Livestock Farming, Communities, Biodiversity and Climate Change

Global Social, Cultural, Ecological, and Ethical Impacts of an Unsustainable Industry – and the Alternatives that Exist

Prepared by Brighter Green and the Global Forest Coalition (GFC) with inputs from Biofuelwatch

Photo: Brighter Green

1. Modern Livestock Production: Factory Farming and Climate Change

For many, the image of a farmer tending his or her crops and cattle, with a backdrop of rolling fields and a weathered but sturdy barn in the distance, is still what comes to mind when considering a question that is not asked nearly as often as it should be: Where does our food come from? However, this picture can no longer be relied upon to depict the modern, industrial food system, which has already dominated food production in the Global North, and is expanding in the Global South as well.

Due to the corporate take-over of food production, the small farmer running a family farm is rapidly giving way to the large-scale, factory farm model. This is particularly prevalent in the livestock industry, where thousands, sometimes millions, of animals are raised in inhumane, unsanitary conditions. These operations, along with the resources needed to grow the grain and oil meals (principally soybeans and

corn) to feed these animals place intense pressure on the environment. This is affecting some of the world's most vulnerable ecosystems and human communities.

The burdens created by the spread of industrialized animal agriculture are wide and varied—crossing ecological, social, and ethical spheres. These are compounded by a lack of public awareness and policy makers' resistance to seek sustainable solutions, particularly given the influence of the global corporations that are steadily exerting greater control over the world's food systems and what ends up on people's plates.

The Food and Agriculture Organization (FAO) of the United States estimates that 18 percent of global greenhouse gas emissions can be attributed to the world's livestock sector.[i] Each year, more than 60 billion animals are raised for human consumption. Meat and dairy production already uses 30 percent of Earth's land surface, 70 percent of agricultural land, and accounts for eight percent of the water humans use, mostly to irrigate feed crops. The global livestock industry is, according to the FAO, "probably the largest sectoral source of water pollution," and one of the key agents of deforestation.[ii]

2. The Exponential Growth of an Unsustainable Industry

Some estimates project that the global production of meat will double by 2050, which could mean increasing the number of animals used each year in the food industry to 120 billion.[iii] This prediction has serious implications for the continued—and escalating—impacts that industrialized animal agriculture has on the Earth. Almost all of the growth in production of livestock is occurring within the industrial system, not among small operations or local farms. This has created a notable geographic concentration of large-scale farming operations, resulting in a disconnect between the animals raised for food and the animal feed needed to support the industry.

Animal feed is purchased internationally, lowest cost being the highest priority, no matter the ecological impacts. These include the clearing of land for crops and the use of fossil fuel-based and often toxic pesticides and fertilizers that pose risks to human health and wildlife populations. Increasing demand for grain and oil- and fish-meals to sustain the growing global livestock population means that more of the planet's surface will have to be converted to cropland to grow food for farmed animals, not people.[iv]

In addition, "industrial agriculture and the cultivation of mono-crops for feed or fuel are eroding ecological processes that allow carbon to be stored in soils and not released into the atmosphere. As a result of the use of chemical fertilizers, intensive agriculture and animal monocultures produce important quantities of nitrous oxide, the third most significant greenhouse gas responsible for global warming," according to a report by La Via Campesina.[v]

Deforestation as a result of the growth of industrial animal agriculture is a compound problem, reducing available habitat for wildlife, decreasing water quality in streams and rivers, lowering ecosystems' resilience to the effects of climate change, and threatening the livelihoods and rights of indigenous peoples and other forest-dependent communities.

Globally, agriculture is estimated to be directly responsible for 80 percent of deforestation.[vi] In Latin America, the growth of large-scale cattle ranching is the primary driver of forest loss, threatening Indigenous communities, including communities living in voluntary isolation in the Amazon rainforest, the Gran Chaco, and other major forests. Over half of all life on earth is found in tropical forests, which now cover only 7 percent of the world's surface.[vii] This paints a grim picture for the future of Earth's species, both human and animal.

