The just transition from industrial animal production to equitable, humane and sustainable food systems

About this paper

This white paper was created by a coalition of organisations dedicated to ensuring a just transition away from the industrial animal agriculture system. The document has been through extensive consultation amongst impacted groups, including food chain worker organisations (e.g. unions, farmworker and meat-processing workers), smallholder farmers, small-scale fishers, pastoralists, women and youth in agriculture, Indigenous peoples, peasant communities, and just transition organisations. Over 120 individuals representing 72 organisations from 35 countries provided feedback.

The outcomes of the consultation process are reflected throughout the paper to support the views and narratives of impacted groups. As we work together to build a global movement to phase-out industrial animal agriculture, it's important to acknowledge the diversity of perspectives and needs among impacted groups. While the paper's contents represent a shared vision and pathways for transformation away from the industrial animal agriculture system, the details may not fully represent each organisation's unique viewpoints and priorities.

Core writing team:

Center for Biological Diversity

World Animal Protection

Global Forest Coalition

Brighter Green

Aquatic Life Institute

Contributors: Youth in Agroecology and Restoration Network, Jeunes Volontaires pour l'Environnement/ Youth Volunteers for the Environment, African Biodiversity Network, Real Food Systems, New Roots Institute, Care About Climate.

Executive summary

Urgent action for a just transition from industrial animal production to equitable, humane and sustainable food systems

The global system of industrial animal production, including industrial fishing and aquaculture, is fundamentally flawed, inequitable and pushing our planet to the brink. It prioritises profit over everything else, exploiting workers, communities, women, animals and the environment, and is a critical threat to public health. It is unsustainable and undermines crucial international targets such as the United Nations Sustainable Development Goals, the Paris Agreement on climate change and the Kunming-Montreal Global Biodiversity Framework. This alarming situation demands urgent action for a just transition towards an equitable, humane and sustainable food system.

Despite mounting evidence of its disastrous impacts, industrial animal production continues to expand, driving deforestation, habitat destruction and pollution. This rampant growth poses a grave threat to our planet's climate, with global food system emissions alone endangering the 1.5°C target even if we phase out fossil fuels immediately. Reducing the size of the industrial animal agriculture, fishing and aquaculture sectors, together with a shift towards diets within planetary and social boundaries and agroecology, must become a central climate mitigation strategy.

According to experts, global emissions from animal production must decline by 50% by 2030 to meet the targets of the Paris Agreement[1]. In an equitable, humane and sustainable food system, there is no place for false solutions. Concepts such as 'carbon farming', 'sustainable intensification' and 'regenerative agriculture' have significant trade-offs or limitations,[2] are poorly defined[3] or are not feasible at scale.[4] Carbon markets and other offset programmes allow industrial agriculture facilities to continue business as usual and keep producing greenhouse gas emissions and releasing air, water and soil pollution instead of reducing these harms. To meet the necessary emissions-reduction target, efforts will have to be led by high meat and dairy consuming and producing countries through a decrease of consumption of animal-based products and the number of farmed animals in industrial production systems.

We must act now to shift towards equitable, humane and sustainable food systems. This involves putting smallholder farmers at the centre and adopting agroecological practices that actively promote human rights, particularly the rights of traditionally marginalised populations including women and girls, Indigenous populations, people of colour and people with disabilities. It also means protecting the environment and animal welfare, while ensuring food sovereignty meets food security needs and guaranteeing that people working across the food system live in dignity and receive a liveable income.

Along with significantly decreasing consumption of animal products in high-consuming countries, remaining animal sourced foods are produced on small and medium-sized diversified farms using high welfare standards, strong worker protections and agroecological practices. Corporations are held accountable for the social and environmental damage they cause and the power that the multinational meat, dairy and seafood corporations currently hold over the system is shifted towards communities, worker-led programmes, cooperatives, Micro, Small & Medium Enterprises and smallholder farmers to strengthen local and regional economies.

Alternative proteins require far less land, water and energy to produce than conventional animal-based meat and dairy and, as such, can be a tool in the short term to address the environmental harms of high meat consumption by rapidly increasing the access and availability of humane and sustainable proteins. This can help accelerate the shift towards diets within planetary boundaries in high-consuming countries and free up land and resources to support diversified agroecological production systems. However, alternative proteins are not the end goal of a just transition as there are concerns about the social and public health dimensions of this sector. There are also concerns about whether alternative proteins can be compatible with food sovereignty since the sector is firmly entrenched in the industrial agriculture system. We must be particularly vigilant not to replicate the harmful practices and consolidation of power seen in industrial animal production systems and improve standards of sustainability and justice in this sector, including food tech justice and ensuring open access. In the long-term, food system transformation will move away from industrial products towards agroecologically-produced, humane and sustainable foods.

The need for analog products to accelerate the shift from animal-sourced foods to diets within social and planetary boundaries is largely a regional issue in high-consuming countries. There is an opportunity for the low-consuming countries to leapfrog these technologies and the industrial animal agriculture model of the

Global North by maintaining and promoting diets within social and planetary boundaries through the strengthening of agroecology and ensuring the availability of whole plant and minimally processed plant-based proteins.

Any exploitation of people, communities, workers, or the planet is not a just transition. A just transition shifts to a worker-owned, local and regional system where a healthy economy and a clean environment can and should co-exist. The process for achieving this vision should be a fair one that does not cost workers or communities their health, environment, jobs, or financial security.[5]

A just transition can only be achieved with the active involvement of women, youth, smallholder farmers, peasants, pastoralists, small-scale fishers, food workers, Indigenous communities and people of colour. It must address inequality and achieve food sovereignty, while addressing the climate drivers that create injustice. It must centre social, racial and gender equity and take an approach that addresses the multiple intersecting forms of discrimination such as sexism, racism, and ableism. Gender-based solutions and racial equity strategies that acknowledge the specific impacts experienced by women, Indigenous people, and people of colour and their crucial role in and knowledge of agriculture are critical.

This requires a strong commitment and inclusive process from governments that must use a human rights-based approach based on multilateralism with a clear definition of roles and responsibilities that involves impacted groups at all levels. Climate justice and the principle of common but differentiated responsibilities under the United Nations Framework Convention on Climate Change must guide this process, accounting for regional and cultural variations and sensitivities towards food.

Animal-based foods can be part of an equitable, humane and sustainable food system with Indigenous and traditional practices, knowledge and consumption patterns, which are vastly different from industrialised, high-meat diets in Global North countries. The just transition primarily applies to industrialised production and agribusinesses. It recognises the role of culturally-appropriate meat consumption and the economic, social, nutritional, and cultural significance of traditional livestock and pastoralist systems in certain contexts and communities. It also recognises the essential role of smallholders farmers, pastoralists, small-scale fishers, women, Indigenous peoples and peasants in providing healthy and nutritious food for all. The transition is an opportunity to address and advance the conditions and livelihoods of these groups by improving the current system through the adoption of agroecology, high welfare standards and the recognition and

strengthening of traditional land rights of smallholders and marginalised groups, particularly women, people of colour and Indigenous communities.

This paper outlines a roadmap to accelerate the just transition to a climate-resilient food system that is locally and democratically governed, mitigates greenhouse gas emissions, promotes biodiversity, protects animal welfare, empowers workers, and advances food sovereignty that fulfils food security. This is a global framework to guide the development of context specific roadmaps.

To achieve the transition, we must pull three key levers of change:

- **Strengthen food system governance**: We need to challenge the dominance of the food system by multinational corporations and put policies in place to foster transparency and hold them accountable for their social and environmental impacts. At the same time, we should support environmentally and socially responsible companies and protect and elevate traditional and local food systems.

- **Promote agroecological practices**: A just transition necessitates the embracing of agroecology to promote human rights, environmental protection and animal welfare, and to ensure food sovereignty meets food security needs while providing dignified and sustainable livelihoods.

- **Shift towards diets within planetary and social boundaries**: Countries with high per capita consumption of animal-based products must transition to plant-rich diets with reduced meat and dairy to stay within planetary and social boundaries. This shift will benefit public health and free up land and resources to support diversified agroecological production systems.

The roadmap includes more than 100 specific policy recommendations that will vary in priority, relevance, and applicability depending on local and regional contexts, including current legislation, cultural sensitivities, community-based solutions, levels of consumption and production of animal-sourced foods, and how entrenched industrial animal agriculture is in the region.

The urgency of this just transition cannot be overstated. The consequences of inaction are dire, from irreversible biodiversity loss and climate catastrophe to human rights abuses, public health crises and widespread animal suffering.

Governments, businesses, civil society and individuals must come together to drive this transformative change. We must embrace a future in which the systems that produce our food prioritise the well-being of people, animals and our planet over corporate profits. The time for action is now, and the path forward is clear. It is time to create an equitable, humane and sustainable food system that will secure a future for generations to come.

Table of contents

Glossary

Agroecology: La Via Campesina Definition[6]: refers to a way of life that supports life-enriching systems and opposes life-alienating systems. It works together with nature and not against it, cherishing synergies between living beings and prioritising traditional farmer knowledge and participatory, transgenerational, and experiential learning processes. Agroecological principles are based on solidarity, circular, and regional economies within ecological boundaries that are truly beneficial for communities. It prioritises the rights of small-scale food producers and forms a movement towards equality and social justice for all people worldwide.

Alternative proteins: refers to engineered proteins that are plant-based, cultivated or fermentation-derived[7]. These products are intended to taste the same as, or better than, conventional animal products and to provide similar nutritional value while costing the same or less. This term covers a wide variety of emerging products, some of which use novel technologies that are not yet regulated. Many currently rely primarily on monoculture crops[8].

Compared to conventionally produced animal proteins, alternative proteins require fewer inputs such as land and water, and generate far fewer negative externalities, such as greenhouse gas emissions (GHGs) and pollution[9].

Some of these products are available to consumers today, including numerous plant-based and fermentation-derived options. Others, such as cultivated meats, remain primarily in development, with a few products commercialised only in Singapore and the US[10]. It is important to note that the full health and environmental impact of these new products will depend on several factors, including the energy sources used, the efficiency and sustainability of production methods, the scalability of the technology and the overall lifecycle analysis of the process[11].

Alternative proteins raise numerous concerns about the social and public health dimensions of a just transition since the sector is firmly entrenched in the industrial agriculture system. With the sector continuing to grow, alternative proteins are addressed in this document as a potential tool in the short-term to help reduce consumption of animal-based products in high-consuming countries only if certain conditions are met to ensure equity and justice. They are not considered the end goal of the transition.

Diets within planetary and social boundaries: refers to balanced diets with low environmental impacts that contribute to food and nutrition security and to the

health of present and future generations. Diets within planetary and social boundaries are protective and respectful of animal welfare, biodiversity and ecosystems. They are culturally acceptable, accessible, economically fair and affordable, nutritionally adequate, safe and healthy, and optimise natural and human resources. Diets within planetary and social boundaries prioritise plant-based foods such as whole grains, fruits, vegetables, nuts, and legumes. Meat and dairy are still included, but make up a smaller portion of the overall diet compared to plant-based foods.

Diversified protein system and protein diversification: refers to moving away from over-reliance on animal protein from industrial systems to the production and consumption plant-based proteins, particularly beans, lentils, nuts, seeds and minimally processed plant-based food and small amounts of food of animal origin (dairy, eggs, meat and fish) from equitable, humane and sustainable systems.

