# POWER CONCENTRATION IN THE GLOBAL FOOD SYSTEM



AND THE THREAT OF BIG DATA



Mobilize resist transform

POWER CONCENTRATION IN THE GLOBAL FOOD SYSTEM

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friends of the earth international APRIL | 2019

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**OUR VISION** IS OF A PEACEFUL AND SUSTAINABLE WORLD BASED ON SOCIETIES LIVING IN HARMONY WITH NATURE. WE ENVISION A SOCIETY OF INTERDEPENDENT PEOPLE LIVING IN DIGNITY, WHOLENESS AND FULFILMENT IN WHICH EQUITY AND HUMAN AND PEOPLES' RIGHTS ARE REALIZED. THIS WILL BE A SOCIETY BUILT UPON PEOPLES' SOVEREIGNTY AND PARTICIPATION. IT WILL BE FOUNDED ON SOCIAL, ECONOMIC, GENDER AND ENVIRONMENTAL JUSTICE AND BE FREE FROM ALL FORMS OF DOMINATION AND EXPLOITATION, SUCH AS NEOLIBERALISM, CORPORATE GLOBALIZATION, NEO-COLONIALISM AND MILITARISM. WE BELIEVE THAT OUR CHILDREN'S FUTURE WILL BE BETTER BECAUSE OF WHAT WE DO.

Lead Author: Camiel Donicie. Acknowledgments: This briefing was published in April 2019 as part of the 'Who Benefits?' series, with financial support from Bread for the World (Brot für die Welt). The opinions and views expressed herein are the sole responsibility of Friends of the Earth International. Design: www.onehemisphere.se.

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#### FOEI FOOD SOVEREIGNT

# POWER CONCENTRATION IN THE GLOBAL FOOD SYSTEM AND THE THREAT OF BIG DATA



Mega-mergers and acquisitions have led to an unprecedented concentration of power across the industrial food chain. The food sovereignty of hundreds of millions of people is at stake, and things are likely to take a turn for the worse with the introduction of new technologies and Big Data in agri-food production, distribution and retail.

A small group of agri-food giants now controls major chunks of the industrial food chain, ranging from the production of fertilizers, pesticides, livestock genetics and farming machinery to the distribution of agro-commodities, food processing and retail. While mergers and acquisitions in the food system are by no means new, until recently these deals were largely struck between corporations operating in the same sector. Now they also connect different sectors across the whole value chain, strengthening control of the big players over what is produced and consumed, under which conditions, and at what price. (IPES-Food, 2017)

A striking example of this 'vertical integration' is the melting together of agrochemicals and seeds producers. Following the 2017-2018 mega-mergers, just four companies now control two thirds of corporate seed sales worldwide, while four companies control about 70 percent of global agrochemical sales. Three

companies figure in both top four lists: Bayer (including Monsanto), Corteva Agriscience (formerly DowDuPont) and Syngenta (owned by ChemChina). (ETC Group, 2018a)

These oligopolies strongly reinforce the model of industrial food production and aggravate its social and environmental consequences, felt first and foremost by small-scale farmers, indigenous peoples, fisher folk and pastoralists all over the world. Spurred by an ever-growing appetite for natural resources, the corporations and investors behind the industrial food system deny them their right to food and livelihoods by grabbing and polluting their lands, fisheries, forests and water. If not expelled from their territories, they are often left with no other choice but to enter into unfavorable contract farming arrangements or take badly paid, often seasonal jobs.

In a process best characterized as the 'financialization' of agriculture, financial institutions have become a major driver behind the mergers and acquisitions across the different links of the industrial food chain. The financial sector intensified its grip on agriculture after the global financial crisis of 2007-2008, when investors turned to agro-commodities and land en masse in order to diversify their portfolios. This prominence of the financial sector

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TABLE	1	PERCENTAGE MANAGEMENT	PERCENTAGE OF SHARES HELD IN THE BIG SIX BY LARGE ASSET MANAGEMENT FUNDS									
			MONSANTO	BAYER	DOW	DUPONT	SYNGENTA	B				

