

WHOSE FOOD FOOTPRINT? CAPITALISM, AGRICULTURE AND THE ENVIRONMENT

Robert G. Wallace

*Institute for Global Studies,
University of Minnesota*

Richard A. Kock

*Department of Pathology & Infectious Diseases,
Royal Veterinary College, University of London*

Abstract

Many of the world's largest agribusinesses and their NGO grantees have launched an aggressive public relations offensive claiming highly capitalized monocropping is the only food regime with the production efficiencies needed to both protect the environment and feed a growing population. We critique the proposition as the latest evolution in declensionist greenwashing. In the context of a new land rush in Africa, where 60% of the world's undeveloped farmland remains, Big Food apologies are shifting from what have long been defensive maneuvers covering for the sector's destructive practices to brazen rationalizations such practices are the sole means of saving the planet. The narrative seeks to justify devolving food security into the hands of a small cartel of agricultural conglomerates pressured by the kind of land loss and environmental damage the industry helped bring about in the first place. There are eminently viable alternatives, however. Communal projects in conservation agriculture embody living refutations of the agribusiness program. With the right state support, these latter efforts, some already feeding millions, are in a demonstrably better position to sustainably feed and employ local populations, support broad food sovereignty, and protect wildlife, health and the environment for generations to come.

Key words: agribusiness, conservation agriculture, declensionist narrative, food sovereignty, land grabbing, spatial fix.

¿LA HUELLA ECOLÓGICA DE QUIÉN?
CAPITALISMO, AGRICULTURA Y EL MEDIO
AMBIENTE

Muchos de las compañías de agronegocios más grandes del mundo y sus ONGs han lanzado una agresiva ofensiva de relaciones públicas argumentando que el monocultivo altamente capitalizado es el único régimen alimentario con las eficiencias productivas necesarias para proteger al medio ambiente y alimentar a una creciente población mundial. En este artículo cuestionamos esta idea como el más reciente lavado de cerebro declensionista. En el contexto de una nueva fiebre colonizadora en África, adonde se encuentran el 60% de las tierras cultivables poco desarrolladas, la apología de la "Big Food" está girando de maniobras defensivas de las prácticas destructivas del sector a una racionalización de la idea de que tales prácticas son la única forma de salvar al planeta. Estas narrativas buscan justificar la necesidad de dejar la seguridad alimentaria en manos del pequeño cartel de conglomerados agrícolas, debido a la pérdida de tierras y los problemas medioambientales actuales, que la industria contribuyó a causar originalmente. No

obstante, existen, evidentemente, alternativas viables. Proyectos comunales de agricultura conservacionista refutan rotundamente el programa de los agronegocios. Con el adecuado apoyo del estado, estos esfuerzos (algunos de los cuales ya alimentan a millones) están en una posición claramente mejor para alimentar y emplear poblaciones locales en forma sustentable, para garantizar la soberanía alimentaria y para proteger el medio ambiente y la salud por varias generaciones.

Palabras clave: agronegocios, agricultura conservacionista, narrativa declesionista, soberanía alimentaria, saqueo de tierras, anclaje espacial.

Food on a precipice

Scientists across disciplines agree humanity is on an environmental precipice. Climate change, ocean acidification, water and air pollution, nitrate and phosphate loading, and disruptions in thermohaline circulation have either surged across ecological tipping points or are rapidly approaching them.¹⁻⁴

The crisis has been brought about largely by exponential increases in resource extraction and per capita consumption. We are dipping deeply into many of Earth's assets, with profound implications for humanity's existence as we know it. In a blink of a geological eye, habitat destruction, biodiversity loss, ecosystem dysfunction, disease emergence, resource depletion, eutrophication, soil degradation, oceanic collapse, environmental toxicity, peak energy, and climate shifts have hit home together, threatening many of the plant and animal populations upon which our very species' survival depends.

The resulting environmental damage, accruing across biomes and at the global scale, is impinging upon our capacity to feed a world population growing in both its size and rates of consumption. The Food and Agriculture Organization estimates a record 1.2 billion people the world over suffered from chronic hunger or undernourishment in 2009, with the greatest morbidity and mortality resulting in the global South.⁵ Of the 925 million undernourished people FAO estimated in 2010, 906 million live in developing countries.

Humanity has so far 'resolved' one famine after another by shifting food surpluses, with millions left dead in the wake of these successes. As recent and looming famines in the Horn of Africa and the Sahel illustrate, the crises continue to multiply nonetheless and the options for resolving them are dwindling in number and scope. Ecosystem resilience continues to decline and food availability is threatened by the very models of production presently used to feed the world. As food prices spike, in part spurred by equity speculation,^{6,7} the poorest are closed out of the commodity markets through which food staples are increasingly distributed.

A veritable army of researchers, policymakers, and advocates of a variety of stripes has articulated the problem. But a clear course of action has yet to be agreed upon, much less acted on. There are, however, a number of efforts making the attempt.

In a recent *Nature* opinion Jason Clay, senior vice-president for market transformation at World Wildlife Foundation, one of the world's leading environmental NGOs, describes one such program,⁸

In the past 18 months, members of non-governmental organizations (NGOs), academia and the private sector have come together to develop ways to reform the global food system by increasing food production without damaging biodiversity. Groups such as Global Harvest Initiative...and the Sustainable Agriculture Initiative...are working to freeze the footprint of food.

Clay offers a number of strategies around which efforts aimed at reducing the impact of agriculture on the environment should be organized, paying particular attention to sub-Saharan Africa. According to Clay, we must cut consumption, eliminate food waste, rehabilitate degraded lands, double the efficiency of agricultural inputs, codify property rights for farmers, increase the productivity of neglected crops through genetics and cutting-edge technologies, and protect soil carbon by growing trees and root grasses and introducing a carbon market for agriculture.