Equitable, humane and sustainable protein: refers to alternative and animal proteins produced in ways that protect human rights, the environment and animals, while ensuring food sovereignty fulfils food security and guaranteeing that food workers, smallholder farmers and small-scale fishers live in dignity and receive a sustainable livelihood. Animal proteins are from high-welfare systems where farm animals' physical, environmental and behavioural needs are met, where resource use is sustainable and where benefits flow across the value chain and to local communities.

Factory farming, industrial animal agriculture and industrial livestock production: refers 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 from hundreds to hundreds of thousands of animals in concentrated feeding operations (mostly chickens, dairy cows, pigs and some fish farms), feedlots (beef cows) or extensive, controlled grazing systems (beef and dairy cows) that feed into massive vertically integrated supply chains. These production models do not acknowledge the sentience, or prioritise the welfare, of nonhuman animals. **For the purpose of this paper we will be consistently using the term 'industrial animal agriculture' to keep in mind the fact that we are talking about living beings.**

Global South/Global North: There is no agreed definition. For the purpose of this paper, Global South refers to low and middle-income countries in Africa, Asia

(excluding Japan, and South Korea), Oceania (excluding Australia and New Zealand), Latin America, and the Caribbean. The Global North comprises North America and Europe, Israel, Japan, South Korea, Australia, and New Zealand.

High meat and dairy consuming countries: refers to countries with annual per capita consumption over the recommended intake by EAT Lancet Commision to be in line with the planetary health diet. Consumption per capita should be no more than 98 grams of red meat (pork, beef or lamb), 203 grams of poultry and 196 grams of fish per week, or 5,1 kg, 10,5 kg and 10,2 kg a year respectively[12].

Industrial animal production: refers to industrial livestock, fish and aquaculture production.

Industrial aquaculture: refers to extensive, semi-intensive or intensive aquaculture, depending on the level of input and output per farming area and the stocking density. Intensive aquaculture refers to fish farms that rely predominantly on fish meal and fish oil in the growth process, whereas extensive aquaculture allows the stock to grow on its own, using natural food sources and conditions (e.g. oyster farming).

Industrial fishing: refers to large commercial fishing vessels (as opposed to artisanal fishing) that make long trips far out to sea and catch large volumes of fish in any waters.

Just transition: (Just Transition Alliance definition)[13]: refers to a principle, a process and a practice. The principle of just transition is that a healthy economy and a clean environment can and should co-exist. The process for achieving this vision should be a fair one that should not cost workers or community residents their health, environment, jobs, or economic assets. Any losses should be fairly compensated. And the practice of just transition means that the people who are most affected by pollution — the frontline workers and the fenceline communities — should be in the leadership of crafting policy solutions.

Just transition of the animal production system: refers to shifting the global system of protein production from industrial animal production (which favours high-quantity, low-quality meat and seafood and maximising corporate profits at the expense of workers, animals, public health and the environment) to one that is based on agroecological practices that produce equitable, humane and sustainable proteins, in order to alleviate animal, human and environmental suffering on a global scale. The just protein transition applies throughout the

supply chain from farm to fork and protects and empowers smallholders by adhering to agroecological principles.

Marginalised population: refers to groups and communities who experience discrimination and exclusion due to unequal power relationships across economic, political, social and cultural dimensions[14]. Marginalised populations include but are not limited to women, people of colour, and Indigenous populations.

Plant-based foods[15]: refers to fruits, vegetables, legumes, grains, nuts and seeds; their derived processed counterparts such as breads, pasta, breakfast cereals, cooked and fermented vegetables and legumes, and fruit purées, juices and jams; and their derived ingredients such as oleaginous seed-derived oils, sugars and some herbs and spices.

Plant-based protein: refers to protein derived from plants. Plant-based proteins include protein-rich whole plant foods such as pulses, nuts and seeds, and minimally processed plant-based foods such as tofu, tempeh and seitan.

Private investment: refers to money invested by private actors, such as transnational corporations, investment banks, private equity firms, and other profit-driven entities, rather than by democratically-governed public institutions, local cooperatives, tribal collectives, or other community-centred initiatives.

Regenerative agriculture: there is no single scientific or legal definition of regenerative agriculture as opposed to agroecology. Further, according to the International Panel of Experts on Sustainable Food Systems (IPES Food) analysis[16] 'the primary difference with agroecology concerns the human and social dimensions, social equity being one of the 3 pillars of agroecology, but not explicitly mentioned in the concept of regenerative agriculture. By contrast, definitions of regenerative agriculture tend to refer to a more confined scope in that they refer primarily to natural systems and technical practices, emphasising environmental restoration, preservation, and sustainability in ways that downplay human dimensions and socio-technical relations.' **For these reasons, we will be using and promoting agroecological practices throughout this paper.**

Scope 3 emissions (GHG Protocol definition)[17]: refers to the result of activities from assets not owned or controlled by the reporting organisation but which the organisation indirectly affects in its value chain. Scope 3 emissions include all sources not within an organisation's scope 1 and 2 boundary. The scope 3 emissions for one organisation are the scope 1 and 2 emissions of another

organisation. Scope 3 emissions, also referred to as value chain emissions, often represent the majority of an organisation's total GHGs.

Smallholders or smallholder farmers: the definition for smallholders or smallholder farmers, sometimes called small-scale farmers, can vary from country to country in terms of the exact size of the farm, but for the purpose of this paper the term refers to small-scale farmers, pastoralists, forest keepers who farm or manage areas on a limited scale, varying from less than one hectare to 10 hectares, independent of multinational agribusiness corporations. They may or may not own the land they work and often rely on labour from family members. They retain some of the food they produce for household consumption.

Small-scale fishers: as for smallholders, although the definition may vary from country to country. For the purposes of this paper the term refers to producers fishing on a limited scale, independent of multinational agribusiness corporations. They may or may not own their boat and often rely on labour from family members. They retain some of the seafood they catch for household consumption.

Unsustainable livestock production: refers to any method of animal agriculture that causes ongoing or escalating harm to the environment at any stage of production — both at the farm level and at scale — including but not limited to habitat destruction, desertification, eutrophication, water scarcity, biodiversity loss and excessive GHGs. These forms of damage typically have long-term effects on both ecosystems and agricultural production. Exploitation and other harm to animals, workers, women and communities also defines unsustainable production, because sustainability can only be achieved through practices that protect animals, people and the planet.

Part I – Background

1.1 Introduction

The global system of industrial animal production, including industrial fishing and aquaculture, favours high-quantity, low-quality meat, dairy, eggs and seafood and maximises corporate profits at the expense of workers, local communities, women, animals, public health and the planet. This system is fundamentally inequitable, inefficient, financially flawed and environmentally unsustainable. As such, it is incompatible with the United Nations Sustainable Development Goals (SDGs), the Paris Agreement, the Kunming-Montreal Global Biodiversity Framework and other critical international targets[18,19]. The widespread use of industrial animal farming, fishing and aquaculture make a sustainable future for our planet impossible.

The future we advocate for is a reduction of industrial animal agriculture, fishing and aquaculture through a just transition to a system based on agroecology that results in the production of equitable, humane and sustainable proteins on a global scale. The transition applies throughout the supply chain from farm to fork and protects and empowers smallholders by adhering to agroecology. The transition is viable and necessary.

Yet industrial animal agriculture continues to expand despite widespread evidence proving its detrimental impact on people, the environment and animals. Even amid avian and swine flu outbreaks, high feed prices and COVID-19-related disruptions, meat production increased by 5% in 2021[20].

Globally, the availability of protein from poultry, pigs, cattle and sheep is projected to increase by 14%, 17%, 9% and 15% respectively by 2032[21], with poultry accounting for the highest proportion at 48% of protein consumed from meat sources[22]. This projected increase is expected to be driven, particularly in low- and middle-income countries, by rising incomes, leading to an increased demand for meat and dairy and to a larger number of animals being raised in intensive industrial systems[23], with all the associated negative social and environmental consequences.

Similarly, most of the increase in world fisheries and aquaculture production will come from the industrial aquaculture sector, which is the fastest-growing animal protein industry. Global fish production (capture and aquaculture) is expected to grow from 181 Metric tons (2021–22 average) to 202 Metric tons by 2032, an increase of 12%[24].

While the industrial animal agriculture, fishing, and aquaculture models fit within a broader industrial agriculture system that also needs to shift, this paper will focus solely on a just transition for the industrial animal production sectors.

The first section highlights the impacts of the current industrial system on people, the environment and animals. The second section examines some of the factors that currently support the industrial animal agriculture, fishing, and aquaculture systems. It describes the levers of change in the Global North and South towards food systems that protect human rights, the environment and animals, ensure food sovereignty that fulfils food security and guarantee that food workers, smallholders and small-scale fishers live in dignity and receive a sustainable livelihood. The last section provides a road map for policymakers, guided by the United Nations Framework Convention on Climate Change (UNFCCC) principle of 'common but differentiated responsibilities'[25], to accelerate the transition.

1.2 The case for a just transition

While the risks of industrial animal production and the benefits of a just transition have broad socioeconomic, environmental, health and equity implications, this paper focuses on seven key areas: livelihoods, human and labour rights, food sovereignty and food security, climate, biodiversity, public health, and animal welfare.

Livelihoods

Traditional forms of animal husbandry in the Global South, such as pastoralist or agropastoral systems, provide an important source of nutrients, family income, community cohesion, transport, fuel, and fertiliser inputs (manure) for crop production on mixed farms. As a result, the sector plays a major role in reducing poverty, improving resilience, and combating food insecurity and malnutrition [26,27]. A UN Food and Agriculture Organization (FAO) report estimates that livestock contributes to the livelihoods of about 1.7 billion poor people; 70% of those employed in the sector are women [28].

However, traditional animal food production systems are currently facing two challenges. On the one hand, increasing temperatures, less-productive soil and unreliable rains will significantly impact crop yields[29,30] and increase the risk of heat stress[31] in grazing animals, leading to higher mortality and lower productivity[32].

On the other hand, industrial livestock systems are replacing traditional forms of livestock production in the Global South [33], where only larger farms are able to compete with the economy of scale of multinational corporations and survive; smaller farms cannot structurally compete in domestic or international markets, leading to concentration in the sector[34].The import of inexpensive food results in

limited opportunities for local small-scale farmers to sell their goods, compelling individuals to relocate[35]. This is often reinforced by the financial and policy support and powerful lobbying and investment enjoyed and wielded by agribusinesses[36].

In Latin America, around 70% of pastoral areas are degraded, with the consequent loss of productivity[37] associated with long-standing trends such as land concentration and the exclusion of women from land tenure. The enabling conditions for agricultural production (subsidies, access to land and loans) tend to increase social injustices, further marginalisin g small producers, particularly women[38].

In the Global North and some parts of the Global South, where industrial animal production is already entrenched, smallholder farmers have had no option but to sign contracts with multinational meat and dairy corporations, requiring heavy investments and leading them into debt[39]. In Thailand, which has been a pioneer of contract farming, the scheme has resulted in numerous farmers experiencing high levels of debt and low levels of income, particularly those raising livestock[40]. Through these contracts corporations pass on production risks to farmers. These include crop failure due to environmental disasters, floods and droughts, or livestock dying due to disease[41], making it challenging for farmers to live in dignity and earn a livable income.

