Mark Lawrence**[1,2] · **Benjamin Wood**[3] · **Paulo Serodio**[4] · **Amber Van Den Akker**[5] · **Phillip Baker**[6]

Accepted: 9 May 2024

Abstract

The rise of multi-stakeholder institutions (MIs) involving the ultra-processed food (UPF) industry has raised concerns among food and public health scholars, especially with regards to enhancing the legitimacy and influence of transnational food corporations in global food governance (GFG) spaces. However, few studies have investigated the governance composition and characteristics of MIs involving the UPF industry, nor considered the implications for organizing global responses to UPFs and other major food systems challenges. We address this gap by conducting a network analysis to map global MIs involving the UPF industry, drawing data from web sources, company reports, business and market research databases, and academic and grey literature. We identified 45 such global food system MIs. Of these, executives from the UPF industry or affiliated interest groups held almost half ($n = 263$, or 43.8%) of the total 601 board seat positions. Executives from a small number of corporations, especially Unilever ($n = 20$), Nestlé ($n = 17$), PepsiCo Inc ($n = 14$), and The Coca-Cola Company ($n = 13$) held the most board seat positions, indicating centrality to the network. Board seats of these MIs are dominated by executives from transnational corporations ($n = 431$, or 71.7%), high-income countries ($n = 495$, or 82.4%), and four countries (United States, Switzerland, United Kingdom, and the Netherlands) ($n = 350$, or 58.2%) in particular. This study shows that MIs involving the UPF industry privilege the interests of corporations located near exclusively in the Global North, draw legitimacy through affiliations with multi-lateral agencies, civil society groups and research institutions, and represent diverse corporate interests involved in UPF supply chains. Corporate-anchored multi-stakeholderism, as a form of GFG governance, raises challenges for achieving food systems transformation, including the control and reduction of UPFs in human diets.

Keywords Multi-stakeholder · Global food governance · Ultra-processed foods · Corporate power · Food policy · Food systems

✉ Scott Slater
sslater@deakin.edu.au

1 School of Exercise and Nutrition Science, Deakin University, 1 Gheringhap Street, Geelong, Victoria 3220, Australia

2 Institute for Physical Activity and Nutrition, Deakin University, Geelong, Australia

3 Global Centre for Preventive Health and Nutrition, Institute for Health Transformation, Deakin University, Geelong, VIC, Australia

4 Institute for Social and Economic Research, University of Essex, Essex, United Kingdom

5 Department for Health, University of Bath, Bath, United Kingdom

6 School of Public Health, University of Sydney, Sydney, Australia

Introduction

The global food system in its present form is unhealthy and unsustainable, and transformative change is now urgent if global sustainable development goals are to be achieved (FAO, IFAD, UNICEF, WFP, WHO 2023; IPES-Food 2023a; Schneider et al. 2023; Béné 2022). To address this challenge, many food systems experts and authoritative organisations have called for the transformation of global food governance (GFG) system (FAO, IFAD, UNICEF, WFP, WHO 2023; Béné 2022; Canfield et al. 2021; Montenegro de Wit et al. 2021)—the multi-level system of institutions, actors, and interests involved in dialogue, decision making, and implementation of actions that impact the global food system, including those to overcome food

Published online: 11 June 2024

system challenges (Candel 2014). One such challenge is the rise of ultra-processed foods (UPFs) in human diets (Baker et al. 2020). UPFs are defined as 'formulations of ingredients, mostly of exclusive industrial use, typically created by series of industrial techniques and processes'. Examples include soft drinks, confectionery, many mass produced breads, biscuits, sweetened breakfast cereals, flavoured yoghurts, reconstituted meat products, and many commercial baby foods (Monteiro et al. 2019).

Growth of the ultra-processed dietary pattern occurred first in high-income countries but is now growing rapidly in middle and low-income countries, as the industry has globalized and pursued new growth opportunities in emerging markets (Baker et al. 2020; Popkin and Ng 2022). This raises serious concerns for global health, given a large and growing body of evidence showing associations between the ultra-processed dietary pattern with multiple adverse health outcomes, including obesity, type-2 diabetes, cardiovascular disease and mental health disorders (Elizabeth et al. 2020; Lane et al. 2024). The production of UPFs also harms the environment, including through biodiversity losses linked with commodity ingredient production, and plastic packaging waste (Fardet and Rock 2020; Anastasiou et al. 2022). According to Monteiro et al., the purpose of ultra-processing food is profit – the business model relies on using cheap commodity ingredients and processing technologies to minimise cost, and emphatic branding, intensive marketing and product designs to drive sales and normalise consumption; features that make UPFs 'liable to displace all other foods in human diets' (Monteiro et al. 2019). Corporations that manufacture and distribute UPFs have indeed become the most profitable in the food system, generating growing returns to their shareholders located near exclusively in the Global North (Wood et al. 2021, 2023a).

Some countries, especially those in Latin America, have adopted world-leading policy responses to tax, limit the availability and restrict the marketing of UPFs (Popkin et al. 2021). Yet, elsewhere policy responses to this issue have so far been weak or are only emerging, akin to where tobacco control responses were decades ago. Many reasons have been put forward for this inertia, but among the most important is the growing economic and political power of the UPF industry. Evidence from studies spanning multiple countries, show how this industry uses a number of corporate political strategies – often described as a playbook similar to the tobacco industry – to block, weaken, or delay government regulation, influence civil society, and shape scientific research in its favour (Swinburn et al. 2019). Studies also demonstrate how this industry has attempted to influence responses by UN agencies, and across the global food and governance systems more broadly (Lauber et al. 2021). This includes the promotion and initiation of public–private and multi-stakeholder partnerships, a development that coincides with the emergence of multi-stakeholderism as a prominent model of GFG (Moodie et al. 2013).

With the founding of the United Nations system (UN) in 1945, the GFG system was anchored in a multi-lateral governance model, led by intergovernmental organizations and their member nation states (Buxton 2019). The UN multilateral agencies – the Food and Agriculture Organization of the United Nations, United Nations Children's Fund, World Health Organization, and World Food Programme – played the primary role in convening and coordinating responses to global food system challenges (Canfield et al. 2021). In the 1970s, concerns emerged about the growing power of transnational corporations in the world economy, and there was an attempt by those working across the UN system to regulate their conduct (Gleckman 2018). By the 1980s these efforts had largely failed, and the US and other powerful governments sought to empower, rather than constrain, the transnational corporations domiciled in their countries. These developments coincided with the adoption of neoliberal economic policies and norms, including a push for global market liberalization, and a growing preference for a multi-stakeholder approach to addressing global development challenges (Buxton 2019; Bovaird 2010; FIAN International 2020; Hawkes and Buse 2011).

The GFG system started to evolve towards a more decentralised, market-orientated and corporate-engaged system of governance, involving a more diverse range of public and private actors (IPES-Food 2023b). Proponents of multi-stakeholderism claimed that the multilateral system, in its present form, was struggling to address the world's economic, social, and ecological crises (Gleckman 2018), and that harnessing the innovation, expertise, and resources of the private sector, presented an important opportunity to achieve food systems change (Food and Agriculture Organization of the United Nations 2023; Steiner et al. 2020). This view gained the support of some UN agencies (UNEP, FAO, UNDP 2023), and was further institutionalised through the UN Global Compact, and in the UN Sustainable Development Goals (SDGs) through SDG 17 on Partnerships for the Goals (United Nations 2015). The multi-stakeholder approach was also promoted by powerful business associations, most prominently the World Economic Forum (WEF) through its Global Redesign Initiative, reflecting a broader vision of stakeholder capitalism (Canfield et al. 2021). According to this vision, the WEF through its chairman Klaus Schwab believe that private corporations as 'stakeholders' should play the leading role in sustainable development (Schwab and Vanham 2021) and be positioned as 'trustees of society' in response to today's social and environmental challenges (Schwab 2019).

These developments have had several major implications for GFG. For example, it has resulted in the proliferation of prominent multi-stakeholder initiatives, partnerships,

platforms, and roundtables involving the world's largest transnational food corporations, their affiliated business interest groups, along with multilateral agencies, international non-governmental organizations, national governments, and research institutions. In this paper we use the term '*multi-stakeholder institutions'* (MIs) to capture these diverse institutional forms (Utting 2001; McKeon 2017). Through these MIs, these corporations and business interest groups have positioned the UPF industry as a key 'part of the solution' to many food system challenges, including malnutrition, food insecurity, biodiversity loss, climate change (Lacy-Nichols and Williams 2021). Scholars and advocates have raised several concerns about the proliferation of MIs in GFG, relating to commercial conflicts of interest (Hawkes and Buse 2011), power asymmetries between corporate and non-corporate actors (Brouwer et al. 2013; Dentoni et al. 2018), and questions regarding their legitimacy and effectiveness (McKeon 2017; Michéle et al. 2019).

Yet despite the above, no studies have systematically mapped the global MIs involving the UPF industry, described their governance compositions or characteristics, nor considered their implications for GFG. Recognizing this gap, our aim is to contribute to understanding multi-stakeholderism in GFG by mapping and characterising MIs involving the UPF industry and affiliated corporate actors. To achieve our aim, we address two objectives. First, we identify, map, and describe the most prominent MIs involving the UPF industry in GFG through a network analysis of board seat memberships. Second, we describe the characteristics of these MIs, in terms of which corporations or organisations, industries, executive job titles, actor types, and countries of origin are represented. We then discuss the implications of UPF industry engaged multi-stakeholder governance for GFG, food systems transformation, and global responses to the health and environmental harms of UPFs.

Methods

To map, analyse, and describe MIs involving the UPF industry, we adopted a network analysis method (Wasserman and Faust 1994) involving three steps: i) quantitative and qualitative data collection; ii) data categorization, mapping, and analysis; and iii) synthesis of results. This method is well suited to addressing the study aim, given its previous applications in the study of food systems governance and organizational change (Rocker et al. 2022), and the investigation of corporate power and interlocking directorships (Scott 2011). Moreover, this method also elucidates structural features of social networks and measures of degree centrality, which helps identify the most central actors to the network based on the number of direct connections actors have within the overall network (Borgatti et al. 2018). Understanding direct connections in a network is beneficial in food systems analysis, particularly when trying to understand how actors in the network establish influence, rapid communication, and ease in spreading information (Golbeck 2013). We conceptualized the UPF industry broadly as "a commercial ecosystem comprising UPF and beverage manufacturers at its core, as well as other co-dependent food supply chain sectors and industries who profit from the proliferation of UPFs, and the displacement of NOVA groups 1–3 (Unprocessed or minimally processed foods, processed culinary ingredients, processed foods) in human diets" (Slater et al. 2024).