	MONSANTO	BAYER	DOW	DUPONT	SYNGENIA	BASE
BlackRock	5.76%	10.09%	6.11%	6.61%	6.00%	8.30%
Capital Group	2.68%	3.68%	3.60%	10.69%	4.01%	0.91%
Fidelity	3.12%	1.71%	1.17%	3.54%	0.21%	0.50%
The Vanguard Group, Inc.	7.33%	2.30%	6.27%	6.87%	2.28%	2.31%
State Street Global Advisors	4.63%	0.50%	4.14%	5.01%	0.40%	0.45%
Norges Bank Investment Management (NBIM)	0.81%	1.64%	0.43%	0.63%	1.75%	3.00%
% Owned by the Top 6 Firms Before Mergers	24.34%	19.93%	21.72%	33.36%	14.65%	15.47%

SOURCE: THOMSON REUTERS EIKON DATABASE (PERCENTAGE OF SHARES AS OF DEC. 31, 2016) AS CITED IN CLAPP (2017).

has led to a situation in which more land, agricultural products and related complex financial products such as derivatives have become tradable assets for speculation on the global markets.

By buying up stocks, private investors, hedge funds and asset managers for pension funds and other institutional investors have gained a great deal of influence on the strategy of agribusiness. Whether they are looking for quick wins or are in it for the long haul, investors tend to push for mergers and takeovers to increase their returns. The decade-long low interest rates certainly contributed heavily to the closure of these deals, making loans very cheap. (IPES-Food, 2017)

The concentration in the agrochemicals and seeds sectors mentioned above is an illustration of this push for consolidation by the financial sector. In 2016, before the mega-mergers between agrochemical firms converted the 'Big Six' into the 'Big Four', the six biggest asset managers jointly owned between 15 and 33 percent of the shares in Monsanto, Bayer, Dow, DuPont, Syngenta and BASF. (Clapp, 2017)

# NEW DRIVERS BEHIND CONCENTRATION

The consolidation wave in the global industrial food system is still largely fueled by the financial sector. But another powerful driver is emerging in the form of new, disruptive technologies. In particular, the sudden appearance of the 'Big Data platform' has the potential to completely alter power dynamics within the industrial food system, and its consequences could reach far beyond it.

'Big Data' is all about the ability to gather, analyze and reinterpret vast amounts of data – both old and real-time – with the means to extract commercially-relevant information. In the industrial food system, this could include information on historic weather conditions, market prices, yields, soils, distribution, and so on. New players such as tech giants are unleashing their algorithms on the industrial food system, while traditional agri-food corporations are nervously looking up and down the chain, acquiring start-ups or competitors in this field to ensure they do not lose out. A clear example of how this could interfere with the power dynamics in the industrial food system is the global trade in agricultural commodities. Historically, this trade has been in the hands of a few global players who control storage and shipping. Due to their unique market position and knowledge, traders like Archer Daniels Midland, Bunge and Cargill enjoyed huge competitive benefits over other companies in the industrial food chain. Enter Big Data, and this advantage may disappear, with valuable data being mined across the chain, from production, trade and distribution to processing and consumer preferences.

As the Canadian based researchers of ETC Group put it: "The big deal about the Big Data platform is that the technology suddenly shifts the commercial advantage to the companies that have the most data and are most able to manipulate it. ... The consequences are extraordinary: Alibaba and Google are advising Chinese farmers on hog breeding and markets; Amazon is not just delivering food but buying grocery chains; global farm machinery companies (John Deere, AGCO and Kubota) are using their storehouse of field data to team up with the newly-merged seed/chemical companies (Bayer, Corteva Agriscience, Syngenta and BASF) and at the other end of the food chain, Walmart, Carrefour, Unilever and Nestlé are using their Big Data to slide along the food chain and negotiate directly with farmers." (ETC Group, 2018a)

The Big Data platform thus encourages and even demands corporate concentration. The more information a corporation manages to accumulate, analyze, manipulate and monopolize, the easier it becomes to ward off competitors and the more profit it will be able to generate. Companies – and more importantly, their shareholders – feel the need to merge across sectors to ensure their competitors are not controlling more information than they are.