Globally, nearly 60 million people rely on fisheries and aquaculture for employment[42]. While aquaculture can positively impact economic growth and poverty reduction at a national level, evidence shows that promoting aquaculture can primarily benefit larger and better-off farms, thus increasing inequality[43]. Further, many of these communities, such as those in West Africa, are threatened by poor fisheries management (e.g. catch limits, illegal fishing) and unsustainable fishing practices that result in overfishing[44], which displaces aquatic resources from local fishing communities[45].

Human and labour rights

Industrial animal agriculture jobs are notoriously dangerous, with slaughterhouse and other workers in the sector at higher risk of respiratory diseases[46], exposure to antimicrobial-resistant bacteria[47], and debilitating injury and death[48]. The hazards of the meatpacking industry have been well documented for more than a century, as have the poor protections for slaughterhouse workers, creating one of the most high-risk industries in the world[49]. Exploitative conditions, including overcrowded accommodation, long working hours, low pay, illegal wage deductions and job insecurity have a disproportionate impact on vulnerable populations such as migrant and cross-border workers[50,51]. These working conditions, coupled with the stressful nature of the work, lead to slaughterhouse workers being more likely to experience mental health problems compared to other industries. These can

include depression, anxiety and stress-related symptoms, and post-traumatic stress disorder[52].

The gender gap in the agricultural sector is also a recurrent concern. In Latin America, 40.9% of women work unpaid, compared to 11.1% of men. Likewise, child labour (10–14 years) in the rural sector is considerably higher than in the urban sector in several of the countries analysed, and in some countries, such as Mexico and Honduras, it exceeds 30%[53].

Industrial fishing has also been known to have a poor human rights record, with violations including slave and child labour[54]. Industrial fishing and aquaculture can infringe on the rights of Indigenous peoples and other marginalised groups by disrupting traditional land and resource-use practices and contaminating nearby waters and native species.

Animal production is a significant driver of land use change. Livestock production accounts for 83% of all agricultural land and 30% of the land surface of the planet[55]. The amount of land required for industrial livestock production often leads to human rights violations, land grabbing from Indigenous peoples[56] and other local communities, and increased land concentration in the hands of multinational corporations at the cost of smallholders and causing loss of livelihoods and compromised food sovereignty[57].

Food sovereignty and food security

Food sovereignty is based on the fundamental right to food as nourishment, and on valuing sustainable livelihoods for food producers, local food systems, ecosystem improvement and the knowledge and skills of Indigenous peoples, peasant communities, young people and women. It is grounded in democratic decision-making by affected communities[58].

Industrialised animal agriculture defies food sovereignty by commodifying food, preventing contracted farmers from choosing what to grow and how to grow it, and impeding the ability of local producers to grow their own food. This is exacerbated by the fact that just four companies control more than two-thirds of global seed sales — the same companies that control the majority of agrochemicals[59]. Furthermore, the industrialised food system not only undermines the basis for future food security and sovereignty but also ignores the fact that smallholders produce one-third of the world's food, with large variations depending on country and regional contexts[60].

In Latin America, livestock production has grown twice as fast as in the rest of the world and the region has become the world's largest exporter of beef and poultry – activities that account for around 45% of the subregion's agricultural GDP[61]. However, this does not necessarily translate to food sovereignty, since 86% of

agrifood exports are to countries outside Latin America and are concentrated on a few products[62] (including soybeans used for animal feed): ten products account for 51% of agrifood exports[63], making them highly vulnerable to the dynamics of international markets.

Industrial animal agriculture is often said to be essential for food security, but in fact it undermines food security through the inefficient use of resources. Industrial livestock occupy agricultural land that could be used to produce food crops, and livestock production diverts human-edible food for livestock feed[64]. Globally, 36% of cereals[65] and 77% of soya[66] are currently fed to farmed animals rather than directly nourishing people.

According to the FAO[67], primary crop production has increased by 52% (to 9.3 billion metric tons) since 2000, and meat production has risen by 45% (to 337 million metric tons). Yet only 55% of food-crop calories feed people directly. Indeed, for every 100 grams of protein in human-edible cereals fed to livestock, just 43 grams of protein enter the human food chain as meat or dairy milk and only 17 to 30 calories out of 100 can be used for energy[68].

Industrial animal agriculture relies on the international trade in animal feed, increasing interregional interdependencies globally, which increases the vulnerability of countries importing feed for industrial animal agriculture to major world events such as wars, pandemics (e.g. COVID-19, highly pathogenic avian influenza) and market price shocks[69].

Although aquaculture has been touted as one solution to feed a growing population, global aquaculture production is dominated by intensive and fed aquaculture (carnivorous species that rely on wild-caught fish feed to grow, i.e., farmed salmon). Feed for this type of aquaculture is composed of one-third to one-half wild-caught fish[70] in addition to corn and soy crops[71].

This translates to 1.2 trillion individual fish[72] that are fed to farmed fish not people, creating a highly inefficient use of animal protein sources and calories. In fact, an estimated 90% of the wild fish used in feeds could instead be eaten directly by humans[73].

Industrial aquaculture further undermines food security because it disproportionately affects local food production and distribution by exporting fish feed that could instead be used for human consumption locally. An FAO report found that since fishmeal factories began operating in Mauritania the price of locally consumed fish has increased fourfold[74].

Climate

Estimates for the contribution animal agriculture makes to global GHG emissions range from 11.2% to 19.6%[75,76]. Estimates are far higher when factoring in emissions from land conversion for animal feed production and grazing[77]. Industrial animal agriculture causes 32% of global anthropogenic methane emissions, more than natural gas, oil or coal production[78]. Methane emissions may be underestimated by as much as 39% to 90% in areas with highly intensified confined feeding operations, which further undermines these models as a sustainable development solution[79]. Methane is a short-lived gas with more than 80 times the global warming potential of CO2 over a 20-year period, making it essential to reduce industrial livestock to reach the targets of Paris Agreement[80]. Just 15 dairy and meat companies produce a staggering quantity of emissions, amounting to approximately 734 million tons of CO2 equivalent. This is roughly the same as the total GHG emissions of Germany, the world's fourth-largest economy[81].

In addition to methane, the industrial animal agriculture sector is also a significant source of nitrous oxide emissions through both the production of animal feed and the management of manure. Producing animal feed requires substantial use of nitrogen-based fertilisers, whilst nitrous oxide emissions occur when nitrogen from manure evaporates and disperses. Nitrous oxide is also a cause of water pollution when nitrogen from manure runoff enters water bodies or leaches into groundwater through soil[82].

Industrial fishing, specifically bottom trawling, releases massive amounts of carbon that would otherwise be stored in the seabed. It also causes ocean acidification and reduces the ocean's ability to store carbon dioxide. In industrial aquaculture, climate impacts include the destruction of carbon-sequestering ecosystems such as mangroves for shrimp farming, the emissions from fishing, and the transport and processing of feed for farmed salmon. In fact, scope 3 emissions[83] account for over 80% of all GHG emissions in salmon farming, 40% of which comes from feed[84].

Global food system emissions driven by unsustainable industrial animal agriculture, fishing, and aquaculture will make it impossible to achieve the 1.5°C target even if fossil fuels are immediately phased out[85]. The latest IPCC report has identified shifts towards diets rich in plant-based foods, particularly pulses, nuts, fruits and vegetables, such as vegetarian, pescatarian or vegan diets, as a substantial mitigation strategy for industrialised countries[86].

Biodiversity

Industrial animal agriculture, fishing and aquaculture are responsible for a disproportionate contribution to the extinction crisis. They are a primary driver of threats to wildlife, including habitat destruction and degradation (including loss of forests, grasslands and ocean ecosystems), air and water pollution, drought, climate change, overfishing and direct threats to keystone species [87]. Diseases originating in industrial animal agriculture facilities can spill over into wildlife with deadly consequences. Highly pathogenic avian influenza is an example and has led to the culling of millions of birds and put the future of already imperilled wild species, including the California condor, at risk[88,89].

[90]. This has the greatest negative impact on nature and on the ability of biodiversity to recover and thrive. In South America and Africa the most significant losses of forest cover between 2010 and 2020[91] occurred mainly because of the conversion of forested land to pasture for livestock and animal feed crops such as soybeans.

According to a landmark report supported by the United Nations, agriculture is a primary source of biodiversity loss and threatens 86% of species at risk of extinction[92].

One million wild plant and animal species will face extinction in the coming decades unless action is taken to address the key drivers of biodiversity loss[93]. The disappearance of species and habitats poses serious consequences for all life on Earth, from the loss of carbon sinks, crop pollination, soil health, marine biodiversity and water purification to medical, spiritual and cultural losses.

Public health

Industrial animal agriculture accounts for 73% of global antibiotic use[94]. The overuse of these products in animals as growth promoters and for the prevention of diseases caused by overcrowding and unhygienic conditions increases the threat of antimicrobial resistance (AMR) and has been linked to drug-resistant infections in animals and humans[95].

Antibiotic misuse is also a common practice in the industrial fishing and aquaculture sector[96], leading to the prevalence of multi-drug-resistant bacteria in marine waters and sediments in close proximity to aquaculture, industrial and municipal discharges[97]. AMR already causes 1.27 million human deaths per year[98], a figure that could rise to ten million global deaths annually by 2050 if no action is taken[99]. The World Health Organization (WHO) has called the AMR crisis

‘one of the biggest threats to global health, food security and development today’[100].

The massive amount of animal waste generated by industrial animal production can contaminate nearby rivers and other water bodies and lead to the deaths of large populations of fish [101]. Antibiotic residues and antibiotic-resistant bacteria pollute water[102]; pigs and poultry assimilate less than half of the nitrogen in their feed: most is excreted in their manure. The nitrogen not absorbed by crops or animals leaches into rivers, lakes, groundwater and marine ecosystems[103]. Slaughterhouses are also a major source of pollution, with data documenting facilities discharging 63 pollutants and 17 metals into waterways[104]. A study of 98 large slaughterhouses found that mid-range facilities produced an average amount of daily nitrogen pollution equivalent to the untreated sewage of 14,000 people[105]. Excess nitrogen can contaminate drinking water and lead to toxic algal blooms that cause harm to people and aquatic life.[106]

Furthermore, nitrogen undergoes transformations, releasing the reduced form ammonia (NH3) into the atmosphere. Agriculture is responsible for over 81% of global ammonia emissions and significantly contributes to PM2.5 air pollution. PM2.5 is linked to chronic respiratory illnesses and premature mortality[107].

About 75% of all emerging infectious diseases are zoonotic in nature. Increasing human demand for animal protein drives industrial animal agricultural expansion and land-use change, which are the main drivers of zoonotic diseases globally[108].

Industrial animal agriculture also negatively impacts soil health. The sector’s huge demand for cereals has fuelled intensive crop production which, in seeking to maximise yields, has caused compaction and loss of organic carbon [109]. This has degraded soils to the point where poor soil quality is constraining productivity[110].

Industrial animal agriculture is also responsible for an enormous volume of pesticide use – more than 200 million pounds of pesticides are used each year just on feed crops in the US[111] – leading to reduced soil biodiversity; without rich biodiversity soil fertility declines[112]. The FAO calculates that soils are now so degraded that we have only about 60 years of harvests left.[113]

Pesticide exposure can contribute to a wide range of chronic illnesses, including neurodegenerative disorders, endocrine disruption, respiratory disease, cardiovascular disease and cancer[114]. Pesticide Action Network estimates that about 44% of farmers and farm workers globally are poisoned by pesticides each year, leading to more than 7,000 deaths[115]. A US analysis found that pesticide exposures disproportionately harm black and Indigenous people and people of colour, and low-income and low-wealth communities[116]. Pesticide exposure also affects communities in sub-Saharan Africa, particularly women [117].