Data collection

To identify MIs involving the UPF industry, we extracted quantitative data from diverse sources. First, using data from the Euromonitor Passport Market Information Database (Passport Global Market Information Database 2022), we identified the world's top-10 leading corporations by sales revenue for each major UPF product category identified by (Baker et al. 2020), and then collated this data to generate an initial list of world's leading UPF corporations. The UPF categories include: Baked goods; Breakfast cereals; Confectionery; Dairy products & alternatives; Frozen processed potatoes; Ice cream & frozen desserts; Instant Pasta/Noodles; Processed Meat, Seafood and Alternatives to Meat; Ready meals; Sauces, dressings & condiments; Savoury snacks; Sweet biscuits, snack bars & fruit snacks; Sweet Spreads; Butter and Spreads; Ready Soups; Carbonated soft drinks; Concentrates; Drinking Milk Products; Functional Bottled Water; Flavoured Bottled Water; Juice drinks; Nectars; Ready to drink Coffee; Ready to drink Tea; Asian speciality drinks; Sports drinks; Energy drinks; Flavoured Powder Drinks (Baker et al. 2020). Second, we searched for business association and MI membership disclosures listed on the websites of these leading UPF corporations. Third, we conducted Google and Google Scholar searches for academic and grey literature, including corporation reports. We did this using the different combinations of the keywords, multistakeholder*, partnership*, initiative*, public-private, global food system, food policy, governance, annual, sustainab*, Environmental, Social and Governance, and the names of the leading corporations identified in the previous step, with no date limits. Fourth, we scanned the reference lists and appendices of food system multi-stakeholder reports and academic articles identified in the previous step, until no further MIs were identified, and saturation was reached.

To understand who participates in and leads MIs involving the UPF industry, we collected data on the individual members involved in the governance of each MI, framed for example, in terms of executive board, steering committee or

advisory council, hereafter 'board members'. We searched the website of each MI using the menu tab and search function using various keywords, including governance, management, about us, our team, board of directors and advisors. We collected data on each board member, including their employer/affiliation, job title, full name, gender, and if possible, country, and then further verified this data by searching each individual's LinkedIn or employer/affiliation website. When a global business association (i.e., the WEF or World Business Council for Sustainable Development—WBCSD) were the overarching driver or coordinator of the MI, and a specific MI board member list couldn't be identified from the MI webpage, we captured board member data through the overarching driver/coordinators website, if possible. The headquarter location of each board member's employer/affiliation was sourced from the employer website or a Google search. All data collected were extracted into a table format in Microsoft Excel before being cleaned for duplicates prior to categorisation and analysis.

Data categorisation

The categorization of the identified MIs board member was conducted in four stages. First, the affiliation of each board member was categorized under one of three main actor types according to Baker and Demaio's food system actor types (Baker and Demaio 2019): State—including governments and multi-lateral organizations; Civil Society – including non-governmental organisations and social movement organisations; and Corporate – including food manufacturers, food producers and input suppliers, financiers, and supermarkets. We also included a 'hybrid' type, if the board member was affiliated with an organisation involving various combinations of the three main types.

Second, board members involved in the MIs analysed were affiliated not only with the UPF industry but multiple other industries. Therefore, we categorised the identified board member data by 'industry type', according to what was stated on the 'about us' or 'mission statement' pages of the affiliated employer's website or LinkedIn page. At this stage, we adjusted two categories to meet the objectives of the study: (i) the non-profit organization category, and (ii) food system actors such as the Food and Beverage Manufacturer, Food and Beverage Services, Farming, Chemical Manufacturing to either UPF Manufacturer, UPF Ingredients (involved in supplying UPF primary products or ingredients), UPF Retailer or UPF Associate (donor, partner, non-governmental organization-NGO, or other business association of the UPF industry).

Third, to categorize headquarter location data, the country and region the corporation, organization, or MI was headquartered in, we matched these with World Bank country and income level groupings: high income countries (HICs); upper-middle income countries (UMICs); lower-middle income countries (LMICs); and low-income countries (LICs) (World Bank 2023).

Fourth, to categorise the MI founding member data, we used these same 'actor type' categories from above (i.e.: State, Civil Society, Corporate, Hybrid), however we inductively (during data collection) added an extra actor type 'philanthropists' during this process given the prominence of these actors in the MI founding member data.

Analysis and network mapping

Using an interpretive analytic approach, we identified and adapted several broad focus areas and questions from the High Level Panel of Experts on Food Security and Nutrition multi-stakeholder partnerships questionnaire, which was developed to collect detailed inputs and assess existing multi-stakeholder partnerships (HLPE 2018). Our key focus areas and questions included:

(i) When was the MI founded, and who were the actors involved?
(ii) Who governs the MI, who are the MI board members or leadership and which countries do they come from?
(iii) Which industries, organizations and actor types (corporate, state, civil society, hybrid) (Baker and Demaio 2019) are represented in the governance structure/board?
(iv) Who presides over the MI, and is there an overarching 'parent' organization in a position of control?

To explore these key questions, we used publicly available data sourced from the websites of the MI themselves, rather than other reports or interpretations of the MI from the literature. The network graph was generated using Gephi product version 0.10.1. We generated descriptive statistics using Microsoft Excel and Gephi and for clarity in the network figure, we shortened the names of the actors as we saw fit (Fig. 2). We also used Gephi's analysis tools to calculate degree centrality for the actors in the MI network.

Results

Our results are divided into two sections, which correlate to the objectives of the paper. First, we describe the general characteristics of the global food system MIs which were analysed. Second, we show which corporations, industries, actor types, and countries of origin are represented on global food system MI boards.

Global food system multi-stakeholder institutions

In this section, we describe several core characteristics of the MIs in terms of the year founded and by whom, total number of board members, and gender and job titles of board members. In total, 45 MIs were included in the analysis (see Supplementary Table 2), with 88.9% ($n=40$) being founded since the year 2000. Categorisation of the main founding partners by actor type shows that 53.3% ($n=24$) were initiated by solely private sector actors, 26.7% ($n=12$) by a hybrid group, 11.1% ($n=5$) by state entities, and 4.4% ($n=2$) by both civil society and philanthropists respectively. When combining the private sector and hybrid founding groups, 88.9% ($n=32$) included either one or more global UPF corporations, or corporations with either membership or donor ties (e.g.: The World Economic Forum, World Business Council for Sustainable Development) to UPF corporations. Specifically, the actors who were most present as founding members in the MIs analysed were the World Economic Forum ($n=7$), Unilever ($n=6$), World Business Council for Sustainable Development ($n=4$), Nestlé ($n=4$), World Wildlife Fund ($n=4$), Danone ($n=3$), United Nations ($n=2$), PepsiCo ($n=2$), United Nations Global Compact ($n=2$), EAT ($n=2$), and the European Commission ($n=2$).

In total, 601 board members were identified from the 45 MIs, and across those board members, 381 different private corporations, state or civil society organisations were represented. There were several overlaps on boards (meaning the same board member sat on multiple MI boards), with two individuals sitting on four of the 45 different boards, and a further 19 individuals sitting on two MI boards. In terms of gender, 62.9% were males ($n=378$) and 37.1% ($n=223$) were females. Overall, 31% of the total board members had the job title indicating that they were the executive decision-maker (e.g., Chief Executive Officer, President, Managing Director, or Director General) of their respective organization, and were responsible for a corporations entire operation, with a further 55% having a major decision-making role within their corporation of employment (e.g., Director, Head of Sustainability, Chief Sustainability Officer, or Vice President).

Which corporations, industries, countries of origin, income level countries, and actor types are represented on global food system MI boards?

Across the board seats of the MIs analysed, specific corporations, industries, countries of origin, income level countries, and actor types were represented at a disproportionately higher rate. We categorized the industry of the employer from which the board member was employed/affiliated. Based on data sourced from LinkedIn (*adjusted to represent links to the UPF industry), the leading actor types represented were UPF Manufacturers ($n=120$), UPF Ingredients ($n=64$), UPF Associates ($n=58$), Government Administration ($n=39$), Non-profit Organizations ($n=25$), UPF Retailers ($n=21$), Environmental Services ($n=18$), United Nations Organisations ($n=18$), Higher Education ($n=18$), Banking ($n=16$), Research Services ($n=15$), Farming ($n=12$), and International Trade and Development ($n=12$). When combined, UPF corporations held almost half ($n=263$, or 43.8%) of the total board seats across the MIs analysed. The total MI board members by type are shown below in Fig. 1.

Figure 2 displays the full network. For a full list of all the acronyms used, see Supplementary Table 1. When combined a powerful group of UPF system actors, including UPF Manufacturers, UPF Ingredient, UPF Retailer and UPF Associate actors (shown in red and orange circles) are central and dominant across the MI network. The organisations which had the highest representation on the MI boards analysed were Unilever ($n=20$), Nestlé ($n=17$), PepsiCo Inc ($n=14$), The Coca-Cola Company ($n=13$), The World Economic Forum ($n=10$), Mars Inc ($n=10$), DSM ($n=9$), Rabobank ($n=8$), The World Business Council for Sustainable Development ($n=7$), and Danone ($n=7$). Of the total number of corporations or organizations represented in the network, 83 held more than 1 board seat, with 35 holding at least 3 board seats across the MI boards analysed.

Figure 3 displays the total distribution of global food system MI board members by World Bank country classification and actor type. Of the total 601 leadership positions who govern the MIs we analysed, 82.4% were from HICs, almost half (49.1%) from the US and EU alone, and just 9.2%, 6.7%, and 1.8% were from UMICs, LMICs, and LICs respectively. When categorised by actor type, our results demonstrate that corporate ($n=430$, 71.5%) and hybrid actors ($n=37$, 6.2%) account for more than three-quarters of the total board positions. State ($n=80$, 13.3%) and civil society ($n=54$, 9%) actors have a small representation throughout the network.

