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The co-optation of regenerative agriculture: revisiting the corporate environmental food regime

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ABSTRACT

There is increasing concern regarding the influence corporations have over the global food system. The extent of this power is so great that it is described as a defining feature of the current global food regime. In this paper, I explore the case study of regenerative agriculture, a growing transnational sustainable agriculture movement which has received increasing interest from corporate actors. Existing literature has highlighted the risks of corporate co-optation in regenerative agriculture but has failed to explore these patterns in any great depth. To address this gap, I analyse 21 multi-national corporations with regenerative agriculture programs and policies. Combining food regime theory with a three faces of power framework, I document the nature of corporate involvement in regenerative agriculture and how it reflects a broader attempt by agri-food corporations to legitimize their power in the global food system via the corporate environmental food regime.

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Introduction

The global food system is facing a range of crises, with 20–40% of agricultural land degraded (UNCCD, 2022), 70% of agro-biodiversity lost (Holt-Giménez & Altieri, 2013), and 21% of global greenhouse gas emissions attributable to agricultural production (IPCC, 2019). There also remain ongoing challenges of inequity and injustice as the Global South continues to be the breadbasket for affluent consumers in the Global North (Prause et al., 2021), while people on low incomes across the world are food insecure, and both under- and overnutrition are rife (FAO et al., 2023).

Political economy scholars are striving to understand the underlying power dynamics and systemic drivers of these issues (Anderson & Leach, 2019) and the role different actors play in delivering (or inhibiting) solutions (Béné, 2022). One political-economic explanation for the origins and nature of these dynamics is offered by food regime theory, a critical approach to understanding global food systems and their power relations, flows of capital, social forces, and environmental and technological shifts.

Food regime theory demarcates distinct historical epochs in the food system, their demise, and the transitions in between (Bernstein, 2016), documenting how the global food system has evolved through the Colonial-Diasporic food regime, to the Mercantile-Industrial food regime (Friedmann,

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2005). However, food regime theorists remain divided over how best to describe the current (third) food regime and whether a third food regime has even materialized. There is consensus that the global food system currently reflects a broader trend in global political economy – corporate concentration (Clapp & Purugganan, 2020), but the ways in which these private interests relate to state actors and social movements is still debated. For instance, McMichael (2000, 2021) points to international institutions and state governments which facilitate corporate concentration and market infiltration to re-assert Global North control over the Global South. On the other hand, for Friedmann (2005, 2016) the third food regime is more acutely defined by the emergence of green capitalism and the need for corporations to legitimize their power by co-opting social and environmental causes.

To test the explanatory power of these different theorizations of the third food regime, in this paper I explore corporate involvement in the regenerative agriculture (RA) movement, an increasingly popular alternative approach to industrial agriculture among Global North farmers (Bless et al., 2023). Many researchers of RA have noted this corporate interest (Cusworth et al., 2022; Gordon et al., 2023), but there remains no systematic analysis of which corporations are involved or what actions they are taking. To address this gap, and to contribute to ongoing scholarly enquiry regarding the third food regime and corporate power in global food system governance, in this paper I consider corporate involvement in the RA movement using a ‘three faces of power’ framework, as developed for food systems research by Clapp and Fuchs (2009).

This paper begins with a summary of food regime theory and its development to date, followed by an explanation of RA and the methodological approach for this analysis. I identify 21 of the world’s largest agri-food corporations which have active RA programs or policies and explore how these companies are enacting their instrumental, structural, and discursive power (Clapp & Fuchs, 2009) to co-opt RA. Co-optation here meaning to use cooperative practices to absorb opposing actors and appropriate their views, while granting minimal relative benefit and undermining their opposition (Baur & Schmitz, 2012). I find that corporate engagement with RA reflects Friedmann’s (2005) theorization of the corporate environmental food regime. That is, while these companies seemingly take action to restore and revitalize farming environments in their supply chains, they continue to support industrial agriculture and the ongoing consumption of unhealthy foods at unsustainable levels, doing little to truly transform social inequities and environmental destruction in the food system. The co-optation of RA is instead a tool for these companies to legitimize their role as ‘responsible’ leaders of the global food system.

Conceptual background and approach

Food regime theory and debating the third food regime

Developed by Friedmann and McMichael (1989), food regime theory considers the political-economic relations of the modern global food system from the late 1800s to the present. Combining French regulationism with historical-comparative analysis, food regime theory emerged from critical agrarian studies (Prause et al., 2021) and draws on Gramscian conceptualizations of hegemony (Friedmann, 2009), Polanyian critiques of the interplay of markets and agriculture, and the structures of world-systems theory (Friedmann, 2009; Holt-Giménez & Shattuck, 2011). It uses these elements to explore the interplays between the evolution of capitalism and the global food system.

Definitions of what a food regime entails are still debated, but the concept is drawn from international organizations literature as ‘a specific set of (often implicit) relationships, norms,

institutions, and rules around which the expectations of all relevant actors converge' (Friedmann, 2009, p. 335). Regimes are demarcated by the international relations of food production and consumption, and distinct periods of capitalist behaviours.

In the original conceptualization of food regime theory, Friedmann and McMichael (1989) identified the first food regime, which Friedmann (2005) terms the 'Colonial-Diasporic' food regime, as lasting from 1870 to 1914 and defined by Euro-centrism. Settler and colonial economies provided key commodities including grains, livestock, and sugar back to the European continent, especially Britain as it industrialized. This regime also pushed the industrialization of agriculture, increasing chemical and mechanical inputs, and monocultural production.

Periods of global political and economic turmoil typically characterize the transitions between food regimes; hence the second food regime did not begin until the 1950s. This 'Mercantile-Industrial' food regime (Friedmann, 2005) represented a shift in power away from Britain and Europe towards the most powerful settler-state, the USA. With an excess of commodities such as wheat and meat due to decades of specialization and industrialization in agriculture, the US began to provide 'food aid' to developing countries as it sought to increase its influence in the developing world. Industrialization of the food system became widespread through the Green Revolution in the Global South and replication of the US model of national regulation of agriculture (Friedmann & McMichael, 1989).