Clay's program appears a mix of sound advice and objectives other teams have also presented.⁹⁻¹¹ Any effort aimed at alleviating food crises across locales would seriously consider many of his technical suggestions. However, the larger argument in which Clay situates his advice essentially posits the solutions to the food and environmental crises lie in more of the same. In other work, Clay, in terms rarely found so explicitly, proposes any successful effort to feed humanity sustainably must pivot about handing corporate agribusiness, the progenitors of energy-intensive monocropping, greater control of the world's food regimen.¹²

We review Clay's position here, unpacking the line of argument that the responsibility for food security should devolve to a small cartel of agricultural conglomerates. We address its appeal to political expediency, its narrow view of production efficiency and economies of scale, and its marketing of agribusiness' magnanimity despite historical evidence to the contrary. Along the way we enlarge upon key omissions in the argument, notably its treatment of capitalism as a force of nature, the declensionist narrative justifying expropriating smallholdings, and the socioeconomic, health and environmental consequences already arising from just such a food program.

Finally, we offer examples of alternate paradigms for feeding the planet as it converges on its environmental limits. Communally directed efforts in conservation agriculture, minimizing input costs and ecological subsidies, embody living refutations of the agribusiness model. Their specifics offer concrete evidence such projects, some feeding millions, are means enough for sustainably feeding and employing local populations, supporting responsive food sovereignty, and protecting wildlife, health and the environment for generations to come. A food revolution is underway and growing, even in, or especially in, developing countries agribusiness views as its path of least resistance for commodifying what land and resources remain.

Press-ganging constituencies

To support a global population projected to grow to as large as eleven billion by 2050, FAO estimates the world must bring six million additional hectares into cultivation every year for the next thirty years.^{5,13} These numbers appear to put a premium on the kind of rapid expansion in large-scale production of which multinational agribusiness alone seems capable. It is an assumption Jason Clay and many of his colleagues appear to accept and promote. Their project, then, can be construed as much a political program as it is technical advice, aimed first and foremost at justifying, and consolidating support behind, the corporate model.

In a 2010 TED presentation, Clay describes what any successful effort to simultaneously save and feed the planet must look like,¹²

We've got thirty five [biodiversity hotspots]. We've got fifteen priority commodities [with the greatest impact on biodiversity]... Who do we work with to change the way those commodities are produced?... Three hundred to five hundred companies control 70% or more of the trade of each of the fifteen commodities that we've identified as the most significant. If we work with those, if we change those companies and the way they do business, then the rest will happen automatically...

Even that group appears too large a one with which to collaborate,

One hundred [of those companies] control 25% of the trade of all fifteen of the most [ecologically] significant commodities on the planet. We can get our arms around 100 companies... Why is 25% important? Because if these companies demand sustainable products they'll pull 40-50% of production. Companies can push producers faster than consumers can. By companies asking for this we can leverage production so much faster than by waiting for consumers to do it. After forty years the global organic movement has achieved .7 of 1% of global food. We can't wait that long. We don't have that kind of time.

Working with individual companies is not enough, however,

We need to begin to work with industries. So we've started roundtables where we bring together the entire value chain, from producers all the way to retailers and brands... to figure out what are the key impacts of these products, what is a global benchmark, what's an acceptable impact, and design standards around that.

Why are these companies participating? Two reasons.

For the big companies it's reputational risk, but more importantly they don't care what the price of the commodities is. If they don't have commodities they don't have a business. They care about availability. So the big risk for them is not having product at all. For the producers if a buyer wants to buy something produced a certain way, that's what brings them to the table. It's the demand that brings them to the table.

To his credit Clay puts on a polished presentation. But his TED line of reasoning is rooted in a number of dubious assumptions and stray inferences. For one, why should the top 100 companies be allowed to retain—and expand—control over the fifteen ecologically significant products Clay identifies when their practices helped produce the environmental crises to begin with?

In passing over the question, Clay's argument effectively corners the environmental and food movements into catering to these companies' needs. It presents naked expediency as reason enough. It is too hard for 'us' to organize consumers and small producers, who, after all, hold too small a market share to make a difference. As if these very companies weren't engaged in all-out campaigns against alternate models of food production.

The appeal to this kind of economy of scale press-gangs myriad constituencies false premise by false premise. Throughout his talk Clay repeatedly alludes to a nebulous 'we', who, if *really* interested in

saving the world, should work with agribusiness. He addresses the possibility millions of small farmers and their communities can make major contributions to local and regional food production in equal terms by omission and dismissal.

The Jevons trap

During his TED talk Clay offered veritable prospectuses for two companies with which he works, confounding collaboration and boosterism.¹² First, Cargill, the food conglomerate, which has

funded research that shows that we can double global palm oil production without cutting a single tree in the next twenty years and do it all in Borneo alone by planting on land that's already degraded... They're also undertaking a study to look at all of their supplies of palm oil to see if they could be certified, and what they would need to change in order to become third-party certified under a credible certification program. Why is Cargill important? Because Cargill has 20 to 25% of global palm oil. If Cargill makes a decision, then the entire palm oil industry moves...

Clay skips here what Cargill did to win such a large proportion of palm oil production. The World Rainforest Network points out the industry-dominated Roundtable for Sustainable Palm Oil, to which Clay refers, partakes in the same omission.¹⁴ The Roundtable has absolved its members, Cargill included, of their sordid pasts deforesting the land and dispossessing its inhabitants. The sustainability clock would now be set starting at 2005, which, according to WRN,

means that all deforestation prior to that date will not be taken into account, and that plantations where such deforestation occurred will still receive the RSPO seal of approval. Given that oil palms can be harvested for up to 30 years, this implies that much of the palm oil traded with the RSPO "sustainable" seal in the next 10–20 years will be harvested from plantations that have "replaced primary forest".