In line with these new trends, the production of food is increasingly digitized, a process in which food or agricultural inputs are turned into digital information and commodified. (RtFN Watch, 2018) A case in point is DivSeek, a questionable initiative partially funded by big seed corporations to gather genetic data on seeds from all



### THE HARDWARE AND SOFTWARE OF THE BIG DATA PLATFORM - AGRICULTURE WITHOUT FARMERS

**Robots, Sensors and Artificial Intelligence.** If it's up to agribusiness, the future of agriculture is more drones, robots, self-driving vehicles and other types of automation. All equipped with sensors and artificial intelligence, they gather data on soil, crop and weather conditions, informing choices on when to plant, harvest and apply fertilizer or pesticides. These decisions no longer have to be taken by farmers on the land itself; they can be taken in a boardroom, or even without the need for human interference, based on algorithms and historical data.

**Blockchain and Dark Pools.** An example of how big data are already being used in the industrial food chain is blockchain technology, known primarily for its use to mine cryptocurrencies such as Bitcoin. Blockchains can be used to take out intermediaries, digitalize distribution processes and track crops from source to final destination. Agribusiness, food companies and financial institutions can reduce transaction costs by up til 40 percent using blockchains, so they will likely make up a significant part of future transactions in the industrial food chain. Blockchain contracts also feature in 'Dark Pools', cloudy internet trading platforms which have become popular with traders for private deals on agricultural and other commodities. These trade arrangements hide any information about their value and the parties to the deal and until after the deals have been struck. Therefore, states are hardly able to monitor movements in the commodity markets, which may jeopardize food security if countries depend on food imports.

**Synthetic Biology / Gene Editing.** Other tech investment opportunities for the world's agri-food giants are arising in the field of synthetic biology or SynBio. Referring to a new generation of genetic engineering, synthetic biology is a rapidly growing area of research that some project to be a 40 billion dollar industry by 2020. Ignoring the dangerous aspects of this new set of technologies, the agri-food industry sees the adjustment of DNA in the form of 'gene editing' and 'gene drives' as a promising way to get rid of pests, introduce novel traits in plants or animals, and produce all kinds of ingredients, flavors, fragrances and food stuffs under factory controlled circumstances. (ETC Group 2018 and 2018a)

over the world. Although presented as a 'community-driven effort' to 'enhance the productivity, sustainability and resilience of crops and agricultural systems', critics maintain that it does not protect the rights of farmers and peasants and opens the door for agri-food corporations to patent seeds and edit genes of crops. (IPC, 2017)

### CONSEQUENCES FOR FOOD SOVEREIGNTY

Land grabs, biodiversity loss, deteriorating soils, contamination, deforestation, unhealthy diets, appalling working conditions; the problems associated with the industrial food system have been widely reported. Alarmingly, circumstances for the world's small-scale food producers – still responsible for over 70 percent of the global food production (ETC Group, 2017; FAO 2014) – are likely to get much worse as power concentration in the industrial food chain advances. Add the emergence of disruptive data-driven technologies described above, and a poisonous cocktail is brewing.

Following expert panel IPES-Food, we can identify eight general impacts of concentration in the industrial food system, ranging from the exploitation and shrinking autonomy of small-scale farmers to information control and the shaping of agricultural and trade policies. (IPES-Food, 2017)

**Squeezing farmers' incomes.** The 'efficiency' of economies of scale has generally led to higher prices for inputs such as seeds and fertilizers, while farmers get lower prices for their produce. More concentration puts further pressure on farmers' incomes as the most powerful players use their enormous bargaining power to define prices on each end of the food chain. It is important to note that the 'cheap' food being produced this way rarely leads to lower prices for consumers, as far as this is a good measure to assess the sustainability of a food system in the first place; the profits tend to end up in the pockets of the most powerful players in the chain, and their shareholders.

**Reducing farmer autonomy.** Power concentration in the chain not only squeezes farmers' incomes, it also reduces their autonomy and burdens them with higher risks and uncertainties. Farmers often have no other option than to enter into unfavorable contracting arrangements that limit their choices in how they produce and entrench them in cycles of debt and dependency.

**Narrowing scope of innovation.** Innovation generally does not benefit from power concentration. Agri-food giants may spend more and more money on research and development (with public funding for research declining) and present themselves as 'groundbreaking', their strategies are often defensive rather than innovative; instead of developing new ideas, they invest in ways to fend off competitors and regulation to protect their own interests. Following the same logic, innovative start-ups are taken over.