Food regimes come to an end when their tensions or contradictions eventually make them untenable. The second food regime ended in the 1970s due to the increasing international replication of the US model leading to chronic surpluses and volatile markets. Multi-national corporations who had benefitted from elongated supply chains also began to outgrow the national regulatory system (Friedmann, 2005).

While we know that after the 1970s the predominant force in the global economy was neoliberalism, food regime theorists have yet to agree on whether this has consolidated as a new food regime (Pechlaner & Otero, 2010). However, there is consensus that a key feature of the current food system is corporate power. McMichael (2000) proposes that from the 1980s a new 'corporate food regime' (CFR) emerged in which nation states have less control over the food system. In this regime, states serve markets as the second 'green revolution' of biotechnology has come to the fore, supported by international institutions such as the World Trade Organization. The CFR is therefore defined by the displacement of producers who are unable to compete or are unwilling to comply with subsidized or monopolized market power wielded by transnational corporations (McMichael, 2013).

McMichael also identifies in social movements such as La Via Campesina a resistance against the CFR, defending the 'peasant way' and strengthening cultural practices that do not reduce food and agriculture to a commodity. The food sovereignty movement and the concept of 'food from somewhere' versus 'food from nowhere' (Campbell, 2009) is what McMichael (2009) views as the strongest challenge to the CFR.

McMichael's interpretation of the third food regime has attracted support from other scholars and has been quoted extensively by peasant studies and food sovereignty literature (Bernstein, 2016). However, outside these fields there is criticism that McMichael's interpretation is too specific to the Global South (Roche, 2012) and misses the multi-polar dynamics of the global economy, such as the rise of China and other BRICS nations, especially in corporate power (Wilkinson & Goodman, 2018), as well as state intervention in food system dynamics (Pritchard et al., 2016).

Friedmann (2009) is more hesitant than McMichael to affirm the beginning of a new food regime in the early 2000s, arguing that the rules of legitimation necessary for a regime's hegemony are not yet sufficiently established. What is lacking, according to Friedmann, is a shared definition of purpose by the key actors of the food system and a renewed means of accumulation of capital. In 2005, Friedmann had suggested that a 'corporate environmental food regime' (CEFR) was emerging as part of a 'greening' of capitalism. Friedmann (2005) notes how agri-food corporations, led by food retailers, are selectively appropriating the values and causes of environmental, food safety, animal welfare, fair trade and other social movements that emerged during the second food regime. Profits are being renewed through less depletion of resources, and instead by selling products that are culturally defined as environmentally or socially superior. This regime is two-faced, it intends to supply value-laden premium foods to the growing number of middle-to-high income customers in the Global North and increasingly in the Global South, whilst providing cheap food for those on low incomes and, in so doing, maintaining much of the status quo of a productivist food system that prioritizes quantity over quality.

Friedmann (2005) also notes that the CEFR is being challenged by the very movements from which it draws, and accusations of greenwashing are common (Friedmann, 2016). As such, Friedmann (2005) suggests that the CEFR may fall on its own sword before it can ever fully materialize.

Friedmann's theorization of the third food regime also aligns with the food regime analysis of other authors in that it acknowledges the increasing prominence of social and environmental issues in global food system governance. For instance, Campbell et al. (2017) point to increasing attention on food waste, and Dixon (2009) highlights challenges around nutrition (super foods, luxury foods, and ultra-processed foods) as another key feature of the current food regime. Prause et al.'s (2021) study also demonstrates how digitalization is rampant along the agri-food supply chain, at times combining with greening narratives such as through 'climate-smart' agriculture. Finally, Burch and Lawrence (2009) point to agri-food corporations moving into the financial capital space, and the influence of financial institutions in the food regime which are increasingly investing and speculating on agricultural land, supply chains, and commodities.

While there may be a lack of consensus on the exact formulation of the third food regime, there is nonetheless agreement on many of its characteristics. That is, the concentration of corporate power across global food supply chains supported by the spread of neoliberalism. Pechlaner and Otero (2010) even go so far as to describe the third regime as a 'neoliberal food regime'. The third regime is also emblemized in a bifurcation of the food system along the lines of Global North vs South value chains, rich versus poor consumers, 'food from somewhere' versus 'food from nowhere', and corporate power versus opposing social movements.

Ongoing debate around the third food regime demonstrates that there is further room to test and consider the applicability of food regime theory against empirical findings. While much of the existing food regime literature emerged from the 2000s and 2010s, the dynamics that Friedmann and McMichael describe are enduring and evolving (IPES-Food, 2023). In particular, Friedmann's notion of the CEFR, which has attracted less scholarly attention to date (Bernstein, 2016; Smith et al., 2010), merits deeper enquiry. This includes a need to further explore how non-state actors are increasingly involved in governance of the global food system (Béné, 2022), and the ways in which they are invoking sustainability narratives to legitimize their power and influence (Friedmann, 2016; IPES-Food, 2023). On this point, there remains a notable lack of application of power theory in food regime analysis. While elements of Gramsci's conceptualization of hegemony are present (Friedmann, 2009; McMichael, 2021), as are traditional conceptualizations of

instrumental state economic power, there is minimal consideration of how actors invoke and evoke power in the food regime.

The three faces of power developed to analyse corporate power in the food system

To further explore the application of power theory to food regime dynamics, particularly the interactions between corporations and social movements, in this paper I utilize a framework by Clapp and Fuchs (2009) for analysing the food system using the three faces of power: instrumental, structural, and discursive. This framework has been applied to topics such as red and processed meat reduction (Sievert et al., 2021), corporate power in the baby food industry (Baker, 2021), corporate use of ‘nutritionism’ (Clapp & Scrinis, 2016), and market concentration in the Australian food retail sector (Pulker et al., 2018). As Mikler (2018) attests, this framework is particularly useful for unpacking the complex political power of global corporations and their entanglement with other actors. The three faces of power framework can therefore be embedded within food regime analysis to help unpack how actors, such as corporations, wield power and influence in the food system, rather than simply the outcomes of these actions.

Clapp and Fuchs (2009) define instrumental power by drawing on Dahl’s (1957) relational view of power, where one actor has ‘power over’ another to make them do something they would not otherwise do. Examples among non-state actors include lobbying or political campaign financing; financial, organizational, and human resources; and access to decision-makers.

