CLIMATE MISALIGNMENT:

How Development Bank Investments in Industrial Livestock Are at Odds With Their Paris Agreement Commitments

June 2023

STOP FINANCING FACTORY FARMING

Acknowledgements

This report was written by Kelly McNamara and Kari Hamerschlag, Friends of the Earth U.S., on behalf of the Stop Financing Factory Farming Campaign.

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The Stop Financing Factory Farming Campaign works in partnership with locally affected communities and organizations to shift development finance away from industrial livestock production towards healthier, more humane and sustainable food systems. The campaign's global Steering Committee includes: the Bank Information Center, Friends of the Earth U.S., Feedback Global, the Global Forest Coalition, International Accountability Project, Sinergia Animal, and World Animal Protection. The campaign has more than 30 organizational members and partners globally.

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Executive Summary

During the last several years, including at the November 2021 Finance in Common Summit, the world's public development banks committed to shifting their investment strategies and activities to align with and support the objectives of the Paris Agreement.[1] Despite this commitment, multilateral development banks (MDBs) continue to invest in the global expansion of industrial livestock production, or "factory farming", notwithstanding the United Nations Environment Program's and other climate experts' assessments that absolute reductions in GHG emissions from livestock production are necessary to limit global warming to 1.5°C or "well below" 2°C, as the Paris Agreement requires.[2]

According to research by World Animal Protection, leading MDBs including the European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), IDB Invest (Inter-American Development Bank), and the International Finance Corporation (IFC, World Bank Group) invested $4.6B in the sector between 2010 and 2021.[3] EBRD and IFC were the largest investors in private sector industrial operations, deploying $2.6B to help extend the global reach of some of the world's largest meat and dairy producers, including Smithfield and Danone.[4]

Despite the incompatibility of factory farming's global expansion with keeping global warming to Paris-aligned levels, some MDBs have dramatically ramped up their investment in industrial animal agriculture, including feed production. For example, between 2018 and 2021, IDB Invest invested ~$500M in operations across Latin America and the Caribbean after investing just ~$15M in the sector between 2011 and 2017.[5] Since 2021, MDB investments in factory farming have continued across Africa, Asia, Eastern Europe, and Central and Latin America and included support for regional and global agribusiness giants including PRONACA (Ecuador/IDB Invest and IFC), Louis Dreyfus Company (Brazil, IFC) and CMI Alimentos (Central America/IDB Invest).[6] Each is briefly profiled in this report.

Shrinking Industrial Livestock Production is Necessary to Meet Paris Climate Targets

The science is clear. To keep Paris-aligned GHG reduction targets within reach, global production and consumption of industrially produced meat and dairy must decline. Recent estimates of the sector's contributions to global GHG emissions range from 11.2% to 19.6%; estimates are far higher when emissions related to foregone carbon absorption resulting from using land for grazing and animal feed.[7] The sector also accounts for one third of anthropogenic methane (CH_4) emissions.[8] **Because CH_4 has 81.2 times the global warming potential (GWP) of CO_2 over a 20-year timeframe, reductions from industrial livestock production are particularly critical for meeting the goal of reducing global GHG emissions by 45% by 2030 to limit global warming to 1.5°C.**[9]

A 2020 *Science* study warns that even if fossil fuel emissions were immediately halted, livestock emissions could make it impossible to limit warming to 1.5°C and difficult to limit it to "well below" 2°C.[10] While industrial meat and dairy production and consumption must decrease in higher-income countries, several studies, including a 2022 report by the Inter-American Development Bank (IDB), have shown that production and consumption can and must also diminish in regions including China and Latin America, where banks are currently supporting the expansion of factory farming.[11]

Livestock production can play a role in meeting the nutritional and economic needs of the populations whom development banks serve. However, the decades-long industrialization and globalization of the sector has driven the overconsumption of animal-based foods in higher-income countries while exacerbating food insecurity among populations in lower and middle-income countries (LMICs) who should be the beneficiaries of development banks' support.[12]

Multilateral Development Banks Misclassify Industrial Livestock as Paris-Aligned

Since 2021, the World Bank and other leading MDBs have published Paris Agreement alignment methodologies, including the Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations, the EBRD Methodology to determine the Paris Agreement alignment of EBRD investments, and the IDB Group Paris Alignment Implementation Approach. While each of the frameworks refers to at least some industrial livestock operations as "high-emitting", none excludes investments in expanding the sector on the basis that emissions from livestock production must significantly shrink to achieve Paris-aligned global GHG reductions.

Our analysis of published MDB Paris alignment methodologies indicates these are flawed in the following ways:

- While MDB support of industrial livestock operations may involve some limited GHG mitigation requirements, no MDB currently requires clients in the sector to undertake **either comprehensive (Scope 1-3) GHG reporting or commit to absolute GHG reduction targets** (or Paris-aligned targets).
- **Investments in cattle and other "high-emitting" sector operations (e.g., non-ruminants with non-negligible GHG emissions) may *still* be labeled as Paris-aligned** "with the exception of operations that expand and promote expansion into areas of high carbon stocks or high biodiversity areas", presumably via deforestation. Given that deforestation is just one of many climate-related impacts of livestock operations, the failure of MDBs to require time-bound GHG reduction targets from livestock value chains (including methane-generating animals, manure "management" systems, and fossil fuel-intensive feed production) is a serious concern.[13]
- All published methodologies are based on alignment with Nationally Determined Contributions **(NDCs), yet only ~40% of countries have incorporated livestock-specific GHG reduction measures into their NDCs.**[14]

According to the Joint MDB and EBRD Paris alignment frameworks, non-ruminant operations with "negligible" emissions are classified as "universally" aligned. Yet in both frameworks, the term "negligible" is undefined. Whatever that definition may involve, the reality is that ***all*** industrial non-ruminant operations involve significant GHG emissions, including methane associated with manure management systems, N2O emissions from fertilizer application for feed production, and CO2 emissions from energy use for irrigation, pesticide and fertilizer production, processing, transportation, and refrigeration.[15] Industrial livestock production (inclusive of feed) is also a leading cause of deforestation worldwide and the single largest driver of land conversion in Latin America.[16]

- **In every global region, large-scale, industrial livestock value chain operations—from feed production to animal feeding operations to processing facilities—are inherently highly vulnerable to climate change and its ancillary impacts**. These include heat stress, rapid disease spread, and water shortages. While both the EBRD Paris alignment framework and the World Bank's Agriculture and Food Sector Note on Applying the World Bank Group Paris Alignment Methodology acknowledge some of these adaptation vulnerabilities, none of the published Paris alignment frameworks excludes industrial livestock operations from Paris-alignment on the basis of intensifying vulnerability to the impacts of climate change.

MDBs Should Stop Financing the Global Expansion of Factory Farming

To support the goals of the Paris Agreement—including "increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production"—all public development banks must confront the necessity of ***reducing***, not increasing, industrial livestock production.[17] While discussions among industry representatives, policymakers, and leading MDBs about the climate-related impacts of industrial livestock operations have centered on strategies designed to enhance the "sustainability" of industrial livestock operations by

reducing the GHG emission *intensity* (GHG emissions per kilogram of meat, dairy, or eggs), such strategies will not suffice for meeting Paris-aligned climate targets.[18] Data show that even the most ambitious scenarios for reducing livestock emissions via intensity reductions (lowering CO_2 eq per kg or liter of meat or milk) are insufficient to meet critical climate targets.[19]

Where livestock production can improve nutrition, food security, and livelihoods, MDBs should, in consultation with local communities, support diversified, agroecological, mixed crop and livestock and plant-based systems that not only deliver climate and biodiversity-related benefits but also support small-scale farmers who are the backbone of community food sovereignty and food security.[20] Providing such support would also enable MDBs to better meet their pledges to align their investments and activities with the UN Sustainable Development Goals (SDGs).

With just over six years left to avoid the most catastrophic effects of climate change and sufficiently address the concurrent factory farming-driven crises of deforestation, biodiversity loss, and the overuse and pollution of the planet's air, land, and water, we are calling on the world's leading MDBs to acknowledge the need to shrink—not expand—the global industrial livestock sector.[21] Instead, these institutions should leverage their political, economic, and intellectual heft to transform the global food system into one that can sustainably address global food security.

As an important first step, MDBs should add all industrial livestock activities, including feed production, to the list of activities they consider universally not aligned with the goals of the Paris Agreement. In addition, MDBs' agriculture-related development, project finance, and advisory services should:

1 Stop supporting the expansion of industrial livestock production. Instead, MDBs should facilitate the transition of GHG-intensive and otherwise environmentally destructive industrial farming systems to climate-impact mitigating and adaptive agroecological systems. These systems should prioritize the production of crops for human consumption and integrate livestock only where such integration can deliver ecological and social benefits and effectively address—rather than exacerbate—food insecurity and gender inequalities.

2 Strengthen mitigation requirements for all animal agriculture investments, including requirements for mandatory Scope 1-3 reporting and science-based, time-bound absolute emissions reduction targets that align with global targets. Mitigation measures that focus on GHG intensity-reducing technologies should not allow for absolute emission increases, nor should they be permitted if they lead to other negative impacts (e.g., increased water pollution or diminished animal welfare).

3 Strengthen adaptation requirements. At a minimum, "Paris-aligned" labeling should require all borrowers to demonstrate how their operations reduce the risks associated with extreme weather events. These include mass pollution, the increased spread of disease associated with global warming, and reliance on brittle supply chains, interruptions of which can cause severe food insecurity among vulnerable populations.

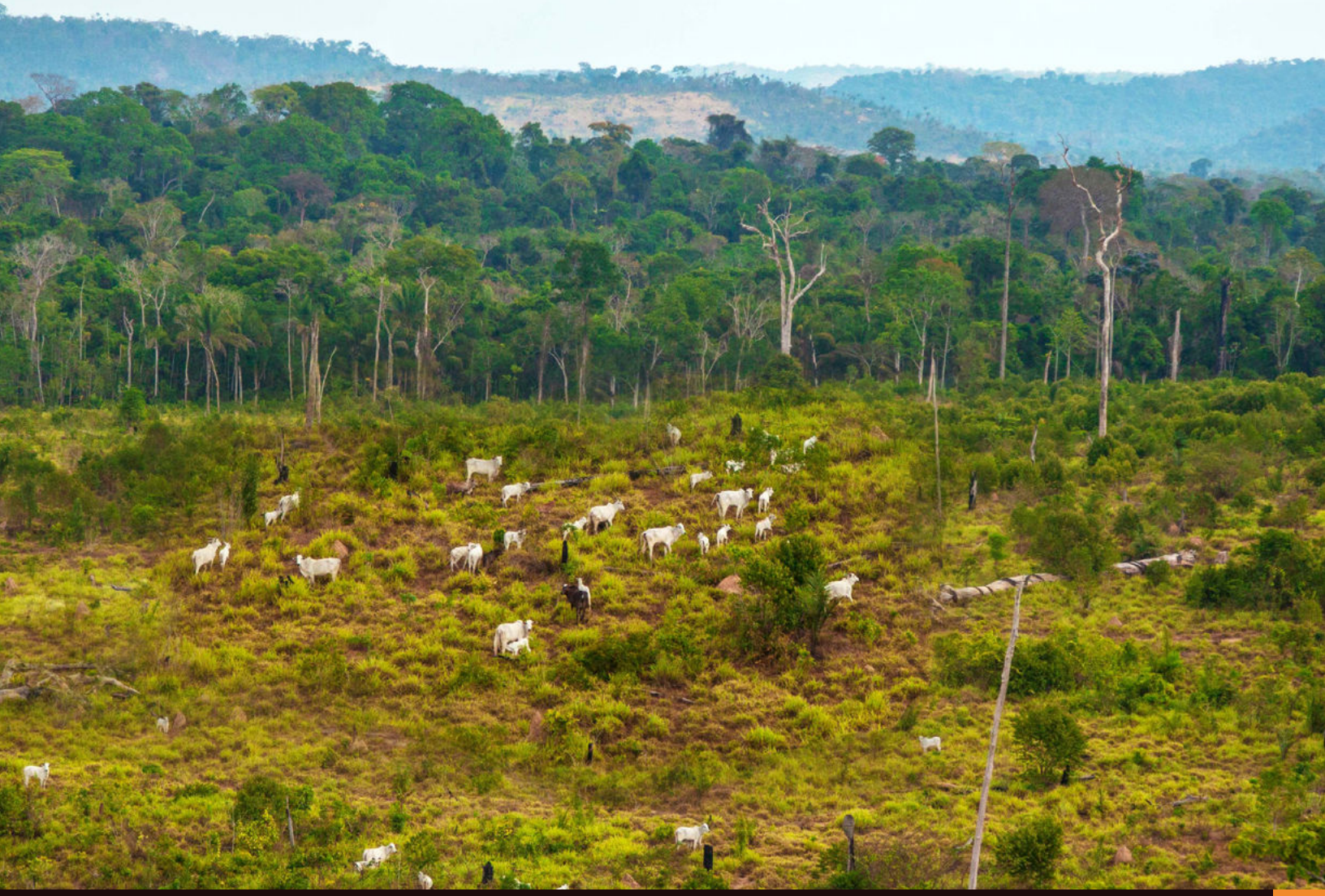
4 Acknowledge the need for and support critical demand-side shifts, including the convergence of global diets toward reduced levels of meat and dairy consumption, by refraining from making investments in livestock and feed operations that serve over-consuming regions including the EU, US, and parts of South America, and by supporting policies, projects and initiatives that promote more sustainable, plant-forward diets.[22]

5 Work with governments in countries with significant industrial livestock production to ensure that NDCs encompass absolute GHG reductions from the sector.

6 With active community participation and consent, support small- and mid-scale agroecological production systems, including diversified, mixed crop and livestock systems, silvopasture, agroforestry, and managed grazing. MDBs should direct their support toward an enabling environment that promotes smallholders' traditional and collective rights to seeds, livestock breeds, territories, and local and indigenous forms of production. These institutions should also seek efficient ways to guarantee access to land and technical support for women and other marginalized groups.