CASE STUDY: PARAGUAY: A Clash of Soy Producers, Cattle Ranchers and Local Communities

In Paraguay, both large-scale, extensive cattle farming and the large-scale production of soy for intensive livestock farming have significant impacts on the lives, livelihoods, and forests of indigenous peoples and small farmers. In particular, genetically-modified soy monocultures are a major cause of the displacement of rural populations. They also cause biodiversity and soil depletion and other social and environmental problems. These include health problems experienced by local populations due to extensive use of agro-toxics. Ninety-eight percent of Paraguay's Atlantic Forest in the east of the country has already been lost to deforestation.[1] Farmers, land grabbers, and speculators have now been focusing their attention on the Chaco, a semi-arid, dry forest region in the north and west of the country, which also extends into Bolivia, Argentina, and Brazil. Though not as lush as the remaining forest in the east, the Chaco is biologically diverse. But deforestation here is accelerating; in 2012 alone, a staggering 600,000 hectares (1.48 million acres) were cleared, primarily for cattle ranching, although soy production is expanding as well.[1]

Soy and cattle

Globally, Paraguay ranks seventh in soy production and fourth in soy exports, with around three million hectares (7.4 million acres) under cultivation.[1] While Paraguay produces a mere fraction of what its neighbors Argentina and Brazil produce, its output has grown much faster and is about five times what it was two decades ago.[1] Like its neighbors, the overwhelming majority of its soy is grown on large monocultures using genetically-modified seeds, mechanized equipment, and heavy applications of pesticides and fertilizers. These soy monocultures constitute 80 percent of all crops in the country.[1] Ninety-five percent of soy grown in the country is Monsanto's Roundup Ready variety, which is genetically-modified to be resistant to the herbicide glyphosate.[1] The large quantity of glyphosate that is used with these seeds has contaminated groundwater, damaged soil, and killed all other vegetation it contacts. In many instances, locals have become sick or even died due to exposure to the herbicide; Silvino Talavera, a young boy from the southern department of Itapúa, died after being accidentally fumigated on a genetically-modified soy plantation near his home and has become a symbol of the resistance against soy.[1]

Cattle ranching has long been practiced in the Chaco, though the scale of production has increased nearly two-fold since 1991 to 12 million head.[1] Brazilian soy producers who entered the country in the 1970s and the large Mennonite populations that settled in the Chaco earlier in the twentieth century have been leading expansion in this area, as cheap land and lax government regulation have enabled strong profits.

Popular discontent

The unsustainable expansion of mono-cropping and cattle ranching in Paraguay is linked to other problems, such as corruption, unequal land distribution, weak property rights, a lack of government willingness to enforce socially and environmentally just regulation, and the foreign ownership (mostly Brazilian) of half of the country's farmland. Businessmen and large landholders exert disproportionate influence over the government, making the legal system skewed to favor their interests.

Peasants and indigenous groups are the most vulnerable to the massive expansion of soy and cattle into the Chaco. Their land is often occupied, their environment polluted, their livelihoods threatened, and their voices largely ignored. Many peasants, indigenous communities, and landless farmer groups have resisted the conversion of their lands into soy by occupying land, burning crops, and even engaging in armed conflict with the police; since 1989, over 120 peasants have been killed in such disputes.[1]

No longer able to farm the land or utilize the forests, the soy boom has driven some 100,000 people from the countryside into urban slums since 1990.[1] The Ayoreo tribe in the Chaco includes some of the last uncontacted communities on the planet, but livestock's expansion is threatening their lives and livelihoods by displacing them from their land. Paraguay's constitution guarantees the right of indigenous people to ancestral land, but land disputes are almost always settled in favor of the big landowners.

Voluntary corporate social responsibility initiatives, such as the Roundtable for Responsible Soy, and a weak system of biodiversity offsets that allow companies to essentially buy the right to clear forests, have not offered viable solutions to forest loss in Paraguay. Many observers are also skeptical that REDD+ will have positive impacts, given the lack of political will and institutional capacity. To be sure, Paraguay has many issues to resolve before it can sustainably manage its forests.[1]

3. Malnutrition, Lack of Food Security, GMOs, and Other Impacts on Human Health

As the world transitions to this more industrial system of agriculture, food producers and food consumers are becoming socially and culturally disconnected from their land, from the natural world, and the food system itself. Can this transition be sustainable? And how do we ensure that traditional lifestyles are maintained to ensure global food security and prevent the loss of valuable cultures and societies? Indigenous communities have used the resources found near their homes to meet their basic needs for thousands of years. "Peasant" farmers all over the world have demonstrated that genuine sustainable agriculture is possible, and can actually contribute to cooling the planet.[viii] Now, people are moving away from traditional cultures, long-standing ways of life, and locally sourced sustenance—in favor of increased consumption of meat and processed foods.