Structural power demonstrates how non-state actors can influence the political process by pre-determining options for decision makers. This agenda-setting power draws from the work of Bachrach and Baratz (1962) on how power can manifest through indirect influence, such as determining who is involved in governance, and what options are considered more or less acceptable. Clapp and Fuchs (2009) note how the increasing instrumental power of corporate actors, paired with the patterns of globalization and neoliberalism which withdrew state-based regulation, has shifted authority from public to private hands. This allows corporations to not only influence decision-making activities via instrumental means, but also to make the decisions themselves, such as through private standards and regulatory bodies. Thereby determining the structure, or the ‘rules of the game’, for their supply chain or industry (Mikler, 2018).

The third face of power, discursive power, goes further to explore what pre-exists decisions and non-decisions (Clapp & Fuchs, 2009). Per Lukes (1974), discursive power encompasses how an actor can influence the ideas, desires, and norms of another so that they act in the interest of the more powerful actor. There is increasing acknowledgement that policy and governance decisions are made through the context of discursive contests and framings (Dryzek, 2013). By shaping the interests of others, powerful actors do not then need to use more overt measures. Discursive power can also enhance the legitimacy of an actor’s instrumental and structural power which can then strengthen it in turn (Mikler, 2018).

It is important to acknowledge that while this framework separates out these faces of power for analytical purposes, in reality they overlap, interact, and even enhance one another (Mikler, 2018). However, considering each separately holds important explanatory value, and applying Clapp and Fuchs (2009) power framework within food regime theory can highlight how non-state actors utilize these different types of power within the regime. This paper therefore applies this framework to build on the empirical literature in food regime theory by considering

the ways in which corporations are enacting power through their involvement in the RA movement.

Regenerative agriculture

RA was chosen as the case study in this analysis for three reasons: (1) RA is a social movement countering the norms of extractivism and productivism that dominate agriculture production under the current food regime (Gordon et al., 2023), (2) corporate actors have been accused of using the RA label for greenwashing (Cusworth et al., 2022; Civil Eats, 2019), and (3) the RA movement originated from, and is largely contained within, the Global North (primarily settler state countries) (Bless et al., 2023). This differentiates it from sustainable agriculture movements in the Global South such as agroecology, which have already been studied extensively in food regime literature (Anderson et al., 2021; Holt-Giménez & Shattuck, 2011; Levidow, 2015; McMichael, 2013; Tilzey, 2024). Exploring how corporate actors might co-opt a Global North movement that ostensibly opposes industrial agriculture, is therefore an important contribution to the food regime literature which currently lacks sufficient analysis of non-state actor dynamics outside of the Global South (Roche, 2012).

The definition for RA is still a matter of debate, but typically it is considered as agriculture which aims to rejuvenate landscapes and farms via the enhancement of ecosystem processes including water, nutrient, and carbon cycles through practices such as minimizing soil disturbance, integrating livestock, maximizing soil cover, rotational grazing, and lowering external inputs. Occasionally, definitions of RA also include social elements such as restoring the health of communities and farmers (Newton et al., 2020).

Coined by organic farming organization, the Rodale Institute, in the late 1970s, RA remained a fringe concept until around 2015 and awareness of the movement has grown exponentially ever since (Gordon et al., 2023). What is notable in the rise of RA is the increasing use of the term by agri-food corporations. As will be demonstrated in this paper, some of the world's largest and most powerful corporations have been positioning themselves as key players in the movement.

While concerns regarding corporate co-optation and dilution of RA's transformative potential have been raised (Bless et al., 2023; Cusworth et al., 2022; Gordon et al., 2023), there is to date no systematic assessment of which corporations are involved in RA, how they are involved, or what the implications might be.

Given the relative infancy of the RA movement, particularly its unsettled definition and questions regarding its transformative potential for the food system, this makes it a relevant case study for the third food regime. In particular, a more in-depth exploration of how well corporate involvement in RA supports Friedmann's theorization of a CEFR.

As such, this paper contributes both to the ongoing theoretical debate regarding the third food regime and the political economy of the food system, whilst providing empirical analysis of corporate involvement in RA.

Method

Empirical data for this paper was gathered via a desktop analysis which identified the different agri-food companies involved in RA. Using the web scraping tool Talkwalker, online mentions of 'regenerative agriculture' or 'regen ag' by agri-food companies within the study period of February

2021 – July 2023 were collected to identify cases for analysis. Talkwalker is a free and publicly available online monitoring service which notifies users of the mention of specified terms online, including web pages, news articles, forums and blogs, and X (formerly Twitter) (Talkwalker, 2023). Alerts were received on a weekly basis during the study period and reviewed for any mention of an agri-food company establishing or referring to a RA program or policy. To contain the scope of this study within corporate actors who wield substantial power, only multi-national agri-food companies with an annual revenue of over US\$10 billion in 2020 and an active RA policy or program were included. In total, 21 companies were identified for the analysis (see Table 1).

Using guidance provided by Clapp and Fuchs' (2009) three faces of power framework the selected corporations were each separately analysed to determine their instrumental power, including economic wealth, disclosed investment in RA programs, and any evident lobbying activity; their structural power, being their market share, any supply chain targets or policies related to RA, and private governance initiatives; and their discursive power, through a content analysis of their definitions of RA, documenting partnerships with non-governmental organizations as part of their RA programs, and any other indications of their involvement in the promotion of RA, such as through public events.

Rich friends with deep pockets: instrumental power in the regenerative agriculture movement

The companies who are supporting RA hold substantial material wealth (see Table 1), and therefore substantial instrumental power capacity. Taken together, their annual revenue in 2020 was US \$1.646 trillion, or 1.9% of global GDP (The World Bank, 2023). In terms of investment in RA, the data available indicates that these companies are spending significant capital in aligning themselves with the RA movement. Eleven of the 21 companies identified have disclosed an investment or commitment to invest in RA, ranging from US\$2 million to US\$2 billion. The total investment committed up to July 2023 was US\$3.919 billion, with the majority of this spend being from seven corporations: Syngenta, Nestlé, PepsiCo, Unilever, JBS, Walmart, and Danone (see Table 1).