Without reducing and cutting down on meat consumption and the associated high-intensity agriculture systems, we will not be able to keep global warming to 1.5 degrees. That is very clear.

Prof Hans Pörtner, Scientist and Co-chair of the UN Intergovernmental Panel on Climate Change (IPCC), 2022



Introduction

During the last several years, including at the November 2021 Finance in Common Summit, the public development banks committed to shifting their investment strategies and activities to align with and support the objectives of the Paris Agreement.[23] Despite this commitment, multilateral development banks (MDBs) continue to invest in the global expansion of industrial livestock production, or "factory farming", notwithstanding the United Nations Environment Program's and other climate experts' assessments that absolute reductions in GHG emissions from livestock production are necessary to limit global warming to 1.5°C or "well below" 2°C, as the Paris Agreement requires.[24]

According to research by World Animal Protection, leading MDBs including the European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), IDB Invest (Inter-American Development Bank), and the International Finance Corporation (IFC, World Bank Group) invested $4.6B in the sector between 2010 and 2021.[25] EBRD and IFC were the largest investors in private sector industrial operations, deploying $2.6B to help extend the global reach of some of the world's largest meat and dairy producers, including Smithfield and Danone.[26] Some banks have dramatically ramped up their investment in factory farming since the Paris Agreement was signed. For example, between 2018 and 2021, IDB Invest invested ~$500M in operations across Latin America and the Caribbean after investing just ~$15M in the sector between 2011 and 2017.[27]

Since 2021, MDB investments in factory farming have continued across Africa, Asia, Eastern Europe, and Central and Latin America. Perhaps more concerningly, leading MDBs have published Paris Agreement alignment methodologies according to which factory farming investments may be labeled "Paris-aligned", or compatible with the GHG reductions required to limit global warming to 1.5°C or "well below" 2°C.

Such labels matter. The world's 522 public development banks manage roughly $23T in public assets, investing ~$2.7T in 2022.[28] They also mobilize trillions in private finance via de-risking investments and other measures. Such economic heft translates into impact on public policies. In the context of factory farming, this means helping to entrench the universal trend of over-subsidizing and under-regulating this high-emitting sector.[29] Expanding finance in this sector and labeling investments in the industry's global expansion as "Paris-aligned" will only worsen this worrying trend at a time when we can least afford it.

Industrialization and overproduction has made livestock production a leading cause of deforestation, biodiversity loss, and climate change.[30] Recent estimates of the sector's contributions to global GHG emissions range from 11.2% to 19.6%; estimates that include emissions from the production, distribution, and disposal of animal byproducts.[31] The sector also accounts for one third of anthropogenic methane (CH_4) emissions.[32] **Because CH_4 has 81.2 times the global warming potential (GWP) of CO_2 over a 20-year timeframe, reductions from industrial livestock production are particularly critical for meeting the goal of reducing global GHG emissions by 45% by 2030 to limit global warming to 1.5°C.**[33]

MDBs Should Stop Funding the Global Expansion of Factory Farming

To support the goals of the Paris Agreement—including "increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production"—all public development banks must confront the necessity of ***reducing***, not increasing, industrial livestock production.[34] With just over six years left to avoid the most catastrophic effects of climate change and sufficiently address the concurrent factory farming-driven crises of deforestation, biodiversity loss, and the overuse and pollution of the planet's air, land, and water, we are calling on the world's leading MDBs to acknowledge the need to shrink, rather than expand, the global industrial livestock sector.[35] Instead, these institutions should leverage their political,

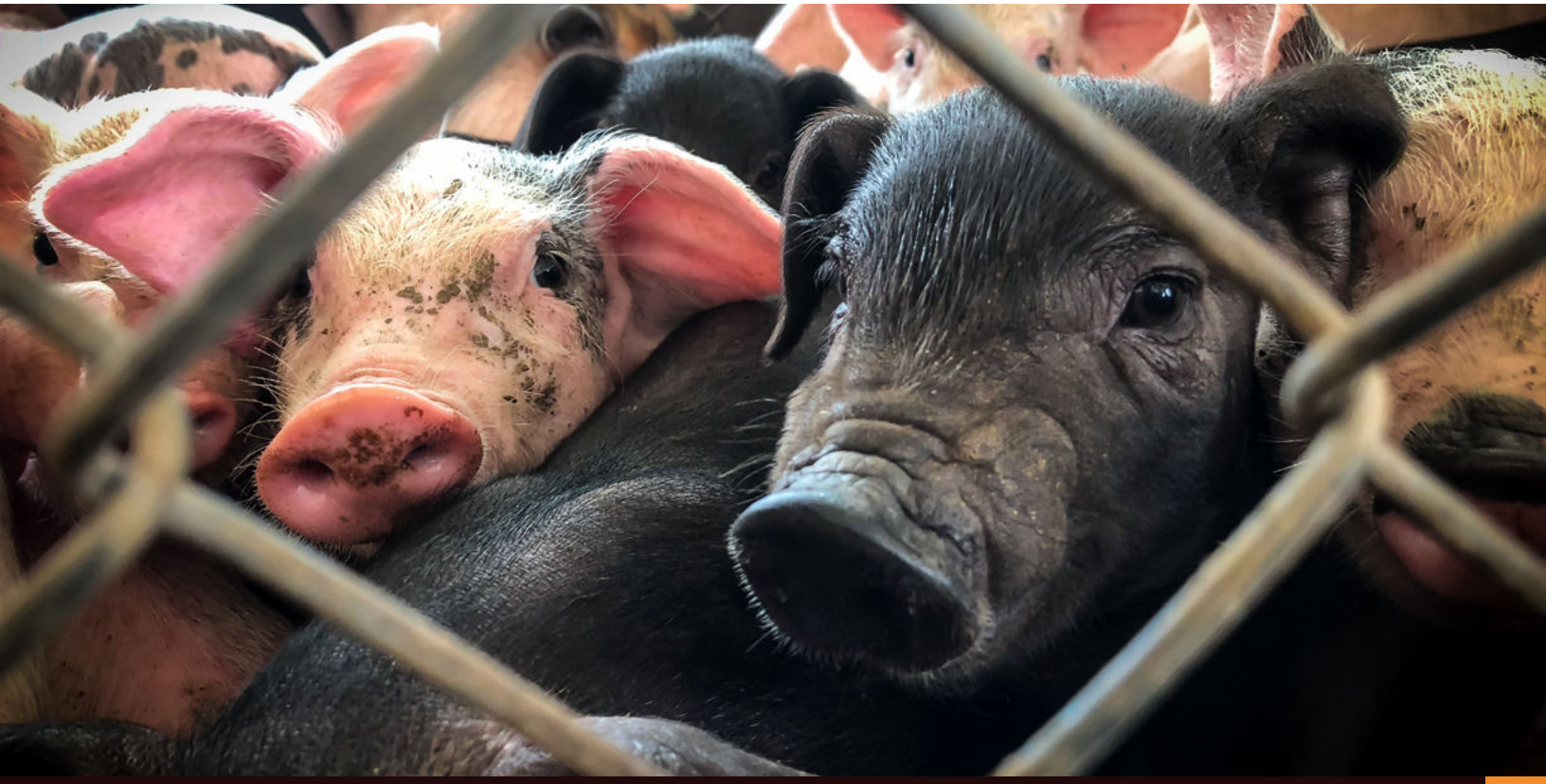
economic, and intellectual heft to transform the global food system into one that can sustainably address global food security. Providing such support would also enable MDBs to better meet their pledge to align their investments and activities with the UN Sustainable Development Goals (SDGs).

The need to reduce demand for livestock products is now a scientifically mainstream view. Only a significant decrease in meat and milk consumption will allow us to deliver a food system fit for the future – for the benefit of humans and the planet as a whole. Producing the same mix of foods as we consume now, even if we were to do so more sustainably, cannot deliver the reduction in environmental impacts we need to protect the planet for our children and their children.

Pete Smith, former lead convening author for The Intergovernmental Panel on Climate Change (IPCC), 2018

In the following pages, we document:

- Factory farming's negative impacts on climate and the global imperative to reduce the production and consumption of meat and dairy to limit global warming to 1.5°C or "well below" 2°C
- How flaws in development banks' Paris alignment methodologies are leading to the misclassification of expanding industrial livestock operations expansion as compatible with a 1.5°C or "well below" 2°C warming scenario and resilient to extreme weather and other impacts of climate change
- How strategies to mitigate industrial livestock emissions will not suffice to align the sector's emissions with a 1.5°C or "well below" 2°C warming scenario AND will likely exacerbate other negative impacts of factory farming, including animal cruelty and the spread of disease
- How a commitment to aligning strategies and activities with the Paris Agreement should lead MDBs to stop financing the expansion of industrial livestock production and shift their support toward diversified, decentralized, and resilient small-scale agroecological crop and livestock operations



Section 1:

Shrinking Industrial Livestock Production is Necessary to Meet Paris Climate Targets

Animal agriculture is a leading cause of climate change. Recent estimates of the sector's contributions to global GHG emissions range from 11.2% to 19.6%; estimates are far higher when including emissions related to foregone carbon absorption resulting from using land for grazing and animal feed.[36] While leading development banks have presumed that the global production and consumption of meat and dairy will increase in line with rising income and population levels, experts warn that production and consumption must diminish by 70% to keep global warming to 2°C above pre-industrial levels.[37] A 2020 Science study warns that even if fossil fuel emissions were immediately halted, livestock emissions could make it impossible to limit warming to 1.5°C and difficult to limit it to "well below" 2°C.[38] The IPCC's 2022 report underscored this point, noting "even if fossil fuel emissions were eliminated immediately, food system emissions alone would jeopardise the achievement of the 1.5°C target and threaten the 2°C target."[39]

Cattle production is of particular concern. According to historical FAO estimates, cattle account for 65% of the global livestock sector's emissions.[40] Industrially produced cattle are a leading cause of deforestation, which is the top land-change source of GHG emissions in Latin America, where MDBs are currently investing in industrial meat, dairy, and feed operations.[41] While these investments are supposed to address food insecurity in the region, industrial cattle operations are having outsized impacts while also failing to deliver on this objective. According to IDB's 2022 "Options to achieve net zero" report, beef production is responsible for 57% of the region's agriculture emissions and 58% of land use emissions but contributes just 12% of the region's protein and 4% of calorie intake.[42]

It is critical to decrease livestock production because of its associated methane (CH_4) emissions. According to the UN Environment Programme (UNEP), the sector accounts for one third of the global total.[43] Because CH_4 has 81.2 times the global warming potential (GWP) of CO_2 over a 20-year timeframe, reductions in methane emissions in the shorter term are critical for meeting the goal of reducing global emissions by 45% by 2030 to limit global warming to 1.5°C. The necessity to rapidly reduce methane emissions has been codified in the Global Methane Pledge, which refers to such reductions as "the single most effective strategy to keep the goal of limiting warming to 1.5°C."[44]

The Need to Constrain the Production and Consumption of Animal-Based Foods

Livestock's GHG emissions and other harmful impacts have prompted calls for substantial reductions in the production and consumption of animal-based foods from organizations including the International Panel of Experts on Sustainable Food Systems (IPES Food), Chatham House, and the IPCC.[45] The IPCC has emphasized the importance of demand-side climate solutions as an "essential complement to supply-side, technology, and productivity-driven solutions," noting that a shift toward plant-based diets is the strategy with the second highest global warming mitigation potential after reduced deforestation.[46] UNEP's 2022 Emissions Gap report highlighted meat reduction as a key mitigation strategy and pointed out that "if everybody on the planet consumed within levels recommended for health and the environment, meat production would not need to increase beyond current levels."[47]