Industrial animal agriculture has a huge negative impact on health and the environment. Added to this is high consumption of red and processed meat[118], both risk factors for obesity, non-communicable diseases (type 2 diabetes, cardiovascular disease and some forms of cancers) and premature mortality in most regions of the world. High consumption of these animal products, combined with low intake of fruit and vegetables, is among the main drivers of global health-related deaths among adults[119].

A global switch to diets within planetary and social boundaries could save 5.1 million lives and reduce healthcare costs by at least $735 billion USper year by 2050[120]. A just transition to agroecology would save even more lives by reducing the risks of AMR[121], zoonotic disease transmission[122] and exposure to pesticides.

Animal welfare

The concept of animal sentience, which entails the capacity for an animal to have subjective experiences including pleasure and pain, is now widely accepted and supported by scientific evidence[123]. However, after almost six decades of discussion of the impacts of industrial farming on animal well-being, the world's default system for producing livestock for human consumption remains the biggest cause of animal suffering.

It is estimated that 90% of farmed animals globally are currently living in industrial systems. This includes an estimated 72% of farmed land animals (vertebrates only) and virtually all farmed fish[124]. To put this into perspective, approximately 630 million cattle, 670 million pigs and 19.24 billion poultry animals are raised in these industrial systems at any given time globally[125]. When considering these three categories together, the total exceeds 20 billion animals. An additional 124 billion farmed fish are raised under similar conditions[126].

Animals bred and reared in industrial operations are routinely subjected to extreme physical and mental harm. Most animals are kept in small cages or overcrowded, unsanitary spaces and throughout their lives cannot express natural behaviours[127]. Standard industry practices include beak trimming, teeth clipping, tail docking and castration, all without anaesthetic or analgesics, and routine early separation of mothers from their young. Animals are subject to intensive genetic selection for traits that maximise fast growth, high yields of eggs and dairy milk, and the production of large litters. Genetic selection prioritises productivity and profit at the expense of animal welfare[128].

Fish in aquaculture operations are also kept in poor conditions; industrial fishing relies on the use of destructive and cruel fishing methods. The level of sentience can vary among different animals and fish species but the fact that animals and

fish are sentient beings is well established[129]. Despite this, the industry does not allow them to live a good life.

Part II – Transforming the industrial animal-production sector

2.1 Protecting livelihoods

This just transition applies essentially to industrialised animal production and agribusinesses. It recognises the role of culturally-appropriate meat consumption and the economic, social, nutritional and cultural significance of traditional livestock and pastoralist systems in certain contexts and communities, particularly for women, providing them with income, capital, fertiliser, fuel, draught power, fibres and hides[130]. Animal-based foods can be part of an equitable, humane and sustainable food system with Indigenous and traditional practices, knowledge and consumption patterns, which are vastly different from industrialised, high -meat diets in many Global North countries. It also acknowledges the essential role of smallholders, pastoralists, small-scale fishers, women, Indigenous peoples and peasants in providing healthy and nutritious food for all. This transition is an opportunity to advance their livelihoods by improving the current traditional livestock and pastoralist systems through the adoption of agroecology and high welfare standards to improve animal health, longevity and increase productivity. Agroecological, integrated livestock systems with reduced herd sizes in high-consuming countries and traditional livestock and pastoralist systems in the Global South can also contribute to healthy and resilient ecosystems. Achieving a just transition of the industrial animal production sector is interconnected with the right to food sovereignty, health and access to a healthy environment, particularly for the poorest and most marginalised communities[131] ,including smallholders, pastoralists, peasants, small-scale fishers, women, Indigenous peoples and people of colour.

A just transition requires reducing our over-reliance on industrial animal protein by transitioning towards diets within planetary and social boundaries and supporting the consumption of the traditional, diverse and plant-rich diets that millions of the world's people eat or want to eat.

A study by global development experts estimates that a just transition to plant-based agriculture would create 19 million jobs by 2030 in Latin America and the

Caribbean. The transition would net 15 million jobs in that region alone, taking into account the loss of 4.3 million jobs in the traditional livestock industry[132].

The diversification of our protein system towards plant-based and other humane and sustainable proteins should emphasise bioregional[133], climate-resilient heritage foods[134] rather than mass-produced convenience food low in nutrients[135]. Further, shifting diets in high- and upper-middle income countries[136] to reduce consumption of animal-sourced food and increase plant-based foods would free up crop land[137], allowing the development of diversified agroecological production initiatives including plant-based protein crops for human consumption, high-welfare animal husbandry and smallholder farming that reduces the risk to farmers from natural disasters, pests and disease, and reduces income losses from variable yields and seasonal shortages[138]. Freed-up crop land that is converted back to native habitats, such as grasslands or forests, and other ecosystem restoration efforts, could also play an important role in carbon sequestration, reversing biodiversity declines, increasing resilience, restoring ecosystem services and improving livelihoods[139] .

Transitioning to agroecology, by its nature, would provide a sustainable livelihood for smallholder farmers and small-scale fishers in the Global North and South and would safeguard food and nutrition security by protecting the pollinators, soil, water and other natural resources on which agriculture itself relies[140]. An agroecological transition must also address the gender gap in agriculture: the FAO has acknowledged that if women had the same access to resources as men, they could feed up to 150 million more people.[141]

An FAO, United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP) report states that reallocating agricultural support to rewarding sustainable practices could improve productivity and environmental outcomes while boosting the livelihoods of the 500 million smallholder farmers worldwide, many of them women [142].

As with any major industry transition, the people who are the backbone of the industry – small-scale fishers, smallholder farmers and workers throughout the supply chain – usually bear the brunt of change. But with an inclusive and participatory capacity-building and skill-development process supported by governments, a just transition of the industrial animal production sector has the potential to significantly boost global and local economies by creating jobs that are safer, more equitable and inclusive, and better paid[143,144].

2.2 Ensuring food security and sovereignty

Despite global production from industrial animal agriculture and aquaculture increasing significantly on a global scale in the last two decades, the UN's 2023 'State of Food and Nutrition in the World' report revealed that approximately 735 million people continued to experience hunger in 2022. This represents an increase of 122 million compared to 2019, before the global pandemic. While there was progress in reducing hunger in Asia and Latin America between 2021 and 2022, instances of hunger are increasing in Western Asia, the Caribbean and all subregions of Africa[145].

Simply growing more food does not eliminate hunger. Food and nutrition security are only possible when food systems are environmentally and socially sustainable[146], when access and availability to nutritious food is guaranteed for all, and when food waste is addressed[147]. According to the FAO and UNEP nearly one-third of all food produced is lost or thrown away, leading to severe environmental repercussions and perpetuating food insecurity[148,149].

Additionally, the disconnect between food production and consumption, coupled with global trade, leads to uneven food distribution, which further undermines food security and sovereignty. Global food production is about 2,200 kilocalories per person per day – sufficient to feed the world's current population[150]. About 40% of cropland produces animal feed and 30% of human-edible crops is used to feed livestock. In addition, 13% of global cropland is used to produce biofuels and textiles. Direct consumption of cereals by humans is more resource-efficient[151]. The diversion of food capable of feeding humans to industrial livestock systems exacerbates unsustainable food production and consumption.

It is, therefore, critical to transition away from industrial animal production, which inherently puts biodiversity, ecosystems, the health of soils and fresh water[152], and the stability of our climate at risk, making the restoration of nature untenable and threatening our ability to continue growing sufficient nutritious food. It must be replaced by an agroecological system supported by policies developed in consultation with local communities that decrease food loss and waste and guarantee access and availability to healthy and nutritious diets within planetary and social boundaries for all.

Alternative proteins have a lower environmental footprint compared to animal-based proteins, however, despite potential environmental benefits when compared to animal products, alternative proteins raise numerous concerns about the social and public health dimensions of a just transition since the sector is firmly entrenched in the industrial agriculture system. With the sector continuing to grow,

alternative proteins can be a tool in the short-term to help reduce consumption of animal-based products in high-consuming countries only if certain conditions are met to ensure equity and justice. But in the long-term, food system transformation will move away from industrial products toward agroecologically-produced, humane and sustainable foods.

The role of alternative proteins in the short term in decreasing consumption of animal-sourced proteins and diversifying proteins will vary depending on the local context. There is an opportunity for the Global South to leapfrog these technologies and the industrial animal agriculture model of the Global North by maintaining and promoting diets within social and planetary boundaries through strengthening agroecology and ensuring the availability of whole plant and minimally processed plant based proteins.
As the alternative protein sector is growing and multinational meat, dairy and seafood corporations are expanding into alternative protein [153], it is critical that the just transition addresses the drivers of market concentration and corporate power in the sector to avoid replication of the same system failure of the industrial animal production sector it is replacing and limit corporate influence on food policies, so that food sovereignty is strengthened and smallholders, cooperatives and Micro, Small and Medium Enterprises are supported and in control of what to grow and how to produce it.

Declining land access, land ownership and control over land are significant barriers to shifting to agroecology. Globally, 1% of the world's largest farms control 70% of the world's farmland[154]. Competition for land has never been as high with governments and businesses grabbing lands for carbon and biodiversity offsetting schemes and the expansion of extractive industries, including growing feed crop monocultures for industrial animal agriculture.

For generations, smallholders and Indigenous communities across the world have been farming their land without recognised or formalised ownership rights, putting them at risk of being evicted as governments, investors, speculators and businesses seek land for expansion, the carbon market or as financial assets[155].

Women, in particular, have experienced a weakening of their customary land rights due to formalisation processes that favour officially designated household heads, typically men. Consequently, decisions and meetings often predominantly involve men, while land use planning tends to overlook resources primarily managed by women. The transition towards agroecology will be an opportunity to advance the legal recognition of women's tenure over household land.

Recognition of traditional land rights and policies that strengthen land rights of marginalised groups, such as women, Indigenous communities and people of colour are essential to advance agroecology.

2.3 The role of food and agricultural policies

The current industrial animal agriculture and fishery sectors rely heavily on government subsidies, leading to artificially cheap animal protein [156]. According to UNEP, 87% of the $540 billion used to support agricultural producers is either price distorting or harmful to nature and health [157]. The joint FAO, UNDP, UNEP report 'A Multi-Billion-Dollar Opportunity' calls for governments to rethink the way in which agriculture is subsidised and supported. It states that the 'phasing out of the most environmentally and socially harmful producer support is essential' to ensure sustainability and human health [158].

Governments should use financial incentives such as subsidies, taxes and grants to support foods with a much lower carbon footprint and higher nutritional value. The US government, for instance, spends $38 billion annually supporting industrial animal agriculture and a mere $17 million for fruits and vegetables[159].

Shifting these subsidies away from industrial animal agriculture and fisheries towards reduced levels of sustainable and humane animal production, and increased plant-based protein sources and plant-based food systems can incentivise the production and con sumption of healthy, environmentally friendly options. Government subsidies should also be redirected towards supporting smallholder farmers implementing agroecological practices; small-scale fishers practising local artisanal fishing and seaweed and multi-trophic aquaculture; and improving infrastructure for local and regional food systems. Public funds should support in particular Indigenous peoples, peasants, pastoralists and youth communities, women, people of colour and other marginalised producers to ensure gender, racial and social justice, and food sovereignty that meets food security needs while protecting nature.