Figure 4 shows a proportional map of MI board members by country and industry. Out of the total number of MI board seats, ten countries represent 74.9% ($n=450$) of the MI board seats. The United States ($n=188$) takes up almost one-third (31.3%) of the total, which is more than double the next highest Switzerland ($n=71$), followed by the United Kingdom ($n=52$), The Netherlands ($n=39$), Germany ($n=21$), France ($n=19$), Singapore ($n=16$), Brazil ($n=16$), Italy ($n=16$), and Belgium ($n=12$). The remaining board seats (excluding those listed above) in the global food system MIs alalysed were occupied by board members from fifty-three other countries. When combining the lower-middle and low income country governance positions ($n=51$, 8.5% of the total), 70% of the total were representatives of 7 organization types, Agricultural Business Association ($n=6$, 12%), Government Administration ($n=6$, 12%), Non-profit

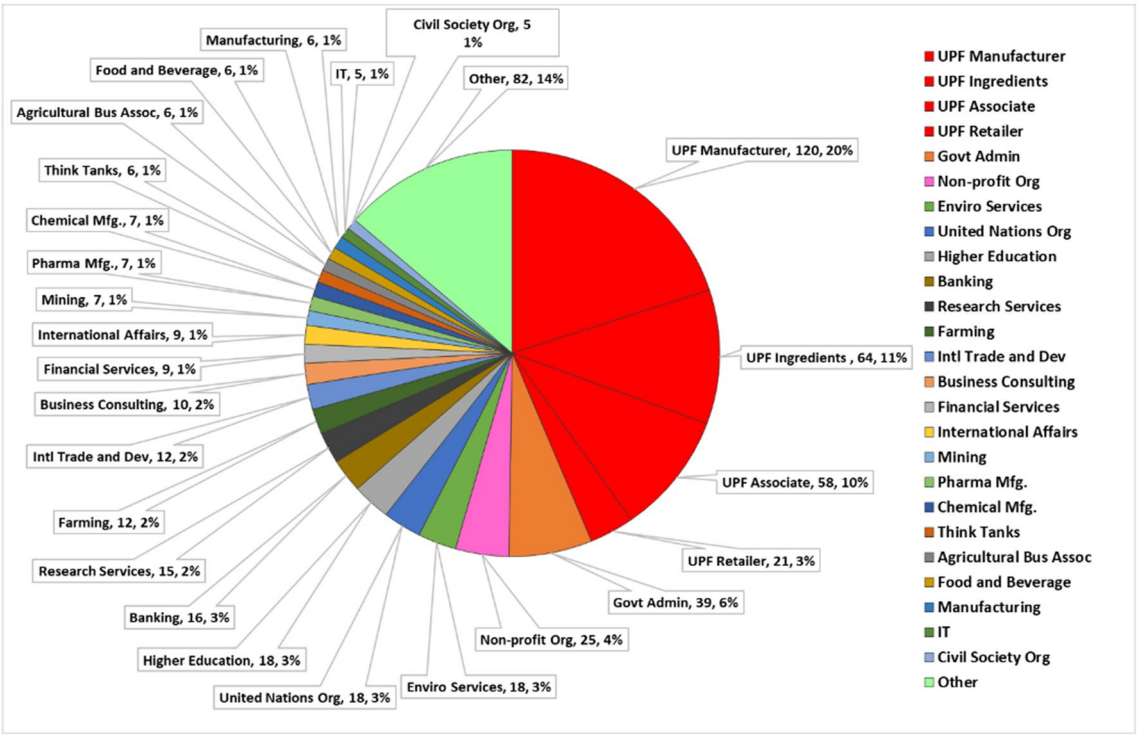

Fig. 1 Total analysed MI board members by types. Notes: The type 'other' includes: Product Mfg, Motor Vehicle Mfg, Retail, Research, Building, Telecommunications, Non-profit Org Mgmt, Venture Capital, Ind Machinery Mfg, Alcoholic Beverage Mfg, Software, Development, Insurance, Biotechnology, Advertising Services, Plastics Mfg, Law Practice, Health Care, Utilities, Oil and Gas, Govt Relations, Executive Offices, Consumer Services, Energy, Food Production, Music, Electrical Eq Mfg, Wholesale, Transportation, Design, Public Relations, Historical Sites, Dispute Resolution, Hospitality, Retail Apparel and Fashion, Computer Software, Technology, Machinery Mfg, Beverage Mfg, Agricultural Tech Bus, Travel Arrangements, Design Services, Professional Services, Human Resources, Packaging Mfg, Consumer Goods, Fisheries, Philanthropy, Media, Medical Eq Mfg, Investment Mgmt. Mfg = Manufacturing, Mgmt = Management

Organization ($n=6$, 12%), UPF Business Associates ($n=5$, 10%), Farming ($n=5$, 10%), Research Services ($n=4$, 8%), International Trade and Development ($n=3$, 6%).

Figure 5 displays the World Bank country classification of the governance positions per each individual MI. Over half of the MIs analysed are led by various combinations of actor types solely from HIC's ($n=24$). HIC executives were present on all the MI governance groups ($n=45$). Twenty-one of the MIs analysed, contained executives from HIC's and at least one from either UMIC's, LMIC's, or LIC's, yet only 15.6% of the total, contained at least 1 actor from a LIC. When we analyse each individual MI by industry, we find that all but one, has a direct connection through a board position to the UPF industry, as either an UPF manufacturer, UPF ingredient, UPF retailer, or UPF associate actor (see Fig. 6). The only MI which was an outlier in terms of governance positions not containing an UPF system actors according to our categorisation, was a sustainability focussed MI (Rimba Collective) which was founded by several UPF corporations. In total, 5 MIs were led by actors 100% from the UPF industry, a further 13 contained at minimum a 50% UPF industry actor make up, 17 contained at minimum a 25% UPF industry actor make up, and the remaining 9 had at minimum a 10% representation of governance positions from the UPF industry.

Discussion

In this paper, we aimed to map, analyse, and further understanding of global food system MIs involving the UPF industry in GFG. Our analysis revealed three key findings. In the section below, we summarize each of these findings and elaborate the potential implications for GFG, the food systems transformation agenda, and the future actions to attenuate the rise of UPFs in human diets.

First, our findings show that global food system MIs are disproportionately led at the board and advisory level by a small number of UPF manufacturers, corporations from affiliated industries, and their representative corporate interest groups. This indicates that there is strong centrality to the MI network, given that a small number of corporations, in

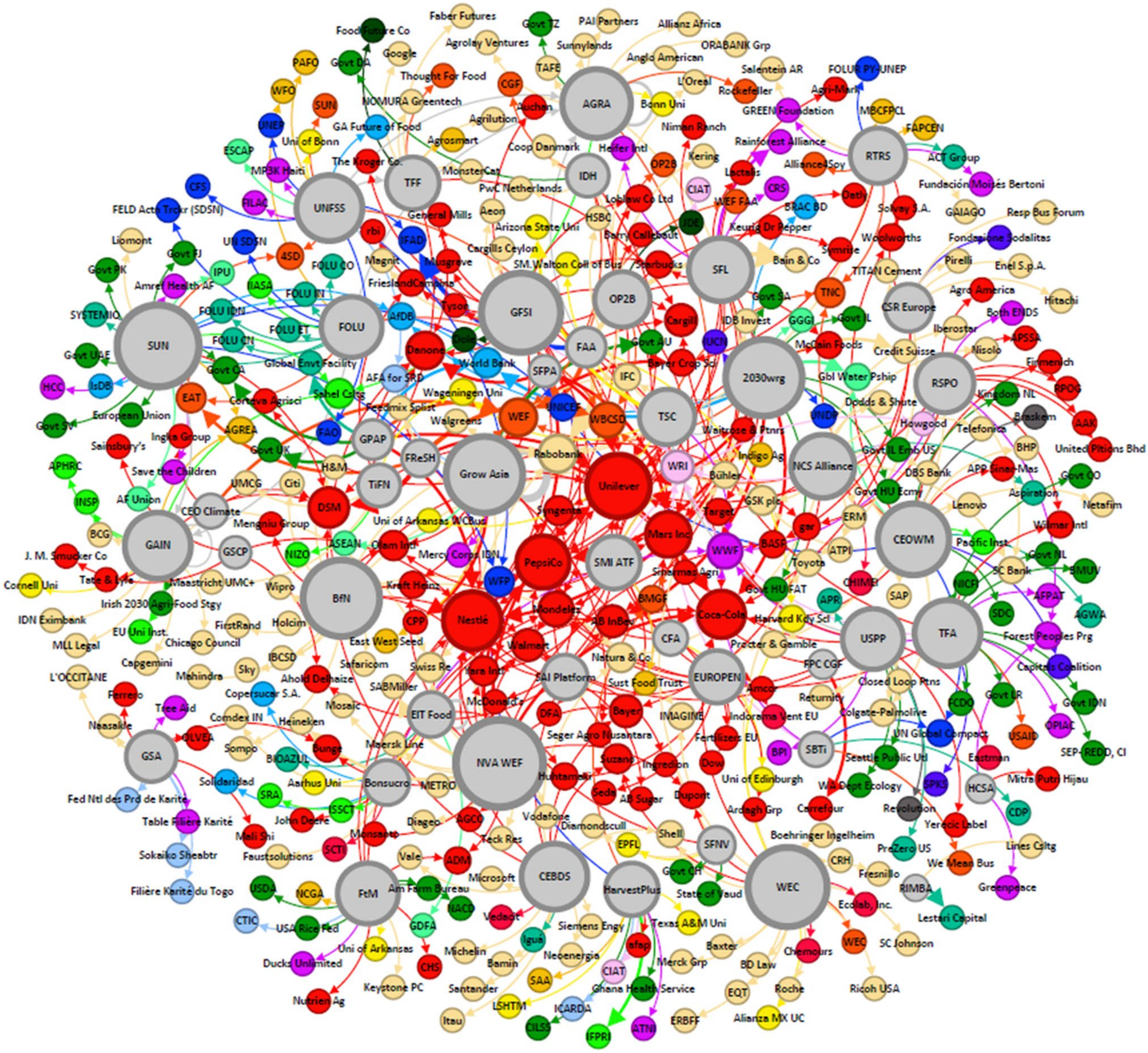

Fig. 2 The network of global food system MIs, their board member links and food system actors. * The lines represent the links between board member employment affiliation and global MIs. The circle size is proportionate to the number of 'links' the organization has with others in the network. Colours—light grey circles represent global food system MIs; red circles represent UPF corporations (manufacturers, ingredient suppliers, retailers); orange circles represent UPF business associates and donors connected with the UPF industry; light purple circles represent non-profit organisations; the dark blue circles represent United Nations organisations; light blue circles represent international trade and development organisations; teal circles represent environmental services actors; gold circles represent farming actors; green circles represent government administration organisations; aqua circles represent international affair actors; yellow circles represent higher education actors; light pink circles represent research service actors; pink circles represent chemical manufacturers; dark green circles represent food and beverage actors not directly linked with the UPF industry; dark purple circles represent civil society organisations; sky blue circles represent agricultural business association actors; lime green circles represent research service actors; cream circles represent the remaining corporate actors with indirect ties to the UPF industry. The grey half circles jutting from the grey MIs (e.g.: GAIN, GROW ASIA, AGRA) indicate that the MI has both representation as a board member and an MI within the network

particular Unilever, Nestlé, PepsiCo, The Coca-Cola Company, WEF, Mars, DSM, Rabobank, WBCSD, and Danone fill close to half of the MI board seats analysed. As other MI investigations have shown, our results also show that a select group of corporate actors, and government and UN agencies as 'host' or 'strategic partner' often dominate MI boards and leadership positions (Manahan and Kumar 2021; Michéle et al. 2019; Chandrasekaran et al. 2021).