For example, only a generation ago, most chickens in India were raised in backyard flocks, often by women. Now, 90 percent of the more than 2 billion chickens that come to market each year have lived their entire lives in industrial-style facilities, and India is the world's fifth biggest poultry meat producer.[ix] In addition to a loss of connection with nature and deviation away from traditional cultures, the industrialization of the meat industry is amplifying public health issues across the globe. In China, now the world's largest producer and consumer of animal products, diet-related chronic disease is now the most common cause of death.[x]

Genetically-modified crops, relied upon in the industrial model of agriculture as they have large outputs and are resilient to many pests and weather conditions, pose largely unknown risks to human health. China also purchases nearly 50 percent of the world's soybeans sold in global markets for use as domestic animal feed.[xi] This includes large quantities from the U.S., Brazil, and other countries in the America.[xii]

Industrial Livestock and Agro-fuels

Strong synergies have been forged among agribusiness, intensive livestock producers, and bio-energy. Alliances among energy, agribusiness, and livestock corporations have helped to drive the expansion of agro-fuels. Mandates and subsidies for bio-energy are contributing huge new demand for corn, sugarcane, soya, palm oil, wheat, and various other crops used to produce ethanol and bio-diesel, as well as wood and other biomass for both liquid fuels and combustion for heat and energy. Expansion of these crops is now driven by both increased demand for animal feed and increased demand for bio-fuels.

Expansion of soybean cultivation, for example, is being fueled by the combination of growing demand for soybean meal for animal feed plus increased demand for the soybean oil and rising prices for it for use in bio-fuels production (either directly or indirectly). In North America and Europe, expansion of corn- and wheat-based ethanol is being legitimized, as well as being made far more profitable, by the use of residues (dried distillers grains with solubles or DDGS) from the ethanol production process in livestock feed. This in turn has serious consequences for animal welfare and public health, e.g. through an increased risk of E. coli epidemics due to cows being fed such an unsuitable diet.[xiii]

In the U.S., as elsewhere, the ethanol and livestock industry are very closely tied. Agribusiness companies such as Cargill, ADM, and Monsanto have varied interests at every level of the production process, from crops, seeds and agrichemicals, to transport infrastructure, meat processing, and refineries. With federal mandates for bio-fuels in place, and tight economics for refineries, ethanol producers in the U.S. have sought profitable markets for DDGS, the very large quantities of byproducts of ethanol production.

This has led to the practice of substituting DDGS for corn and soy in animal feed for cattle and poultry, which now make up as much as 20 percent of revenues for some refineries.[xiv] The ethanol/agribusiness sector promotes this as a "win-win" solution, claiming it reduces overall demand for corn in the livestock sector. They even argue that

greenhouse gas lifecycle assessments for corn ethanol should discount emissions from this displaced demand for livestock feed. (However, manure from cows fed DDGS contains very high levels of nitrogen and phosphorus, contributing to high nitrous oxide emissions.)

Unfortunately, DDGS has been found to be difficult for cows and other livestock to digest and the resulting gastrointestinal illness is linked to a major increase in the incidence of human illness from E. coli in contaminated meat. Also, the high sulfur content typical of DDGS causes neurological disease in livestock.