Additionally, government policies can be used to enforce corporate accountability for animal agriculture pollution, including utilising existing environmental laws, strengthening regulations and holding companies liable for damage to land, water, climate and public health. Policymakers can also end the externalisation of the GHG costs of industrial animal and fish production, water use, soil erosion, use of chemical pesticides[160] and fertilisers, and damage to public health, and make the retail price of these products reflect the true cost of production. This would disincentive the consumption of foods that cause significant environmental and social harm and, in turn, increase the affordability of healthy plant-based options, including fresh produce and plant-based proteins.

Alongside corporate accountability and transparency, governments must ensure that corporations and private actors aren't influencing policymakers by proactively requiring disclosures and assessing, addressing, and preventing conflicts of interest. Corporations currently have an enormous influence over policymakers – including politicians who sit on agriculture and trade committees – through political

donations, direct lobbying, trade associations, and funding academic institutions. US agribusinesses alone spent $750 million on national political candidates from over the past 20 years and more than $2.5 billion on lobbying in that same period, in addition to funding academic research that downplayed the industry's environmental impact[161]. In Brazil, agribusinesses have created a think tank with a working agenda and a monthly budget of around $100,000 US to bring their narrative to the Brazilian congress[162].

It is also important to acknowledge the role of supply-side policies and government-supported agri-food industry marketing in driving demand for more animal products, and redirect them towards supporting healthy, plant-based options. For example, a Greenpeace report found that 'In the period 2016–2020, the EU spent €252.4 million to exclusively promote European meat and dairy products, 32% of the overall €776.7 million spending on the promotion of agricultural products in the EU and abroad, compared to only 19% for exclusive promotion of fruit and vegetables. In addition to this, many of the funded campaigns state that it is their objective to reverse trends of falling meat or dairy consumption, or to stop the growth of consumption from slowing'[163].

Food and nutrition policies such as food-based dietary guidelines (FBDGs) are essential to increase access to healthier diets and promote sustainable food choices. About one-third of FBDGs are incompatible with the agenda on non-communicable diseases[164], and most are incompatible with the Paris Agreement and other environmental targets[165]. The policies of high-meat-consuming countries should prioritise the development and promotion of national FBDGs and subsidies that align with the objectives of the Paris Agreement by emphasising the importance of diets within planetary and social boundaries, with reduced industrial meat, dairy and fish consumption, and increased intake of fruit, vegetables, whole grains and legumes.

Reducing the size of the industrial animal agriculture, fishing and aquaculture sectors is a neglected climate mitigation strategy. If G20 countries shifted towards diets within planetary and social boundaries the bloc's food-related emissions would fall by as much as 46% (1.7 gigatons)[166]. A just transition away from intensive animal production would rapidly cut GHGs by reducing emissions of short-lived climate pollutants such as methane, restoring carbon-sequestering ecosystems and improving food system resilience by bringing about a shift towards more diversified, less resource-intensive plant-based foods.

Finally, governments must implement and enforce regulations to ensure safe and fair conditions for workers in the agricultural and fishing sectors. This includes proper training, protective equipment, fair wages and the prevention of exploitative practices such as bonded labour[167], and eliminating the gender gap in salaries.

2.4 The role of trade agreements

Current trade agreements set conditions for social, environmental and economic policies, requiring that they be the least trade-restrictive options possible. They also encourage corporate concentration in the industrial animal agriculture sector: a handful of global meat and dairy companies control significant market share in surplus livestock-producing countries. This leads to the massive overproduction of meat and commodity crops[168,169].

Corporate capture of both trade and agriculture policy has led to farm policies in livestock-producing countries supporting corn and soy production, resulting in the overproduction of those goods at artificially low prices. Cheap feed results in cheap meat that fails to account for the real costs to the environment, public health or animal welfare. The interest of multinational meat and dairy corporations in capturing a bigger share of the global market is driving a push for new export markets, leading to a vicious cycle of low prices, overproduction and corporate concentration. In the US, just four firms control more than 80% of meat processing. In Brazil, three companies dominate the domestic market[170]. This concentration gives those companies ever greater power over supply chains and the choices that farmers and consumers make about their food systems.

Specific trade policies influence countries' ability to regulate their food systems and encourage a just transition to agroecology. For example, rules on plant and food safety (called Sanitary and Phytosanitary Standards or SPS) limit restrictions on GMOs and new technologies such as CRISPR-CAS9 in feed, as well as dubious existing practices such as the use of ractopamine in pork and hormones in beef. Mexico is currently involved in a trade dispute with the US over its plans to phase out of GMO corn and glyphosate.[171] Agreements such as the EU–Mercosur deal would increase quotas for meat imports, overwhelming local farmers in Europe who are attempting to change their production methods and increasing pressure on land use and forests in Brazil[172]. Rules on intellectual property rights limit farmers' ability to save and share seeds.

These policies are not set in stone, however. New trade rules should take into account food systems, sovereignty and planetary boundaries. This can include climate waivers or a Climate Peace Clause at the WTO and in other trade deals that prevents trade disputes arising from countries' climate actions. It could specify that actions taken under the Paris Agreement, and others such as the Deforestation Pact, are free from trade challenges. SPS and Technical Barriers to Trade rules should prioritise the precau tionary principle and consumers' right to know.

Other examples include: deforestation-free supply chain regulations that include meat and soy (as in the EU) and that provide substantial financial support to enable changes in food systems in producing countries[173]; international trade

agreements that include farm animal welfare standards in line with domestic regulations in the EU[174]; and Canada's dairy supply management programme that pays farmers a fair price for a limited volume of production[175]. Coupled with trade rules that limit floods of cheap imports, more policies such as these would facilitate smaller herds, pasture-based production and smaller overall production while supporting rural livelihoods.

Rethinking current trade agreements will be critical to avoiding further consolidation and to breaking down the dominance of the few multinational seafood, meat and dairy corporations as they increase their presence in the plant-based food and cultivated meat and seafood markets. Plant-based alternatives can be tools to reduce dependency on industrial animal protein in high-consuming countries in the short term. However, the growing alternative and plant-based protein sector requires additional guardrails, including improving worker protections and worker-owned production, strengthening agroecological approaches to the supply of plant-based protein and feedstocks, and strong animal welfare policies for the provision of cells for cultivated meat and seafood to avoid replicating the impacts of factory farming systems.

2.5 The role of public and private finance

Despite making commitments to align their investments with the Paris Agreement, the SDGs and the Kunming-Montreal Global Biodiversity Framework[176], some multilateral development banks (MDBs) are increasing their investment in industrial animal agriculture, including feed production. Between 2010 and 2021, the five largest public development banks allocated more than $4.6 billion of taxpayers' funds to this sector[177].

In order to align with the goals of the Paris Agreement and address the urgent need to mitigate climate change, it is imperative that MDBs exclude industrial livestock and animal feed operations from the sectors they consider 'Paris-aligned'. Furthermore, it is crucial that MDBs cease financing the expansion of the global industrial livestock sector.

Private finance is even more problematic due to the lack of effective accountability mechanisms. Between 2015 and 2020, global meat and dairy companies received over $478 billion in backing from more than 2,500 investment firms, banks and pension funds headquartered around the globe[178]. And, while financial institutions have been touting their climate action, the majority of their efforts are focused on fossil fuels and ignore the significance of industrial animal agriculture. Financiers should publicly disclose a time-bound action plan to reduce all financed emissions in alignment with a 1.5ºC pathway and based on climate science. This should exclude all investment in the industrial animal agriculture sector, beginning with an immediate halt to any form of finance that enables the industry to expand.

Rather than promoting global sustainability and the achievement of development goals, each dollar invested in factory farming undermines communities and exacerbates the problems caused by an unsustainable system.

Both public and private institutions have the power to redirect their investments to help mitigate the negative social and environmental impacts of industrial animal agriculture and fishing and create a more equitable, humane and sustainable food system.

Part III – Roadmap to an equitable, humane and sustainable food system

3.1 Our vision for an equitable, humane, and sustainable food system

In an equitable, humane and sustainable food system, nutritious foods are supplied through agroecology production systems that promote human rights — particularly the rights of traditionally marginalised populations including women and girls, Indigenous populations, people of colour and people with disabilities — and protect the environment and animals, while ensuring food sovereignty meets food security needs and guaranteeing that people working across the food system live in dignity and receive a liveable income.

Consumption of animal products in high-consuming countries is significantly decreased in favour of diversified, plant-rich diets, and remaining animal sourced foods are produced in worker-driven, cooperative production models using agroecological practices and high-welfare standards. Corporations are held accountable for the social and environmental damage they cause and the power that the multinational meat, dairy and seafood corporations currently hold over the system is shifted towards communities, worker-led programmes, smallholders, cooperatives and Micro, Small & Medium Enterprises to scale up local and regional economies.. At the same time, policies and subsidies support food production that embraces just transition principles and agroecological approaches without undermining the basis of food sovereignty.

In an equitable, humane and sustainable food system, there is no place for false solutions. Concepts such as ‘carbon farming’, ‘sustainable intensification’ and ‘regenerative agriculture’ have significant trade-offs or limitations,[179] are poorly defined[180] or are not feasible at scale.[181] Carbon markets and other offset programmes allow industrial agriculture facilities to continue business as usual and keep producing greenhouse gas emissions and releasing air, water and soil pollution instead of reducing these harms.

Animal-based foods can be part of an equitable, humane and sustainable food system with Indigenous and traditional practices, knowledge and consumption patterns, which are vastly different from industrialised, high -meat diets in many Global North countries. This just transition primarily applies to industrialised animal production and agribusinesses. It recognises the role of culturally-appropriate meat consumption and the economic, social, nutritional and cultural significance of traditional livestock and pastoralist systems in certain contexts and communities, particularly for women, providing them with income, capital, fertiliser, fuel, draught power, fibres and hides[182]. It also acknowledges the essential role of smallholders, pastoralists, small-scale fishers, women, Indigenous peoples and peasants in providing healthy and nutritious food for all.

This roadmap demonstrates pathways to shift to a climate-resilient food system that is equitable, humane and sustainable, as well as locally and democratically-governed, while mitigating greenhouse gas emissions, biodiversity loss and food insecurity — a global framework to guide the development of context-specific roadmaps.

It outlines **three key levers** of change to transform our food system that must be tailored to local and regional contexts, including current legislation, cultural sensitivities, community-based solutions, levels of consumption and production of animal-sourced foods, and how entrenched industrial animal agriculture is in the region:

1. **Strengthen food system governance**: We must challenge the dominance of multinational corporations over the food system and put policies in place to foster transparency and hold them accountable for their social and environmental impacts. At the same time, we should support environmentally and socially responsible companies and protect and elevate traditional and local food systems.
2. **Promote agroecological practices**: A just transition necessitates the embracing of agroecology to promote human rights, the environment and animals,

ensuring food sovereignty meets food security needs while providing dignified and sustainable livelihoods.

3. **Shift towards diets within planetary and social boundaries**: Countries with high per capita consumption of animal products must transition to plant-rich diets with reduced meat and dairy to stay within planetary and social boundaries. This shift not only benefits public health and the environment but also frees up land and resources to support diversified agroecological production systems.