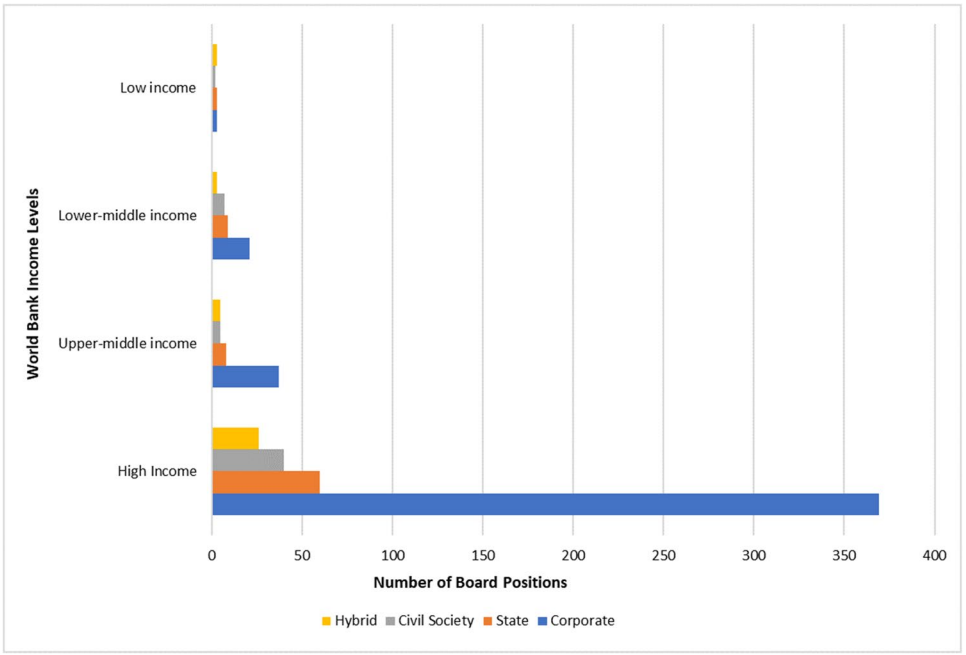

Fig. 3 Distribution of global food system MI board members by World Bank country income level classification and actor type

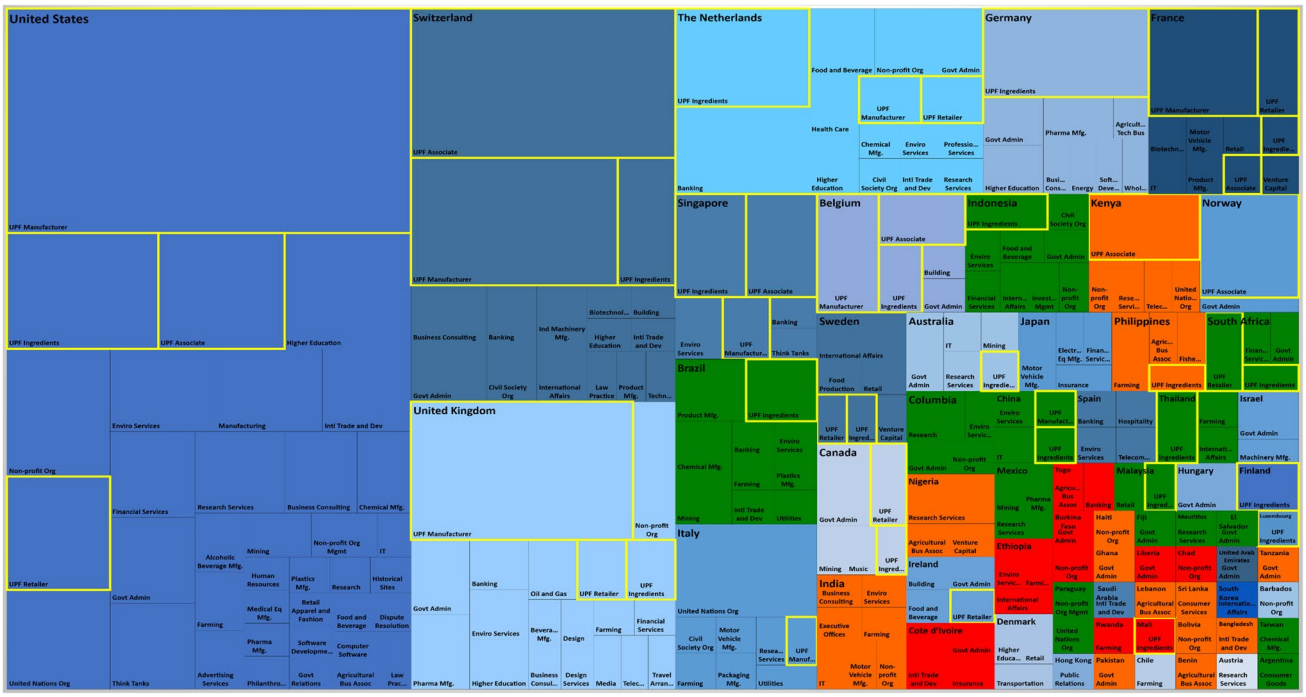

Fig. 4 A proportional map of global food system MI board members by country, industry, and income level. * The rectangle size is proportionate to the number of 'board seats' the industry has compared to the total network. Red squares – low-income countries, orange squares – lower middle-income countries, green squares – upper middle-income countries, blue (shades of) squares – high income countries. Yellow boxes—UPF industry and associates

For example, in relation to contemporary GFG, this study's results (see Fig. 2) are also analogous to a recent analysis of corporate influence in the UN Food Systems Summit by Chandrasekaran and colleagues (Chandrasekaran et al. 2021). This analysis found that: (i) many leading food system MIs are disproportionately led by for-profit corporations and businesses tied to the industrial food system; and (ii) the MIs (e.g.: Alliance for a Green Revolution in Africa,

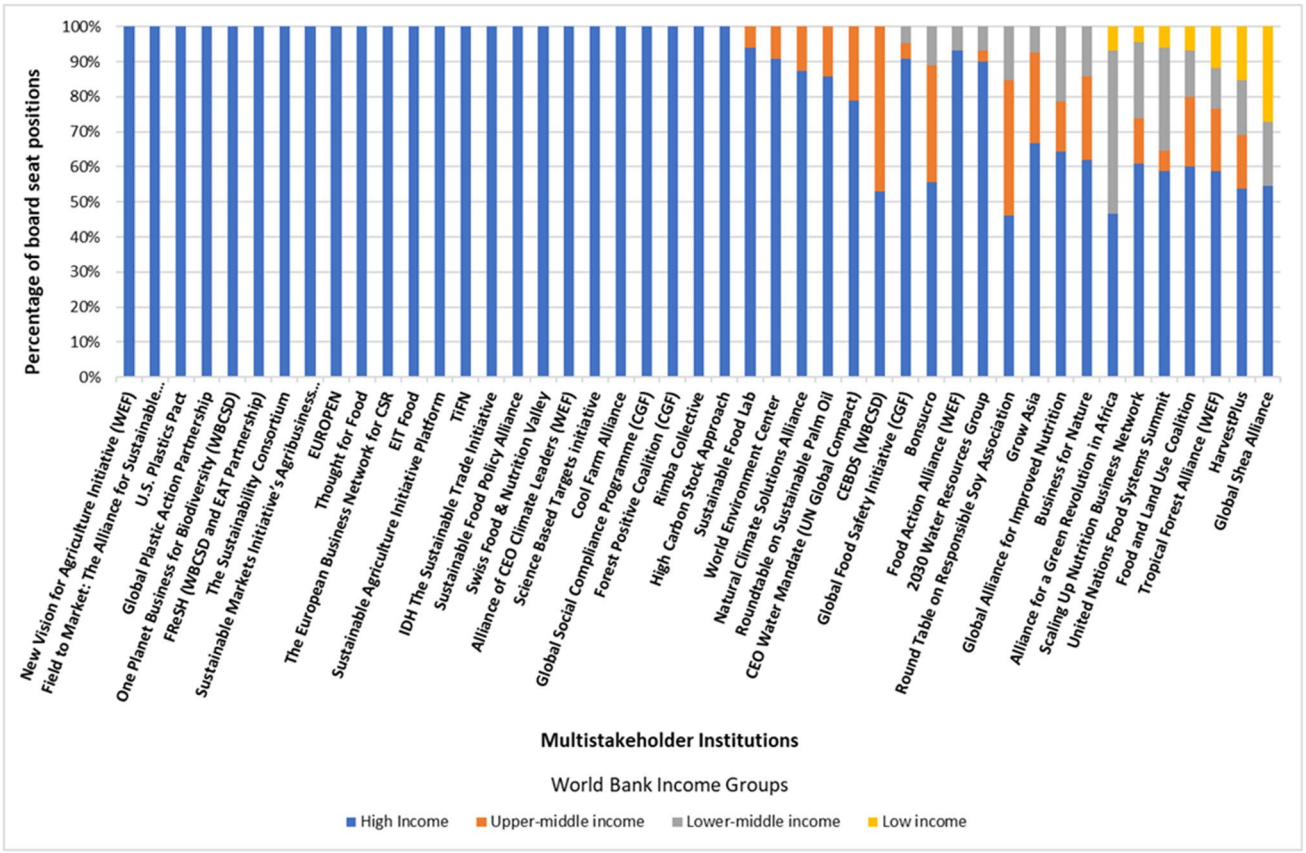

Fig. 5 Distribution of individual global food system MI boards by members and their World Bank country classification