The largest of these investment commitments is by Syngenta who, as one of the world's biggest agrochemical producers (Clapp & Purugganan, 2020), has set a target to reduce the carbon intensity of its operations by 50% by 2030 (Syngenta, 2020). Part of this commitment includes a US\$2 billion investment over five years towards Syngenta's 'good growth plan', which aims to 'increase agricultural productivity in a sustainable and responsible way to advance regenerative agriculture' (Syngenta Group, 2020). This investment is likely motivated by the increasing pressure on the agriculture industry to reduce the emissions that come from fertilizer use, namely in the form of nitrous oxide (De Schutter, 2017). Similarly, other companies investing in RA, such as Unilever (2024) and General Mills (2024), are also focussed on reducing emissions from fertilizer applications.

However, reducing agricultural emissions is not the primary focus of RA investments by the corporations analysed. Instead, these companies appear to see more potential in soil carbon sequestration via RA as a means to offset their supply chain emissions. There have been numerous claims and suggestions that RA practices can increase the capture and retention of carbon in the soil and offset emissions, some have even suggested that RA could 'solve' climate change through this soil carbon sequestration (Civil Eats, 2020). Despite limited evidence that soil carbon sequestration can meet this potential (Moinet et al., 2023), these corporations are making these investments regardless.

Table 1. Companies with regenerative agriculture programs or policies selected for analysis (See Supplementary Material for data sources).

Name	Industry	Headquarters	2020 revenue (US\$ billion)	Market share	Disclosed investment in regenerative agriculture (US\$ million)	Member of One Planet Business for Biodiversity? (Y/N)	Provided definition of regenerative agriculture? (Y/N)
Walmart	Food and apparel retailer	USA	\$559.2bn	World's largest company by revenue	\$60.0mn ^a	N	Y
Amazon	Food and apparel retailer	USA	\$386.1bn	World's largest online retailer	NDA	N	Y
Cargill	Food producer, trader and processor	USA	\$134.4bn	Top three global meat packers 73% of global grain trade Largest private company in the US	NDA	N	Y
Nestlé	Food manufacturer	Switzerland	\$92.2bn	World's largest food and beverage company World's 7th largest confectionary company	\$1,300.0mn	Y	Y
PepsiCo	Food manufacturer	USA	\$70.2bn	World's 2nd largest food and beverage company	\$276.0mn ^a	Y	Y
Unilever	Food manufacturer	UK	\$57.8bn	World's 4th largest consumer goods company	\$104.8mn	Y	Y
JBS	Food processor	Brazil	\$50.9bn	World's largest meat processor	\$100.0mn	N	N
Bayer	Agriculture chemical inputs and seeds	Germany	\$47.3bn	19% of global agriculture input market (seed and chemical)	NDA	N	Y
Mars Inc.	Food manufacturer	USA	\$40.0bn	World's largest confectionary company	NDA	Y	N
Danone	Food producer and manufacturer	France	\$26.9bn	World's largest dairy and plant-based products company	\$57.1mn	Y	Y
Mondelez	Food manufacturer	USA	\$26.6bn	World's 3rd largest confectionary company	NDA	Y	N

Syngenta Group	Agriculture chemical inputs and seeds	Switzerland	\$23.1bn	19.6% of global crop protection market	\$2,000.0mn	N	Y
McDonalds	Food retailer	USA	\$18.9bn	World's largest fast-food chain	\$8.2mn	N	N
General Mills	Food manufacturer	USA	\$17.6bn	World's 23rd largest FMCG company	\$7.3mn	N	Y
Diageo	Beverage producer	UK	\$15.7bn	25% of global premium spirits market	NDA	Y	Y
Kering Group	Apparel manufacturer and retailer	France	\$14.9bn	World's 4th largest luxury goods group	\$3.7mn	Y	Y
Fonterra	Food producer	New Zealand	\$14.2bn	World's 6th largest dairy company	NDA	N	N
Kellogg's	Food manufacturer	USA	\$13.8bn	13% of global breakfast cereal market	\$2.0mn	N	N
Friesland-Campina	Food producer	The Netherlands	\$12.6bn	World's 8th largest dairy company	NDA	Y	N
Arla Foods	Food producer	Denmark	\$12.0bn	World's 9th largest dairy company in the world	NDA	Y	Y
Yara International	Agriculture chemical inputs and seeds	Norway	\$11.6bn	23.3% of agriculture fertilizers market	NDA	Y	Y
NDA: No data available		Total	\$1,646.1bn		\$3,919.1mn		

^a Joint investment of US\$120 million between PepsiCo and Walmart.

For instance, as the world's largest meat producer, JBS has committed to achieving net-zero by 2040 (JBS Foods, 2021), and is investing in RA as part of this goal. It has pledged an investment of US\$100 million by 2030 for research that will support producer efforts to strengthen and scale regenerative farming practices via soil carbon programs (JBS Foods, 2021). Similarly, PepsiCo (2023), Nestlé (2021a), Walmart (2023), Danone (2023), McDonald's (2020), General Mills (2024), and Kellogg's (2024) are all targeting their RA investments towards soil carbon 'restoration' as an avenue to reach their net-zero targets.

In addition to these individual commitments, some of the companies analysed are also co-investing in RA programs. PepsiCo and Walmart have made a joint US\$120 million investment to support the uptake of RA across two million acres of farmland over seven years. With the aim to achieve four million metric tons of greenhouse gas emission reduction and removal by 2030 (Walmart, 2023). Similarly, Cargill and Nestlé are partnering to reduce the carbon footprint of Purina's US grain supply from Cargill by up to 40% over the next three years, with an RA program reaching over 200,000 acres (Cargill, 2024). Cargill has also partnered with McDonald's and Target through a joint US\$8.5 million investment to support the implementation of RA practices across 100,000 acres of corn cropland. This is in addition to a US\$1.6 million commitment with McDonald's, Cargill, and Walmart to support ranchers implementing regenerative grazing practices across one million acres in the Northern Great Plains (McDonald's, 2020).