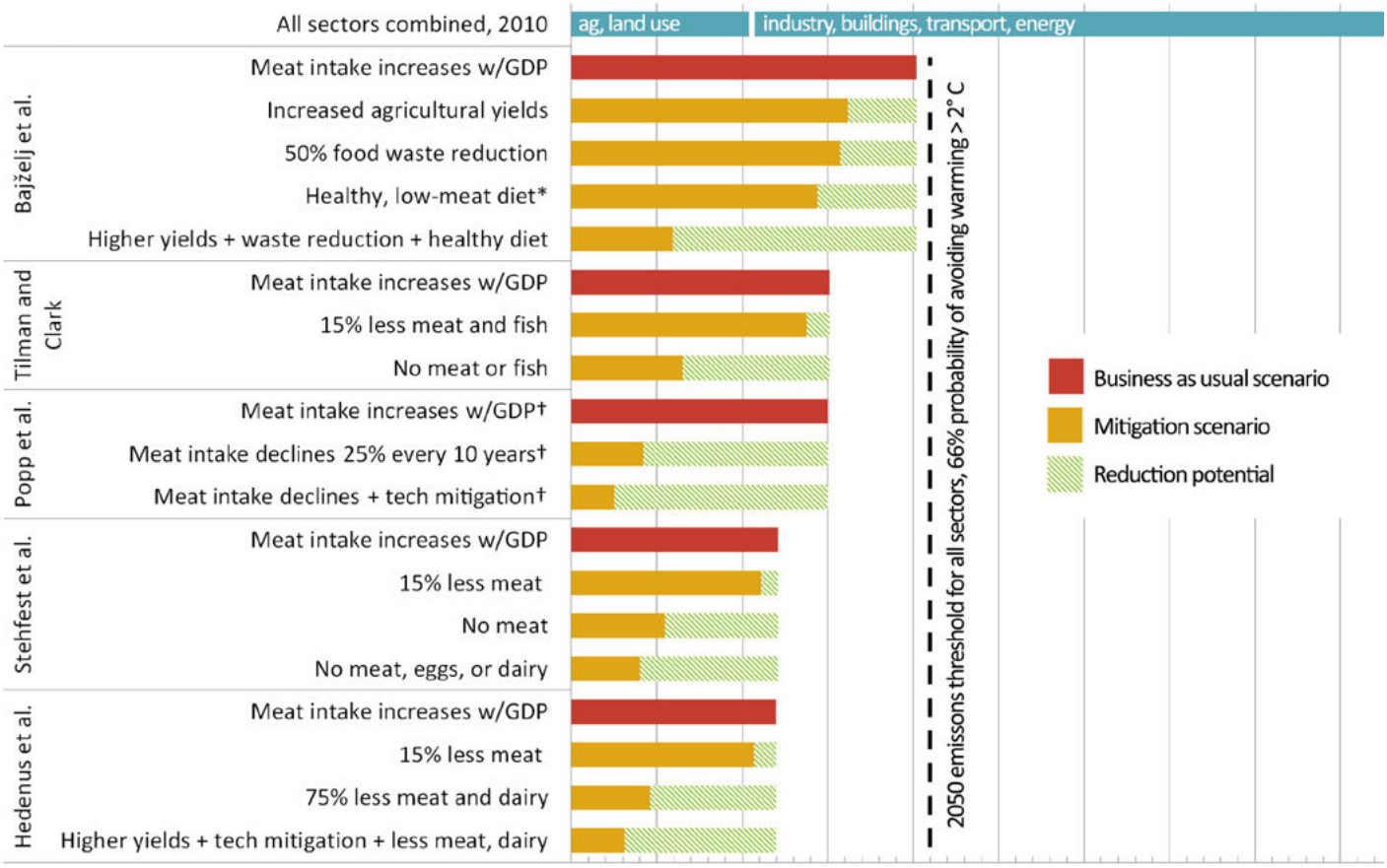
Data show that even the most ambitious scenarios for reducing livestock emissions via supply side mitigation measures that may result in intensity reductions (lowering CO_2 eq per kg or liter of meat or milk) are insufficient to meet critical climate targets, given projected increases in demand.[48] A collection of studies has shown that a failure to achieve reductions in

livestock production and consumption would necessitate substantial GHG emissions cuts from other sectors that are simply not realistic.[49] (See Figure 1.)

Leading MDBs, including the Inter American Development Bank, have emphasized the importance of demand-side shifts.[50] The recent World Bank's Agriculture and Food Sector Note on Applying the World Bank Group Paris Alignment Methodology acknowledged the importance of such changes, noting, "public spending on consumer subsidies…should be designed in a way that prevents distortions in consumption preferences in favor of carbon-intensive commodities, inputs, or technology."[51]

A 2021 International Monetary Fund (IMF) report also highlighted the value of aligning public procurement practices and educational programs designed to induce dietary changes towards more plant-based diets, referring to both as "key steps to reduce demand for emission-intensive agricultural products." The IMF continued: "The adoption of healthy, sustainable diets would increase food security, lower emissions, enhance the food system's resilience and free up land to meet agricultural demands."[52]

Figure 1. 2050 Livestock-related Emissions Scenarios[53]



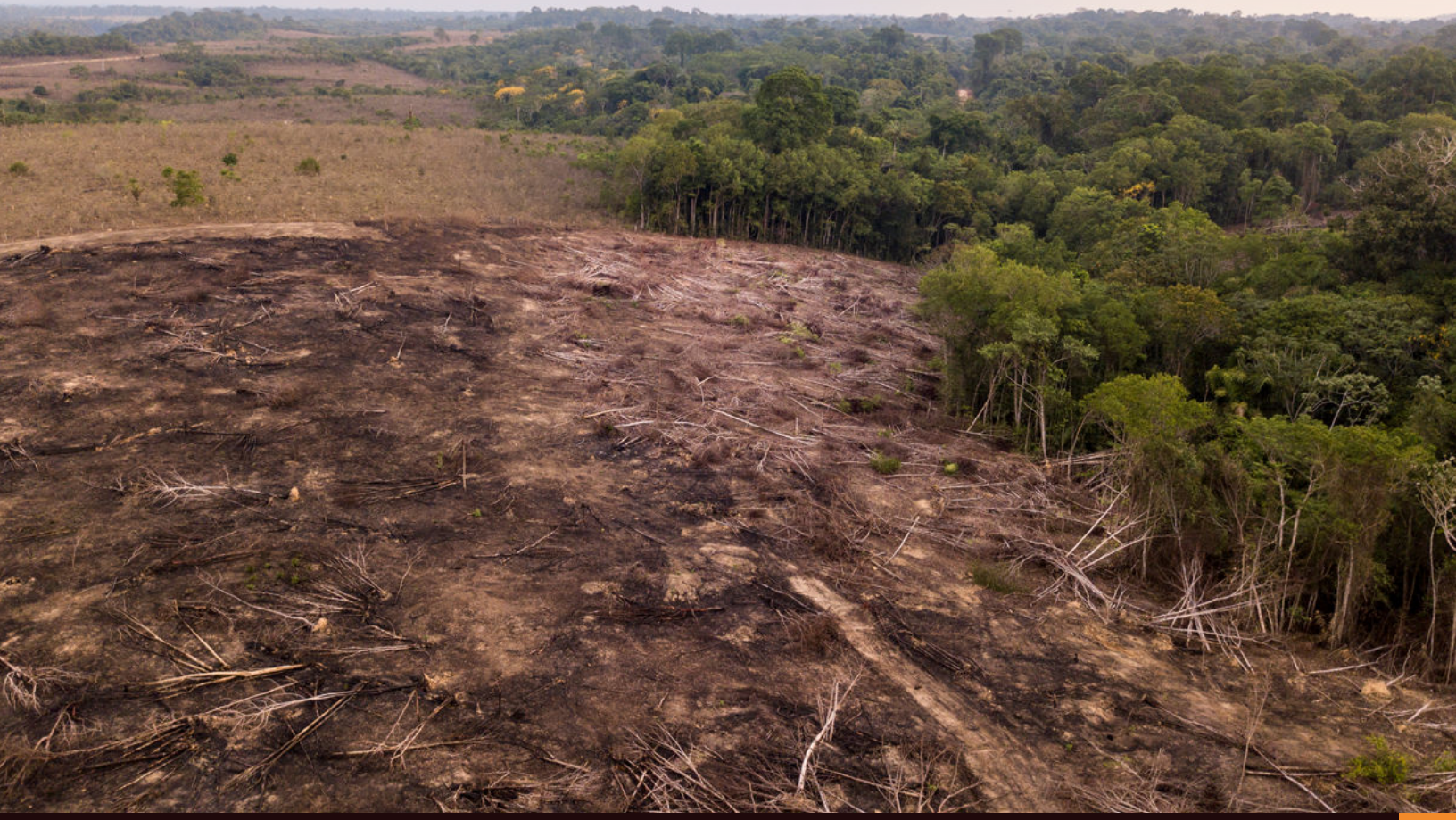
The black dotted line represents the 2050 emissions threshold (21+ 3Gt CO2e) for at least a 66% chance of keeping global warming below *2° Celsius*; the blue bar shows 2010 emissions from all sectors (49 Gt). Red shows emissions in 2050 from the business-as-usual scenario; orange bars show various 2050 mitigation scenarios; the arav bars represent the potential emission reductions associated with each mitigation scenario.

Unfortunately, MDBs' support for the continued expansion of industrial livestock production (including animal feed) remains the rule—even in Latin America, the region with the highest global livestock emissions, where livestock and related deforestation account for an estimated 1.3GT CO2eq, or 70% of the region's agricultural greenhouse gas emissions.[54] Given the available data on the need to constrain production and consumption in several global regions, it is untenable to suggest that investments in livestock expansion could be considered aligned with the Paris Agreement.

PROJECT PROFILE

Louis Dreyfus Corporation (Brazil, IFC)

In June 2022, IFC granted a $200M loan to agribusiness giant Louis Dreyfus Company (LDC) for purchases of soy and corn—crops mostly headed for factory farms in Europe and Asia. The crops are grown primarily on multi-thousand-hectare industrial operations located in heavily deforested regions of the Brazilian Cerrado, a biodiversity-rich biome that is home to 5% of the world's animals and plants and 216 Indigenous territories. These chemical-intensive operations generate numerous negative environmental and human health impacts, including: significant GHG emissions, biodiversity loss, and pesticide-related illness and death, including among children. A 2019 report by the German Federal Ministry for Economic Development details how human health and environmental impacts of industrial monoculture soy production in this region (similar to LDC's operations) undermine a host of SDGs including SDG 1 (no poverty), SDG 2 (zero hunger), SDG 3 (good health), SDG 6 (clean water), SDG 8 (decent work), SDG 12 (responsible consumption and production), SDG 13 (climate action), and SDG 15 (life on land).



Section 2:

How MDB Paris Alignment Frameworks Lead to the Misclassification of Industrial Livestock Operations as Paris-Aligned

Following international finance institutions' universal commitment to aligning their strategies, investments, and activities with the Paris Agreement, leading MDBs developed frameworks for determining the alignment of direct investment projects. These frameworks include: the Joint MDB Assessment Framework for Paris Alignment for Direct Investment Operations, the EBRD's Methodology to determine the Paris Agreement alignment of EBRD investments, the IDB Group's Paris Alignment Implementation Approach: Principles. Methodology, and Technical Guidance, and the World Bank Paris Alignment Method for Investment Project Financing.[1]

All these frameworks involve assessments against mitigation and adaptation goals of the Paris Agreement.[2] None states that industrial livestock activities or investments are "universally not aligned" or excluded from bank portfolios on that basis. (Examples of "universally not aligned" activities include mining of thermal coal, electricity generation from coal, extraction of peat, and electricity generation from peat.)

There are some differences among the frameworks that are relevant to this paper. The most important is that the Joint MDB Assessment, EBRD Methodology, and World Bank Framework classify certain terrestrial livestock and feed production activities as "universally aligned" with the mitigation goals of the Paris Agreement while the IDB Group's Implementation Approach does not. (See Tables 1 and 2 below for details).

In what follows, we discuss the ways in which flaws in the MDB frameworks can lead to the misclassification of investments in industrial livestock expansion as Paris-aligned. Our analysis addresses all the frameworks referred to in this document and accounts for relevant differences among them. Where appropriate, we also reference the World Bank's recent Agriculture and Food Sector Note on Applying the World Bank Group Paris Alignment Assessment.

Table 1: Joint MDB, EBRD, and WBG Classifications of Livestock Activities' Alignment with the Mitigation Goals of the Paris Agreement

Type of Livestock Operation/Activity[3]	Classification
Non-ruminants (e.g., chickens, pigs) with negligible emissions	▪ Universally aligned across all countries "with the exception of operations that expand or promote expansion into areas of high carbon stocks or high biodiversity areas"
Fishing and aquaculture	
Low-GHG agriculture, climate-smart agriculture[4]	
Ruminants (e.g., cows and goats)	▪ "High-emitting" sectors ▪ Not universally Paris-aligned (must meet certain criteria to be assessed as aligned; criteria extend to feed supply)
Non-ruminants with non-negligible emissions	

1 As of November 2021, the Joint MDB Assessment referenced here is a working draft. The draft covers two of six "building" blocks the authoring banks indicate will comprise their "approach for aligning activities with the Paris goals." The document was "developed with input from the African Development Bank Group, the Asian Development Bank, the Asian Infrastructure Investment Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank Group, the Islamic Development Bank, the New Development Bank, and the World Bank Group (International Finance Corporation, Multilateral Investment Guarantee Agency, World Bank)."

2 Mitigation alignment entails consistency with a given country's nationally determined contribution (NDC), low-GHG development pathway and transition to a decarbonized economy. Adaptation alignment entails management of physical climate risks and consistency of this management with a country's resilience strategy and plans.

3 "Ruminants": hoofed herbivorous grazing or browsing mammals that acquire nutrients from plant-based food by fermenting it in a specialized stomach prior to digestion. Ruminants include cows, sheep, goats, buffalo. "Non-ruminants": non-foraging animals with single-compartment stomachs. Non-ruminants include pigs and chickens.

4 "Low-GHG" and "climate-smart agriculture" are undefined, making it unclear whether any relevant practices involve terrestrial livestock or animal feed production, which may involve negative environmental and/or social impacts, such as pesticide and fertilizer pollution and economic disadvantages for smallholders.

Table 2: IDB Group Paris Alignment Implementation Approach's Classifications of Livestock Activities' Alignment with the Mitigation Goals of the Paris Agreement

Type of Livestock Operation/Activity	Classification
Sustainable fishing and aquaculture Climate smart agriculture[5]	▪ Universally aligned with the mitigation goals of the Paris Agreement requirements[6] with the exception of operations that expand and promote expansion into areas of high carbon stocks or high biodiversity areas ▪ IDB Group also notes: » "Project teams will pay particular attention to components and operations that promote the production of items that could be associated with high levels of GHG emissions such as livestock..."