The certification process is itself voluntary, in effect allowing the industry to sanction its own bad practices. To WRN,

To pretend that a product obtained from large-scale monocultures of mostly alien palm trees can be certified as “sustainable” is—to say the least—a misleading statement, especially for oil palm plantations, with their history of tropical deforestation and widespread human rights abuses...RSPO certification is a fraud.

Clay next endorses M&M Mars, the candy company,¹²

Mars has made sustainability pledges to buy only certifiable product for all of its seafood. Turns out that Mars buys more seafood than WalMart, because of pet food. But they're doing some really interesting things around chocolate. And it all comes from the fact that Mars wants to be in business in the future. And what they see is that they need to improve chocolate production...[Mars is] sequencing the genome of the cocoa plant. They're doing it with IBM and the USDA. And they're putting it in the public domain because they want everybody to have access to this data. Because they want everybody to help them make cocoa more productive and more sustainable. What they've realized is that if they can identify the traits on productivity and on drought tolerance, they can produce 320% as much cocoa on 40% of the land. The rest of the land can be used for something else. It's more with less and less again. That's what the future's got to be.

“Everybody” includes none of the tens of thousands of children Mars suppliers enslave to cultivate monoculture cocoa in Ghana and Côte d'Ivoire, or the thousands of contract farmers, living there in abject poverty, to which the company refuses to offer Fair Trade prices.^{15,16}

In championing Cargill and Mars, Clay makes the claim agribusiness is in the best position to improve on the kinds of production efficiencies needed to reduce

resource depletion, the key article of faith underlying green capitalism. The contention is at best ahistorical, omitting the wholesale destruction that produced these monocultures. Efficiencies found in producing commodities are often traded in for deficiencies elsewhere, including such cloying ‘overhead’ as human rights, health, wages, and, to use a reductionist term, ecosystem services.

But even as a logical premise, production efficiencies as deployed by ‘sustainable’ capitalism have long been contradicted by the Jevons paradox.^{4,17} In researching coal, William Stanley Jevons observed increasing efficiency in extracting a resource in the long term led to an *increase* use in the resource. Runaway fossil fuel consumption proves Jevons' case well enough, but the idea also has been supported spectacularly with respect to food. The Green Revolution doubled food production per hectare but in its aftereffects also drove widespread malnourishment.¹⁸

In an economic system dedicated to 3% compound growth, better—and cheaper—extraction, increasing efficiency per unit currency invested, actually selects for *greater* exploitation, often until a resource is exhausted. Under the present economic model the paradox is ‘solved’ only by exploiting an alternate resource once the original is depleted, wiping out the natural base species by species, mineral by mineral, and region by region, a practice from which Cargill and Mars, among others, until now profited to a superlative degree.

If history is any guide, agribusinesses have rarely let worrying about losing a commodity's resource base change anything more than their operational *tactics* from one annual report to the next. Green marketing, for instance, presently sells best in upscale markets in the U.S., the European Union and Asia, even as these host greater per-capita consumption across products than much of the rest of the world.^{19,20} The companies' core *strategies*, however, structured by competitive advantages they are unlikely to give up voluntarily, remain largely intact.

Turning other people's resources into enormous private profit (and blaming somebody else for the resulting damage) remains the order of the day. As

Luke Bergmann's calculations show, much of the carbon emissions, market cropland and forestry in the global South originate, or result, depending on one's perspective, largely in capital accumulation and consumption in the U.S., Europe and Japan.²¹ Becky Mansfield and her colleagues meanwhile refute the influential Forest Transition Theory linking economic growth and forest regrowth.²² The team shows the direct relationship is no intrinsic universal but is dependent on the global North's capacity to import forest and agricultural products—and export the attendant environmental impact—when its economies are flush. In this context, green marketing in the wealthier regions appears a means of transubstantiating responsibility for the damage incurred by and along the circuits of capital into the moralism of individual consumer choice.

There is, however, a fly in the sector's ointment. As Jason Moore describes it, the globalizing crises of land loss and environmental damage may signal a tipping point in neoliberalism's capacity to deliver continuing declines in systemwide production costs, or, perhaps more grandly, may even mark the end of capitalism's "*longue durée* regime of 'cheap ecology': cheap energy, labor, raw materials and food."²³ Either scenario, to foreshadow our argument, could explain the urgency with which agribusiness is pushing a narrative of dystopic rescue.

A convenient omission

It is on this background that the character of Clay's ostensibly benign recommendations changes, however free his *Nature* article may be of references to specific brands.⁸ If enacted, his recommendations would bring about underlying shifts in Africa's agro-food context that would work to the multinationals' strategic advantage.

Clearly, as Clay suggests, local populations should consider an array of labor-saving and green technologies when devising new agricultures. On this point we have no objections, but agribusiness, only one source of such measures, is not in the business of handing out such solutions for free. Technologies often serve as Trojan horses by which to smuggle in new social relations, in this case letting foreign capital

cheaply buy up or lease what until now was sovereign land worked by subsistence farmers, or locking small farmers into fiercely copyright-protected, biotech production spirals.

Improving the performance of the 'worst' producers—which Clay discusses only in terms of absolute productivity rather than nutrition, sustainability or community—would indeed require offering such smallholders support and expertise. "Conventionally, such extension systems have been run by governments, but it is not clear if they are up to the task in Africa," writes Clay.⁸ It is an observation that elides at one and the same time what support many African countries—much like their European counterparts—have successfully provided their farmers and the structural adjustment programs that stripped out such assistance in agribusiness' favor elsewhere on the continent.²⁴ If privatized support is predicated on turning land and labor over to agribusiness, such assistance would unlikely be offered on anywhere near equitable terms.