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Watered down sustainability claims. The ongoing consolidation in the industrial food system may also undermine corporate commitments to sustainability and people's health. Responding to consumer trends, the big players scoop up small companies that produce healthy food or have a genuinely good track record on sustainability. Many examples show that these commitments are hollowed out soon after being bought. (Smithers, 2017; Cornucopia, 2013) Furthermore, studies show that the involvement of agri-food corporations in the development of sustainability initiatives usually leads to watered down standards. (Jaffee & Howard, 2010)

**Information control.** Farmers and peasants have been gathering information on their crops, soils and animals for thousands of years for use in their own communities or – more recently – scientific purposes. With the application of sensors in farming machinery and drones, this information ends up in the databases of the big agri-food corporations, reinforcing power imbalances in their favor. Farmers wanting to keep up with capital intensive, data-driven agriculture trend need to scale up and take on debts to benefit from specialized machinery, giving further impetus to industrial scale monocropping. Others are simply forced out of farming.

Environmental and health risks. The future productivity and resilience of our agriculture is at risk due to industrial farming. Being responsible for a large part of human-caused greenhouse gas emissions, the industrial food chain is one of the leading causes behind climate change. (GRAIN and LVC, 2014) Its effects are already felt in the fields, with droughts and heavy rains causing yield losses across the globe. Further consolidation in the industrial chain will exacerbate its impacts, especially in the Global South. Other risks for the environment and human health follow from the industry focus on a limited number of commercialized plants and breeds, leading to erosion of genetic diversity and increasing occurrence of pests and diseases. The use of GMOs and gene drives reinforces these risks.

Labour abuses. Due to their systematic tendency to produce at the lowest possible cost, global agricultural supply chains are characterized by human rights violations and exploitative working conditions, from field to fork. They turn independent peasants and farmers into precarious day laborers, while others work undignified jobs in food processing and distribution. Further power concentration is likely to exacerbate circumstances for workers along the chain, despite all the voluntary corporate codes of conduct that big corporations abide to on paper. Suppliers may be told to follow these ethical guidelines, but they often do not comply.

Shaping policies and practices. The corporations that dominate the industrial food system are spending a lot of money lobbying to shape agricultural and trade policies and defend the status quo. They have convinced policy-makers that their economies of scale are a prerequisite for innovation and that they are the ones feeding the world. This way, instead of serving the public good, the governance of our food systems is more and more defined by the interests of a few transnational agri-food giants.

## CONCLUSIONS ON THE INTERPLAY BETWEEN POWER CONCENTRATION AND NEW TECHNOLOGY

Power concentration in the industrial food system and the emergence of new, disruptive technologies tend to mutually reinforce each other. In a business as usual scenario, the Big Data platform will mostly serve the vested interests in the industrial food chain. Backed by the financial sector and facilitated by trade and agriculture policies, only big corporations have the capital and scale to properly take advantage of it. Their dominant market position functions like a flywheel, allowing them to gather more data and attract more capital, which in turn spurs further growth. The stronger their position in the global food system, the harder it becomes to regulate them; they have simply become 'too big to fail', like the banks that were saved with taxpayers' money in the wake of the 2007/2008 financial crisis.

If concentration is not halted here and now, it will eventually lead to the destruction of large parts of the peasant food web. Smallscale food producers run even bigger risks of being crushed by powerful actors in the chain which flood their markets with 'cheap' food and look to expand into their territories to satisfy their appetite for land, water and other natural resources. If not displaced, they are bound to be colonized by the industrial food chain in other ways, for example through strangling contract farming agreements. Both ways, small-scale food systems could ultimately succumb to the pressures of the chain, severely threatening the food security and sovereignty of millions of mostly rural communities.



Protest against gene drives during the during a UN Conference on Biodiversity in Egypt, November 2018. © Friends of the Earth International



### AGROECOLOGY

It does not have to be like this though. If we apply enough public pressure, we can force policy makers to stop favoring the agri-food giants. We can curb their influence by saying no to new mergers and takeovers that lead to more concentration, revising trade and agricultural policies, and getting strict regulation in place to hold corporations to account for violations of human rights abroad, as discussed in the ongoing negotiations for a UN treaty on business and human rights. We also need to shut the doors on corporate lobbyists and reject the false and dangerous 'solutions' promoted by agribusiness, such as 'climate-smart' agriculture and gene drives.