Key Flaws in Paris Alignment Assessments

MDB Paris alignment assessments are flawed on at least three fronts:

1. **"Paris aligned" operations are not required to demonstrate either comprehensive (Scope 1-3) GHG reporting or science-based absolute GHG reduction targets.** The proposed alignment methodology will not change the current status quo—institutionalized in IFC Performance Standards—of not requiring borrowers to calculate, report on, or reduce their Scope 1-3 emissions. Even if an operation does not "expand or promote the expansion" of deforestation into high conservation value areas or elsewhere, livestock operations generate significant emissions from enteric fermentation (the digestive process of ruminants), manure management and/or application, feed production (fossil-fuel-intensive manufacturing of synthetic fertilizers, pesticides, and herbicides and N2O emissions from application of fertilizers), and energy use and production (including water transportation and irrigation).[55]

   To label an investment as Paris-aligned, all MDBs should require investee companies to disclose their Scope 1-3 emissions (if via modeling), commit to a Paris-aligned absolute reduction target, and develop a science-based and time-bound plan for reductions. Requiring neither comprehensive GHG emissions reporting nor reductions makes the notion of alignment with Nationally Determined Contributions (NDCs) or low-GHG development pathways fundamentally nonsensical. Banks' failure to require such reporting also compounds the problematic and nearly universal lack of comprehensive Scope 1-3 reporting from industrial livestock value chain companies.[56]

2. **Only ~40% of countries have incorporated livestock-specific GHG reduction measures into their NDCs.**[57] According to the Joint MDB Assessment, "If [an] activity or sector is not included in the relevant strategy [NDC], then in most cases it can be concluded that the activity is not inconsistent with the strategy..." Given industrial livestock production's considerable GHG emissions and the immediate need to reduce them, this is at least an incautious assumption considering how few countries even include animal agriculture in their NDCs. Certainly, such an assumption should not be the basis for a presumption of Paris alignment. The EBRD has acknowledged this, noting this shortcoming of the MDB approach: "The aggregate commitments in current NDCs are insufficient to secure an emissions trajectory consistent with the global temperature goals [of the Paris Agreement]," reads the bank's Methodology. "[O]nly in rare cases will alignment with an NDC be sufficient to give assurances as to alignment with the Paris Agreement goals."[58]

5 "Climate-smart agriculture" is undefined, making it unclear whether any relevant practices involve terrestrial livestock or animal feed production, which may involve negative environmental and/or social impacts, such as pesticide and fertilizer pollution and economic disadvantages for smallholders.

6 "Mitigation" defined as IDB Group's interpretation of the Joint MDB Assessment Building Block 1 (BB1): mitigation.

3. **Long-term strategies lack relevant (low-GHG) development strategies.** A review of the UNFCCC's long-term strategies (LTS) portal revealed that the majority of countries where MDBs are now investing in the expansion of factory farming have not submitted low GHG long-term development strategies.[59] Similarly, these countries have not published relevant economy-wide, sectoral, or regional low-GHG strategies. Wherever such strategies do not exist, it is impossible for MDBs to assess investments in factory farming against them.

   Fortunately, according to the Joint MDB Assessment, this means that an assessment of alignment would involve an "operation's compatibility with widely accepted data and findings in the global literature on sector specific decarbonization pathways in line with the Paris Agreement's mitigation goals." Given the availability of such pathways, including the IPCC's, it seems reasonable that MDBs should be required to assess investments in the expansion of industrial livestock production against them, though none of the published frameworks reference such assessments as a requirement for Paris alignment.[60]

Banks' Paris Alignment Methodologies Misclassify Industrial Livestock Operations as Paris-Aligned

While all the frameworks mentioned in this report require GHG mitigation assessments of at least some industrial livestock operations, none requires absolute GHG reductions that align with the need to reduce global emissions by 45% by 2030.

The IDB Group's "Paris Alignment Implementation Approach" rightly does not classify ruminant or non-ruminant livestock operations as "universally aligned". According to IDB's approach, all livestock operations are subject to GHG mitigation assessments to determine alignment.[61]

While none of the remaining frameworks classifies ruminant operations as "universally aligned", these do classify non-ruminant operations that have "negligible" emissions as "universally aligned". This means that no assessment of these non-ruminant operations' current or projected future GHG emissions—much less emissions reductions—is required for a determination of Paris alignment.

High-Emitting Ruminant Operations Should Never Be Considered Paris Aligned

Both the Joint MDB and EBRD Assessments rightly classify cattle (ruminants) as a high-emitting sector. However, according to all the frameworks reviewed for this report, investments in cattle and other "high-emitting" sector operations (e.g., non-ruminants with non-negligible GHG emissions) may still be labeled as Paris-aligned. While all frameworks reference exceptions for activities that involve expansion into high value conservation areas (via deforestation for grazing or feed production) and suggest measures clients may undertake to mitigate supply chain-based deforestation, none of the frameworks requires Scope 1-3 calculations or disclosures, or Paris-aligned absolute reduction targets. Given that ruminant operations are particularly methane-intensive, the failure of MDBs to require Scope 1-3 reporting or time-bound reduction targets is a serious concern.[62]

Non-Ruminant Operations and Paris Alignment: Emissions from Industrial Operations Are Never Negligible

With the exception of IDB Group's Paris Alignment methodology, the frameworks reviewed in this report classify non-ruminant operations with "negligible" emissions as "universally" aligned. (Across the frameworks, the term "negligible" is undefined.) Whatever that definition may involve, the reality is that ***all*** non-ruminant operations involve significant GHG emissions. These are only worsening as chicken and pig operations expand and proliferate. Relevant emissions include methane associated with large-scale operations' manure management systems, N2O emissions from fertilizer application for feed production, and CO2 emissions from energy use for irrigation, pesticide and fertilizer production, processing, transportation, refrigeration and wasted food. The industrial production of non-ruminants has also become a major driver of land-clearing (for animal feed), which releases large amounts of carbon into the atmosphere.[63]

Research published by the global NGO World Animal Protection indicates that GHG emissions:

- from broiler chicken production range from 1.8 to 2.4 kg CO2eq/kg carcass weight, increasing to 2.6 to 5.8 kg CO2eq/kg carcass weight when direct land use change emissions are included
- from pork production range from 4.1 to 4.8 kg CO2eq/kg carcass weight, increasing to 4.8 to 6.8 kg CO2eq/kg carcass weight when direct land use change emissions are included[64]

Industrial pig and poultry systems are particularly problematic from an emissions perspective, given their reliance on large-scale manure management systems. According to research by the US Environmental Protection Agency (EPA), methane emissions from pig manure increased by 44% between 1990 and 2010 as pig production became consolidated among fewer large-scale operations housing between thousands and tens of thousands of animals.[65] A similar consolidation trend has occurred among industrial poultry operations in the US and beyond, making poultry-based manure management operations sources of high GHG emissions.[66] Right now, MDBs are supporting the proliferation of these operations across Africa, Asia, and Latin America and may label such investments as Paris-aligned.[67]

Key Flaws in Adaptation Assessments

In every global region, large-scale, industrial livestock value chain operations—from feed production to animal feeding operations to processing facilities—are highly vulnerable to climate change and its ancillary impacts. These include heat stress, disease, and water shortages. In addition, factory farming's expansion continues to decimate the livelihoods of smallholder farmers in developed and developing markets, diminishing the resilience of local agricultural production and distribution systems that help protect food security. The overcrowding and extreme confinement of hundreds to thousands of animals in filthy and stressful conditions are known to produce breeding grounds of diseases (including zoonoses with pandemic potential) that will proliferate as global temperatures rise. Industrial livestock operations also cause significant and potentially irreversible land and water pollution via weather-driven mass mortality events and manure "management" system failures, as well as water and food shortages, owing to overconsumption and disruptions in brittle, weather-vulnerable supply chains.

While both the EBRD Assessment and World Bank's sector note on applying Paris alignment methods acknowledge some of these known vulnerabilities, MDBs continue to fund industrial livestock operations that lack climate adaptability and resilience.

In what follows, we consider each of factory farming's major climate adaptation failures in detail and why these operations should therefore not be considered universally aligned.

Extreme Weather: Due to factory farms containing extremely high numbers of confined animals, climate change-fueled extreme weather events including droughts, floods, hurricanes, tornadoes, and wildfires kill large numbers of animals in industrial feed operations.[68] Recent examples include Hurricane Matthew, which hit the animal agriculture-intensive state of North Carolina in 2016 and killed more than two million chickens, turkeys, and pigs housed in just 140 barns.[69] Two years later, Hurricane Florence struck the state, killing roughly 5,500 pigs and 3.4 million chickens on factory farms.[70] In 2020, near-record floods in China killed nearly 6.5 million animals in industrial operations, causing an estimated $350M in damage.[71]

Such disasters also destroy infrastructure, increase the price volatility of feed and other inputs, and disrupt supply chains, resulting in food shortages and price hikes.[72] Severe weather events can also result in factory farms polluting local communities' land and water supplies.[73] For example, extreme flooding may trigger breaches of factory farm waste lagoons, which can send millions of gallons of manure containing various pathogens into local waterways.[74]

Heat Stress: Rising temperatures are already impacting the productivity of animal agriculture operations in every global region, a trend that will only worsen. Heat stress can result in premature death of animals, reduced productivity, and increased operating costs, as well as heat stress on workers. As the Farm Animal Risk and Return (FAIRR) investor network has reported, by 2045, heat stress will affect up to 95% of livestock in areas of Africa and South America, where

MDB-funded expansion is currently occurring.[75] As the World Bank's Sector Note has warned, "Policies supporting livestock production and livestock feed production are also affected by risks from climate hazards (e.g., heat stress on animals, drought and flood impact on feed production, etc.).[76] For example, if a policy seeks to expand livestock production in locations experiencing extreme heat that do not have adequate measures to reduce heat stress on animals (i.e., limited animal shade/shelters, reduced ability to modify feed intake, reduced availability of water for livestock), the policy may not achieve its intended development objective."[77]

Disease: Climate change will increase the prevalence and spread of diseases common among factory farmed animals. These diseases include zoonoses, a major driver of which is deforestation for industrial-scale grazing and feed production.[78]

Cramming genetically similar animals in overcrowded, dirty, inhumane, and stressful conditions makes them prone to inhibited immune responses and creates a perfect breeding ground for vector-borne infectious diseases, including those with zoonotic pandemic potential. Heat-related metabolic and immune disorders among farmed animals will intensify their susceptibility to infectious diseases, which may increase the use of antibiotics in industrial operations.[79] Current levels are already driving the crisis of antibiotic resistance, which the WHO has called "one of the biggest threats to global health, food security, and development today."[80]

As we write these words, a novel strain of highly pathogenic avian influenza (HPAI) is spreading among industrial poultry operations in Asia, Latin America, and North America, resulting in the deaths of millions of birds and causing human illness and death as well as economic and environmental damage.[81] Given these outbreaks, the WHO has warned, "The variety of zoonotic influenza viruses that have led to human infections is worrying and demands increased surveillance in both animal and human populations, as well as a comprehensive examination of each zoonotic infection, and planning for pandemics."[82]

Currently plaguing factory farms across Asia and Europe, African Swine Fever (ASF) has resulted in the deaths of hundreds of millions of pigs and significant economic losses, particularly among smallholder farmers.[83] Beginning in 2018, just a year after IFC invested $50M in "top pig company" GXYX, China lost more than half its herd—an estimated 300 million hogs—to the virus or extermination.[84] Experts have estimated the outbreak could cost China as much as $300B.[85]

Water Shortages: The expansion of industrial livestock production will intensify water use at a time when the FAO has warned that by 2025, 1.8B people will be living in regions experiencing "absolute water scarcity," and two-thirds of the global population will be suffering under water "stress" conditions.[86] Climate change has already exacerbated water shortages and increased water and soil salinity (via sea-water intrusion).[87] These conditions will increasingly disrupt the production and price stability of feed crops, including by making irrigation more costly for producers ***and*** public entities that subsidize the industry.

Water shortages and rising temperatures could combine to make water scarcity worse in Africa, where MDBs are actively supporting factory farming's expansion. According to a March 2022 UN report, levels of water security are already low across the region, with 500M people living in nations deemed water-insecure.[88] Despite the World Bank's warning that in parts of Africa, "[f]armers and cities are competing for water, which is stretching water systems to the brink of collapse," MDBs are funding water-intensive factory farms to supply urban retailers and fast-food chains.[89] This diversion of diminishing resources will leave rural populations, including the smallholder and pastoral livestock holders who live and work among them, with even less access to clean water while they are also suffering climate-change-induced food shortages, which the International Monetary Fund (IMF) has reported are already taking hold.

MDBs Lack Requirements for Adaptation Alignment

The industrial livestock supply chain is highly vulnerable to a wide range of climate-related impacts, making it difficult to understand that the world's leading MDBs could label these large-scale, centralized operations "climate resilient." Notwithstanding the World Bank's Sector Note recommendations concerning risk reduction in climate-sensitive operations, no such requirements exist.[90]

PROJECT PROFILE

CMI Alimentos (Central America, IDB Invest)

Since 2019, IDB Invest has provided three loans ($200 million total) to support the expansion of CMI Alimentos' pig and poultry factory farming operations and fast-food restaurants throughout Central America. Investing in expanding the production of CMI's polluting and GHG-intensive pig and poultry operations and supporting the company's purchases of animal feed from ADM, Bunge, and Cargill (whose supply chains are deeply implicated in deforestation and other harmful biodiversity impacts) seems at odds with the bank's pledged support for Paris-aligned GHG reduction targets. A review of IDB Invest's environmental and social review documents revealed no explicit mention of how CMI Alimentos planned to mitigate current or future Scope 3 GHG emissions associated with the company's expansive and increasing pig and poultry production.

Section 3:

The Need to Shrink the Industrial Livestock Sector: GHG Mitigation Measure Will Not Suffice for Paris Alignment

The science is clear. To keep Paris-aligned GHG reduction targets within reach, global consumption of industrially produced meat and dairy must decline. Yet discussions among industry representatives, policymakers, and leading MDBs have largely ignored this fact. [91] Instead, these stakeholders are promoting strategies designed to enhance the "sustainability" of industrial livestock operations by reducing the GHG emission ***intensity***—a measure of GHG emissions per kilogram of meat, dairy, or eggs. Below, we briefly discuss three limitations of emissions intensity reductions.