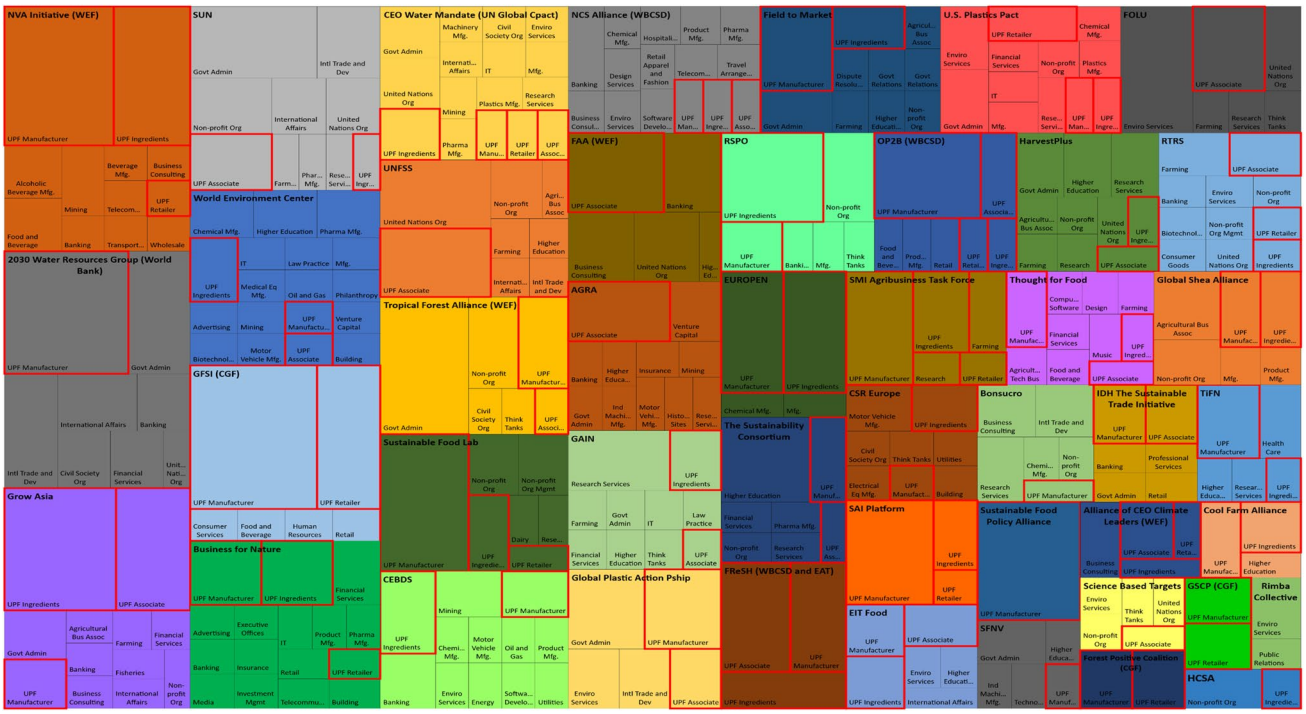

Fig. 6 Distribution of each MI board composition by members industry. * Rectangle size is proportionate to the number of 'board seats' the industry has per MI in relation to the network total

Scaling Up Nutrition, Global Alliance for Improved Nutrition etc.), along with other business and UPF actors (e.g.: WEF, WBCSD, Nestle) and philanthropies (e.g., The Bill and Melinda Gates Foundation, Rockefeller Foundation) involved in the Summit, are deeply connected to each other through board seats, steering committees, and a revolving door of MI leadership positions. Arguably, this indicates that specific UN agencies through their leadership, and an agribusiness aligned, UPF oriented set of corporate actors are now central to the new multi-stakeholder governance paradigm in GFG.

This study's second major finding is that global food system MIs are also disproportionately led by board members from HICs, with more than half drawn from the just four countries including the United States, Switzerland, United Kingdom, and the Netherlands. This indicates that global food system MIs represent the interests of corporations and interest groups located near exclusively in the Global North. Demonstrating this, our results show that of the total 601 leadership positions who govern the MIs we analysed, 82.4% were from high income countries, almost half (49.1%) from the US and EU alone, and just 9.2%, 6.7%, and 1.8% were from UMICs, LMICs, and LICs respectively. As other scholars have suggested, multi-stakeholderism as a governance model potentially reinforces colonial relations of power, especially when specific actors dominate decision making and deciding what are the *'solutions'* (Buxton 2019) to systemic food system inequality and injustice problems (Taylor 2017), rather than working towards addressing issues of colonial legacies, sovereignty, unfair systems of power, privilege, and exploitation (FIAN International and a Growing Culture 2021). Further highlighting these potential neocolonial effects, scholars also suggest that multi-stakeholderism as governance model has led to the creation of new *'invite only'* GFG spaces, a structural development that favours more highly resourced actors (i.e., rich country governments, international development agencies, the private sector and private foundations), over less resourced ones (e.g., poor country governments, civil society organizations and social movements) (Clapp 2012; Fuchs et al. 2011). In contemporary GFG, this could be considered as counterintuitive, particularly to the narrative of inclusiveness in multi-stakeholderism (Gleckman 2016), as often it is framed as a method to address issues of exclusion in GFG spaces.

From the perspective of prominent MIs in contemporary GFG, our analysis shows that only seven MIs (15.5%) had LIC representation as board members (AGRA, SUN, UNFSS, FOLU, Tropical Forest Alliance (a WEF initiative), HarvestPlus, and Global Shea Alliance). Except for Global Shea Alliance, these MIs have: (i) direct and strong business ties to each other; (ii) were among (or had close business ties with) the key actors in the UN Food Systems Summit and its leadership (ETC Group 2021); and (iii) have a strong UPF system presence as program/initiative partners, members, and donor recipients (Chandrasekaran et al. 2021; HarvestPlus 2023). When considering that 'pseudo representation' or 'token' participation is known to be common in MI governance (FIAN International 2020; Schiffer et al. 2010), our results indicate a major legitimacy issue, whereby many MIs seek the optics or appearance that LIC states are '*represented*' in the MIs decisions and activities (Gleckman 2018). For example, governance scholarship commonly suggests that non-HIC state representatives are often *'carefully selected'* to both provide legitimacy (MSI Integrity 2020), and align with the interests of a relatively exclusive selection of stakeholders (Buxton 2019; FIAN International 2020); which also could be suggested is the case from this analysis, when we understand who are the board member actor types involved from low income countries (see Fig. 4).

In relation to GFG, and the actions to attenuate the harms associated with UPFs, studies have shown that in recent decades major UPF corporations have been transferring an increasing proportion of their revenues to their shareholders, a group disproportionately represented by the wealthy in the United States and Western Europe (Wood et al. 2021, 2023b. At the same time, these same predominantly HIC domiciled UPF corporations are known to employ sophisticated business tactics to minimise tax payments, thereby impeding the fiscal capacity of many LMIC & LIC governments to mitigate the diverse social and environmental harms associated with UPFs (Moodie et al. 2021). From a governance perspective, HIC actor interests dominating decision making in GFG forums entrenches structural power, along with providing many other benefits, particularly for UPF corporations reliant on the current agro-industrial food production model and maintaining the status quo. This includes by maintaining the upper hand in political and policy decision making that may change, impact, or reduce, an UPF corporations' ability to generate profits for shareholders, particularly from Asia, the Middle East and Africa where markets are rapidly growing (Baker et al. 2020). Interestingly, this approach to maintaining a dominant position in GFG through multi-stakeholderism and UPF industry corporate aligned MIs supports Monteiro's initial thesis on the purpose of ultra-processing – UPF industry profit maximisation—achieved through mass producing and marketing 'foods' from cheap industrial agricultural products, that are highly palatable, with a long shelf life, that can travel long distances (Monteiro 2009; Monteiro et al. 2010), i.e., to UMICs and LMICs where markets have potential for growth (Baker et al. 2020).

Third, MIs involving the UPF industry demonstrate connections with UN agencies, governments, NGOs, and research institutions, which they may seek to influence and draw legitimacy from by association. Analysis of the MI founding member data along with several leading business association and UPF corporation reports (Nestlé 2023a;

Unilever 2020), shows that many MIs, UPF corporations, and powerful business associations are using in conjunction, the UN (Manahan and Kumar 2021), the SDGs (Corporate Accountability 2023), particularly SDG17 on 'partnerships' which calls for 'strengthening implementation and revitalizing the global partnerships for sustainable development' (United Nations 2015), and other Corporate Social Responsibility initiatives and Environmental, Social and Governance indicators to entrench themselves as 'part of the solution' (McKeon 2017; Lacy-Nichols and Williams 2021). When these direct connections are with the UN, and or the UN Global Compact institution, and the corporation doesn't take any meaningful environmental or human rights actions or making any real business activity changes (Berliner and Prakash 2015), this trend is referred to within the literature as 'blue washing' (Bruno and Karliner 2000). Blue washing specifically refers to corporations projecting corporate values, governance practices, and a socially responsible image through their association with the UN (Zammit and Utting 2006). Despite this understanding, the acceptance of multi-stakeholderism and MIs has been adopted by some UN food and nutrition agencies (Martens 2007), and this change has raised concerns for many food systems experts and organisations (Fakhri et al. 2021; De Schutter and Yambi 2020; Nisbett et al. 2021a; Liaison Group 2023). These concerns relate to the reputational risk to the UN systems values of independence, impartiality, and integrity (Canfield et al. 2021) and a growing body of scholarship suggesting that multi-stakeholderism (as a GFG model) and MIs collectively (as a structural governance mechanism), both prioritise the interests of the corporate sector through, for example, voluntary self-regulation (Corporate Accountability 2023) and market based technological solutions (e.g.: UPF reformulation, high-input intensive agriculture, biofortification) (Michéle et al. 2019) to systemic challenges, and their ability to truly transform food systems is limited (Béné 2022; IPES-Food 2023b; Canfield 2022; Herens et al. 2022).