Ethanol facilities and livestock operations find it advantageous to co-locate. For example, some refineries use manure to generate power, and then feed DDGS, which is difficult and expensive to transport, back to nearby cattle. The production of ethanol involves the use of a variety of chemicals, residues from which can end up in DDGS. These include antimicrobial drugs, antifoam, and boiler chemicals to enhance steam generation. Of particular concern is that antibiotics, used to control unwanted bacteria in fermentation vats, can and do make their way into DDGS. The livestock industry is already contributing to a disastrous proliferation of antibiotic resistant bacteria, and the consumption of DDGS as livestock feed contributes further.[xv]

More recently, the industry is looking at human consumption of DDGS. A recent article published in the *Wall Street Journal* states: "U.S. ethanol producers are finding creative ways to earn more money as demand for their flagship product stagnates. These companies are using corn not only to make ethanol but also ingredients for products ranging from baked goods and nutrition bars to industrial coatings to fish food."

Bio-energy and livestock production find further synergies in the subsidizing of biogas from anaerobic digestion of manures. This practice has raised concerns that the process may be ineffective at eradicating the prions responsible for bovine spongiform encephalopathy (BSE, or "mad cow" disease). This is of particular concern given that carcasses from "downed" cows (i.e., cows that have fallen down as a result of illness or injury) are sometimes used.

Intensification of animal agriculture means that "the livestock sector enters into more and direct competition for scarce land, water, and other natural resources," according to the FAO. This, of course, has a significant impact on the prospects for ensuring equity and sustainability globally, along with broad-based prosperity for the world's people. "You could even feed 8 billion [people], maybe you could feed 9 billion," UN Population Fund advisor Michael Herrmann says of the current global food system, but adds that "a large share of the food we produce does not actually end up as food on our plates;" instead it's used as animal feed. Globally, about 98 percent of soy meal (which is created by crushing soy beans) is used as feed for farmed animals.[xvi]

High meat consumption also puts human health at risk, contributing to rising rates of diabetes, heart disease, and increasing occurrence of some cancers. Meat production itself is a major driver of animal cruelty around the globe, threatening both animal welfare and public health. Meat chickens have been bred to grow so quickly that their bodies cannot support their own weight, and many of them spend their lives in chronic pain, unable to walk or move around.[xvii] Many also regularly receive antibiotics and hormones to promote rapid growth, contributing to antibiotic resistance, which is an increasing concern of global health professionals.[xviii]

Soybean production for fodder causing deforestation in Paraguay. Photo: Simone Lovera

Impacts on Biodiversity:

- Ten percent of the world's plant and animal species that face some degree of threat are experiencing habitat loss based on livestock production.[xix]

- According to the Millennium Ecosystem Assessment (MEA), the most important drivers of biodiversity loss are habitat change, climate change, invasive alien species, overexploitation, and pollution. Livestock production and intensification contributes to all of these drivers.[xx]

- Of the world's thirty-five biodiversity "hotspots,"containing the highest levels of endemic species that have lost 70 percent or more of their original habitat, twenty-three are affected by livestock production.[xxi xxii]

Examples of the impacts of the industrial livestock sector from all over the world[1]

- In **Argentina**, the Chaco forests were wiped out to export soybeans to China; but there is still a tendency, even by some NGOs, to call genetically-modified soy production "climate smart" as no tilling is needed and it replaces cattle ranching. There also is a significant loss of genetic diversity amongst livestock since the intensive livestock farming industry is interested in a few animal varieties only.

- In the **United States**, over 95 percent of egg-producing chickens are raised in "battery cages," which are stacked upon each other in rows in warehouses. Each chicken has less floor space than a sheet of paper, preventing them from expressing natural behaviors or even spreading their wings. While the E.U. has outlawed battery cages, they are becoming increasingly common in the global South as the U.S. factory-farming model is exported.[xxiii]

- In **Indonesia**, the government is promoting the introduction of genetically-modified crops by Monsanto, as a means to intensify agriculture in the country. There is a push by the government to turn Indonesia into a "food state" (like Thailand), with big plantations of soy, and rice, among other crops. But this strategy only benefits corporations, not the small farmers.

- Corporations in **India** and other parts of Asia create contracts with farmers, which oblige the farmers to grow a certain type of seed to produce corn for chicken feed, as well as the chickens themselves. The company also provides vaccines, growth hormones and/or antibiotics and all other inputs as part of the contract. The chickens basically belong to the corporation, with the farmers having very little to no control over production. Also, chicken fat is being fed to cattle, causing significant risks in the food chain.