Corporate investment in RA is therefore occurring throughout the food system, including from some of the world's largest food manufacturers, seed and agro-chemical input suppliers, and producers and processors. These corporations are also collaborating in their efforts, combining investments and targets to help meet their net zero commitments. However, while these private investments in climate mitigation and farmland regeneration are promising, there is little clarity as to how these targets and efforts relate to state-based mitigation policies or avoid double-counting (Kreibich & Hermwile, 2021). Similarly, there remain questions regarding the validity of soil carbon sequestration as a mitigation method due to additionality, leakage, and permanence concerns (Moinet et al., 2023) which these companies seem intent to disregard in order to maintain their net-zero targets (Carbon Market Watch, 2022).

Agri-food corporations are also wielding their instrumental power in RA via lobbying. For instance, the CEO of Syngenta Group, Erik Fyrwald, wrote an op-ed for CNBC calling on the Biden administration to 'look to regenerative agriculture' to help advance climate action. Fyrwald (2021) describes a 'truly sustainable future of farming', comprised of RA and driven by enhanced soil health and digital technologies or 'precision tools'. It is likely no coincidence that Syngenta has also been rapidly expanding its digital agriculture arm, with claims that it is the only company with access to the leading farm management platforms in the world's largest agriculture markets. These platforms already manage approximately 28 million hectares of farmland (Prause et al., 2021) and would likely expand with the growth of RA practices such as no-or minimal-tillage that require more advanced technologies for large-scale production (Bless et al., 2023). Similarly, another major agrochemical and inputs supplier included in this analysis, Bayer, has established its own 'sustainable agriculture platform' ForGround, which provides farmers with tools and resources to implement RA practices and integrate with Bayer's Climate FieldView digital farm management platform and the Bayer Carbon Program (Bayer, 2022).

There has also been evidence that companies including Tyson and Cargill are pointing to the potential benefits of RA as reason to avoid the implementation of climate and other environmental policies for the agriculture sector (The Guardian, 2023). They have historically invested heavily in lobbying on environmental issues, an estimated US\$46.5 million from 2001 to 2021 with 290

lobbying reports between them (Lazarus et al., 2021). Most recently, the World Business Council for Sustainable Development (WBCSD), of whom a majority of the companies analysed are a member, launched the COP28 Action Agenda on Regenerative Landscapes, which aims to ‘accelerate public-private collaborations’ and ‘amplify existing efforts and new commitments to transition large agricultural landscapes to regenerative landscapes by 2030’ (WBCSD, 2023). These actions being taken by groups such as WBCSD at COP28 are also an example of the increasing structural power multi-national corporations are coming to possess in terms of private authority and governance.

Invoking structural power: setting the agenda for scaling regenerative agriculture up and out

By virtue of their size and market share (see Table 1), agri-food corporations have a structural advantage over other actors when it comes to the RA movement. Each of the companies analysed are dominant in their respective industries, and the scale of their supply chains means any rules, policies, or targets they set will impact a vast network of suppliers. Many of whom are from the Global South and are likely small-scale farmers, who already struggle to make a living wage (McMichael, 2021). Clapp and Fuchs (2009) describe how corporate concentration can limit the political power and decision-making ability of states. Likewise, the dominance of these corporations also means that farmers and other supply chain actors have little choice when it comes to compliance with targets such as those being set for RA.

Of the 21 companies analysed, 11 have set supply chain targets as part of their RA programs (see Table 2). For instance, Nestlé has committed to investing US\$1.3 billion by 2025 to contribute to building RA practices in their supply chain, which covers 500,000 producers and 150,000 suppliers (Nestlé, 2021a). Nestlé has set a target to source 20% of their key ingredients through RA by 2025 and 50% by 2030 (Nestlé, 2021b). Similarly, PepsiCo has also committed to driving the adoption of RA across 7 million acres by 2030, and Walmart is hoping that RA can support its goal to ‘protect, restore, or more sustainably manage’ 50 million acres of land by 2030 (Walmart, 2023).

While these companies may be providing some support for producers to transition to regenerative practices (Food Dive, 2021), it is unlikely that this will reach all suppliers. If Nestlé were to evenly distribute its pledged US\$1.3 billion investment across its 500,000 producers, each farm

Table 2. Companies included in the analysis who have specified a target for the implementation of regenerative agriculture practices or sourcing in their supply chain and a summary of their stated goal (See Supplementary Material for data sources).

Company	Target
Walmart	Protect, manage or restore at least 50 million acres of land by 2030.
Cargill	Advance regenerative agriculture practices across 10 million acres of North American row crop farmland by 2030.
Nestlé	Source 20% of key ingredients through regenerative agriculture by 2025, and 50% by 2030.
PepsiCo	Spread regenerative farming practices across 7 million acres by 2030.
Unilever	Protect and regenerate 1.5 million hectares of land, forests and oceans by 2030.
Danone	Sourcing 100% of ingredients produced in France from regenerative agriculture by 2025.
General Mills	Advance regenerative agriculture on 1 million acres of farmland by 2030.
Diageo	Doubling the number of farmers trained on regenerative agriculture in Africa, Latin America, North America, Asia and Europe, supporting 150,000 smallholder farmers by 2030.
Kering Group	Transform 1 million hectares of farms and landscapes to regenerative agriculture by 2025.
Kellogg’s	Reach 1 million farmers and workers through regenerative agriculture program by 2030.
FrieslandCampina	Fully regenerative farming system in the supply chain by 2050.

business would only receive US\$2,600. Regenerative practices in cropping have been demonstrated to lead to lower yields whilst requiring sophisticated machinery such as direct drilling technologies (LaCanne & Lundgren, 2018). It is unlikely that these costs will be sufficiently offset by Nestlé's pledged funds. However, with the increasing domination of these agri-food corporations in the market, and with overlapping commitments from companies across different stages of the supply chain (see Table 2), farmers have few alternatives if the cost of transitioning to regenerative practices, a process which can take five to fifteen years (O'Donoghue et al., 2022), is too great.

This challenge echoes a history of farmers bearing the financial burden of practice changes to suit supply chain demands. For instance, in the case of targets and commitments around sustainable palm oil production smallholder and independent farmers in developing nations have been priced out of markets due to insufficient support to achieve certifications or shift their production. These sustainability initiatives therefore further embedded power inequities in the food system (Ruyschaert et al., 2019).