Consistent with other studies which show that legitimacy is a major issue in both multi-stakeholderism and the GFG system more broadly (IPES-Food 2023b; Fuchs et al. 2011; Smythe 2009; Clapp and Fuchs 2009), we find that legitimacy, in terms of making sure every stakeholder gets a 'seat at the table' (Schwab and Vanham 2021), may also be an issue in the MIs analysed. As a case in point, the Food Reform for Sustainability and Health initiative (FReSH), the WBCSD and EAT Partnership, is one such MI. FReSH was founded by the WBCSD – who declares to be 'the premier global, CEO-led community of over 200 of the world's leading sustainable businesses' (World Business Council for Sustainable Development 2023a) and EAT—a science-based global platform for food system transformation (EAT 2023a) with strong partnership and funding ties to the private sector (Montenegro de Wit et al. 2021; EAT 2023b, c). Yet, this MI, through its *'sustainability'* focussed founding members and a rhetoric of being "the leading global business initiative developing ambitious, action-oriented solutions delivering healthy and sustainable diets to all, produced responsibly and within planetary boundaries" (World Business Council for Sustainable Development 2023b) provides conflicting messages, as its board seats and leadership positions are entirely derived from executives from the UPF industry. Other examples from our analysis include the Sustainable Food Policy Alliance (founded by Danone, Mars Inc, Unilever, Nestlé), SAI Platform (founded by Danone, Nestlé, and Unilever), and the Consumer Goods Forum's Forest Positive Coalition, whose entire board/steering committees are 100% led by UPF manufacturers and UPF retailers (see Fig. 6). A critical point to note is that food system actors whose businesses supply Nova group 1 foods – minimally processed foods, through sustainable healthy supply chains – are excluded from FReSH, most of the MIs analysed, and thus, this new multi-stakeholder sub-system in GFG (IPES-Food 2023b).

According to the High Level Panel of Experts on Food Security and Nutrition, another important factor related to the legitimacy of MIs and multi-stakeholder governance arrangements is accountability (HLPE 2018). Our results show that many of the UPF corporations which hold the greatest number of board memberships within the analysed MI network (e.g., PepsiCo, Unilever, Nestle and the Coca Cola Company), also occupy board seats in several plastic pollution focussed MIs (e.g., Global Plastic Action Partnership and European Organization for Packaging and the Environment). While this inherently isn't a major issue, these UPF corporations state in their ESG, sustainability, and investor reports goals such as '2025 target of 100% reusable, recyclable or compostable …' and 'percentage reductions in plastic packaging' (The Coca-Cola Company 2021a; PepsiCo Inc 2021; Nestlé 2023b; Unilever 2022). However despite stating such goals, in 2021, self-reported data from these same UPF corporations showed that combined, they produced 7,357,395 metric tonnes (MTs) (or over 7.3 billion kilograms) of plastic packaging (Ellen Macarthur Foundation 2022a), with the 2 largest contributors by far, PepsiCo (2,500,000 MTs) and Coca-Cola (3,224,395 MTs) (Ellen MacArthur Foundation 2020), both showing substantial increases in their plastic packaging production over the last 5 years (Ellen Macarthur Foundation 2022b). Given that research suggests, as a global average, only approximately 10% of all plastic is recycled (OECD 2022; United Nations Environment Programme 2021), when merged with knowledge that these corporations still use, for example, approximately 93.7% and 86% 'virgin' fossil-based content material respectively in their packaging (Ellen Macarthur Foundation 2022b; The Coca-Cola Company 2021b), a clear disconnect is evident between what the UPF industry actually does, and

the public image they seek through the MIs they lead, in food systems sustainability efforts.

This study had several limitations. First, our analysis was limited to the programmes, projects and initiatives of MIs directly connected to the UPF industry. Thus, we acknowledge that our results are not representative of all the programmes, initiatives, and projects of the analysed MIs. Second, given the nature of board seat rotations, board positions and corporation memberships in MIs might have changed since the data were collected. We identified and recorded each governance structure, board position, and related information as it was reported on the MIs website at the time of data collection (between December 2022 – May 2023), and hence, this may not represent current positions or information at the time of publication. Finally, our analysis relied on the quality of the data available through web-based searching, and future studies on this topic could possibly field different results if other search or analysis methods were employed. We also cannot validate the accuracy of the collected information sourced from these websites.

Conclusion

Given the rapid rise of UPFs globally in the last few decades, and the broad acceptance of multi-stakeholderism in GFG, our results, which suggest that we now have a corporate aligned, MI led, GFG system disproportionately organized by specific actors with common interests in advancing the UPF industry, raises important concerns. Indeed, this represents a tendency whereby multi-stakeholderism and MIs hide the UPF industry's harmful human and planetary health effects, in addition to providing UPF industry executives a privileged 'seat at the table' in GFG decision making spaces. If left unchecked in GFG, this trend will likely perpetuate, rather than address, the myriad of harms associated with UPF production and consumption, and the long-standing inequalities and injustices in GFG spaces. As many of the studied MIs now hold significant decision-making positions in GFG, this change spells a major challenge for both GFG, the responses to UPFs, and other major global health and sustainable food system goals. To address this, key GFG decision makers must implement structural and regulatory changes to ensure the interests of powerful MIs and UPF corporations, are not placed ahead of health and sustainability actions, including those on UPFs that are urgently needed.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s10460-024-10593-0.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions

Data availability The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate Not applicable.

Competing interests ML is a Board member of Food Standards Australia New Zealand. The views expressed in this article do not necessarily reflect the positions of any organization with which he is associated.

References

Anastasiou, K., P. Baker, M. Hadjikakou, G.A. Hendrie, and M. Lawrence. 2022. A conceptual framework for understanding the environmental impacts of ultra-processed foods and implications for sustainable food systems. *Journal of Cleaner Production* 368: 133155.

Baker, P., and A. Demaio. 2019. The political economy of healthy and sustainable food systems. In *Healthy and sustainable food systems*, ed. M. Lawrence and S. Friel, 181–192. London: Routledge.

Baker, P., P. Machado, T. Santos, K. Sievert, K. Backholer, M. Hadjikakou, et al. 2020. Ultra-processed foods and the nutrition transition: Global, regional and national trends, food systems transformations and political economy drivers. *Obesity Reviews* 21 (12): e13126.

Béné, C. 2022. Why the great food transformation may not happen – A deep-dive into our food systems' political economy, controversies and politics of evidence. *World Development* 154: 105881.

Berliner, D., and A. Prakash. 2015. "Bluewashing" the firm? Voluntary regulations, program design, and member compliance with the United Nations Global Compact. *Policy Studies Journal* 43 (1): 115–138.

Borgatti, S.P., M.G. Everett, and J.C. Johnson. 2018. *Analyzing social networks*. Sage Publications.

Bovaird, T. 2010. A brief intellectual history of the public–private partnership movement. In*International handbook on public–private partnerships*. Edward Elgar Publishing.

Brouwer, H., W. Hiemstra, S. van Vugt, and H. Walters. 2013. Analysing stakeholder power dynamics in multi-stakeholder processes: Insights of practice from Africa and Asia. *Knowledge Management for Development Journal.* 9 (3): 11–31.

Bruno, K., and J. Karliner. 2000. Tangled up in blue: Corporate partnerships at the United Nations. San Francisco: The Transnational Resource & Action Center. Available from: http://www.corpwatch.org/sites/default/files/Tangled%20Up%20In%20Blue.pdf. Accessed Aug 2023.

Buxton, N. 2019. Multistakeholderism: A critical look. Workshop report. The Transnational Institute. Available from: https://