First, GHG intensity-reducing technologies that still allow for the expansion of animal production and absolute emission increases, particularly in high producing and consuming regions, cannot sufficiently reduce industrial livestock emissions to align the sector with a 1.5°C or "well below" 2°C warming scenario. For example, if a company reduces its emissions intensity per kg of product by 10% but increases production by 12%, production increases would lead to increased overall emissions. Adding to this, diminishing emissions intensity per kg of product may require increased feed inputs, which involve increased supply chain (Scope 3) emissions that are typically excluded from industrial livestock operations' already scant reporting.[92]

Second, intensity reduction schemes may rely on technologies that are still undergoing research and development and/not deployed or deployable at scale with sufficient speed (e.g., feed additives, genetic engineering, masks).[93] Even the most widely touted and tested "solution"—methane biodigesters—face economic and logistical barriers to implementation.[94] Important also, where implemented, biodigesters can result in increases in upstream or downstream emissions ***increases***. Research has shown that leakages alone could mean that biomethane, and especially manure biomethane, would "provide minimal to zero climate benefits."[95] Adding to this, there is growing evidence that expanded factory farmed gas and biodigester subsidies incentivize farm operators to increase herd sizes, which involves increased methane emissions (from enteric fermentation) as well as supply chain emissions from increased feed production.[96]

Third, marginal techno-fixes do nothing to mitigate, or may worsen, the myriad other harmful impacts of industrial animal agriculture. For example, while digesters remove some manure-based pathogens, they do not effectively treat the high concentrations of nitrogen, phosphorus, and heavy metals in the manure that contaminate land and water. In addition, digestate applications can even ***increase*** emissions of nitrous oxide and ammonia. In some cases, increased "efficiency" results from higher stocking density and routine use of antibiotics as growth promoters, exacerbating serious problems with respect to animal welfare and development of antibiotic-resistant bacteria. Such "gains" can also have negative effects on water consumption and food security via diversion of resources and waste. As the FAO has warned: "When evaluating GHG mitigation measures, attention should be paid to the potential impacts on other policy objectives, such as sustaining water resources, improving food security and reducing poverty."[97]

We had our chance to make incremental changes, but that time is over. Only a root-and-branch transformation of our economies and societies can save us from accelerating climate disaster.

Inger Andersen,
Executive Director, UNEP, 2022

PROJECT PROFILE

PRONACA (Ecuador, IDB Invest and IFC)

In 2020 and 2021, IFC and IDB Invest each provided $50 million in financing to expand the pork and poultry operations of Ecuador's fourth largest corporation, PRONACA. (Each institution had previously financed the company.) Channeling public resources to support PRONACA's expansion exacerbates a highly concentrated sector in which PRONACA already controls more than 50% of the poultry and pork market. The company's large-scale pig facilities in Santo Domingo have long polluted the soil, air, and local rivers on which the Tsáchilas indigenous people and smallholder farmers depend, undermining their health and ability to use the water for daily activities, including food production. PRONACA's owned and contracted factory farms are also sources of significant GHG emissions, including methane from manure "management" systems. Despite this, neither IDB Invest nor IFC has required that PRONACA provide either Scope 1-3 reporting or absolute GHG reductions.

The company has been the target of both a lawsuit and an IFC Compliance Advisor Ombudsman (CAO) complaint; as of mid-2023, NGOs and community members continue to raise serious concerns about the MDBs' investments as documented in this case study.

What it has caused us is the destruction of the river and our beautiful place, you can no longer fish, you can no longer use the river... ...It affected us a lot in my work in tourism.

Maria Calazacon,
local indigenous resident

Section 4:

MDBs Must Ensure Paris-Alignment of Their Agricultural Invesments

The prevailing assumption that increasing the production and consumption of underpriced meat and dairy products is both sustainable and necessary to meet the growing global population's nutritional requirements is wholly out of step with the science around healthy diets, addressing food insecurity among the world's most vulnerable populations, and the ecological limits of the planet.

This statement bears repeating: the science is clear. We must reduce the number of animals raised for food and do this in a way that does not involve the irreversible destruction of finite natural resources. Agroecological systems that sustainably balance herd sizes and husbandry practices with ecological requirements can produce sufficient yields while conserving critical natural resources and mitigating climate impacts to preserve long-term food security.

Agroecology encompasses both agricultural practices that build diversity and resilience into farming systems as well as social values, such as protecting rural livelihoods, co-creation of knowledge and building circular economies that reconnect producers and consumers. The IPCC describes agroecological principles—such as access to land and natural resources, flexible local institutions, and livelihood strategies—as key contributors to climate change resilience.[98] Agroecology has also been identified by the FAO as a way to help achieve several of the SDGs.[99]

Agroecological Livestock Production: Climate Mitigation and Adaptation

Agroecological livestock production systems that support environmentally sustainable numbers of animals and meat and dairy production levels can reduce agricultural fossil fuel use and GHG emissions and build healthy soils that conserve water, enhance carbon sequestration potential, and improve farmers' resilience to floods and droughts.[100] These SDG-aligned benefits can accrue both from integrating crop and livestock production and by implementing well-managed pasture-based grazing.[101]

While agroecological livestock systems may involve lower yields relative to factory farms, agroecological systems produce a significant array of other benefits while also minimizing environmental and social externalities. Assessing agricultural production as a multifunctional system that provides food, livelihoods, environmental conservation, protection of public health, and long-term food security and sovereignty is key to understanding the superiority of agroecological systems.

The oft-repeated emphasis on increasing yield to "feed the world" is myopic. Not only does it obscure the fact that industrial agricultural systems are rapidly undermining long-term food security by depleting the natural resources we need to sustainability produce food for generations to come, it also ignores the vast body of data showing that hunger is not primarily a problem of overall supply of food but rather of poverty, lack of democracy, and unequal access to land, water, and other resources, especially for women.[102]

Reduced energy use and emissions: By integrating crop and livestock production, manure can be used to improve soil fertility and animals to control weeds, decreasing dependence on fossil-fuel intensive fertilizers and pesticides.[103]

Soil health and carbon sequestration: Research has shown that well-managed grazing systems employing environmentally sustainable livestock-to-land ratios can support deep-rooted perennial grasses, build topsoil, and sequester carbon.[104] A number of studies have shown how silvopasture in particular can significantly reduce cattle-related carbon emissions.[105]

Water conservation: Healthy living soils and rotational and holistic grazing systems conserve precious water resources by capturing and storing more water below the ground. Increasing soil organic matter by one percent can enhance water storage in the soil by up to 11,000 liters per acre.[106]

Climate resilience: Agroecological methods strengthen farmers' ability to cope with extreme weather events related to climate change, like drought and floods, by improving soil structure and water-holding capacity[107]. Prioritizing crop varieties and livestock breeds that are well-suited to regional variability also enhances climate resiliency.[108] By building healthy soils and developing locally-adapted seeds, agroecological methods can help to protect yields amid the weather extremes and seasonal disruptions of climate change.

Biodiversity: Only 12 plant species and 5 livestock breeds make up 75% of the world's industrial food system.[109] In contrast, agroecological practices build biodiversity into agriculture. Agroecological food systems should play a central role in biodiversity conservation strategies and supporting MDBs' commitments to align investments with the 2022 Global Biodiversity Framework (GBF).[110]

Food security: According to UNEP, agroecological farming techniques help make soils more productive, minimize the use of agrochemicals and pollution, and enhance crop diversity.[111] Reducing dependence on external inputs while adding diversity increases agricultural resilience and food security. Diminishing reliance on global industrial supply chains is also central to promoting food security and sovereignty. This will become only more important as extreme weather events and other impacts of climate change intensify.[112] The COVID-19 pandemic highlighted the impacts of such supply chain disruptions and the importance of supporting small-scale producers who can support food security among vulnerable communities and regions.[113]

A large segment of the scientific community now acknowledges the positive impacts of agroecology on food production, poverty alleviation and climate change mitigation – and this is what is needed in a world of limited resources.... Despite its impressive potential in realizing the right to food for all, agroecology is still insufficiently backed by ambitious public policies.

Olivier De Schutter, former UN Special Rapporteur on the right to food and author of "Agroecology and the Right to Food" (2011)

Conclusion and Recommendations

Given climate-related harms, risks, and opportunities tied to MDBs' agricultural investments, we are calling on the banks to acknowledge the urgent need for a global transition away from industrial livestock production and toward sustainable food systems and to align their strategies, investments, and activities with a livable future.

As an important first step, MDBs should add all industrial livestock activities, including feed production, to the list of sectors they consider *universally not aligned* with the goals of the Paris Agreement. In addition, MDBs' agriculture-related development, project finance, and advisory services should:

1 Stop supporting the expansion of industrial livestock production. Instead, MDBs should facilitate the transition of GHG-intensive and otherwise environmentally destructive industrial farming systems to climate-impact mitigating and adaptive agroecological systems. These systems should prioritize the production of crops for human consumption and integrate livestock only where such integration can deliver ecological and social benefits and effectively address—rather than exacerbate—food insecurity and gender inequalities.

2 Strengthen mitigation requirements for all animal agriculture investments, including requirements for mandatory Scope 1-3 reporting and science-based, time-bound absolute emissions reduction targets that align with global targets. Mitigation measures that focus on GHG intensity-reducing technologies should not allow for absolute emission increases, nor should they be permitted if they lead to other negative impacts (e.g., increased water pollution or diminished animal welfare).

3 Strengthen adaptation requirements. At a minimum, "Paris-aligned" labeling should require all borrowers to demonstrate how their operations reduce the risks associated with extreme weather events. These include mass pollution, the increased spread of disease associated with global warming, and reliance on brittle supply chains, interruptions of which can cause severe food insecurity among vulnerable populations.

4 Acknowledge the need for and support critical demand-side shifts, including the convergence of global diets toward reduced levels of meat and dairy consumption, by refraining from making investments in livestock and feed operations that serve over-consuming regions including the EU, US, and parts of South America, and by supporting policies, projects and initiatives that promote more sustainable plant-forward diets.[114]

5 Work with governments in countries with significant industrial livestock production to ensure that NDCs encompass absolute GHG reductions from the sector.

6 With active community participation and consent, support small- and mid-scale agroecological production systems, including diversified, mixed crop and livestock systems, silvopasture, agroforestry, and managed grazing. MDBs should direct their support toward an enabling environment that promotes smallholders' traditional and collective rights to seeds, livestock breeds, territories, and local and indigenous forms of production. These institutions should also seek efficient ways to guarantee access to land and technical support for women and other marginalized groups.

To uphold their climate-related commitments, **MDBs should add all industrial livestock activities, including feed production, to the list of activities they consider universally not aligned with the goals of the Paris Agreement**. In addition, MDBs' agriculture-related development, project finance, and advisory services should:

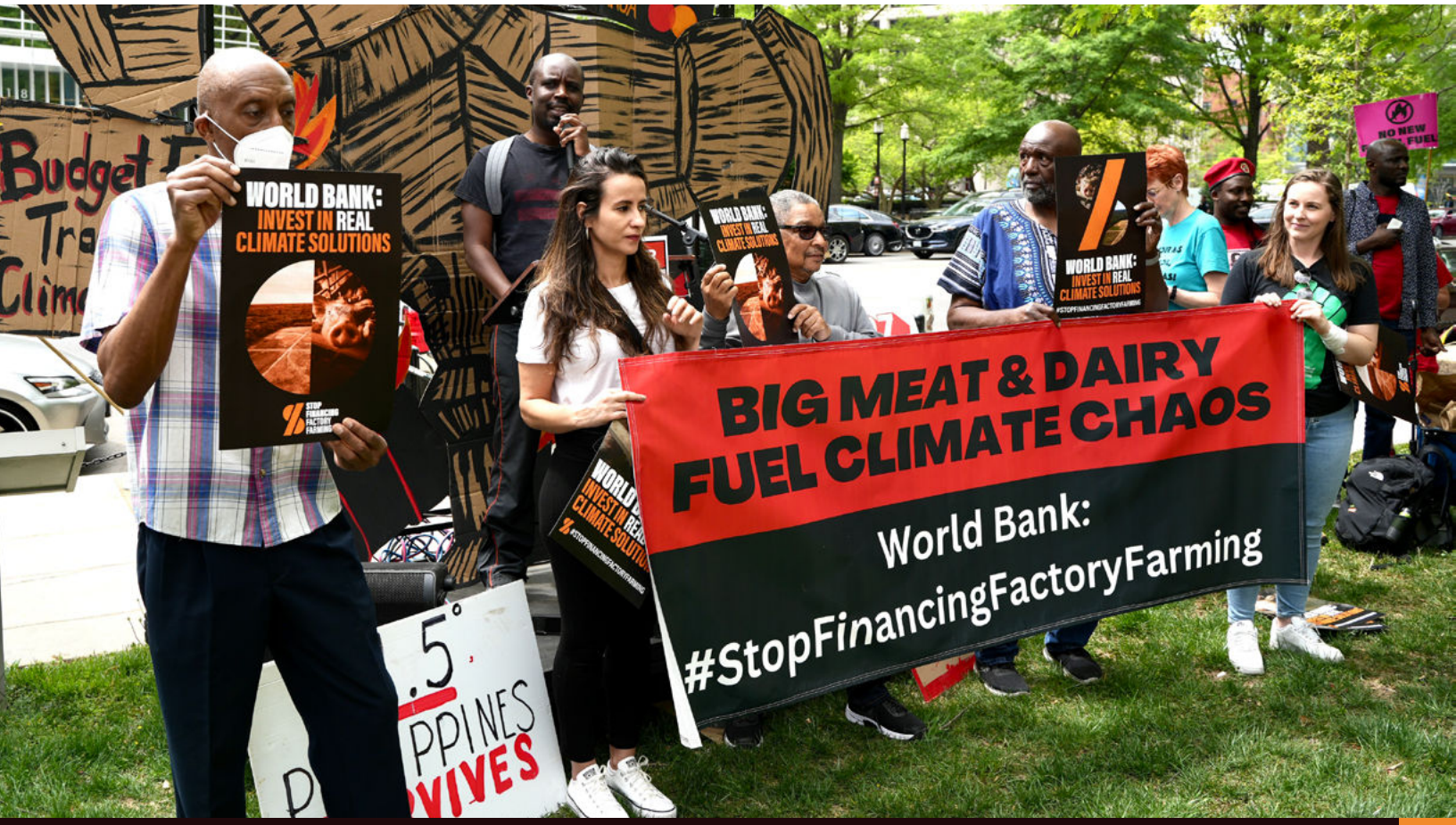
- Directly enhance food security in the country or sub-national region where support is being deployed
- Support smallholders, women, cooperatives, and local distribution
- Not involve deforestation or forest or land degradation

- Not involve corporate or unlawful takeover of Indigenous, traditional, or community-held lands
- Not infringe on Indigenous People and Local Communities (IPLC) or the lands, territories, resources, or ecosystems on which they rely for their livelihoods
- Not promote export of animals, animal products, or feed from countries whose citizens are experiencing hunger

Implementation of these recommendations is essential for putting MDBs on a path of aligning their agricultural investments with the Paris Agreement. These recommendations also point to the urgent need for support for sustainable food systems that will pay economic, public health, food security, and climate dividends now and for future generations.