Clapp and Fuchs (2009) also note how the structural power of multi-national corporations is evolving beyond influencing decision-making through material means, to being 'in a position to make governance decisions themselves' (p. 9). Mikler (2018) likewise observes the way in which multi-national corporations are enacting private authority through a range of informal norms and practices and more formal mechanisms that border on the authoritative power typically wielded by sovereign states. Corporations utilize private governance as a tool to legitimize their power, as they 'take responsibility' for themselves rather than being governed by states or anyone else.

A key example of private authority in RA is the One Planet Business for Biodiversity (OP2B) group (supported by the WBCSD), which was launched at the United Nation's Climate Action Summit in 2019. OP2B is a coalition of agri-food corporations focused on three action areas: scaling up RA practices, enhancing biodiversity, and protecting high-value ecosystems (OP2B, 2019). Its members include many of the corporations in this study (see Table 1), as well as other notable members such as Ikea, Microsoft, and BCG (OP2B, 2023). The establishment of OP2B also points to a degree of coordination between these corporations in how they would like to shape the future of the RA movement. Acting not only as individual entities with their own corporate social responsibility programs, but in collaboration with one another through a form of private governance (Mikler, 2018).

An example of this coordination and governance behaviour is the establishment of the OP2B's 'Regenerative Agriculture Framework' (the Framework, OP2B, 2021). Acknowledging the confusion and ongoing debate around the term 'regenerative agriculture', OP2B members established the Framework, with a set of objectives deemed most relevant for scaling up RA across their supply chains and agreed metrics for evaluating their RA programs. Although the Framework indicates some positive steps towards accountability for the targets that companies are committing to in their supply chain, it is also an example of how business groups like to write the rules before anyone else can. While discussion among farmers and farming groups is ongoing as to how to define or whether or not to try and measure RA outcomes (Newton et al., 2020), OP2B has set its own parameters, goals, and areas of focus that will have repercussions along supply chains.

The agenda-setting capacity of these agri-food corporations is also seen in traditionally inter-governmental forums, and many authors have noted the increasing dominance of corporations in international governance organizations such as the United Nations (Seitz & Martens, 2017). This is also the case in food system governance, where corporations are seemingly given equal footing with states in determining what issues are discussed and how. A recent example is the UN Food

Systems Summit 2021, which was denounced by many as ‘an effort by a powerful alliance of multinational corporations, philanthropies, and export-oriented countries to subvert multilateral institutions of food governance and capture the global narrative of “food systems transformation”’ (Canfield et al., 2021, p. 1). The establishment of the COP28 Action Agenda on Regenerative Landscapes by the WBCSD at COP28 (WBCSD, 2023) is another example of the increasing influence of private interests in intergovernmental food system governance, limiting interrogation of the structural drivers of food system challenges.

While corporate support for RA may broaden the movement’s reach, the involvement of corporations in governance activities surrounding RA also supports another form of their influence in the movement, discursive power. That is, the ways in which RA is discussed and thought about, and the legitimacy of corporate influence in RA.

Discursive power: setting the parameters of regenerative agriculture

Discursive power can help avoid the need for more overt or aggressive means of achieving desired goals, and it also allows corporations to legitimize their dominance of the global economic system. To do so, they undertake what many would describe as ‘greenwashing’ whereby these corporate actors adopt the terms and ideas of environmental movements to paint themselves as essential supporters of sustainability (Dahmann et al., 2019). In the global food system, it appears that RA is one of the new discourses corporations are adopting for this purpose. Since the definition for RA remains debated, agri-food corporations can infiltrate the discussion with their own interpretations and spread these ideas through structural and instrumental mechanisms.

Of the companies analysed, 14 have published their preferred definition of RA (see Table 1). The definitions have some variety, and there are areas of alignment and divergence between them and those of academics and farmers. In Table 3 I compare the results of a systematic review of RA definitions from practitioners and academia conducted by Newton et al. (2020) with those of the corporations analysed. This comparison highlights how corporations and farmers are more aligned than with researchers on the practices and outcomes of RA. Although, the companies analysed were

Table 3. Definitions of regenerative agriculture, comparison of results from Newton et al. (2020) and the corporations analysed for this study (% of source authors/organizations analysed which include outcome or practice in definition).

Outcomes	Newton et al. (2020) (journal articles, practitioner websites)	Corporations analysed
Improve soil health	41%, 86%	79%
Sequester carbon	17%, 64%	50%
Increase biodiversity	17%, 46%	71%
Improve water resources	15%, 46%	64%
Improve the social and/or economic wellbeing of communities	17%, 41%	50%
Practices	Newton et al. (2020) (journal articles, practitioner websites)	Corporations analysed
No or low external inputs	26%, 31%	29%
Integration of livestock	19%, 41%	29%
Cover crops	8%, 31%	36%
No- or minimal-tillage	12%, 41%	50%
Maximize soil cover	5%, 18.2%	29%
Crop diversity	9%, 14%	29%

divided in terms of their emphasis on reducing external inputs. Those that did include this in their definition were typically food processing or apparel companies (like Nestlé and Kering), rather than those that produce food or inputs (such as Syngenta, Bayer, Cargill, or General Mills) who instead emphasise no- or minimal-tillage.

While an alignment between farmer and corporate definitions of RA seems promising, it is difficult to ascertain the extent to which farmer perspectives have been influenced by the discursive power of corporations. News and media mentions of RA have prominently featured corporate-led discourse. A search of the ProQuest database for news mentions from January 2014 to September 2023 of ‘regenerative agriculture’ or ‘regenerative farming’ and the companies analysed returned 674 results. In comparison, news mentions with ‘farmer’ yielded 2002 results. This demonstrates the scale of corporate discourse, even by only these 21 companies, in the RA movement.

Furthermore, it is one thing for corporations to nominally support RA, it is another for this support to be implemented. As with other cases of corporate social responsibility (Dahmann et al., 2019), it is often difficult to determine the extent to which corporations are following through on their RA commitments. These programs are not regulated or overseen by independent bodies, and the question remains as to what motivation these corporations have for pursuing RA beyond greenwashing. It is pertinent to remember that many of the corporations included in this analysis have been key players in developing and growing the industrial and extractivist food system that RA is supposed to be counter to (Clapp & Scrinis, 2016).