- In **Benin**, subsistence farmers are struggling against "land-grabbing" by foreign governments (including Kuwait, China, and Saudi Arabia), which are growing grains and raising livestock to feed citizens in their own countries. This is a serious threat to the food sovereignty of Benin, and other West African nations facing the same intrusions.[xxiv]

- In **Chad**, the Bororo community, which is still 100 percent nomadic, is fighting to maintain their traditional culture and way of life. In this country, one-fifth of the economy is based on cattle production. Now conflicts are escalating between subsistence pastoralist herders and industrial

[1] *These examples of the impacts of the industrial livestock sector are drawn from two informal consultations held on this topic on the sidelines of recent UN meetings in Hyderabad (COP 11 for the Convention on Biological Diversity/CBD) and Qatar (COP 18 for the Framework Convention on Climate Change/UNFCCC).*

farmers who are buying up large tracts of land. This land is soon exhausted of its resources and no longer able to support large numbers of cows.

- In **Kenya**, the Borona pastoralists are competing with large-scale industrial agriculture for land and resources. The Borona do not want to change their lifestyle or lose their livelihoods, but the government is now importing cattle, which is decreasing the value of the domestic stock. Droughts are occurring with increasing frequency, and during the last major drought, 80 percent of cattle died. Mining—another driver of global climate change—is also causing problems for the Borona people, as it reduces their territory and limits their ability to move their animals from place to place in search of food and water.

- In **Cameroon**, pastoralist farmers face unpredictable weather that threatens their traditional way of life. Cattle are unable to withstand the prolonged droughts that they are now experiencing, which can last up to six months. This forces the traditional cattle herders to migrate to cities for employment, where they get jobs as servants, maids, or other low-paid, low-status positions.

Examples of More Sustainable Livestock Production: Community Conservation and Pastoralist Practices of Indigenous Peoples

Territories and Areas conserved by Indigenous Peoples and local communities (ICCAs) play a very important role not only in the conservation of biodiversity (an estimated 22% of the Earth' terrestrial lands are managed by Indigenous peoples and local communities)[xxv], but also in sustaining the livelihoods, traditions, and cultural survival of these peoples and communities. Pastoralist peoples often manage extensive areas using biocultural approaches and management techniques that have conserved and used the biodiversity of these often fragile lands in a sustainable manner for centuries.

Lazur Rangelands in Iran

A number of inspiring examples of such ICCAs can be found in Iran. In the Tehran Province of Iran, for example, the Lazur rangelands are regulated by several tribes indigenous to the region. These lands supply a major portion of the communities' livelihoods, which are centered on livestock rearing. The pastures are grazed on an annual rotational grazing system, and allocated to members of each clan through a ritual drawing of lots. An equitable distribution of gains and losses is built into the system. Also embedded in this model is a conscious effort to maintain the local floral and fauna.[xxvi]Pastoralist communities in Iran share responsibilities for managing the remaining forest areas and grasslands are restored through a traditional system of seed dispersal, which entails that seeds of local grasses are being disseminated by attaching seedbags with a small hole to the first animal in a moving herd. The seeds are slowly dispersed and subsequently trampled into the ground by the other animals in the herd. When the tribe returns to the same lands the next season, new grass is waiting for their animals.[xxvii]

The Maasai in Kenya and Tanzania

The Maasai Mara is a national reserve spanning southwest Kenya and northern Tanzania. The Naboisho Conservancy was created in 2010 in a section of the Mara as a joint-effort between the local Maasai community and the Basecamp Foundation (the charitable arm of the Basecamp ecotourism company) to combat outside land grabbing and threats to indigenous livelihoods.[xxviii] The Maasai are pastoralists native to Kenya and Tanzania who have become increasingly marginalized due to their nomadic lifestyle and dependence on livestock. The 50,000 hectares of Naboisho, owned by Maasai and leased to Basecamp and other eco-tourism partners, allow for biodiversity to thrive while also providing livestock owners with grazing lands.[xxix] The area leased to tourism partners is a dedicated wildlife protection zone, with the rest of the land serving as pasture for livestock. Other groups of Maasai in Kenya have begun growing supplemental feed crops, such as corn, beans, and sorghum, in addition to pasturing their

animals, as a result of changing climate patterns, including drought, and the urbanization of nearby Nairobi, creating significant pressure on land and water resources.[xxx]

Conclusion & Ways Forward

Industrial agriculture is having devastating impacts on the lives, health, lands, territories and ecosystems of peasants, Indigenous Peoples, and other food producers and consumers all over the world, as well as on the lives and habitats of other species. Intensive livestock farming and other forms of large-scale livestock production also present significant threat to food security by absorbing massive amounts of land for the production of fodder or feed for often very badly treated animals, instead of food for human beings.