Clay's recommendation farmers' property rights be individually granted requires elaboration. While there very well may be merits in shifting such rights from governments to specific communities of smallholders, agribusiness appears to support such a change only in its own interests. Companies favor producing a legal framework under which they may purchase land out from underneath the smallest farmers, many of whom, impoverished by export economies bereft of price supports, would sell cheaply. Similar campaigns took place in post-Soviet Russia and appear underway in China.^{25,26} The agro-ecological and social degradation that results from such land rushes are already undercutting the demonstrable economic and ecological efficiencies African pastoral and transhumant communities have until now enjoyed for centuries.^{27,28}

Setting up food regimes under which agribusinesses, as opposed to local populations, best prosper can take other forms. For instance, the soil carbon markets Clay promotes, expanding nature's neoliberalization, would likely permit companies that are able to pay for the kinds of offsets smaller

operations can ill-afford to continue to produce and pollute unimpeded.²⁹⁻³¹ The offsets become another green barrier to smallholders, who, on their own, when not being forced by dispossession into the forest, contribute relatively insignificantly to the problem.

These kinds of economies of scale, green or otherwise, are, however, in no way guaranteed. Large operations are more productive than smaller units if and only if their scale economies persist with growth, and diseconomies—labor costs, exhaustion of resources, etc.—are postponed.³² Smaller production models, many of which have evolved over millennia and assimilate the inherently biological (and social) nature of agriculture, can, and often do, succeed in the face of multinational competition, particularly those cooperatives that can negotiate the costs of managing production across many small farms.

But the primary fallacy in Clay's argument pivots about an omission common to many programs in ecological modernization.^{4,33} Clay treats present-day neoliberal capitalism as a force of nature along the lines of the planet's rotation and gravity. In this way capitalism's political and economic premises, whatever any of us think of them, are left outside the bounds of analysis and action.³⁴ We must work with agribusinesses not just because they produce and distribute much of the world's food supply, but because they *are* and *will continue to be*, by dint of declaration, the world of food as we know it.

If history is any indication, however, capitalism as we know it is as much a conditional—and likely passing—form of social organization as the pharaohs and feudalism; dominant one day, subject to collapse, modification or rejection the next. The political and financial rewards found in assuming otherwise drive such greenwashing efforts. For once we assume capitalism to be a part of the natural order, an accommodation itself greenwashed as 'ecopragsmatism', we find ourselves tied into a series of subsidiary presumptions, which together lock all subsequent discussion in agribusiness' favor.

Clay, for instance, confounds capitalist efficiencies in turning natural resources into commodities with the efficiencies needed in conserving resources and

feeding the world. Multinationals may be able to transform vast landscapes into billions of packaged products, often of dubious nutritional value, but it speaks little to whether they can, or frankly are willing to, feed the world's population, even as a matter of rapacious expediency. The billion hungry worldwide own few of the assets needed to participate in the capitalist markets in which agribusiness prospers, and so, by virtue of their poverty, are treated on the demand end as if they do not even exist.

On the supply end, the largest agribusinesses and the rural and urban poor who farm are placed fundamentally at odds. The industry's growth is dependent on dispossessing millions of subsistence farmers of the lands it needs to grow export crops and livestock for more lucrative markets.³⁵ As Clay himself put it, agribusiness cares about availability. The collateral damage that results—the unfed and increasingly restive masses left unabsorbed by the new labor markets that arise in place of indigenous food systems—has been long left to local governments and NGOs to clean up or control.¹¹

The keys to the planet

If agribusiness is to save the world, it needs a free hand to do what it pleases, or so says the sector. Clay concurs, in essence arguing self-regulation, by which companies operate outside governmental interference, provides the means by which the companies can save themselves from the environmental destruction they have wrought. If we are lucky enough, the argument suggests, these companies will, in passing, if their margins provide, save the planet too.

This is as dubious a proposition as it is self-serving. Multinational agribusinesses become and remain as large as they are by virtue of translating capital accumulation into political power. That power in turn secures the very laissez-faire economic environment that allows agribusiness to continue to decimate the environment with impunity. Indeed, political power permits agribusiness its bottom line in the first place, allowing it to externalize its costs elsewhere: to indigenous peoples, governments, farm workers, taxpayers, consumers, livestock, and nearby wildlife.^{36,37} If anything goes wrong—a spill, unemployment,

a disease outbreak, price fluctuations—someone else picks up the bill, introducing moral hazards of apocalyptic proportions.

Only by socializing such costs and moving these off their balance sheets have agribusinesses survived as incorporated entities. Despite depending on the public for its very survival, multinationals, with the aid of many of the foundations they fund, are now trying to position themselves as the only recourse to which the world can turn.

Consider that another eminently arguable proposition, but the effort's primary objective is something else entirely. The notion only agribusiness can save the world serves as the packaging in which the companies are delivering a chilling demand. In exchange for access to enough food in the future—a fraught possibility as it is—humanity must hand over control of what is left of virgin land and resources to a small, highly remunerated minority. Corporate expropriation has been underway for centuries but its justification within an environmental narrative, as a means of further cementing material control over the world's resources, is something new all together. One does find similar appeals in other sectors. On a background of slower growth, megabanks embraced high-risk financial instruments, gambling whole sectors of the world's real economy under the guise the new packages would ensure cost benefits to consumers.³⁸ The results we know well enough.

The demand for the keys to the planet is itself a product of another capitalist conundrum. Lauderdale's paradox has been on the books for over two hundred years.^{4,39} It arises out of the inverse relationship between, on the one hand, public wealth, including what were for most of human history our environmental commons, and, on the other, private riches. The environment was long defined by its availability to humanity at large, and so embodied little exchange value. We cannot bottle and sell air (or until recently water) if it is freely available. In contrast, the value of private riches emerges out of extracting scarce resources (or, more precisely, rolling over enough capital to pay someone else to do the work).