www.tni.org/en/publication/multistakeholderism-a-critical-look. Accessed Apr 2023.
Candel, J.J.L. 2014. Food security governance: A systematic literature review. *Food Security* 6 (4): 585–601.
Canfield, M. 2022. The ideology of innovation: philanthropy and racial capitalism in global food governance. *TheJournal of Peasant Studies* 50 (6): 2381–2405. https://doi.org/10.1080/03066150.2022.2099739.
Canfield, M., M.D. Anderson, and P. McMichael. 2021. UN food systems summit 2021: Dismantling democracy and resetting corporate control of food systems. *Frontiers Sustainable Food System* 5(103). https://doi.org/10.3389/fsufs.2021.661552.
Chandrasekaran, K., S. Guttal, M. Kumar, L. Langner, and M.A. Manahan. 2021. Exposing corporate capture of the UNFSS through multistakeholderism. Food Systems 4 People. Available from: https://www.foodsystems4people.org/wp-content/uploads/2021/09/UNFSSreport2021.pdf. Accessed Jun 2023.
Clapp, J. 2012. *Food*. Cambridge, UK: Polity Press.
Clapp, J., and D. Fuchs. 2009. *Corporate power in global agrifood governance*. Cambridge: MIT Press.
Corporate Accountability. 2023. Big food's big black box. How corporations attempt to shape global politics outside of public view. Boston: Corporate Accountability. Available from: https://corporateaccountability.org/wp-content/uploads/2023/11/Big-Foods-Black-Box-Fact-File-11.02.pdf. Accessed Jun 2023.
De Schutter, O., and O. Yambi O. 2020. Op-Ed: The 2021 Food Systems Summit Has Started on the Wrong Foot – But it Could Still Be Transformational: Food Tank. [Available from: https://foodtank.com/news/2020/03/2021-food-systems-summit-started-on-wrong-foot-it-could-still-be-transformational/. Accessed Apr 2023.
Dentoni, D., V. Bitzer, and G. Schouten. 2018. Harnessing wicked problems in multi-stakeholder partnerships. *Journal of Business Ethics* 150 (2): 333–356.
EAT. 2023a. About: EAT. [Available from: https://eatforum.org/about/. Accessed Jun 2023.
EAT. 2023b. Partnerships: EAT. [Available from: https://eatforum.org/about/partnerships/. Accessed Jun 2023.
EAT. 2023c. Other partners: EAT. [Available from: https://eatforum.org/partnerships/other-partners/. Accessed Aug 2023.
Elizabeth, L., P. Machado, M. Zinöcker, P. Baker, and M. Lawrence. 2020. Ultra-processed foods and health outcomes: A narrative review. *Nutrients* 12 (7): 1955.
Ellen MacArthur Foundation. 2020. BRANDED Vol III: Demanding Corporate Accountability for Plastic Pollution. Manila, Philippines: Ellen MacArthur Foundation. Available from: https://www.breakfreefromplastic.org/2020/12/02/top-plastic-polluters-of-2020/. Accessed Jun 2023.
Ellen Macarthur Foundation, United Nations Environment Programme. 2022a. Global Commitment Progress Report Data Sheet 2022. In: UNEP Ea, editor. Accessed May 2023.
Ellen Macarthur Foundation, United Nations Environment Programme. 2022b. Global Commitment Progress Report 2022. Available from: https://gc-22.emf.org/ppu/. Accessed May 2023.
ETC Group. 2021. Hijacking food systems: technofix takeover at the FSS. Canada: ETC Group. Available from: https://www.etcgroup.org/content/hijacking-food-systems-technofix-takeover-fss. Accessed Jul 2023.
Fakhri, M., H. Elver, and O. De Schutter. 2021. Inter Press Service.. Available from: http://www.ipsnews.net/2021/03/un-food-systems-summit-not-respond-urgency-reform/. Accessed May 2023.
FAO, IFAD, UNICEF, WFP, WHO. 2023. The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural–urban continuum. Rome: FAO. Available from: https://www.fao.org/3/cc3017en/cc3017en.pdf.
Fardet, A., and E. Rock. 2020. Ultra-processed foods and food system sustainability: What are the links? *Sustainability.* 12 (15): 6280.
FIAN International. 2020. Briefing Note on Multi-Stakeholder Initiatives (MSI). Geneva, Switzerland FIAN International. Available from: https://fian.org/en/publication/article/briefing-note-on-multi-stakeholder-initiatives-msi-2507. Accessed Apr 2023.
FIAN International and a Growing Culture. 2021. Q & A: (Almost) all you need to know about the UNFSS: Dissecting and digesting what's behind the controversy-ridden 2021 UN Food Systems Summit: FIAN International. [Available from: https://www.fian.org/en/publication/article/q-a-almost-all-you-need-to-know-about-the-unfss-2840. Accessed Feb 2023.
Food and Agriculture Organization of the United Nations. 2023. FAST Partnership, Food and Agriculture for Sustainable Transformation. FAST - For people, for climate, for nature. Rome, Italy: FAO. Available from: https://www.fao.org/3/cc8159en/cc8159en.pdf. Accessed May 2023.
Fuchs, D., A. Kalfagianni, and T. Havinga. 2011. Actors in private food governance: The legitimacy of retail standards and multistakeholder initiatives with civil society participation. *Agriculture and Human Values* 28 (3): 353–367.
Gleckman, H. 2016. Multi-stakeholder governance: A corporate push for a new form of global governance. Amsterdam, The Netherlands: The Transnational Institute (TNI).
Gleckman, H. 2018. *Multistakeholder governance and democracy: A global challenge*. Routledge.
Golbeck, J. 2013. Analyzing the social web: Newnes.
HarvestPlus. 2023. Funding partners. Washington: CGIAR, IFPRI. [Available from: https://www.harvestplus.org/funding-partners/. Accessed May 2023.
Hawkes, C., and K. Buse. 2011. Public health sector and food industry interaction: It's time to clarify the term 'partnership' and be honest about underlying interests. *European Journal of Public Health* 21 (4): 400–401.
Herens, M.C., K.H. Pittore, and P.J.M. Oosterveer. 2022. Transforming food systems: Multi-stakeholder platforms driven by consumer concerns and public demands. *Global Food Security* 32: 100592.
HLPE. 2018. Multi-stakeholder partnerships to finance and improve food security and nutrition in the framework of the 2030 Agenda. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome: CFS. Available from: https://www.fao.org/3/CA0156EN/ca0156en.pdf. Accessed May 2023.
IPES-Food. 2023a. Breaking the cycle of unsustainable food systems, hunger, and debt. IPES-Food. Available from: http://www.ipes-food.org/pages/debtfoodcrisis.
IPES-Food. 2023b. Who's tipping the scales? The growing influence of corporations on the governance of food systems, and how to counter it. IPES-Food. Available from: https://www.ipes-food.org/_img/upload/files/tippingthescales.pdf. Accessed May 2023.
Lacy-Nichols, J., and O. Williams. 2021. "Part of the solution:" Food corporation strategies for regulatory capture and legitimacy. International Journal of Health Policy and Management (IJHPM)10(12):845–856.https://doi.org/10.34172/ijhpm.2021.111.
Lane, M.M., E. Gamage, S. Du, D.N. Ashtree, A.J. McGuinness, S. Gauci, et al. 2024. Ultra-processed food exposure and adverse health outcomes: Umbrella review of epidemiological meta-analyses. *BMJ* 384: e077310.
Lauber, K., H. Rutter, and A.B. Gilmore. 2021. Big food and the World Health Organization: A qualitative study of industry attempts to influence global-level non-communicable disease policy. *BMJ Global Health* 6 (6): e005216.

Liaison Group. 2023. Civil society and indigenous peoples mechanism. Risks of the increased systemic corporate capture fuelled by the UN Food Systems Summit (UNFSS) and its follow up process. Rome: CSIPM. Available from: https://www.foodsystems4people.org/wp-content/uploads/2022/05/UNFSSAnalysisReportMay2022_FS4P.pdf. Accessed May 2023.

Manahan, M.A., and M. Kumar. 2021. *The great takeover: Mapping of multistakeholderism in global governance*. Amsterdam: People's Working Group on Multistakeholderism and its members.

Martens, J. 2007. Multistakeholder partnerships: future models of multilateralism?: Friedrich-Ebert-Stiftung Berlin.

McKeon, N. 2017. Are equity and sustainability a likely outcome when foxes and chickens share the same coop? Critiquing the concept of multistakeholder governance of food security. *Globalizations* 14 (3): 379–398.

Michéle, L., S. Prato, P. Rundall, and F. Valente. 2019. When the SUN casts a shadow. The human rights risks of multi-stakeholder partnerships: the case of Scaling up Nutrition (SUN). Geneva, Switzerland: FIAN International, IBFAN and Society for International Development (SID). Available from: https://www.fian.org/files/files/WhenTheSunCastsAShadow_En.pdf. Accessed Apr 2023.

Monteiro, C.A. 2009. Nutrition and health. The issue is not food, nor nutrients, so much as processing. *Public Health Nutrition* 12 (5): 729–31.

Monteiro, C.A., R.B. Levy, R.M. Claro, I.R. Castro, and G. Cannon. 2010. A new classification of foods based on the extent and purpose of their processing. *Cadernos de Saúde Pública* 26 (11): 2039–2049.

Monteiro, C.A., G. Cannon, M. Lawrence, M.L. Costa Louzada, and P. Pereira Machado. 2019. Ultra-processed foods, diet quality, and health using the NOVA classification system. Rome: FAO. Available from: https://edisciplinas.usp.br/pluginfile.php/4867253/mod_resource/content/1/Ultraprocessed%20foods%20%20health.pdf. Accessed May 2023.

Montenegro de Wit, M., M. Canfield, A. Iles, M. Anderson, N. McKeon, S. Guttal, B. Gemmill-Herren, J. Duncan, J. D. van der Ploeg and S. Prato. 2021. Editorial: Resetting Power in global food governance: The UN Food Systems Summit. *Development*. https://doi.org/10.1057/s41301-021-00316-x

Moodie, R., D. Stuckler, C. Monteiro, N. Sheron, B. Neal, T. Thamarangsi, et al. 2013. Profits and pandemics: Prevention of harmful effects of tobacco, alcohol, and ultra-processed food and drink industries. *The Lancet.* 381 (9867): 670–679.

Moodie, R., E. Bennett, E. J. L. Kwong, T. M. Santos, L. Pratiwi, J. Williams and P. Baker. 2021. Ultra-processed profits: the political economy of countering the global spread of ultra-processed foods – A synthesis review on the market and political practices of transnational food corporations and strategic public health responses. *International Journal of Health Policy and Management*. https://doi.org/10.34172/ijhpm.2021.45

MSI Integrity. 2020. Not fit-for-purpose: The grand experiment of multi-stakeholder initiatives in corporate accountability, human rights and global governance. The Institute for Multi-Stakeholder Initiative Integrity. Available from: https://www.msi-integrity.org/wp-content/uploads/2020/07/MSI_Not_Fit_For_Purpose_FORWEBSITE.FINAL_.pdf. Accessed Apr 2023.

Nestlé. 2023a. Contributing to the global goals: Nestlé; [Available from:https://www.nestle.com/sustainability/regenerative-food-systems/global-goals. Accessed Jun 2023.

Nestlé. 2023b. Accelerate, transform, regenerate: Nestlé's net zero roadmap. Available from: https://www.nestle.com/sites/default/files/2020-12/nestle-net-zero-roadmap-en.pdf. Accessed Aug 2023.

Nisbett, N., L. Hoey, and J. Collin. 2021a. Strengthening Governance of the United Nations Food Systems Summit (UNFSS). Ad Hoc Committee on UNFSS Governance and signatories. Available from: https://www.iatp.org/strengthening-governance-un-food-systems-summit. Accessed May 2023.

OECD. 2021. *Global plastics outlook: Economic drivers, environmental impacts and policy options*. Paris: OECD. https://doi.org/10.1787/de747aef-en.

Passport Global Market Information Database. 2022. Euromonitor International. London.

PepsiCo Inc. 2021. ESG performance metrics. PepsiCo Inc. Available from: https://www.pepsico.com/docs/default-source/sustainability-and-esg-topics/2021-esg-summary/pep_csr21_perfmetrics_v21.pdf?sfvrsn=f2d66820_9. Accessed Apr 2023.