Small-scale, integrated, agro-ecological farming systems and traditional pastoralism not only represent alternatives that are much better for the planet. They also sustain social and cultural values, and respect the role of women in food production. Moreover, agro-ecological agriculture and pastoralism play important roles in ecosystem-based climate change mitigation and adaptation. For that reason, respecting the territorial and land rights of pastoralists and other Indigenous Peoples and peasants, and actively supporting their production systems is one of the responses to climate change most urgently needed.

Government subsidies that now support the expansion of industrial-scale livestock and feed operations should be ended and the "externalities" on which animal agriculture is dependent—such as riverine and marine pollution, contamination of soil and groundwater, land degradation, and greenhouse gas emissions (GHGs)—should be paid for, in full, by the industry and/or specific facilities that cause them.

It will also be necessary to change consumption and production patterns that "promote waste and unnecessary consumption by a minority of humankind, while hundreds of millions still suffer hunger and deprivation." [xxxi] Also required will be energy systems that do not harm the environment or remove land from food production; some of these may be based successfully on local resources and technologies. Political openness, especially in policy-making, ought to be encouraged so that voices questioning intensive animal farming and promoting sustainability and equity can be heard.

More Information on the Issues Explored Here is Available From:
Biofuelwatch: http://www.biofuelwatch.org.uk/
Brighter Green: http://www.brightergreen.org/
Econexus: http://www.econexus.info/
Global Forest Coalition: http://globalforestcoalition.org/
Indigenous Peoples of Africa Coordinating Committee (IPACC): http://www.ipacc.org.za/eng/default.asp
La Via Campesina: http://viacampesina.org
World Alliance of Mobile Indigenous Peoples and Nomadic Pastoralists (WAMIP): http://www.rtfn-watch.org/

For comments or other feedback, please contact simone.lovera@globalforestcoalition.org

Global Forest Coalition (GFC)
The mission of the Global Forest Coalition (GFC) is to reduce poverty amongst, and avoid impoverishment of, Indigenous Peoples and other forest-dependent peoples by advocating the rights of these peoples as a basis for forest policy and addressing the direct and underlying causes of deforestation and forest degradation. GFC is a worldwide coalition of 54 environmental groups and Indigenous Peoples' Organizations from more than 39 different countries. It implements joint campaigns to promote rights-based, socially just forest policies at the international, national and local level. It was founded in 2000 by 19 large and small organizations that were concerned about the impact of forest conservation policies on the rights and needs of Indigenous peoples and

local communities. GFC has non-governmental organization (NGO) focal points in each continent, Indigenous focal points in Africa, Latin America and Asia and two small offices in Paraguay and the Netherlands.

Brighter Green

On its own and in partnership with other organizations and individuals, Brighter Green generates and incubates research and project initiatives that are both visionary and practical. It produces publications, websites, documentary films, and programs to illuminate public debate among policy-makers, activists, communities, influential leaders, and the media, with the goal of social transformation at local and international levels. Brighter Green seeks to advance core commitments to Sustainability, Equity, and Rights through three program areas: Climate Change, Livelihoods, and Rights; Sustainability and Community; and Food Policy and Equity. Brighter Green has produced a unique set of multimedia research on climate change and livestock intensification in four key countries—China, Brazil, Ethiopia, and India—that is being used by policy-makers in a number of countries, civil society organizations, academics, advocates, the media, and others to better understand the challenges and possible solutions.

Based in the U.K. and U.S., **Biofuelwatch** works to raise awareness of the negative impacts of industrial biofuels and bioenergy on biodiversity, human rights, food sovereignty and climate change.

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