We're making unsustainable demands on the natural world, having so believed there could be infinite economic growth on a planet with finite natural resources and a growing number of humans and livestock.... Factory farms should be phased out.... The good news is that a great deal of experimental work is being done in these fields and it's proving that these methods of farming, working with rather than against nature, restoring biodiversity and helping to slow down climate change, truly can become sustainable and feed us for generations to come.

Dr. Jane Goodall, Author and Conservationist,
speaking at the Extinction or Regeneration Conference, May 2023



Endnotes

1 Finance in Common. (2020). "Joint Declaration of All Public Development Banks in the World". Paris. https://financeincommon.org/sites/default/files/2020-11/FiCS%20-%20Joint%20declaration%20of%20all%20Public%20Development%20Banks.pdf.

2 The interchangeable terms "factory farming" and "industrial livestock production" refer to animal breeding, rearing, slaughtering, processing, and/or feed operations involved in the mass production of meat, dairy and eggs. Typically controlled by multinational corporations, this production involves breeding and/or rearing between hundreds and thousands of animals in concentrated feeding operations (mostly chickens, dairy cows, and pigs), feedlots (beef cows), or extensive, controlled grazing systems (beef cows) that are vertically integrated into international value chains. "MDBs" refers to leading development banks, including ADB, EBRD, IDB Invest, IFC, and the World Bank. Sources: United Nations Environment Programme (UNEP, 2022). Emissions Gap Report 2022: The Closing Window: Climate crisis calls for rapid transformation of societies. https://www.unep.org/emissions-gap-report-2022; Harwatt, H. (2019). Including animal to plant protein shifts in climate change mitigation policy: a proposed three-step strategy. Climate Policy, 19:5, 533-541, DOI: 10.1080/14693062.2018.1528965.

3 These figures do not include financing that went to smallholder livestock farmers and pastoralists or feed production and infrastructure that supports the industrial livestock sector. Source: World Animal Protection. (2021). IFI Industrial Livestock Investments. https://docs.google.com/document/d/1dPwot3xkSw7HV5LdSI5e9q8sgWiTg5F9QGB2q0N___WA/edit.

4 Wasley, A., Heal, A. (2020). Revealed: development banks funding industrial livestock farms around the world. The Guardian. https://www.theguardian.com/environment/2020/jul/02/revealed-development-banks-funding-industrial-livestock-farms-around-the-world; IFC. (2015). IFC Supports Sustainable Food Production with Loan to Smithfield Romania. https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=17990. EBRD. (2010). Danone CIS. https://www.ebrd.com/work-with-us/projects/psd/danone-cis-(f.-project-neva).html.

5 World Animal Protection. (2021). IFI Industrial Livestock Investments. https://docs.google.com/document/d/1dPwot3xkSw7HV5LdSI5e9q8sgWiTg5F9QGB2q0N___WA/edit.

6 IDB Invest. (2020). PRONACA II. https://idbinvest.org/en/projects/pronaca-ii; IFC. (2021). PRONACA Covid. https://disclosures.ifc.org/project-detail/SII/41934/pronaca-covid; IFC. (2022). LDC BRASIL. https://disclosures.ifc.org/project-detail/SII/44281/ldc-brasil; IDB Invest. (2022). CMI Alimentos Global. https://www.idbinvest.org/en/projects/cmi-alimentos-iii.

7 Food and Agriculture Organizations of the United Nations. (FAO, 2022). Global Livestock Environmental Assessment Model (GLEAM) 3.0. https://foodandagriculturеorganization.shinyapps.io/GLEAMV3__Public/. IPCC. (2014). Agriculture, Forestry and Other Land Use (AFOLU). In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf; Twine, Richard, "Emissions from Animal Agriculture—16.5% Is the New Minimum Figure," Sustainability 2021, 13(11), 6276. https://www.mdpi.com/2071-1050/13/11/6276; The Breakthrough Institute. (2023). Livestock Don't Contribute 14.5% of Global Greenhouse Gas Emissions. https://thebreakthrough.org/issues/food-agriculture-environment/livestock-dont-contribute-14-5-of-global-greenhouse-gas-emissions#fn-1; Xu, X., Sharma, P., et al. (2021). Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods. Nature Food. V. 2, pp. 724–732. DOI: https://doi.org/10.1038/s43016-021-00358-x. Note: 19.6% estimate based 7,318 ± 1,675 TgCO2eq yr-1 food system emissions, 57% of which originate in animal-based foods.

8 UNEP. (2022). Emissions Gap Report 2022: The Closing Window: Climate crisis calls for rapid transformation of societies. https://www.unep.org/resources/emissions-gap-report-2022.

9 Intergovernmental Panel on Climate Change. (2021). Chapter 07 The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity – Supplementary material, in Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07_SM.pdf.

10 IPCC. (2014). Agriculture, Forestry and Other Land Use (AFOLU). In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf; Twine, Richard, "Emissions from Animal Agriculture—16.5% Is the New Minimum Figure," Sustainability 2021, 13(11), 6276.

11 Parlasca, M., Qiam, M. (2022). Meat Consumption and Sustainability. Annual Review of Resource Economics. https://www.annualreviews.org/doi/pdf/10.1146/annurev-resource-111820-032340; Shimokawa, S. (2015). Sustainable meat consumption in China. Journal of Integrative Agriculture. v. 14. DOI: 10.1016/S2095-3119(14)60986-2; Dumas, P., Wirsenius, S., et al. (2022). Inter-American Development Bank (IDB). Options to achieve net-zero emissions from agriculture and land use changes in Latin America and the Caribbean. https://shs.hal.science/halshs-03760573/document.

12 UNEP. (2020). 10 things you should know about industrial farming. https://www.unep.org/news-and-stories/story/10-things-you-should-know-about-industrial-farming; Compassion in World Farming. (2023). Factory Farming: Who Benefits? – How a Ruinous System is Kept Afloat.

13 Gerber, P. J., Steinfeld, H., et al. (2013). Tackling Climate Change Through Livestock. https://www.fao.org/3/i3437e/i3437e.pdf.

14 Consultative Group on International Agricultural Research (CGIAR). (2022). Info note: Livestock management ambition in the new and updated nationally determined contributions: 2020-2022. https://cgspace.cgiar.org/bitstream/handle/10568/115885/CCAFS%20Info%20Note%20Livestock%202021%20NDCs.pdf; Farm Animal Investment Risk and Return (FAIRR). (2022). Nationally Determined Contributions Still Lack Ambition on Agriculture. https://www.fairr.org/article/nationally-determined-contributions-lack-ambition-on-agriculture/#:~:text=7%20G20%20countries%20updated%20their,of%20these%20updates%20mention%20livestock.

15 Goodland, R., and Anhang, J. (2009). Livestock and Climate Change. World Watch. https://awellfedworld.org/wp-content/uploads/Livestock-Climate-Change-Anhang-Goodland.pdf; FAO. (2006). Livestock's Long Shadow: Environmental Issues and Options. http://www.fao.org/3/a0701e/a0701e.pdf; FAO. (2013). Tackling Climate Change Through Livestock. http://www.fao.org/3/i3437e/i3437e.pdf.

16 Ritchie, H. (2021). Cutting down forests: what are the drivers of deforestation? Our World in Data (OWID). https://ourworldindata.org/what-are-drivers-deforestation; Skidmore, M., et al. (2021). Cattle ranchers and deforestation in the Brazilian Amazon: Production, location, and policies. Global Environmental Change. V. 68. DOI: https://doi.org/10.1016/j.gloenvcha.2021.102280. https://www.sciencedirect.com/science/article/pii/S0959378021000595.

17 United Nations Framework on Climate Change. (UNFCCC, 2015). Paris Agreement. https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

18 Fry, J., Neff, R., Martin, B., et al. (2016). John Hopkins Center for a Livable Future. A Response to Dr. Frank Mitloehner's White Paper, 'Livestock's Contributions to Climate Change: Facts and Fiction.' https://clf.jhsph.edu/sites/default/files/2019-04/frank-mitloehner-white-paper-letter.pdf; Collaboration Platform on Agriculture. (2022). USDA-DG AGRI Virtual Event on Strategies to Reduce GHG Emissions from Livestock. https://www.fas.usda.gov/sites/default/files/2022-12/CPA%202022%20Livestock%20Summary.pdf; IFC. (2022). IFC Practices for Sustainable Investment in Private Sector Livestock Operations.https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/agribusiness/priorities/sustainable+livestock/practices-for-sustainable-investment-in-private-sector-livestock-operations.

19 Kim, B., et al. (2015). The importance of reducing animal product consumption and wasted food in mitigating catastrophic climate change. Johns Hopkins Center for a Livable Future Report prepared for United Nations Conference of the Parties 21 (COP21); Bajželj B, et al. (2014). Importance of food-demand management for climate mitigation. Nature Climate Change. V. 4(10), pp. 924-929. DOI:10.1038/nclimate2353; FAO. (2013). Tackling Climate Change Through Livestock: A Global Assessment of Emission and Mitigation Opportunities. https://www.fao.org/3/i3437e/i3437e.pdf.

20 Manmeet, K. (2021). Smallholder farmers: the backbone of food security. World Food Programme (WFP). https://www.wfp.org/publications/smallholder-farmers-backbone-food-security.

21 FAO. (2022). Global Livestock Environmental Assessment Model (GLEAM) 3.0. https://foodandagriculturеorganization.shinyapps.io/GLEAMV3__Public/; Ritchie, Hannah. (2021). "Cutting Down Forests: what are the drivers of deforestation?". Our World In Data. https://ourworldindata.org/what-are-drivers-deforestation; Benton, T. et al. (2021). February. "Food System impacts on biodiversity loss". Chatham House. https://www.chathamhouse.org/sites/default/files/2021-02/2021-02-03-food-system-biodiversity-loss-benton-et-al_0.pdf; FAO. (2019). Water use in livestock production systems and supply chains: Guidelines for assessment (Version 1). Livestock Environmental Assessment and Performance (LEAP) Partnership. https://www.fao.org/partnerships/leap/publications/en/; Animal Legal Defense Fund. (2021). "Urging the EPA to Regulate Factory Farms' Air Pollution". https://aldf.org/case/urging-the-environmental-protection-agency-to-stop-giving-factory-farms-a-free-pass-on-air-pollution/; FAO. (2006). "Livestock's Long Shadow". Livestock, Environment, and Development (LEAD) Initiative. https://www.fao.org/3/a0701e/a0701e.pdf; Gruère, G., Shigemitsu, M. (2021). Measuring progress in agricultural water management: Challenges and practical options. OECD Food, Agriculture and Fisheries Papers. No. 162. https://doi.org/10.1787/52b4db7e-en.

22 Dumas, P., Wirsenius, S., et al. (2022). Inter-American Development Bank. Options to achieve net-zero emissions from agriculture and land use changes in Latin America and the Caribbean. https://shs.hal.science/halshs-03760573/document.

23 Finance in Common. (2020). "Joint Declaration of All Public Development Banks in the World". Paris. https://financeincommon.org/sites/default/files/2020-11/FiCS%20-%20Joint%20declaration%20of%20all%20Public%20Development%20Banks.pdf.

24 The interchangeable terms "factory farming" and "industrial livestock production" refer to animal breeding, rearing, slaughtering, processing, and/or feed operations involved in the mass production of meat, dairy and eggs. Typically controlled by multinational corporations, this production involves breeding and/or rearing between hundreds and thousands of animals in concentrated feeding operations (mostly chickens, dairy cows, and pigs), feedlots (beef cows), or extensive, controlled grazing systems (beef cows) that are vertically integrated into international value chains. "MDBs" refers to leading development banks, including ADB, EBRD, IDB Invest, IFC, and the World Bank. Sources: United Nations Environment Programme (UNEP, 2022). Emissions Gap Report 2022: The Closing Window: Climate crisis calls for rapid transformation of societies. https://www.unep.org/emissions-gap-report-2022; Harwatt, H. (2019). Including animal to plant protein shifts in climate change mitigation policy: a proposed three-step strategy. Climate Policy, 19:5, 533-541, DOI: 10.1080/14693062.2018.1528965.

25 These figures do not include financing that went to smallholder livestock farmers and pastoralists or feed production and infrastructure that supports the industrial livestock sector. Source: World Animal Protection. (2021). IFI Industrial Livestock Investments. https://docs.google.com/document/d/1dPw0t3xkSw7HV5LdSI5e9q8sgWiTg5F9QGB2q0N___WA/edit.

26 Wasley, A., Heal, A. (2020). Revealed: development banks funding industrial livestock farms around the world. The Guardian. https://www.theguardian.com/environment/2020/jul/02/revealed-development-banks-funding-industrial-livestock-farms-around-the-world.

27 World Animal Protection. (2021). IFI Industrial Livestock Investments. https://docs.google.com/document/d/1dPw0t3xkSw7HV5LdSI5e9q8sgWiTg5F9QGB2q0N___WA/edit.