3.2 Principles of a just transition in food and agriculture

According to experts, global emissions from animal production must decline by 50% by 2030 to meet the targets of the Paris Agreement[183]. This effort will have to be led by high meat and dairy consuming and producing countries through a decrease in the consumption of animal products and the number of farmed animals in industrial production systems.

A just transition from industrial animal agriculture can only be achieved in partnership with smallholders, pastoralists, small-scale fishers and food workers to ensure it is developed in ways that address inequality, end exploitation, and achieve food sovereignty that meets food security needs. It must centre social, racial and gender equity and address the multiple intersecting forms of discrimination such as sexism, racism, and ableism. Gender-based solutions and racial equity strategies that acknowledge the specific impacts experienced by women and people of colour and their crucial role in agriculture are essential. The transition must take into account regional and cultural differences and requires a strong commitment and inclusive process from government at all levels. These processes must use a human rights-based approach based on multilateralism with a clear definition of roles and responsibilities.

The just transition must be guided by climate justice and the UNFCCC's 'common but differentiated responsibilities' principle. It must address and improve the conditions of marginalised groups and regions while recognising the role of the Global South, smallholders, pastoralists, small-scale fishers, women, Indigenous peoples and peasants in providing healthy and nutritious food for all. Those who are most impacted must be included in policy discussions and commitments from the beginning.

There must be policy coherence that aligns food and agriculture with social, environmental, health and labour goals and commitments. Policymakers need to transform food system governance to break up market concentration and hold corporations accountable, alongside promoting environmentally and socially responsible companies and supporting a transition to food production based on agroecology and food sovereignty.

Although each region will have its own unique dynamics and needs during this transition, the following principles can serve as a guide for policymakers and communities:

- **Protect livelihoods and the dignity of farmers and farm workers**: The independent livelihoods of those working in the food system, particularly smallholders, pastoralists, small-scale fishers, Indigenous people, people of colour and marginalised workers, must be protected through economic and policy support. This can range from job training and financial aid to mental health support and access to healthcare. Strong community support is essential, as is addressing the cultural impacts on communities from changes in livelihoods and diet.
- **Advance human and labour rights and gender and racial equity**: Every person has the right to safe working conditions free of exploitation, to liveable wages, access to healthcare and to gender and racial justice. Food and agriculture policy must be aligned with trade policy to avoid human rights violations caused by the displacement of industrial animal agriculture impacts via increased imports or exports constrained by few regulations. Additionally, food and trade policies should protect Indigenous communities from land-grabbing by ensuring the application of the right of Free, Prior and Informed Consent[184].
- **Ensure food sovereignty that fulfils food security** : Food and agriculture policy must value the fundamental right to food as nourishment rather than as a commodity, and empower smallholders to decide what to grow and how to grow it. Additionally, it must support local food systems and ecosystem improvement through democratic decision-making by affected communities and through the application of the knowledge and skills of Indigenous peoples, pastoralists, peasant communities, young people and women.
- **Prioritise agroecology and diets within planetary and social boundaries** : Food and agriculture policies and practices should follow the polluter pays and precautionary principles. They must be inclusive and enhance social justice and climate stability, ensure that there is healthy air and water, pollution mitigation, land restoration, animal welfare and wildlife conservation, and also ensure equitable access to land and to nutritious, sustainably-produced food.
- **Enhance public health**: The public health threats caused by industrial animal agriculture – including AMR, zoonotic disease risk, environmental pollution, pesticide exposure and chronic, diet-related diseases – must be addressed and

reversed through policy shifts, corporate accountability, and healthcare while transitioning to a food system focused on advancing individual and community health.

- **Improve animal welfare standards**: In areas where pastoralists depend on livestock for food and livelihoods it will be critical to adopt agroecological practices including high welfare standards in line with the Five Domains[185]. In other parts of the world, as industrial animal agriculture systems are being phased out, welfare standards for animals remaining in those systems must be aligned with the Farm Animal Responsible Minimum Standards (FARMS) to redress animal welfare, environmental and public health impacts[186].

Engaging Stakeholders

A key principle of a just transition in food and agriculture is ensuring an inclusive process that engages those who are most impacted by the transition. These stakeholders representing the food system from farm to fork must be meaningfully involved early in the process, ahead of implementing any new policies. It is critical that this participatory process centres the voices of marginalised populations, including smallholders, pastoralists, small-scale fishers, peasants, women, Indigenous peoples and people of colour, and does not allow corporations to dominate the discussion.

Mechanisms to achieve a just transition in food and agriculture

- Ensure early involvement and consultation with key stakeholders and marginalised groups.
- Use existing mechanisms to engage Indigenous and tribal groups such as the Civil Society and Indigenous Peoples' Mechanism for Relations with the United Nations Committee on World Food Security.
- Create locally relevant resources highlighting the local benefits of transitioning away from industrial animal agriculture and showing how the just transition will protect the different groups impacted.
- Work with key stakeholders to set clear priorities.
- Collaboratively implement and assess changes.

Who does the just transition impact?	Key stakeholders
Smallholder producers and their support systems	Smallholder farmers, small-scale fishers and aquaculture farmers, veganic farmers, organic livestock farmers, subsistence farmers, silvopastoralists/agroforestry

	farmers, organisations that represent the interests of non-corporate farmers (e.g. Via Campesina, IFOAM), farm advisory services, women's organisations (e.g. Paraguay's National Organization of Rural and Indigenous Women Workers (Conamuri), Brazil's National Commission of Rural Women Workers (CNMTR), Rural Women Workers Movement of the Northeast (MMTR-NE), the National Articulation of Women Warriors of Ancestry (ANMIGA))
Industrial producers and related industries	Multinational corporations across the supply chain (agrochemical and commercial seeds, synthetics fertilisers, livestock genetics, agriculture, animal pharmaceutical and health industry, agricultural commodity traders, manufactured equipment, meat/seafood/aquaculture and protein, food and beverage processors, transporters, slaughter/rendering byproduct users, farm insurance providers, meat and dairy industry associations)
Workers throughout the supply chain	Farmworkers in industrial producers e.g. marginalised workers, smallholders, pastoralists, peasants, small-scale fishers, women, Indigenous peoples and people of colour, in industrial fishing fleets, slaughterhouse workers, unions, migrant workers
Communities affected by agricultural production	Rural communities, autonomous communities, Indigenous Peoples, frontline and fence line communities, nomadic/pastoralists
Innovators	Alt protein companies, innovators working to improve agroecology
Researchers and advocates	Universities, research centres, think tanks, policy advocacy organisations, conservation organisations, Consultative Group on International Agriculture Research (CGIAR),

	government agricultural research and development departments, government agricultural extension departments
Regulators	Governments, FAO, UNEP, certification schemes, UNFCCC, CDB
Investors and funders	Development agencies and banks, private investors and shareholders, debtors, insurers, economists, foundations
Consumers	Low-income/low-access urban populations, people whose meat consumption has increased with rising income, chefs, retailers and grocery stores
Animals	Farmed animals, wildlife, fish and crustaceans

3.3 Just transition policy recommendations

Lever 1: Policies to strengthen food system governance

Financial justice

- **Hold corporations accountable for paying taxes and financial responsibility for the harms they caused.** Governments must end tax breaks and loopholes for corporations, and increase corporate tax rates for just and equitable transition. Rather than externalising the costs of corporate pollution and other harms caused by industrial food production, those responsible must fund fixing the harms they caused, with additional financial penalties benefiting impacted communities and/or smallholders.
- **Repurpose direct and indirect government subsidies for multinational meat, dairy and seafood corporations.** Subsidies in the form of direct payments, grants, preferential loans, surplus purchases, tax breaks and other financial benefits should shift away from funding multinational corporations, feed crops, crop insurance, and genetically-modified organisms and redirected towards increasing agroecological and conservation practices; helping farmers create carbon sequestering, biodiverse natural habitats; and supporting smallholders, small-scale fishers, women, historically marginalised producers farmer cooperatives and Micro

and Small Enterprises. This would include preventing multinational corporations from receiving specialised funding such as bailout programmes.

- **Prohibit multilateral development bank investments in the expansion of industrial meat, dairy and seafood operations.** It is crucial that MDBs implement environmental and social supply chain due diligence to all existing and future investments in order to achieve equitable, humane and sustainable food systems.
- **Defund false solutions including biodigesters, carbon offsets and carbon removal or 'carbon farming' schemes.** Funding should not be granted to any schemes or practices that further entrench industrial animal agriculture models, increase harm to marginalised communities, or grant licence to large corporations to continue polluting the environment.
- **Mandate public development bank alignment with global agreements.** Public and Multilateral development banks should add all elements of industrial livestock production, including feed manufacturing, to the list of activities considered universally non-aligned with the goals of the Paris Agreement. Industrial animal production must be excluded from financing due to its economic liabilities from climate risks and the ways in which it threatens to keep the goals of the Paris Agreement, Kunming-Montreal Global Biodiversity Framework, the Sustainable Development Goals (SDGs) and other global agreements out of reach. Banks should also report on progress, gaps and strategies related to meeting their targets.
- **Prevent private investments in the food system.** Private investment lacks effective accountability, encourages deregulation, deepens debt inequalities and threatens local and Indigenous food sovereignty. Safeguard food systems and protect the related "commons" from the investments, management, or ownership of private actors, such as transnational corporations, investment banks, private equity firms, and such profit-driven entities. These actors have been repeatedly documented for exposing food systems to exploitation, extraction, and destruction with minimum accountability. Instead, encourage local cooperatives, tribal collectives, community-centred initiatives, and democratically-governed public institutions to steward food systems with strong regulatory infrastructure for duty of care, access to justice, and reparation mechanisms.
- **Create a task force at the regional (e.g. EU)/national (government)/state level to enforce regulations for investment-related misconduct.** The task force should be empowered to pursue concerns such as corporations misleading investors about environmental commitments and advisors failing to follow environmental, social and corporate governance (ESG) policies. The US Securities and Exchange Commission established a Climate and ESG Task Force that proactively identifies and pursues such violations[187].

- **Strengthen trade and investment agreements to prevent corporate influence and support food sovereignty.** Rules that govern financial markets should prioritise public interest and the right to food while ensuring that regulatory bodies such as the UN are not subject to corporate influence.
- **Fully fund agencies and programmes that enforce environmental and animal welfare protection laws and protections for farmworkers and food chain workers.** Government agencies tasked with enforcing environmental, animal welfare and worker protection laws are often understaffed and under-resourced, making it impossible to hold corporations accountable for violations. In addition to investing in agency-level enforcement, funding should also be directed to private, worker-driven enforcement programmes.