The paradox emerged post-Industrial Revolution

with a shift in the relationship between public wealth and private riches. By destroying the natural environment, capitalists *added* exchange value to what they had yet despoiled, transforming our commons into valuables scarce enough to commoditize.

A decaying resource base, then, is no due cause for agribusiness turning into good global citizens, as Clay argues. On the contrary, agribusiness seeks securing exclusive access to our now fiscally appreciating, if ecologically declining, landscapes. It is, again, all about availability. As a consequence, the industry is maneuvering to rub out alternatives operating on what were until now economic peripheries. As an alternate farm economy, subsistence farmers, comprising in some locales 80% of the population, must effectively be removed, marginalized or turned into laborers so that agricultural capital can geographically spread as it pleases unopposed.^{40,41}

Land grabbing by another name

It is in this context that the race for Africa, Clay's beat, where 60% of the planet's undeveloped farmland remains, is intensifying.⁴²

The Oakland Institute recently reported agribusinesses are collaborating on African projects with a number of American universities, including Harvard, Vanderbilt and Spelman.⁴³ The universities are investing their endowments through European hedge funds and speculators to buy or lease vast swaths of African farmland the school's private partners are to subsequently develop. The Institute estimates US\$500 million from all sources invested in African farmland, with expectations of 25% returns from production and land price appreciation on leases running tax-free for as long as 99 years.⁴⁴ McKinsey consultants estimate Africa's agricultural output could treble as a result, to US\$880 billion a year by 2030.⁴²

One such land grab in Tanzania is spearheaded by AgriSol Energy, Iowa-based agribusiness Summit Group, and the Global Agriculture Fund of the Pharos Financial Group, in partnership with Iowa State University's College of Agriculture and Life Sciences.⁴⁵ The site, according to the Oakland Institute,

encompasses three “abandoned refugee camps” – Lugufu in Kigoma province (25,000 ha), Katumba (80,317 ha), and Mishamo (219,800 ha), both in Rukwa province... [with] negotiations...under way with the Tanzanian government involving...award of strategic investor status to assure availability of incentives (tax holidays, repatriation of dollars out of the country, waiver of duties on diesel, agricultural and industrial equipment and supplies, etc.); and commitment and timetable for construction of a rail link for Mishamo.

Together the three tracts will host agricultural developments in large-scale, genetically modified crops, beef and poultry production, and biofuels, contingent on shuttling out thousands of resident smallholders in favor of labor crews led by expatriate managers.

A spokesman for Emergent asset management, handling one of the largest land acquisition funds, defended the university-associated efforts this way,⁴⁴

Yes, university endowment funds and pension funds are long-term investors...We are investing in African agriculture and setting up businesses and employing people. We are doing it in a responsible way...The amounts are large. They can be hundreds of millions of dollars. This is not landgrabbing. We want to make the land more valuable. Being big makes an impact, economies of scale can be more productive.

The facts refute the assurances, which on their own are damning enough. Much of the new farming appears focused on export agricultures, and many thousands of indigenous farmers are being forced off their land. The memorandum of understanding for AgriSol’s Tanzania project,⁴⁴

stipulates that the two main locations – Katumba and Mishamo – for their project are refugee settlements holding as many as 162,000 people that will have to be closed before the \$700m project can start. The

refugees have been farming this land for 40 years.

Tanzania is no exception. Accumulation by dispossession, North to South, is underway across Africa:

A 2010 study showed Awash Valley pastoral production produced returns per hectare equal to or greater than those from subsidized irrigated cotton and sugar farming.⁴⁶ Yet the Ethiopian government is presently forcing tens of thousands of farmers and pastoralists off traditional lands into new villages, its obligation under a number of international land deals.

A 49-year lease of 600,000 hectares in South Sudan’s Central Equatoria, at a dirt-cheap US\$25,000, with an option for 400,000 more hectares, gives Dallas-based Nile Trading and Development full rights to oil and timber there.⁴⁷

Seventy percent of Kenyan grantees awarded by the Alliance for a Green Revolution in Africa (AGRA), the Gates Foundation’s ‘Africa face,’ work directly with Monsanto.⁴⁸ The Gates Foundation holds 500,000 shares of Monsanto stock worth an estimated US\$23.1 million. In turn, the Foundation effort is staffed by ex-Monsanto executives.

In Rwanda, the tiny plots of refugees returned from Tanzania after the Genocide and settled on degazetted National Park land are being expropriated by the politically connected raising livestock or bought up by beer and biofuel companies for export production.⁴⁹

To round out our examples, Madagascar leased an area the size of Connecticut to Korean conglomerate Daewoo, Mozambique put seven million hectares, 27,000 square miles, up for sale, and South African companies are collaborating with European hedge funds to bring in the investment needed to buy up forest and farmland.⁴³

Primitive accumulation, however clothed in neoliberal or NGO garb, has its privileges, of course. But even on their own terms, land grabs trade one set of contradictions for another. As Giovanni Arrighi warned as far back as his 1966 study of Rhodesia,⁵⁰

fully proletarianizing peasants by driving them off their land and into the labor market can, in an example of the diseconomies of scale, ultimately produce more problems for agribusiness than advantages,⁵¹

[The] process of extreme dispossession was contradictory. Initially it created the conditions for the peasantry to subsidize capitalist agriculture, mining, manufacturing and so on. But increasingly it created difficulties in exploiting, mobilizing, controlling the proletariat that was being created....Fully proletarianized labour could be exploited only if it was paid a full living wage.