Popkin, B.M., and S.W. Ng. 2022. The nutrition transition to a stage of high obesity and noncommunicable disease prevalence dominated by ultra-processed foods is not inevitable. *Obesity Reviews* 23 (1): e13366.

Popkin, B.M., S. Barquera, C. Corvalan, K.J. Hofman, C. Monteiro, S.W. Ng, et al. 2021. Towards unified and impactful policies to reduce ultra-processed food consumption and promote healthier eating. *The Lancet Diabetes & Endocrinology.* 9 (7): 462–470.

Rocker, S., J. Kropczynski, and C. Hinrichs. 2022. 11 - Using social network analysis to understand and enhance local and regional food systems. In *Food systems modelling*, ed. C. Peters and D. Thilmany, 231–56. Academic Press.

Schiffer, E., F. Hartwich, and M. Monge. 2010. Who has influence in multistakeholder governance systems. Using the net-map method to analyze social networking in watershed management in Northern Ghana. IFPRI. Available from: https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/1415/filename/1416.pdf. Accessed May 2023.

Schneider, K., J. Fanzo, L. Haddad, M. Herrero, J. Rosero Moncayo, A. Herforth, et al. 2023. The state of food systems worldwide: Counting down to 2030. Available from: https://www.researchgate.net/publication/369540536_The_State_of_Food_Systems_Worldwide_Counting_Down_to_2030. Accessed Apr 2023.

Schwab, K. 2019. Why we need the 'Davos Manifesto' for a better kind of capitalism, World Economic Forum. [Available from: https://www.weforum.org/agenda/2019/12/why-we-need-the-davos-manifesto-for-better-kind-of-capitalism/. Accessed Jul 2023.

Schwab, K., and P. Vanham. 2021. *Stakeholder capitalism: A global economy that works for progress, people and planet*. Hoboken: Wiley.

Scott, J. 2011. Social network analysis: Developments, advances, and prospects. *Social Network Analysis and Mining* 1 (1): 21–26.

Slater, S., M. Lawrence, B. Wood, P. Serodio, and P. Baker. 2024. Corporate interest groups and their implications for global food governance: Mapping and analysing the global corporate influence network of the transnational ultra-processed food industry. *Globalization and Health* 20 (1): 16.

Smythe, E. 2009. In whose interests? Transparency and accountability in the Global Governance of Food: Agribusiness, the Codex Alimentarius, and the World Trade Organization. In *Corporate power in gobal agrifood governance*, ed. J. Clapp and D. Fuchs, 93–124. MIT Press.

Steiner, A., G. Aguilar, K. Bomba, J. Bonilla, A. Campbell, R. Echeverria, et al. 2020. *Actions to transform food systems under climate change*. Wageningen: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Available from: https://hdl.handle.net/10568/108489. Accessed Apr 2023.

Swinburn, B.A., V.I. Kraak, S. Allender, V.J. Atkins, P.I. Baker, J.R. Bogard, et al. 2019. The global syndemic of obesity, undernutrition, and climate change: The lancet commission report. *The Lancet* 393 (10173): 791–846.

Taylor, R. 2017. Using agroecology to oppose neo-colonialism: Institute of Development Studies. [Available from: https://www.ids.

ac.uk/opinions/using-agroecology-to-oppose-neo-colonialism/. Accessed Oct 2023.
The Coca-Cola Company. 2021a. Business & ESG Report. The Coca-Cola Company. Available from: https://www.coca-colacompany.com/content/dam/journey/us/en/reports/coca-cola-business-environmental-social-governance-report-2021.pdf. Accessed Jul 2023.
The Coca-Cola Company. 2021b. 2021 World Without Waste Report. The Coca Cola Company. Available from: https://www.coca-colacompany.com/reports/world-without-waste-2021. Accessed Jun 2023.
UNEP, FAO, UNDP. 2023. Rethinking our food systems: A guide for multi-stakeholder collaboration. Nairobi, Rome and New York. Available from: https://www.fao.org/documents/card/en/c/cc6325en. Accessed May 2023.
Unilever. 2020. Unilever and the UN: An enduring partnership: Unilever. [Available from: https://www.unilever.com.au/news/2020/unilever-and-the-un-an-enduring-partnership/. Accessed Jul 2023.
Unilever. 2022. Unilever Annual Report and Accounts 2022. London: Unilever. Available from: https://www.unilever.com/files/92ui5egz/production/90573b23363da2a620606c0981b0bbd771940a0b.pdf. Accessed Jul 2023.
United Nations. 2015. Sustainable development goals. The 17 goals New York, USA: United Nations Department of Economic and Social Affairs: Sustainable Development. [Available from: https://sdgs.un.org/goals. Accessed May 2023.
United Nations Environment Programme. 2021. From Pollution to Solution: A global assessment of marine litter and plastic pollution. Nairobi: UNEP. Available from: https://www.unep.org/resources/pollution-solution-global-assessment-marine-litter-and-plastic-pollution. Accessed Aug 2023.
Utting, P. 2001. UN-business partnerships: Whose agenda counts? *Transnational Associations-Associations Transnationales* 3: 118–129.
Wasserman, S., and K. Faust. 1994. *Social network analysis: Methods and applications*. Cambridge University Press. https://doi.org/10.1017/CBO9780511815478.
Wood, B., E. Robinson, P. Baker, G. Paraje, M. Mialon, C. van Tulleken, et al. 2023a. What is the purpose of ultra-processed food? An exploratory analysis of the financialisation of ultra-processed food corporations and implications for public health. *Globalization and Health* 19 (1): 85.
Wood, B., McCoy, D., Baker, P., Williams, O., and G. Sacks. 2021. The double burden of maldistribution: a descriptive analysis of corporate wealth and income distribution in four unhealthy commodity industries. *Critical Public Health* 33(2), 135–147. https://doi.org/10.1080/09581596.2021.2019681
Wood, B., O. Williams, P. Baker, and G. Sacks. 2023b. Behind the 'creative destruction' of human diets: An analysis of the structure and market dynamics of the ultra-processed food manufacturing industry and implications for public health. *Journal of Agrarian Change* 811–843.https://doi.org/10.1111/joac.12545
World Bank. 2023. World bank country and lending groups: World bank group. [Available from: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups. Accessed Apr 2023.
World Business Council for Sustainable Development. 2023a. About us Geneva, Switzerland: WBCSD. [Available from: https://www.wbcsd.org/Overview/About-us. Accessed May 2023.
World Business Council for Sustainable Development. 2023b. FReSH. Healthy & Sustainable Diets Geneva, Switzerland: WBCSD. [Available from: https://www.wbcsd.org/Programs/Food-and-Nature/Food-Land-Use/FReSH. Accessed Apr 2023.
Zammit, A., and P. Utting P. 2006. Beyond pragmatism: appraising UN-business partnerships. United Nations Research Institute for Social Development. Available from: https://cdn.unrisd.org/assets/library/papers/pdf-files/uttzam.pdf. Accessed Aug 2023.

Scott Slater is a PhD Candidate and Research Assistant at the School of Exercise and Nutrition Science, Deakin University, Australia. He has a Masters in Human Nutrition from Deakin University, and a Postgraduate in Not-For-Profit Management, and undergraduate Public Health and Exercise Science degrees from Australian Catholic University. Prior to starting his PhD studies, Scott worked for an Australian Government health department, where he led several public health and obesity prevention research projects. Scott's core research area is global food systems governance, with a particular focus on the political economy of ultra-processed food systems, and the political and policy actions to promote healthy and sustainable food systems.

Mark Lawrence is a Professor of Public Health Nutrition at the Institute for Physical Activity and Nutrition, Deakin University, Australia. He has a PhD from Deakin University, an MSc from the London School of Hygiene and Tropical Medicine (course distinction) and a Graduate Diploma in Nutrition and Dietetics from Flinders University. He has 39 years' experience working as a practitioner and academic in food and nutrition policy at local, state, national and international levels. Mark's research interests focus on healthy and sustainable food systems, dietary guidelines, ultra-processed foods and food regulation. He has published widely on the topics of healthy and sustainable diets and healthy and sustainable foods systems. His latest research book is titled, 'Healthy and Sustainable Food Systems', Mark Lawrence and Sharon Friel (editors).

Benjamin Wood is a Research Fellow with the Global Centre for Preventive Health and Nutrition, and a member of the Institute for Health Transformation, Deakin University, Australia. He has a PhD from Deakin University (Health and Social Development), a Masters of Global Health from the University of Barcelona, Spain, and a Bachelor of Medicine and Surgery from the University of Tasmania, Australia. His research focuses on understanding and addressing the commercial determinants of ill-health and inequity, and the political economy of the global rise of ultra-processed foods. Some of his recent work has examined the financialisation of ultra-processed food corporations and implications for public health.

Paulo Serodio serves as a Senior Research Officer at the Institute for Social and Economic Research at the University of Essex, United Kingdom. He possesses an MA and a PhD in Political Economy from the same university. Prior to joining ISER, he held positions with the D'Amore-McKim School of Business at Northeastern University, Brasenose College at the University of Oxford, the Centre for the Sociology of Organisations at Sciences Po, and the University of Barcelona. His research primarily delves into survey augmentation and methodology, sampling strategies for hard-to-reach populations, commercial determinants of health, and network science.

Amber Van Den Akker is a PhD Candidate and Research Assistant in the Department for Health at the University of Bath, United Kingdom. She has an MSc (Health Policy) from the University of Edinburgh, Scotland, and a BSc (European Public Health) from Maastricht University, Netherlands. She has a background in public health policy, both at national level in the Netherlands and at international level with the World Health Organization. Her research interests include commercial determinants of health, food systems, corporate political activity and the governance and policy implications of multi-stakeholderism, particularly as it relates to unhealthy commodities, non-communicable diseases and sustainable consumption.

Phillip Baker is an Australian Research Council Future Fellow, and a University of Sydney Horizon Fellow at the School of Public Health, University of Sydney, Australia. He has a PhD from the National Centre for Epidemiology and Population Health (Population Health), Australian National University, a Masters of Health Science (Nutrition, with First Class Honors), and a Bachelor of Science (Biology, with Senior Prize) from the University of Auckland. His research focuses on understanding global food systems change, and the implications for human and planetary health. His recent work covers the global rise of ultra-processed foods, the commercial determinants of infant and young child nutrition, and the political economy of food systems transformation.