We can choose a different future if we put control over our food systems back in the hands of the people, particularly peasants and other small-scale food producers. To this end, we have to support small-scale food producers by respecting, protecting and fulfilling their rights, in line with the recently adopted UN Declaration on the Rights of Peasants and other People working in Rural Areas, the Committee on World Food Security guidelines on Land Tenure, the Right to Food and Small-Scale Fisheries, the UN Declaration on the Rights of Indigenous Peoples and other legal instruments. Besides realizing the human rights of small-scale food producers, we clearly need public policies to scale up and mainstream agroecology, considered by many – including a growing number of governments and international institutions – to be the indispensable approach towards fair and sustainable agriculture and food systems. As a science, set of practices and social movement, agroecology is a living concept that continues to evolve and adapt to different contexts. It draws on social, economic, political and ecological dimensions and integrates these with ancestral and customary knowledge and practices of peasants, indigenous peoples and other small-scale food producers.

Supporting agroecology by no means implies discarding all new technological developments. But we do need to ask who really benefits from them. The small-scale food producers practising agroecology are the primary innovators in agriculture, and have been for thousands of years, by designing agroecology systems, exchanging seeds and developing locally-adapted crop varieties and livestock breeds. (FoEI, 2018) Peasants also innovate in new ways, for example by setting up information systems to help each other across the globe. Let's embrace their creativity and strengthen their innovative capacities, instead of facilitating further concentration of power in the industrial food system by promoting the privatization of natural resources and protecting the patents of big corporations.



Participants looking at tree saplings during a training for women at an Agroecology and Agroforestry Centre from Sahabat Alam Malaysia (Friends of the Earth Malaysia), March 2019. Amelia Collins/Friends of the Earth International

# FURTHER READING

Further reading at Friends of the Earth International:

Agroecology: innovating for sustainable agriculture and food systems (FoEl, 2018) In this policy paper, we identify a number of key criteria to assess whether or not technological innovations are contributing to better food systems. To do so, innovations need to be socially and environmentally just, gender-sensitive, and based on participatory governance and they must work towards the eradication of hunger. The paper also lists a number of challenges and provides a set of policy recommendations to unlock the transformative power of agroecology. https://www.foei.org/resources/publications/agroecology-innovatingfor-sustainable-food-systems-and-agriculture

Fight hunger and cool the climate with agroecology (FoEI, 2018) In order to get rid of hunger and mitigate climate change, Friends of the Earth International and our allies are calling for a transformation in agriculture and food production and consumption based on food sovereignty, agroecology and the relocalization of food systems. Real climate solutions are already out there in the fields of small-scale farmers, but they need to be protected, promoted and enhanced. We need governments to implement public policies and investments that support agroecological production controlled by small-scale producers. https://www.foei.org/resources/publications/fighthunger-and-cool-the-climate-with-agroecology

Getting into a bind. How trade and investment agreements block progress on agroecology and food sovereignty (FoEl, 2015) Friends of the Earth International finds that current strategies to raise investment in agriculture are most likely blocking rather than aiding the achievement of food security and food sovereignty. One key reason is that trade and investment agreements focus on attracting investment from agribusiness interests and are geared towards generating profits for them. These agreements are being used to open new markets for agribusinesses and include clauses that give comprehensive protection for agribusiness' profits, even when this comes at the cost of States' and people's welfare. https://www.foei.org/resources/publications/ publications-by-subject/food-sovereignty-publications/agreementsblock-progress-agroecology-food-sovereignty

#### Further reading from our allies.

Blocking the chain. Industrial food chain concentration, Big Data platforms and food sovereignty solutions (ETC Group, 2018) 'Blocking the chain' critically assesses digital developments in the food and agricultural sector. http://www.etcgroup.org/content/blocking-chain

Too big to feed. Exploring the impacts of mega-mergers, consolidation and concentration of power in the agri-food sector (IPES-Food, 2017) Mega-mergers are sparking unprecedented consolidation across food systems, and new data technologies represent a powerful new driver. http://www.ipesfood.org/\_img/upload/files/Concentration\_FullReport.pdf

**Growing power: Mega-Mergers and the fight for our food system (TNI, 2019)** Giant corporations have taken control of our food. How did this happen, and what can we do about it? https://www.tni.org/en/GrowingPower

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Productive reforestation through the implementation of agroecological systems, Petropolis, Brazil. © Luisaazara / Shutterstock POWER CONCENTRATION IN THE

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