Accountability and governance

- **Strengthen and enforce environmental and animal welfare regulations for industrial animal production.** Corporations (including all of their domestic and international subsidiaries, lobbying groups, trade associations, and other related entities) must be held responsible for pollution, animal welfare infringements and other environmental harms caused throughout their supply chains, including those due to monoculture feed crops, animal production facilities, slaughterhouses and industrial fishing operations. Enforcement should include fines, permit revocation, suspension of market access and other appropriate sanctions. Their responsibility cannot be expressed as carbon or biodiversity offsets, net zero, gene editing, breed selection or other false solutions that would not tackle the root cause of the damage.
- **Strengthen and enforce corporate accountability rules, including duty of care mechanisms and a 'do no harm principle' with mandatory disclosures.** Corporations should be required to report on human rights and environmental impacts (including GHGs) along their entire supply chain, including subsidiaries, and compelled to perform duty of care throughout their business operations with appropriate enforcement and punishment for failure to do so. The European Commission's directive on corporate sustainability due diligence requires companies to identify, end, prevent, mitigate and account for negative human rights and environmental impacts as well as requiring certain large companies to have a plan for aligning their business strategy with the Paris Agreement[188].
- **Strengthen and expand worker protection laws to guarantee basic human rights, health care, and collective bargaining.** Corporations should be required to move from contractor relationships to employer relationships to increase protections and benefits for workers, while workers should have the right to collective bargaining. Farmworker and food chain workers must have the same

rights as other workers, including but not limited to access to proper medical care; access to legal representation; ability to attend parent-teacher conferences; protections from heat, smoke, and other climate-related impacts; paid leave and days off; health insurance; housing at a safe distance from pesticide spraying; and immigrant rights.

- **Require companies to meet strong worker-protection standards and participate in worker-driven agreements to qualify for government funding, contracts, and incentives.** End government funding and contracts, including procurement, for companies that engage in bad labour practices. Require companies to ensure specific improvements in employer policies and mechanisms for worker-driven agreements, monitoring and enforcement to qualify for funding initiatives. In 2023, the U.S. Department of Agriculture launched a guestworker expansion pilot programme that requires employers to improve working conditions, such as paid sick leave and worker housing maintenance, and to participate in a worker-driven social responsibility programme, have a collective bargaining agreement in place, or commit to neutrality, access, and voluntary recognition to receive a platinum-level financial award.[189]
- **Ban zero-hour contracts for workers across the food and agriculture supply chain.** Contracts that don't require employers to provide a minimum or guaranteed number of working hours are often used to exploit workers by denying them reliable hours, fixed income and benefits. Banning these contracts would improve equity, dignity and wages for workers.
- **Ratify and enforce the UN treaty on business and human rights.** An intergovernmental working group is developing an international legally binding treaty to regulate transnational corporations and other business enterprises in regards to human rights. A strong treaty aligned with the UN Guiding Principles on Business and Human Rights would provide an instrument to align accountability and liability to protect people from human rights abuses.[190]
- **Adopt a corporate accountability framework across UN proceedings.** UN proceedings, including UNFCCC and United Nations Food Systems Summit (UNFSS), should be free from corporate influence and hold corporations accountable for human rights and environmental harm, while uplifting the voices of those most impacted by the food system[191].
- **Strengthen processes to assess and address conflicts of interest.** Governments need to establish mechanisms to identify, disclose, monitor and mitigate conflicts of interest in food system spaces and processes, including preventing industry influence over regulatory guidance (e.g. advisory committees), public education narratives and research at government and public institutions. These mechanisms should utilise independent, third-party reporting and evaluation rather than relying on self-reporting.

- **Stop the revolving door between government agencies and multinational corporations and industry lobby groups.** Restrict the eligibility of representatives of multinational corporations and lobby groups to serve in government roles that have any oversight or regulatory influence over their former industry, and vice versa.
- **Strengthen rules to prevent corporate interference in government policy.** Lobbying and corporate spending should be restricted and transparent. Reporting should be improved to prevent corporate influence over policy and elections.
- **Strengthen and enforce antitrust rules.** Antitrust rules should address the full range of social and environmental impacts related to market consolidation in the animal agriculture industry. This includes accountability for direct and indirect harms to smallholders and local communities caused by corporate consolidation, restrictions on corporations moving abroad to avoid regulation, and ending monopoly control of slaughterhouses.
- **Establish regulatory frameworks for alternative protein investments.** Any investments in alternative proteins should be paired with regulatory and safety approvals to ensure that this growing sector is subject to the same level of accountability as animal production, that it respects the guidelines contained in global agreements such as the Paris Agreement, the SDGs and the Kunming-Montreal Global Biodiversity Framework and that companies are prevented from locating commercial-scale facilities abroad. Investments should also prioritise domestic production and require open-source, communal properties.
- **Strengthen reporting requirements for industrial animal agriculture facilities and other public health responses to zoonotic diseases and pandemics.** Government agencies must require widespread testing of animals, reporting, on-farm biosecurity measures, and personal protective equipment, sick days, and health care for workers to stop zoonotic diseases emerging from or spreading through industrial animal agriculture facilities. Agency enforcement must be sufficiently funded along with technical assistance and other support needed to meet these requirements, facilitate the adoption of the highest animal welfare standards to prevent disease spread, and ensure a rapid public health response to zoonotic disease threats.
- **Strengthen reporting requirements for all greenhouse emissions associated with industrial animal production.** Corporations should be required to regularly report all greenhouse gas emissions, including Scope 3 emissions, for their entire value chain — including methane from enteric fermentation and manure management and nitrous oxide from feed production — using standardised, science-based methodology. Corporate targets and GHG reporting

and monitoring schemes should be consistent with the IPCC's scenarios to limit warming to 1.5˚C.

- **Establish national and regional councils with the status to influence policy.** Governments should form councils including representatives from civil society and community-led organisations, smallholders, small-scale fishers, women's organisations, economists, youth, and other stakeholders, and empower them with adequate resources, decision-making capabilities, and influence over policy to help democratise food system governance, reduce corporate control, and improve accountability.

Trade

- **Adopt trade policies that prioritise domestic production, support local food systems and disincentivise multinational corporations.** Trade policies that establish agroecological production requirements, prohibit fast food businesses with negative social and environmental impacts, and require businesses to source from local suppliers can help break up market concentration and stop the expansion of multinationals in the Global South.
- **Establish policy coherence between trade and global agreements.** Reform and enforce trade policies to align with the Paris Agreement, SDGs, Kunming-Montreal Global Biodiversity Framework, human rights treaties and other global agreements.
- **Strengthen liability and accountability in trade agreements.** Corporations receiving investments, incentives and access to import/export markets must be held accountable for environmental and social harms in their supply chains.
- **Restrict trade in food and agricultural products associated with deforestation.** Corporations should have to prove that food and agricultural products were produced without harming forest ecosystems. The EU's regulation on deforestation-free supply chains mandates companies to show that products were produced on land where no deforestation or forest degradation took place, in addition to verifying compliance with human rights laws and respecting the rights of Indigenous peoples[192].
- **Allow context-specific trade standards for healthy and sustainable food and agricultural products.** Communities should have the ability to set standards based on local and regional contexts to minimise trade impacts on their environment, public health and local economies.
- **Reject carbon or biodiversity offsetting schemes in domestic and international policy.** Offset schemes, including carbon markets, shift the harm caused by industry to marginalised communities — particularly smallholders, pastoralists, peasants, small-scale fishers, women, Indigenous peoples and people

of colour — while destroying irreplaceable ecosystems and accelerating climate change.

- **Reject enslavement, child labour, and other human rights abuses in food supply chains in domestic and international policy.** Trade policies must hold companies responsible for exploitation and abuse in their supply chains.
- **Strengthen the application of Free Prior and Informed Consent when multinationals set up in the Global South.** The UN declaration on the Rights of Indigenous Peoples recognises the right of Indigenous groups to provide, withhold or withdraw consent regarding investment projects that affect their territories, in addition to engaging in negotiations around the design, implementation, monitoring and evaluation of projects[193]. This right must be universally applied with legal remediations for violations.
- **Protect smallholders, peasants, small-scale fishers and pastoralists from cheap food imports.** Prioritising cheap food and international markets impedes the ability of smaller, local and marginalised producers to find market opportunities.
- **Use mirror analysis to improve accountability in food and agriculture trade flows.** Reconciling import and export data for meat, dairy and seafood can help identify fraud and other trade violations perpetrated by multinational corporations.

Local Food Systems

- **Engage stakeholders in an inclusive process to identify and implement policies to protect food sovereignty.** Marginalised and underrepresented producers and communities — smallholders, pastoralists, peasants, small-scale fishers, women, youth, Indigenous peoples and people of colour — must be involved in the creation and implementation of local food policies and programmes.
- **Tackle gender and racial inequalities in the agrifood systems in a comprehensive way.** This includes production, distribution and consumption. Reducing inequalities in access to land, resources and assets experienced by women and people of colour is mandatory for more just and sustainable agrifood systems. Examples may include addressing the lack of reliable data disaggregated by gender; changing discriminatory norms; securing land tenure; bridging language, digital and literacy divides; and improving social protection programmes such as education and childcare.
- **Adopt policies that prioritise local economic growth across the food system.** Such policies can include promoting local innovation, localised certification standards, directing subsidies to local producers, creating new supply chains and markets, and supporting local control of value chain infrastructure.

- **Reform purchasing policies to break up procurement monopolies.** Government procurement policies can require purchasing from local and regional producers and can incentivise purchasing from those using agroecological practices. Brazil's Food Procurement Programme exclusively purchases produce from family farmers for communities in need. This creates a guaranteed institutional market for family farmers and the ability to invest in and diversify their crops, while increasing access to healthy regional foods[194].
- **Address intentionally food-deprived areas by increasing access to fresh food.** Governments can remove barriers to grocery stores operating in low-income, low-access neighborhoods and offer tax incentives to build grocery stores in communities where they are needed most. Increasing support for farmers markets, community-supported agriculture programmes, community and school gardens and other urban agriculture initiatives can increase food sovereignty and availability and access to fresh food.
- **Prevent the expansion of fast food establishments.** Ending public subsidies for fast food companies and implementing zoning regulations that limit or ban fast food establishments, restrict the number or density of fast food outlets, or regulate the proximity of fast food to sites such as schools or hospitals can help protect local markets for healthy, nutritious food in the Global North and safeguard local food systems in the Global South.
- **Increase support for regional production and protection of local food systems.** Providing financial, regulatory and technical support for regional food hubs along with public outreach campaigns in support of local producers can help increase both the availability and markets for local food.
- **Improve regulation of private procurement practices to ensure fair payment to local food producers.** Stronger regulatory frameworks for purchasing by grocery stores, food service companies, restaurants and other businesses can ensure that smallholders, small-scale fishers and pastoralists have more opportunities and receive fair payment in these sectors.

Lever 2: Policies to shift towards agroecological practices

Financial justice

- **Increase funding for land access and ownership for marginalised farmers including women, Indigenous peoples, ethnic minorities and people of colour.** Land acquisition and retention is a significant barrier to shifting to agroecology. Government funding should include technical assistance for applying for funding, returning stolen land to Indigenous peoples and tribes and establishing land co-ops and land trusts led by people of colour.