Arrighi and colleagues inferred political control could be better exercised by only partially proletarianizing, forcing peasants to feed themselves by off-seasonal subsistence in the home village, as is now routine today in Africa and elsewhere.^{52,53} Ironically, the strategy runs up against agribusiness' appetite for farmland and accessible labor, as peasants have transformed the pluriactivity forced on them into an albeit precarious means by which to survive increasingly informal and inequitable economic conditions.²⁴

Land grabs, breaking up historically mediated, indigenous agro-food complexes, offer little in the way of the 'green' efficiencies proponents claim.

The declensionist diet

The increasing divide between rich and poor that results from such dispossession is itself now treated as a rationale for an agribusiness Earth, even as greater inequality typically produces worse environmental damage.⁵⁴ Egypt offers a telling example.⁵⁵

During the Mubarak regime Egyptian horticulture and livestock underwent massive consolidation, deserting millions of smallholders on the periurban margins. Over the regime's final five years many of the poorest communities were further impoverished by public health interventions ostensibly undertaken to protect them. In an effort to staunch rolling outbreaks of highly pathogenic influenza A (H5N1) ('bird flu') and H1N1 2009 ('swine flu'), authorities destroyed

forty million poultry and the entire swine population, respectively. The greatest impact fell on backyard and small-scale operations despite precarious evidence extensive poultry or wild birds were driving influenza's emergence.

Considerable evidence favors the contention intensive livestock instead serve as the crucible in which many of the newly virulent animal pathogens are now first evolving.³⁷ These pathogens, including the influenzas, are routinely introduced into other countries by way of the geographic reach of the sector's commodity chains, which stretch across continents to extents no smallholder can match.

At no stage, however, were industrial poultry systems seriously investigated as a possible cause of the H5N1 outbreaks in Egypt, or elsewhere for that matter. Nor was the destruction of industrial livestock and poultry undertaken at the scale pursued among smallholder animals. The industry's biosecurity, its capacity to technically respond to a disease of its own making at the expense of its smallholding rivals, serves as the industry's own rationale.

In the case of Egypt the consequences of such an approach extended beyond its epidemiology and agriculture to the country's political core. The technicist interventions into endemic H5N1 appeared to exasperate Egypt's deepening poverty beyond anecdotal evidence of stunting in children under five. Poultry loss alone may not have been the primary cause of the revolution which followed, but its impacts on food prices, food availability, and the Egyptian people's desire to decide their own destiny—including whether they kept chickens—played its part.

Despite these connections, the literature around the influenza outbreaks in Egypt, as well as those elsewhere, at one and the same time embodies the premises of and offers tautological arguments for the transition into highly capitalized farming. That is, the system's failures serve as its justification. Under the prevalent model of offshore agriculture, agribusiness effectively dispossesses indigenous farmers, producing hunger and disease and destroying environments directly and by proxy. The resulting crises are then treated as due cause for expanding dispossession.

Diana Davis⁵⁶ describes such a ‘humanitarian’ framework as part and parcel of

a declensionist colonial environmental narrative, appropriated to help justify and implement the neoliberal goals of land privatization and the intensification of agricultural production in the name of environmental protection.

The narrative appears this season’s Malthusian tragedy of the commons, wherein a rabble competing for a shared resource destroys it, a straw man for fencing off the commons for the very few to ruin instead.⁵⁷ In reality, even when and where nature has provided enough for nearly everyone, commons routinely have been regulated by local councils of a variety of social organization.^{58,59} Interestingly, the objection is embraced as much by some on the right who favor blocking out federal and international intervention as those on the left who favor community control.^{60,61} Such councils are never a guarantee against history—populations do collapse—but the notion of the commons’ intrinsic dysfunction is more ideology than data.

Disease by commodity

To what end are such ‘humanitarian’ narratives directed? Of what do corporate production efficiencies really comprise? Wealthier societies showcase the best of what nomadic capital offers the poorest regions.

Cheap food is mass produced and homogenized, enabling centralized control from source to fork and massive profits for a few. Cleverly packaged and marketed, highly processed, calorific and addictive, but nutritionally deficient foodstuffs have created a new suite of epidemic chronic diseases, from diabetes to morbid obesity.^{62,63}

Agricultural diseases meanwhile evolve at increasing speed in industrialized, genetically limited domestic animal and crop communities.⁶⁴ Such ills are often managed in comparatively sterile but at such densities still pathogen-conducive conditions, requiring continuous applications of vaccine and pharmaceuticals in livestock to reduce now endemic

diarrhoeas and respiratory diseases. Pesticides are applied to crops largely engineered for withstanding still greater petrochemical application, selecting for superweeds and pests.⁶⁵

The resulting waste runoff carries highly evolved cassettes of drug resistance genes, joined by increasing concentrations of hormone mimics and other ecotoxins seeping into local soils, groundwater and river systems, and even recycled as fertilizer.^{66,67} Even pharmaceuticals are becoming detectable in biologically active concentrations in the environment with increasing evidence of ecological, physiological and pathological impacts.⁶⁸ Despite their passing contributions to animal and public health, live-attenuated virus vaccines have selected for new strains evolving out from underneath coverage and can themselves turn into pollutants of a sort by recombining with circulating strains and returning to field virulence.⁶⁹

Pollution and pathogens have become an integral part of the risk frame of the industrialized food system.⁷⁰ The science of food safety is daily called upon to mop up disease spills throughout a global system of shipments of breeding or neonatal stock and potentially contaminated food products. The eleven tons of Egyptian fenugreek sprouts that sickened 4100 Germans with *E. coli* O104 just last year, for instance, were repackaged by a German distributor and resold to seventy companies across twelve European countries.⁷¹ Agribusiness’ economies of scale extend to the evolution and spread of the pathogens the sector selects, in the biological sense of the word. A wildlife squeezed by encroaching livestock populations in turn dumps its own pathogen community back into wet markets, bushmeat butcheries, farmland, and urban environments, producing risky natural experiments in disease transmission and pathogen evolution across multiple animal orders.⁷²