For example, Bayer, Syngenta, Yara International, and their subsidiaries, are some of the world’s largest agrochemical producers (see Table 1). Since 2006, honeybee populations have declined by 29–36% annually and bird populations have reduced by 20–25% since pre-agricultural times, largely due to the application of pesticides sold by these companies (Mahmood et al., 2016). Monsanto, now incorporated into Bayer, also developed and distributes infamous herbicides such as Round-Up, which has been attributed to cancer risk in its users (Chang et al., 2023) and severely damaging ecosystems both on and off-farm (Kanissery et al., 2019). It could therefore be argued that these agrochemical companies have made commitments to reduce their greenhouse gas emissions via RA (Bayer, 2023; Syngenta, 2020; Yara International, 2023) to distract from the impacts their products have caused. However, their definitions of RA do not include the reduction of synthetic or other inputs, rather they emphasize the use of no- or minimal-till cropping techniques. Advocating for RA could therefore also support their growing share in the growing digital agriculture arm of these companies, as ‘precision’ agriculture for no-or minimal-till cropping continues to grow as a lucrative market (Duncan et al., 2021).

Turning to another sector, as two of the world’s largest meat processors (see Table 1), Cargill, JBS and their subsidiaries have perfected the concentrated animal feeding operation and the provision of cheap meat and value-added meat products for mass consumption. They are likewise under pressure to reduce emissions in their supply chain, and RA with its promises around soil carbon sequestration and the emphasis on integration of livestock to achieve it offers an ideal framing to legitimize the ongoing large-scale production of meat (Béné & Lundy, 2023). As Heather Tansey, sustainability director at Cargill, stated, ‘We, at our core, believe cattle can be a force for good when it comes to climate change. Cattle can play a really critical role in North American contexts of helping to preserve nature and ecosystems’ (GreenBiz, 2021). This positioning of cattle as champions of climate action (Cusworth et al., 2022) is also shared by Danone, Fonterra, Friesland-Campina, and Arla Foods as some of the world’s largest dairy producers (for example, see Fonterra, 2022).

Likewise, Nestlé, Unilever, PepsiCo, Mars Inc., General Mills, Kellogg's, McDonalds, and Mondelez also share a desire to enhance their reputation in light of the ongoing critique of their food system impacts. Their production and promotion of ultra-processed foods has caused malnutrition in nations that are otherwise food secure (Clapp & Scrinis, 2016). These foods are addictive, lacking in nutritional quality, and are associated with higher rates of cardiovascular disease, type-2 diabetes, and cancer (Elizabeth et al., 2020). Any means by which these companies can regain some improvement in their public image, such as supporting RA, is therefore of benefit.

It is also important to note that the cropping systems labelled as 'regenerative' by the companies analysed, that is, ones that use cover crops, minimize tillage, and maximize soil cover (also known as 'conservation agriculture'), are already prolific across many of the Global North's biggest farming economies. It is estimated that up to 90% of Australia's cropping systems in some regions are managed using conservation agriculture (Bless et al., 2023). This makes it simple for these companies to claim that a proportion of their products are made using RA. These cropping systems also rely on many of the precision agriculture technologies being developed and sold by Bayer and Syngenta (Duncan et al., 2021). It is likely this technological and digital revolution in cropping will sweep from the Global North across the Global South, offering new markets for these corporations, and a neat solution for food manufacturing companies wanting to label their product as 'regenerative'.

Discursive power can also be gained through the 'halo effect' of a less well-regarded actor aligning themselves with one who benefits from a more positive social perception, thereby improving their own legitimacy and social regard (Bianchi et al., 2021). One example is the partnerships between corporations and respected non-government organizations (NGOs) (Baur & Schmitz, 2012). Of the corporations analysed, Amazon, Nestlé, Syngenta, McDonald's, Cargill, and Kellogg's have all partnered with the Nature Conservancy in their RA initiatives. Meanwhile, WWF has partnered with PepsiCo, Danone, and FrieslandCampina, and Conservation International with Kering Group (see Supplementary Material for data sources). Alignment with these NGOs helps increase the perceived legitimacy of these companies' RA programs and in food system governance more broadly.

Another way corporations are positioning themselves as discursive leaders in the RA movement and are coordinating their efforts is through RA events. As explained by Pascal Chapot, Group Head of Sustainable Agriculture Development at Nestlé: 'We need to speak one voice. We're looking for a transformation for a food system impact. So, there is no way one company alone or one player alone can address it and achieve it' (Kisaco Research, 2023). The event Chapot was speaking at was the Regenerative Agriculture and Food Systems Summit, which was hosted for the first time in Amsterdam in August 2022. The event drew hundreds of business representatives, farmers, and academics, and its platinum sponsors included Nestlé and Syngenta. In spite of protests labelling the event as greenwashing (AgFunder News, 2022), two more summits were held again in 2023, one in Chicago and another in Amsterdam. Platinum sponsors for the Amsterdam conference expanded to include Cargill and Unilever alongside Nestlé, with OP2B as a gold sponsor. Speakers at these events are largely from major agri-food companies, joined by some farmers and a few academics, with no government or political representatives (Kisaco Research, 2023).

By harnessing the RA discourse, corporations are positioning themselves as leaders within the movement. They seek to legitimize their role in determining how RA is understood and their preferred path for its future growth, by capitalizing upon definitional uncertainty and partnering with more well-regarded actors such as environmental NGOs. While there is some alignment between farmer and corporate perspectives on RA, when it comes to taking concrete steps to address issues

of environmental degradation, malnutrition, and social inequity in the food system, the corporate discourse around RA has many of the hallmarks of greenwashing.

Regenerative agriculture and the corporate environmental food regime

This three faces of power analysis of corporate involvement in RA clearly documents how the patterns of the CEFR described by Friedmann (2005) are alive and well. Some of the world's largest corporations have found in RA a preferred discourse to legitimize their ongoing power and influence in the global food system. The companies analysed have positioned themselves as key players in the RA movement, investing capital beyond the means of any farming organization (and many governments) and setting targets that impact global supply chains. They have co-opted the RA discourse as a means to repent for (or disguise) their impacts on humans and the environment, and to frame themselves as legitimate actors in both the RA movement and global food system governance.