28 Finance in Common. (2022). Public Development Banks joining forces to transform the financial system towards climate and sustainability. https://financeincommon.org/.

29 European Bank for Reconstruction and Development. (EBRD, 2022). Methodology to determine the Paris Agreement alignment of EBRD investments. https://www.ebrd.com/paris-agreement-methodology.pdf.

30 Ritchie, Hannah. (2021). "Cutting Down Forests: what are the drivers of deforestation?". Our World In Data. https://ourworldindata.org/what-are-drivers-deforestation; Benton, T. et al. (2021). "Food System impacts on biodiversity loss". Chatham House. https://www.chathamhouse.org/sites/default/files/2021-02/2021-02-03-food-system-biodiversity-loss-benton-et-al_0.pdf.

31 Food and Agriculture Organizations of the United Nations. (FAO, 2022). Global Livestock Environmental Assessment Model (GLEAM) 3.0. https://foodandagricultureorganization.shinyapps.io/GLEAMV3_Public/. IPCC. (2014). Agriculture, Forestry and Other Land Use (AFOLU). In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf; Twine, Richard, "Emissions from Animal Agriculture—16.5% Is the New Minimum Figure," Sustainability 2021, 13(11), 6276. https://www.mdpi.com/2071-1050/13/11/6276; The Breakthrough Institute. (2023). Livestock Don't Contribute 14.5% of Global Greenhouse Gas Emissions. https://thebreakthrough.org/issues/food-agriculture-environment/livestock-dont-contribute-14-5-of-global-greenhouse-gas-emissions#fn-1; Xu, X., Sharma, P., et al. (2021). Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods. Nature Food. V. 2, pp. 724–732. DOI: https://doi.org/10.1038/s43016-021-00358-x. Note: 19.6% estimate based 7,318 ± 1,675 TgCO2eq yr-1 food system emissions, 57% of which originate in animal-based foods.

32 UNEP. (2022). Emissions Gap Report 2022: The Closing Window: Climate crisis calls for rapid transformation of societies. https://www.unep.org/resources/emissions-gap-report-2022.

33 Intergovernmental Panel on Climate Change. (2021). Chapter 07 The Earth's Energy Budget, Climate Feedbacks and Climate Sensitivity – Supplementary material, in Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07_SM.pdf.

34 United Nations Framework on Climate Change. (UNFCCC, 2015). Paris Agreement. https://unfccc.int/sites/default/files/english_paris_agreement.pdf.

35 FAO. (2022). Global Livestock Environmental Assessment Model (GLEAM) 3.0. https://foodandagricultureorganization.shinyapps.io/GLEAMV3_Public/; Ritchie, Hannah. (2021). "Cutting Down Forests: what are the drivers of deforestation?". Our World In Data. https://ourworldindata.org/what-are-drivers-deforestation; Benton, T. et al. (2021). February. "Food System impacts on biodiversity loss". Chatham House. https://www.chathamhouse.org/sites/default/files/2021-02/2021-02-03-food-system-biodiversity-loss-benton-et-al_0.pdf; FAO. (2019). Water use in livestock production systems and supply chains: Guidelines for assessment (Version 1). Livestock Environmental Assessment and Performance (LEAP) Partnership. https://www.fao.org/partnerships/leap/publications/en/; Animal Legal Defense Fund. (2021). "Urging the EPA to Regulate Factory Farms' Air Pollution". https://aldf.org/case/urging-the-environmental-protection-agency-to-stop-giving-factory-farms-a-free-pass-on-air-pollution/; FAO. (2006). "Livestock's Long Shadow". Livestock, Environment, and Development (LEAD) Initiative. https://www.fao.org/3/a0701e/a0701e.pdf; Gruère, G., Shigemitsu, M. (2021). Measuring progress in agricultural water management: Challenges and practical options. OECD Food, Agriculture and Fisheries Papers. No. 162. https://doi.org/10.1787/52b4db7e-en.

36 Food and Agriculture Organizations of the United Nations. (FAO, 2022). Global Livestock Environmental Assessment Model (GLEAM) 3.0. https://foodandagricultureorganization.shinyapps.io/GLEAMV3_Public/. IPCC. (2014). Agriculture, Forestry and Other Land Use (AFOLU). In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf; Twine, Richard, "Emissions from Animal Agriculture—16.5% Is the New Minimum Figure," Sustainability 2021, 13(11), 6276. https://www.mdpi.com/2071-1050/13/11/6276; The Breakthrough Institute. (2023). Livestock Don't Contribute 14.5% of Global Greenhouse Gas Emissions. https://thebreakthrough.org/issues/food-agriculture-environment/livestock-dont-contribute-14-5-of-global-greenhouse-gas-emissions#fn-1; Xu, X., Sharma, P., et al. (2021). Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods. Nature Food. V. 2, pp. 724–732. DOI: https://doi.org/10.1038/s43016-021-00358-x. Note: 19.6% estimate based 7,318 ± 1,675 TgCO2eq yr-1 food system emissions, 57% of which originate in animal-based foods.

37 International Finance Corporation. (2022). Investment in Private Sector Livestock Operations. https://www.ifc.org/wps/wcm/connect/800075ec-7c23-4cb3-8925-d0adc7858fed/IFC-practices-for-sustainable-investment-in-private-sector-livestock-operations.pdf?MOD=AJPERES&CVID=oeb6UEE; Springmann, M., et al. (2018). Options for keeping the food system within environmental limits. Nature. V. 562, pp. 519–525. DOI: https://doi.org/10.1038/s41586-018-0594-0.

38 Clark, M., et al. (2020). Global food system emissions could preclude achieving the 1.5° and 2°C climate change targets. Science. V. 370, issue 6517, pp. 705–708. DOI: 10.1126/science.aba735.

39 IPCC. (2022). Climate Change 2022: Mitigation of Climate Change. Working Group III contribution to the Sixth Assessment Report of the Intergovernmental Report on Climate Change. https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf.

40 FAO. (2014). Key facts and findings. https://www.fao.org/news/story/en/item/197623/icode/.

41 London School of Economics and Political Science. (2023). What is the role of deforestation in climate change and how can 'Reducing Emissions from Deforestation and Degradation' (REDD+) help? https://www.lse.ac.uk/granthaminstitute/explainers/whats-redd-and-will-it-help-tackle-climate-change/.

42 Dumas, P., Wirsenius, S., et al. (2022). Inter-American Development Bank. Options to achieve net-zero emissions from agriculture and land use changes in Latin America and the Caribbean. https://shs.hal.science/halshs-03760573/document.

43 UNEP. (2022). Emissions Gap Report 2022: The Closing Window: Climate crisis calls for rapid transformation of societies. https://www.unep.org/emissions-gap-report-2022.

44 Global Methane Pledge. (2022). https://www.globalmethanepledge.org/.

45 IPES Food. (2021). July. "A unifying framework for food systems transformations". https://www.ipes-food.org/_img/upload/files/sfsENhq.pdf; Benton, T. et al. (2021). February. "Food System impacts on biodiversity loss". Chatham House. https://www.chathamhouse.org/sites/default/files/2021-02/2021-02-03-food-system-biodiversity-loss-benton-et-al_0.pdf.

46 IPCC. (2019). Climate Change and Land. Summary for Policymakers. https://www.ipcc.ch/site/assets/uploads/2019/08/Fullreport-1.pdf.

47 UNEP. (2022). Emissions Gap Report 2022: The Closing Window: Climate crisis calls for rapid transformation of societies. https://www.unep.org/emissions-gap-report-2022.

48 Kim, B., et al. (2015). The importance of reducing animal product consumption and wasted food in mitigating catastrophic climate change. Johns Hopkins Center for a Livable Future Report prepared for United Nations Conference of the Parties 21 (COP21); Bajželj B, et al. (2014). Importance of food-demand management for climate mitigation. Nature Climate Change. V. 4(10), pp. 924-929. DOI:10.1038/nclimate2353; Gerber, P. J., Steinfeld, H., et al. (2013). Tackling Climate Change through Livestock: A Global Assessment of Emissions and Mitigation Opportunities. https://www.fao.org/3/i3437e/i3437e.pdf.

49 Kim, B., et al. (2015). The importance of reducing animal product consumption and wasted food in mitigating catastrophic climate change. Johns Hopkins Center for a Livable Future Report prepared for United Nations Conference of the Parties 21 (COP21), using data from Baizeli B, et al. (2014) Importance of food-demand management for climate mitigation. Nature Climate Change 4(10), pp. 924-929. DOI:10.1038/nclimate2353. https://clf.jhsph.edu/sites/default/files/2019-01/importance-of-reducing-animal-product-consumption-and-wasted-food-in-mitigating-catastrophic-climate-change.pdf.

50 Dumas, P., Wirsenius, S., et al. (2022). Inter-American Development Bank. Options to achieve net-zero emissions from agriculture and land use changes in Latin America and the Caribbean. https://shs.hal.science/halshs-03760573/document .

51 World Bank Group. (2023). Agriculture and Food Sector Note on Applying the World Bank Group Paris Alignment Assessment Methods. https://documents1.worldbank.org/curated/en/099832004072338218/pdf/IDU037edc0990002e04db6088280d203aa274ff2.pdf.

52 International Monetary Fund. (IMF, 2021). Regional Economic Outlook for Latin America and the Caribbean. Chapter 3, Climate Change Challenges in Latin America and the Caribbean. https://www.imf.org/en/Publications/REO/WH/Issues/2021/10/21/Regional-Economic-Outlook-October-2021-Western-Hemisphere.

53 Reprinted from Kim, B., et al. (2015). The importance of reducing animal product consumption and wasted food in mitigating catastrophic climate change. Johns Hopkins Center for a Livable Future Report prepared for United Nations Conference of the Parties 21 (COP21), using data from Baizeli B, et al. (2014) Importance of food-demand management for climate mitigation. Nature Climate Change 4(10), pp. 924-929. DOI:10.1038/nclimate2353. https://clf.jhsph.edu/sites/default/files/2019-01/importance-of-reducing-animal-product-consumption-and-wasted-food-in-mitigating-catastrophic-climate-change.pdf.

54 Gerber, P. J., Steinfeld, H., et al. (2013). Tackling Climate Change through Livestock: A Global Assessment of Emissions and Mitigation Opportunities. https://www.fao.org/3/i3437e/i3437e.pdf; CGIAR. (2020). A Wake-up Call for Latin America's Livestock Sector, emissions reductions crucial to meet SDGs by 2030. Press release. https://ccafs.cgiar.org/media/press-release/wake-call-latin-americas-livestock-sector-emissions-reductions-crucial-meet-sdgs-2030.

55 Goodland, R., and Anhang, J. (2009). Livestock and Climate Change. World Watch. https://awellfedworld.org/wp-content/uploads/Livestock-Climate-Change-Anhang-Goodland.pdf; FAO. (2006). Livestock's Long Shadow: Environmental Issues and Options. http://www.fao.org/3/a0701e/a0701e.pdf; FAO. (2013). Tackling Climate Change Through Livestock. http://www.fao.org/3/i3437e/i3437e.pdf.

56 Institute for Agriculture and Trade Policy. (2021). Emissions Impossible Europe: How Europe's Big Meat and Dairy are heating up the planet. https://www.iatp.org/emissions-impossible-europe.

57 Consultative Group on International Agricultural Research (CGIAR). (2022). Info note: Livestock management ambition in the new and updated nationally determined contributions: 2020-2022. https://cgspace.cgiar.org/bitstream/handle/10568/115885/CCAFS%20Info%20Note%20Livestock%202021%20NDCs.pdf; Farm Animal Investment Risk and Return (FAIRR). (2022). Nationally Determined Contributions Still Lack Ambition on Agriculture. https://www.fairr.org/article/nationally-determined-contributions-lack-ambition-on-agriculture/#:~:text=7%20G20%20countries%20updated%20their,of%20these%20updates%20mention%20livestock.

58 European Bank for Reconstruction and Development. (EBRD, 2022). Methodology to determine the Paris Agreement alignment of EBRD investments. https://www.ebrd.com/paris-agreement-methodology.pdf.

59 UNFCCC. (2023). Long-term strategies portal. https://unfccc.int/process/the-paris-agreement/long-term-strategies.

60 Rogelj, J., D. Shindell, et al. (2018). Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter2_Low_Res.pdf.

61 IDB. (2023). IDB Group Paris Alignment Implementation Approach: Principles, Methodology, and Technical Guidance. https://drive.google.com/file/d/1yD1xR5Xo-LB6EPliTqR3LviFpLw-WHmCA/view?usp=sharing.

62 Gerber, P. J., Steinfeld, H., et al. (2013). Tackling Climate Change Through Livestock. https://www.fao.org/3/i3437e/i3437e.pdf.

63 Terrastendo. (2015). Chickens, pigs, and the Amazon tipping point. https://terrastendo.net/2015/10/05/chickens-pigs-and-the-amazon-tipping-point/.

64 World Animal Protection. (2023). Top Five Factory Farming Climate Culprits Scorecard. https://www.worldanimalprotection.org/sites/default/files/media/top-five-factory-farming-climate-culprits-rationale-technical-report.pdf.

65 United States Environmental Protection Agency. (EPA, 2022). Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020. https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-main-text.pdf.

66 The Pew Environment Group. (2011). Big Chicken: Pollution and Industrial Poultry Production in America. https://www.pewtrusts.org/~/media/legacy/uploadedfiles/peg/publications/report/pegbigchickenjuly2011pdf.pdf; Pi, C., Rou, Z., et al. (2014). Fair or Fowl? Industrialization of Poultry Production in China. Institute for Agriculture & Trade Policy. https://www.iatp.org/documents/fair-or-fowl-industrialization-poultry-production-china.