The short-term gains in agribusiness’ production and supply efficiencies have been developed only by way of a series of perverse subsidies from and costs to local peoples and the environment—costs kept off company balance sheets. Occupational hazards, pollution, food poisoning, antibiotic resistance, price

spikes, climate change, monopolistic consolidation, declining nutritional content, flooding, export economics, farmland bubbles, grain dumping, farm dispossession, forced migration, research gaps, and damage to transportation and health infrastructure are routinely externalized to governments, the indigenous, workers, consumers, taxpayers, livestock and wildlife.^{36,37,73}

Once removed from the protection of such creative accounting, the agribusiness model turns unsustainably expensive (and given its capacity for catastrophe, nigh on sociopathic). What to do, then? All parties about such debates, agribusiness included, routinely cite human ingenuity as the means by which we can solve the ecological crises. But as soon as something other than agribusiness is suggested, tax-deductible consultants, Clay included, object, 'That's impossible!'^{12,74} The ideological cover agribusiness enjoys is itself a marginal cost we are asked to subsidize.

Conservation agriculture

Another agriculture, however, *is* possible and in fact is, at various stages of development, already underway.^{33,75,76} Alternate approaches propose lower input costs—minimizing ecological subsidies to be floated by governments, consumers and wildlife alike—using organic, naturally renewable production methods and cutting-edge conservation cultivation.

A number of practices even now comprise sustainable agro-ecosystems, including of 'sustainable intensification', which where best developed are producing as much food per acre as petrochemical agribusiness.^{77,78} Integrated pest management, integrated nutrient management, conservation tillage, cover crops, trap crops, contour cropping, agroforestry, aquaculture, water harvesting, and mixed crop-livestock systems are all already in play.⁷⁹

Underlying such efforts is the presumption humanity is still part of the ecology from which we emerged. As much as human civilization has been organized around segregating our welfare from nature red in tooth and claw, we cannot *escape* the ecologies in which we are embedded, however much we modify them. Nor, however, should we fall into prelapsarian

fantasies of agriculture as it never was. Farmers are daily devising and applying new innovations in organic agriculture to solve today's problems in growing plants and raising livestock, and in climatic and economic contexts of a particular historical moment.

The work still required in developing such theoretical and practical applications cannot be overstated. Many such nascent efforts have been financially and infrastructurally starved. Even now, however, examples abound across orders of industrial integration and community organization:

With the support of the Mexican government, Zapotec Indians developed a certified-sustainable, community-controlled forestry.⁸⁰ Plain pine is sold to the state government, and finished goods, including furniture, are produced in an on-site factory. The Oaxaca cooperative, still a work in progress, ploughs a third of its profits back into the business, a third into forest preservation, and the rest into its workers and the local community, including pensions, a credit union, and housing for its children studying at university.

The Federation of Unions of Farmers' Groups of Niger (FUGPN-Mooriben)—with over 62,000 members, 60+% women—offers its members training, grain banking, input shops, credit lines, savings services, liaison consultation, advocacy, and community radio.⁸¹ Previously, on the dismantling of state cooperatives, farmers could only consume their harvests or sell them to traders to whom they accumulated massive debt. The poorest cut trees for sale or housing, causing a silted Niger River to flood, worsening already bad conditions. The grain banks cut out usurious traders and improved food coverage during lean seasons. Mooriben shops meanwhile permit farmers informed access to quality farm inputs and rental machinery. The federation's credit cooperatives allow farmers to turn excess grain into cheap liquidity for non-farm economic activity.

In the face of national policy aimed at subsidizing conventional irrigated crop agriculture and livestock ranching, community trusts in Northern Kenya have established viable integrated land management, diversifying livelihoods while benefiting natural

resources and livestock production alike.^{27,82} Using conservation of selected key resources, including grass banks, the environment and wildlife is recovering from a previously degraded state, whilst the economy and income of the people has increased threefold.

Tarun Bharat Sangh, a local voluntary organization in Jaipur, India, initiated a watershed restoration program that grew to a thousand villages.⁸³ The organization rebuilt 'johads', traditional mud barriers for collecting water that recharge groundwater, improve forest growth, and conserve water for irrigation and wildlife, livestock and domestic use. The efforts, coordinated by village councils, restored the Avari River—dry since the 1940s—as well as native bird populations.

Some agricultural innovations are informal to the extreme but no less fundamental. A social network of women farmers across neighboring villages in Mozambique copied farmers participating in more formal agricultural projects in the area.⁸⁴ To cushion the risk of increasingly variable weather the women adapted short-maturing varieties of cassava and sweet potatoes, which could be grown on marginal sandy soils during increasingly frequent droughts. Their effort speaks both to the power organized women can exert and the marginalization they must routinely overcome.

As the examples illustrate, many such efforts work only because local populations take executive initiative beyond the "community-led" market-oriented pathways promoted by neoliberal natural resource management.⁸⁵ Sustainability arises in part from communal ownership of the problem of integrating food and ecology, including recycling physical and social resources for the next season, year, or generation. Such communities are almost by definition unlikely—even unable—to engage in the kinds of 'spatial fixes' routinely undertaken by agribusinesses, which, with little compulsion otherwise, are able to move their operations out of a region they've environmentally ruined or even geographically 'surf' their own wave of destruction.^{86,87} Indeed, as far back as the 1850s German chemist Justus von Liebig framed chemically driven intensification in and of itself, destroying soils for generations, as an act of theft.⁴

The success of community alternatives is never guaranteed and is contingently dependent upon 1) routinely reconceptualizing responses, 2) accumulating natural and social buffers to global environmental and economic processes that can swamp or contradict local efforts, and 3) state support in material and morale. The details are critical and, as described here by Richard Levins, require constant place- and time-specific adjustment,⁸⁸

Instead of having to decide between large-scale industrial type production and a "small is beautiful" approach *a priori*, we saw the scale of agriculture as dependent on natural and social conditions, with the units of planning embracing many units of production. Different scales of farming would be adjusted to the watershed, climatic zones and topography, population density, distribution of available resources, and the mobility of pests and their enemies.