While the food regime theory approach is somewhat out of vogue in the current political economy literature on food systems, the findings of this paper demonstrate that many of its premises remain relevant to today's context. However, more recent developments, such as those outlined in this paper, demand further refinement of the theory. For instance, Friedmann's (2005) description of the CEFR was largely focussed on the ways in which agri-food retailers co-opt social and environmental movements to cement their position of power and sell premium products to Global North consumers. What the analysis in this paper makes clear is that it is not only agri-food retailers adopting this tactic, but also food processors, producers, and agricultural-input suppliers. For food processors, like Nestlé and Unilever, RA offers a useful label for drawing broad brushstrokes of sustainability over products and supply chains and framing themselves as facilitators of broadscale environmental regeneration. For food producing companies, such as Cargill, JBS, and Danone, RA presents an opportunity to reframe emissions-intensive animal agriculture as a tool for climate mitigation. Likewise, agrochemical producers such as Syngenta and Bayer are promoting RA as a means to help reduce fertilizer emissions and to stimulate the growth of the precision agriculture industry which they are set to capitalize upon.

As this analysis shows, the CEFR is therefore not simply about achieving a price premium or staving off critique through greenwashing. It is also, or indeed first and foremost, a mechanism to further the infiltration of private interests into global food system governance via instrumental, structural, and discursive means, and to open up new industries and economic opportunities for the ongoing spread of corporate concentration.

McMichael's (2000) conceptualization of the CFR as a food system dominated by private interests also reflects the results of this analysis. However, McMichael (2013) continues to tie the power of these corporations back to their home states. Like Mikler (2018) and Pritchard et al. (2016), McMichael highlights how state and private interests are intertwined, and these corporations can be seen as tools for maintaining the dominance of powerful states who likewise rely upon them. While this dynamic of state-corporate relations may exist, it cannot explain the involvement of corporations in RA as the movement has only minimal direct support from governments. Instead, there is a sense in the RA movement that governments are curtailing RA's spread (Bless et al., 2024; Wilson et al., 2022). Funding and support for RA remains firmly in the private sector. The CFR's explanatory power is therefore limited here due to its state-centric approach, which fails to consider corporations as discrete actors or adequately explain their activities within the Global North where RA remains based.

There is a need for food regime theory to capture the duplicity of powerful actors, how they might cause negative impacts for humans and the environment on the one hand, whilst seemingly adopting better policies and practices on the other. While Campbell's (2009) conceptualization of 'food from somewhere' versus 'food from nowhere' highlights this duplicity, what the findings of this paper, and Friedmann's (2016) work, emphasize is that the 'food from somewhere' trend is not just a response to consumer demand, but also a tool for legitimizing the dominance and power of corporations in the food system.

RA therefore exemplifies an ongoing pattern of 'green capitalism',

a shift in rules of economic activity so that profits are renewed through less depletion of resources (which can mean lower raw material costs), less pollution (which can create demand for new technologies), and selling products that are culturally defined as environmentally superior. (Friedmann, 2005, p. 230)

In addition, as Campbell (2009) and McMichael (2013) highlight, green capitalism also functions in parallel with ongoing patterns of extraction and wealth/health disparity between the Global North and South and affluent and poor consumers and growers.

In the nearly two decades since Friedmann (2005) conceptualized the CEFR, it does not appear that there has been a change in these patterns. Rather, the dominance of corporations in the food system is only increasing, as they further embed themselves in food system governance and widen the gap between public and private authority. As such, RA and its corporate benefactors appear to be further reinforcing the political-economic dynamics of the CEFR.

Conclusion

In this paper, I have explored the case study of corporate involvement in the RA movement and where it is situated in academic debate on the third food regime. Using a three faces of power framework, the analysis demonstrates how some of the world's largest corporations are investing in RA, setting targets across their vast supply chains, and co-opting the discourse of RA to enhance their own legitimacy.

This co-optation of the farmer-led RA movement via instrumental, structural, and discursive means, is evidence of the spread of green capitalism under the CEFR (Friedmann, 2005). The involvement of corporations in the RA movement could be seen as a positive step, given the absence of government interest or investment in RA (Bless et al., 2024). However, the support for RA by the corporations analysed does not mean that they no longer have a negative impact on people and the environment, namely within the Global South. Rather, these corporations walk the dialectical line posited by Campbell (2009) that defines the third food regime; supporting the production of both ethically superior foodstuffs for affluent consumers whilst also driving the ongoing consumption of cheap, unhealthy, and ultra-processed foods for those consumers who cannot afford or access other alternatives. However, as suggested by Friedmann (2005), within this duality is also a desire to legitimize private authority and power in the food system. A trend that remains a central and enduring feature of the third food regime, undermining transparency, inclusivity, and fairness in food system governance and distracting attention away from actions to hold these corporations accountable for their social and environmental impacts (IPES-Food, 2023).

This paper therefore echoes the findings of others on the political economy of food systems, that corporate power and interests remain an obstacle to achieving sustainability outcomes (Béné, 2022; Baker et al., 2021). This power dynamic is especially important considering the growing trend

towards multi-stakeholder governance of the global food system, and a lack of government action (Canfield et al., 2021). Likewise, social movements calling for the transformation of the food system towards a more sustainable pathway, such as RA, must be wary of their movement being co-opted by actors who wish to maintain the status quo (De Schutter, 2017). Particularly when that co-optation is pushing the discourse in favour of technological, rather than structural, solutions to food system sustainability (Anderson & Leach, 2019). Instead, these movements could consider building a stronger grassroots coalition with each other and with consumers to collectively shift the focus of food system governance towards more transformative socio-economic aims and reinvigorate government action (Béné, 2022; De Schutter, 2017).

These challenges also highlight the need for an ongoing critical research agenda on corporate power and accountability in the global food system. This agenda should focus on understanding and monitoring the activities of agri-food corporations more broadly as they navigate an increasingly degraded natural environment, hostility from counter social movements, and the normalization of private influence in food system governance. In particular, future research could explore the degree to which there is evidence of coordination and collaboration between these corporations and the extent to which they meet the social and environmental commitments they make. For if it is corporations, as opposed to governments, who seem set to invest and lead transformative shifts in food production and consumption, then accountability will be more important than ever.

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