67 IFC. (2021). Summary of Investment Information: YoKuku Mezz. Project Number 44775. https://disclosures.ifc.org/project-detail/SII/44775/yokuku-mezz; IFC. (2023). Summary of Investment Information: GXYX GFSP. Project Number 46874.https://disclosures.ifc.org/project-detail/SII/46874/gxyx-gfsp; IDB. (2020). Pronaca II Investment Summary. Project Number 11598-04. https://www.idbinvest.org/en/projects/pronaca-ii.

68 Pivot Food Investment. Climate Disasters. https://pivotfood.org/climate-disasters/.

69 Naik, Gautam. (2018). Food companies face increasing investor pressure to tackle factory farming. S&P Global Market Intelligence. https://www.spglobal.com/marketintelligence/en/news-insights/trending/-lwa4jkIkWjdC2hoaMP_aw2; Formuzis, A. (2016). Fields of Filth: First Inventory of Hurricane's Impact on N.C. Factory Farms. https://www.ewg.org/news-insights/news-release/2016/11/fields-filth-first-inventory-hurricanes-impact-nc-factory-farms.

70 Davis, W. (2018). Overflowing Hog Lagoons Raise Environmental Concerns in North Carolina. NPR. https://www.npr.org/2018/09/22/650698240/hurricane-s-aftermath-floods-hog-lagoons-in-north-carolina.

71 Siqi, J. (2021). China Floods: economic damage to livestock industry tops US $348 million, 6.4 million chickens dead. South China Morning Post. https://www.scmp.com/economy/china-economy/article/3143212/china-floods-economic-damage-livestock-industry-tops-us348.

72 Korte, C. (2021). "These losses were staggering": Destruction from Iowa's derecho still lingers one year later. https://www.cbsnews.com/news/iowa-derecho-destruction-one-year-later/; Wallace, A. (2022). Extreme weather could push food prices even higher. CNN Business. https://edition.cnn.com/2022/09/14/economy/heat-inflation-economy-drought/index.html.

73 Bethea, C. (2018). Could Smithfield Floods Have Prevented the "Rivers of Hog Waste" In North Carolina After Florence? The New Yorker. https://www.newyorker.com/news/news-desk/could-smithfield-foods-have-prevented-the-rivers-of-hog-waste-in-north-carolina-after-florence.

74 Davis, W. (2018). Overflowing Hog Lagoons Raise Environmental Concerns in North Carolina. NPR. ; Bethea, C. (2018). Could Smithfield Floods Have Prevented the "Rivers of Hog Waste" In North Carolina After Florence?

75 FAIRR. (2016). Factory Farming: Assessing Investment Risks. https://www.fairr.org/article/factory-farming-assessing-investment-risks/.

76 The World Bank Group. Agriculture and Food: Sector Note on Applying the World Bank Group Paris Alignment Assessment Methods. https://documents1.worldbank.org/curated/en/099832004072338218/pdf/IDU037edc0990002e04db6088280d203aa274ff2.pdf.

77 Ibid.

78 UNEP World Conservation Monitoring Centre. (2020). Zoonotic Diseases: What We Need To Do Next. https://www.unep-wcmc.org/en/news/zoonotic-diseases--what-we-need-to-do-next; International Institute for Sustainable Development (IISD). (2021). Preventing Future Pandemics Starts with Protecting Our Forests. https://sdg.iisd.org/commentary/guest-articles/preventing-future-pandemics-starts-with-protecting-our-forests/.

79 Gale, P., Drew, T., et al. (2009). The effect of climate change on the occurrence and prevalence of livestock diseases in Great Britain: a review. Journal of Applied Microbiology. V. 106(5), pp. 1409-23. DOI: 10.1111/j.1365-2672.2008.04036.x; Ali, M., Carlile, G., Giasuddin, M. (2020). Impact of global climate change on livestock health: Bangladesh perspective. Open Veterinary Journal. V. 10(2), pp. 178–188. DOI: 10.4314/ovj.v10i2.7.

80 World Health Organization. (2020). Antibiotic Resistance. https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance.

81 Centers for Disease Control. (CDC, 2022). U.S. Approaches Record Number of Avian Influenza Outbreaks in Wild Birds and Poultry. https://www.cdc.gov/flu/avianflu/spotlights/2022-2023/nearing-record-number-avian-influenza.htm#:~:text=Since%20early%202022%2C%20more%20than,outbreak%20that%20occurred%20in%202015.; WHO. (2023). Avian Influenza A(H3N8)—China. https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON456; WHO. (2023). Human infection caused by Avian Influenza A (H5) – Chile. https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON453; Nelson, B. (2023). High Path Avian Influenza Update – What's next? https://www.fb.org/market-intel/high-path-avian-influenza-update-whats-next; World Organization for Animal Health. (OIE, 2023). Avian Influenza. https://www.woah.org/en/disease/avian-influenza/.

82 WHO. (2023). Avian Influenza A(H3N8)—China. https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON456.

83 OIE. (2020). African swine fever: responding to the global threat. https://bulletin.woah.org/wp-content/uploads/bulletins/panorama-2020-1-en.pdf. 84 IFC. (2018). Guangxi Yangxiang Co. Ltd. https://disclosures.ifc.org/project-detail/SII/38720/guangxi-yangxiang-co-ltd; Reiley, L. (2019). A terrible pandemic is killing pigs around the world, and U.S. pork producers fear they could be hit next. https://www.washingtonpost.com/business/2019/10/16/terrible-pandemic-is-killing-pigs-around-world-us-pork-producers-fear-they-could-be-next/.

85 Shibing, Y., et al. (2021). African swine fever outbreaks in China led to gross domestic product and economic losses. Nature Food. V. 2, pp. 802–808. DOI: https://doi.org/10.1038/s43016-021-00362-1.

86 FAO. (2013). Land &Water: Water Scarcity. https://www.fao.org/land-water/water/water-scarcity/en/

87 FAO. (2017). Water for Sustainable Food and Agriculture: A report produced for the G20 Presidency of Germany. https://www.fao.org/3/i7959e/i7959e.pdf; Pearce, F. (2022). Salt Scourge: The Dual Threat of Warming and Rising Salinity. Yale Environment 360. https://e360.yale.edu/features/salt-scourge-the-dual-threat-of-warming-and-rising-salinity.

88 United Nations University Institute for Water Environment and Health. (UNU-INWEH, 2022). 500 Million People Live in 19 African Nations Deemed Water-insecure. Press Release. https://unu.edu/press-release/500-million-people-live-19-african-nations-deemed-water-insecure#:~:text=Press%20Release-,500%20Million%20People%20Live%20in%2019%20African%20Nations%20Deemed%20Water,security%20in%20Africa's%2054%20countries.

89 de Waal, D., Khemani, S. (2023). World Bank Group. The Economics of Water Scarcity in the Middle East and North Africa Institutional Solutions. https://openknowledge.worldbank.org/server/api/core/bitstreams/6d4cbe0d-4156-4a9f-ad2f-57f100f411c6/content; IFC. (2021). YoKuku Mezz. https://disclosures.ifc.org/project-detail/SII/44775/yokuku-mezz.

90 World Bank Group. (2023). Agriculture and Food Sector Note on Applying the World Bank Group Paris Alignment Assessment Methods. https://documents1.worldbank.org/curated/en/099832004072338218/pdf/IDU037edc0990002e04db6088280d203aa274ff2.pdf.

91 Fry, J., Neff, R., Martin, B., et al. (2016). John Hopkins Center for a Livable Future. A Response to Dr. Frank Mitloehner's White Paper, 'Livestock's Contributions to Climate Change: Facts and Fiction.' https://clf.jhsph.edu/sites/default/files/2019-04/frank-mitloehner-white-paper-letter.pdf; Collaboration Platform on Agriculture. (2022). USDA-DG AGRI Virtual Event on Strategies to Reduce GHG Emissions from Livestock. https://www.fas.usda.gov/sites/default/files/2022-12/CPA%202022%20Livestock%20Summary.pdf; IFC. (2022). IFC Practices for Sustainable Investment in Private Sector Livestock Operations. https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/agribusiness/priorities/sustainable+livestock/practices-for-sustainable-investment-in-private-sector-livestock-operations.

92 Lazarus, O., McDermid, S., et al. (2021). The climate responsibilities of industrial meat and dairy producers. Climactic Change. V. 165, issue 30. DOI: https://doi.org/10.1007/s10584-021-03047-7.

93 Hegarty, R., Passetti, R., et al. (2021). An evaluation of evidence for efficacy and applicability of methane inhibiting feed additives for livestock. https://cgspace.cgiar.org/bitstream/handle/10568/116489/An%20evaluation%20of%20evidence%20for%20efficacy%20and%20applicability%20of%20methane%20inhibiting%20feed%20additives%20for%20livestock%20FINAL.pdf?sequence=4&isAllowed=y. Sicard, C. (2023). Can CRISPR Cut Methane Emissions From Cow Guts? University of California at Davis. https://www.ucdavis.edu/food/news/can-crispr-cut-methane-emissions-cow-guts. Zelp. (n.d.). https://www.zelp.co/.

94 Nevzorova, T., Kutcherov, V. (2019). Barriers to the wider implementation of biogas as a source of energy: A state-of-the-art review. Energy Strategy Reviews. V. 26. DOI: https://doi.org/10.1016/j.esr.2019.100414.

95 Zhou, Y., Swidler, D., et al. (2021). Life-Cycle Greenhouse Gas Emissions of Biomethane and Hydrogen Pathways in the European Union. International Council on Clean Transportation. https://theicct.org/sites/default/files/publications/lca-biomethane-hydrogen-eu-oct21.pdf.

96 Association of Irritated Residents, Leadership Counsel for Justice & Accountability, Food & Water Watch, and the Animal Legal Defense Fund. (2022). Petition for Reconsideration of the Denial of the Petition for Rulemaking to Exclude All Fuels Derived From Biomethane From Dairy and Swine Manure From the Low Carbon Fuel Standard Program. https://foe.org/wp-content/uploads/2022/06/2022-03-28-Petition-for-Reconsideration-TOC-Updated.pdf.

97 MacLeod, M., Gerber, P., et al. (2013). Greenhouse gas emissions from pig and chicken supply chains: A global life cycle assessment. FAO. https://www.fao.org/3/i3460e/i3460e.pdf.

98 IPCC. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability. https://report.ipcc.ch/ar6/wg2/IPCC_AR6_WGII_FullReport.pdf.

99 FAO. Agroecology Knowledge Hub. "Overview." https://www.fao.org/agroecology/overview/en/.

100 FAO. Agroecology Knowledge Hub. "10 Elements of Agroecology." https://www.fao.org/agroecology/overview/en/.

101 FAO. Agroecology Knowledge Hub. "Overview." https://www.fao.org/agroecology/overview/en/.

102 Sen, A. (1981). Poverty and famines: an essay on entitlement and deprivation; Lappe, F., Collins, J. (2015). World Hunger: Ten Myths.

103 Drugmand, D., Feit, S., et al. (2022). Center for International Environmental Law. Fossils, Fertilizers, and False Solutions: How Laundering Fossil Fuels in Agrochemicals Puts the Climate and the Planet at Risk. https://www.ciel.org/wp-content/uploads/2022/10/Fossils-Fertilizers-and-False-Solutions.pdf.

104 Project Drawdown. Managed Grazing. https://drawdown.org/solutions/managed-grazing#:~:text=Managed%20grazing%20can%20sequester%2013.72,on%20that%20grazing%20land%20today.

105 Betemariam, E., Suber, M., et al. (2020). Carbon Storage Potential of Silvopastoral Systems of Colombia. Land 9 (9), p. 309. DOI:10.3390/land9090309; Landholm, D., Pradhan P., et al. (2019). Reducing deforestation and improving livestock productivity: greenhouse gas mitigation potential of silvopastoral systems in Caquetá.

106 Libohova, Z., et al. (2018). Reevaluating the effects of soil organic matter and other properties on available water-holding capacity using the National Cooperative Soil Survey Characterization Database. Journal of Soil and Water Conservation. V. 73 (4), pp. 411-421. DOI: https://doi.org/10.2489/jswc.73.4.411.

107 Altieri, M., Nicholls, C., et al. (2015). Agroecology and the design of climate change-resilient farming systems. Agronomy for Sustainable Development. V. 35, pp. 869-890. https://link.springer.com/article/10.1007/s13593-015-0285-2.

108 Cairns, J., Prasanna, BM. (2018). Developing and deploying climate-resilient maize varieties in the developing world. Current Opinion in Plant Biology. V. 45, Part B, pp. 226-230. DOI: https://doi.org/10.1016/j.pbi.2018.05.004.

109 Convention on Biological Diversity, Slow Food. (2019). UN Biodiversity Convention partners with Slow Food International in celebrating the International Day for Biological Diversity. Press Release. https://www.cbd.int/doc/press/2019/pr-2019-05-22-idb-en.pdf.

110 Wanger, T., et al. (2020). Integrating agroecological production in a robust post-2020 Global Biodiversity Framework. Nature Ecology & Evolution. V. 4, pp. 1150-152. https://www.nature.com/articles/s41559-020-1262-y.

111 UNEP. (2020). Agroecology- a contribution to food security? https://www.unep.org/news-and-stories/story/agroecology-contribution-food-security.

112 Porter, J. (n.d.). The World's Food Supply is Made Insecure by Climate Change. United Nations Academic Impact. https://www.un.org/en/academic-impact/worlds-food-supply-made-insecure-climate-change.

113 Aday, S., Aday, M. (2020). Impact of COVID-19 on the food supply chain. Food Quality and Safety. V. 4, issue 4, pp. 167–180. DOI: https://doi.org/10.1093/fqsafe/fyaa024.

114 Dumas, P., Wirsenius, S., et al. (2022). Inter-American Development Bank. Options to achieve net-zero emissions from agriculture and land use changes in Latin America and the Caribbean. https://shs.hal.science/halshs-03760573/document.