The random patchwork of peasant agriculture, constrained by land tenure, and the harsh destructive landscapes of industrial farming would both be replaced by a planned mosaic of land uses in which each patch contributes its own products but also assists the production of other patches: forests give lumber, fuel, fruit, nuts, and honey but also regulate the flow of water, modulate the climate to a distance about ten times the height of the trees, create a special microclimate downwind from the edge, offer shade for livestock and the workers, and provide a home to the natural enemies of pests and the pollinators of crops. There would no longer be specialized farms producing only one thing. Mixed enterprises would allow for recycling, a more diverse diet for the farmers, and a hedge against climatic surprises. It would have a more uniform demand for labor throughout the year.

If a community's source of wealth is found in its landscape, rather than solely in wages from externally sourced capital or a small plot's seasonal output, taking care of the land and local wildlife turns into a prime directive even—or especially—in a global

marketplace. Wealth in a commons a population shares turns back into the kind of value neoclassical economics has long abandoned. Lauderdale's paradox, by which the market rewards efforts to destroy Earth's remaining resources, is resolved in favor of populations that conserve the environments they consume.

Food revolution

Current concerns about global food security are certainly justified, but long-term resolution requires more than pursuing a second Green Revolution, whatever heavily capitalized transgenics, chemicals, and dispossession such a thing might entail. Refuting agribusiness' bedrock assumptions, even if at first by example alone, opens up space for alternate models aimed at assuring food's long-term viability.

In the end, however, the power of example must be consolidated into a paradigm shift that transcends the agro-food sector. The larger world needs to assimilate the already detrimental consequences should unfettered human growth and consumption continue as presently, or as green (or greenwashing) neoliberalism effectively proposes anew. If the likelihood can be conceptually absorbed, there is a chance policy, behaviors and practices around reducing 'growth' and resource consumption, even to a negative rate, can be accepted globally as both the norm and beneficial. Wealth and wages can be newly conceived in our efforts to restore landscape regenerative capacity and to better calibrate community production and consumption.

The resulting 'breathing room' should permit ecosystems and biodiversity time enough to recover, highly sophisticated integrative agricultures to develop, and the quality and sustainability of human life to improve. The rapid growth of interest in steady-state economics is cause for hope, as is the development of the 'One Health' approach, wherein the health of humans, livestock, crops, wildlife and wild plants are treated as inextricably linked in integrated ecosystems.^{89,90} Both are good albeit insufficient starts. Each largely leaves out the central roles expropriation and material alienation play in reordering ecologies and epidemiologies alike. Contrary to charges of Luddism,⁹¹ attempts at devising a sustainable

commons that feeds a growing global population are conceptually orders of magnitude more difficult than keeping the agricultural regime on its present—and disastrous—course. The science around moving out of the trap into which we maneuvered ourselves and toward a sovereign conservation agriculture is exceedingly difficult if at this point also our sole option for a future both fed and fair.

A key to such a revolution—and there can be no other word for it—will be its governance. To give credit where due, many institutions have shifted their policy thinking around food security towards more sustainable and equitable solutions, however much these still remain highly dependent on present global and local governance. Unfortunately, such good faith has been repeatedly cracked with enough lobbying. The political pressure multinational agribusiness exerts in local arenas extends to global institutions.⁹² As a result, to date the progress has been found more in rhetoric and less so, if at times at all, in the field. Change, if still only in principle, is nominally accepted during macroeconomically prosperous fiscal quarters, but is soon abandoned in a panic as economies fail by way of the very models used to justify continuing current production practices.

If such contradictory impulses continue to manifest in weak governance and an inability to boldly take on sustainable food security, the political will may be supplied from elsewhere instead, namely by popular movements outside the present political infrastructure. For some, including Clay, the present revolts across North Africa and the Middle East, correlated with food crises,⁹³ serve as fair warning. For much of the world, on the other hand, the more populist revolts symbolize the very hope of the future.

As our species' history has repeatedly shown—a series of radical shifts born as much out of desperation as innovation⁹⁴—a food revolution is not only a good idea but, as we look across our planet, a precarious necessity. Precarious as its outcome is no sure thing. History offers us an illusion of inevitable existence. Humanity has repeatedly overcome dire food limitations, even as archeological strata are also littered with dead civilizations. These near-misses, however,

can offer us no sample sufficiently representative for guaranteeing a future. So in what direction we next choose may literally mean the world.³³ Agribusiness, on the one hand, treating Earth's ecological collapses as an investment prospectus, machinates at holding the globe at ransom: food for those who can afford it in return for food's control and command.

Millions the world over, on the other hand, see another way. There's plenty of capacity for food production even with a growing population if we treat food as first a source of ecologically integrated nutrition rather than of commodities alone, as a use value before a surplus value, as a renewable and locally tended if globally connected source of income, as well as, lest we forget one of life's pleasures, a tasty delight. In this way, albeit with all the details still open to discovery, we can sidestep the very consumption spirals commodities putatively aim to plug. Our wealth is found in our soil's—and water and air's—self-regeneration. It is found in the work put into preserving those capacities in the course of exploiting them for our own needs.

A conservation agriculture in more than name alone, in a plurality of forms that from place to place sustainably aligns people and their ecologies, marrying food security with food sovereignty, can be brought about in time, but only by prying capital's grip off policy and power. In liberating ourselves we can save our planet and feed its people, as beautiful an act of redemption as it is now by Earth's present damage compulsory.

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