- **Improve access to funding for smallholders, small-scale fishers, pastoralists, rural women and people of colour.** Those who want to transition and small-scale producers using agroecological practices have often been marginalised and face barriers to receiving financial assistance. Governments can improve access to fair credit, loans, grants and other financial aid. Governments can also provide support to facilitate investments by increasing staff support for the application process, reducing paperwork and scheduling application periods during down seasons.
- **Implement inclusive processes for access to and distribution of financial assistance.** Language, literacy, age discrimination, disabilities and the digital divide can create additional barriers to small-scale farmers accessing government funding that would otherwise be available to them. Government agencies should invest in improving their understanding of community needs and the accessibility and inclusivity of their processes and programmes.
- **Redirect subsidies and other financial incentives towards producers transitioning to agroecological practices.** Financial assistance can help remove the barriers associated with the costs of transitioning production practices and diversifying crops. Subsidies can also be used to increase the market for agroecological and organic products to support widespread adoption of these practices.
- **Increase resilience of smallholders, pastoralists and small producers against extreme weather events by increasing access to farming insurance.** Farming insurance is an emerging tool providing smallholders with the security to replant in the next season despite current crop failures, or helping them replace animals lost during extreme weather events.
- **Establish strategic grain reserves and other supply management programmes to ensure fair prices for smallholder farmers.** In addition to eliminating feed subsidies, supply management makes larger producers pay market costs, supports fair prices for smaller producers, improves job security and increases resilience.
- **Provide incentives and technical support to help meat, dairy and seafood producers to shift to plant-based production.** Governments and technical agencies can support companies, investors, and farm workers transitioning from animal production to plant-based production. In Denmark, where 70% of agricultural land is used to grow animal feed, the government allocated 580 million kroner to pay bonuses to Danish farmers who grow plant-based protein for human consumption [195].
- **Link climate and development funding to the guiding principles of agroecology.** Agroecological principles should be mainstreamed into

environmental and development agreements to ensure equity and sustainability are integrated into related funding and policies.

- **Invest in local infrastructures based on community needs.** Local and regional infrastructure needs to support agroecological production, land ownership, distribution and markets will vary at different levels and in different locations and must be identified in consultation with local communities, including marginalised stakeholders.
- **Provide financial support for entrepreneurs and small businesses in rural areas.** Fostering thriving rural communities improves access to information, services and markets for smallholders, pastoralists and farmers transitioning to agroecological practices. Investing in rural communities can also aid the transition from industrial animal production facilities to a more resilient, diversified and just local economy.
- **Implement participatory budgeting and planning for food and agriculture programmes.** Participatory budgeting engages community stakeholders in deciding how to spend part of the public budget, including evaluation of the process. More than 7,000 cities around the world use participatory budgeting to decide municipal, agency and institution al budgets[196].
- **Provide financial resources to maximise restoration opportunities for former agricultural land.** Funds should be allocated for pollution mitigation and land restoration, including rewilding projects, in addition to exploring alternative uses for former agricultural land and ensuring equitable management of changes in land availability.
- **Fund research and academic courses to institutionalise agroecology in science and education.** Research and extension funding at public institutions should be shifted away from industrial animal production to identifying research gaps and increasing knowledge of and resources for scaling up agroecological production and farm transitions. This includes shifting the priorities of land-grant colleges and universities and those of the CGIAR centres to agroecology and prioritising farmer-led research that is co-created and co-implemented with community stakeholders.
- **Implement the true cost accounting for food and agriculture.** Working with economists to identify and quantify the environmental, social, public health and animal welfare costs of food systems would better inform agricultural and economic policy interventions and improve public understanding of the true costs of food production.

Accountability and governance

- **Recognise and support land tenure for Indigenous peoples, women, and people of colour.** Support Indigenous and other ethnic minority claims to

land, including the recognition of land-based farming and livelihood practices to establish tenure rights and legal recognition of women's tenure over household land.

- **Implement policy coherence across agencies and agreements that have direct or indirect impacts on food systems.** Food and agriculture policies and programmes should be aligned with environmental, human rights and development commitments and processes, including economic recovery and growth plans, and coordinated across agencies such as agriculture, health and environment.
- **Ensure and enforce labour rights and living wages for all food and agriculture workers**. Equalise labour laws to make sure farmworkers and other food chain workers are covered by all worker protection and fair wage laws. Implement policies in accordance with the Worker-Driven Social Responsibility Model to ensure legally-binding signed agreements with a code of protection, employer accountability, worker-to-worker education, third party audits, and a living wage paid to each worker.
- **Strengthen animal welfare standards in agroeocology assessment tools including the FAO's Tool for Agroecology Performance Evaluation (TAPE) framework.** The animal welfare standards in TAPE should be aligned with FARMS[197].
- **Establish clear biodiversity metrics for food and agriculture policies and programmes**. In addition to emissions-reduction and deforestation-free targets, food and agriculture policies and programmes should include measurable science-based goals for protecting and promoting native plants and animals and ecosystem health.
- **Implement initiatives to reduce food loss and waste that include environmental metrics.** Food loss and waste policies and programmes must measure environmental outcomes with an emphasis on tracking and measuring waste from animal products.
- **Recognise food as a human right and explore the development of programmes that reject the commodification of food.** Governments can officially acknowledge food as nourishment and as a universal human right. Alongside this recognition, they can explore the development and expansion of community-driven, non-monetary values within the food system, such as mutual aid programmes.

Producer Support

- **Improve access to and control over land and other resources for smallholders, peasants and pastoralists, particularly Indigenous, women, people of colour and other marginalised farmers**. Enact measures to empower

smallholders to access and control land, water, seeds and other productive resources. This includes prioritising smallholder access to land by capping land acquisitions, removing speculative capital and financial actors from land markets, and rejecting land-based carbon offset schemes while supporting alternative forms of land ownership and access such as the commons, cooperatives and other group ownership and financing models. Governments should also build integrated land, environmental, and food systems governance to stop land- and resource-grabbing, defend Indigenous territories, and construct secure, equitable and long-term access to land by communities.

- **Expand employment support, technical assistance and funded training for transitioning to agroecology**. Increase job opportunities and training for equally well-paying jobs for people across the food system, including farmers, smallholders, slaughterhouse workers, agricultural communities and seasonal workers, and cover transition costs and income losses. Government agencies can remove barriers for women, Indigenous, people of colour and other marginalised farmers with additional technical assistance including subsidising soil and water testing, getting certifications, and making government-support programmes and tools more accessible. Training can also include building skills and knowledge in animal welfare and sustainability practices.
- **Increase access to healthcare services for people employed across the food system**. Many farm workers and slaughterhouse workers currently lack access to any healthcare, while many workers and farmers struggle with mental health. Policies and programmes are needed to expand access to comprehensive healthcare and mental health support across the sector.
- **Establish women-led participatory processes in food and agriculture spaces.** The unique experiences of women in agriculture need to be considered as part of advancing agroecology. These processes can include gathering data, knowledge sharing, improving access to resources for producers and creating ways to address gender inequity in agriculture.
- **Establish preferential trading conditions for smallholders, small-scale fishers and pastoralists.** As trade policies can hold multinational corporations accountable, they can also be used to increase equity and support for local and regional food systems.
- **Increase market support for food produced using agroecological practices.** Initiatives that help promote products and educate consumers, such as certification, labelling and procurement policies, can help open up markets for farmers using agroecological practices, particularly women, Indigenous people, people of colour and other marginalised producers.
- **Invest in agroecology case studies from the ground in the Global South.** More research is needed into how agroecology can feed countries in

different regions. The FAO TAPE framework can be used to measure the performance of agroecological systems and create a baseline for monitoring and evaluation[198].

- **Increase support for urban agriculture**. Policies that specifically support urban agriculture can increase food sovereignty and availability and access to healthy and nutritious food. Governments can end regulations that restrict people's ability to grow food, enact policies that support gardens instead of lawns, increase access to land for community gardens, and fund Black, Indigenous and people of colour-led urban agriculture programmes. Cuba has been a leader in urban agriculture with an estimated 383,000 urban farms supplying 40–60% or more of all the fresh vegetables in cities using agroecological methods[199].
- **Provide support for peer-to-peer learning and capacity building, such as farmer-to-farmer networks and platforms.** Governments can provide financial and administrative support and institutional and political recognition of farmer-led organisations that promote best practices and innovation in agroecology, while respecting their autonomy. Farmer-led democratic organisations with open, voluntary membership help increase inclusion, knowledge sharing, capacity building and cooperation among farmers, researchers and policymakers.
- **Increase support for community-driven and farmer-led economic models such as food and land co-ops.** Cooperative models operate for the benefit of their members instead of outside investors or corporate interests, creating shared resources and prosperity. This also includes bringing land from private back to public ownership and protecting the commons. The commons involves cooperatively managed land supporting small-scale or subsistence farming that benefits food sovereignty and the shared interests of the community; in contrast, when agribusiness land grabbing expansions target the commons, the land use shifts towards industrial production with negative social, economic, and environmental consequences.

Public Education

- **Create public education initiatives to build support for agroecology**. Government agencies should work with healthcare professionals and institutions to develop education and outreach programmes to increase knowledge about the health benefits of agroecologically-produced products for people, animals and the planet. Elevating traditional regional foods can strengthen community buy-in for dietary shifts while improving public health. Public education should also emphasise the benefits of agroecology as a tool for increasing farmer and climate resilience

- **Engage veterinarian and animal professionals in promoting animal welfare to support food security**. Although they are often relied upon for health advice, veterinarian doctors[200] often lack training in animal welfare, while livestock technicians are rarely trained in the overlap between health, welfare and sustainable production. Closing these education gaps will increase public understanding of the benefits of animal welfare in ensuring food security and safety.[201]
- **Add agroecology labels to food**. Mandating food labels to reveal agroecological principles in production would enhance public understanding of food impacts. Studies have shown that informing consumers by using on-package labels influence their purchasing decisions[202].

Lever 3: Policies enabling a shift towards diets within planetary and social boundaries

Financial justice

- **Reform agricultural subsidies.** Direct and indirect government subsidies for industrial animal production should be repurposed and shifted towards making ecologically produced whole plant and plant-based foods produced by smallholders, small producers and Micro, Small & Medium Enterprises and cooperatives and marginalised farmers more widely available, accessible and affordable, particularly in high-consuming countries, and supporting humane, sustainable, and agroecological livestock production in the Global South.
- **Incentivise plant protein agriculture.** Funding such as tax breaks and direct investments can be used to incentivise increased production and availability of agroecological, local, and plant-based protein as well as transitional farms to support producers moving from industrial systems towards agroecological production. In 2021 Canada announced an investment of more than $4.3 million in the expansion of markets for pulses, to meet growing consumer demand and promote healthy soil management[203].
- **Incentivise agroecological, integrated livestock systems.** Funding such as loans and direct investments can be used to incentivise the transition to agroecological, high-welfare, integrated livestock systems with reduced herd sizes in high-consuming countries that meet specific, science-based metrics and standards for minimising greenhouse gas emissions and promoting biodiversity, and to support pastoralists in the Global South.
- **Pay producers to retire and rewild land previously used for industrial meat and dairy production.** Government funding programmes can support

farmers with long-term funding and technical assistance to convert land used for pasture and feed crops into native habitats that can store carbon and restore nature.

- **Invest in programmes to bring back ancient crops, increase access to seeds, and support seed banks.** Just four companies control more than two-thirds of global seed sales, threatening crop diversity, the existence of ancient crops, and the resilience of our food system[204]. Breaking up corporate concentration and increasing access to a diversity of seeds is necessary for equitable livelihoods, food system resilience, and food sovereignty[205].
- **Incentivise farmers markets to increase availability of fresh food and food sovereignty.** Governments can support the establishment of farmers markets, particularly in low-access areas, to increase the availability of fresh food and incentivise the participation of marginalised farmers to increase their access to markets and their ability to sell in their own communities. In addition, programmes that double the value of nutrition assistance benefits at farmers markets increase the affordability of fresh food in low-income, low-access areas.
- **Incentivise healthy diets within planetary and social boundaries.** Governments can encourage purchases of fresh fruit and vegetables and plant-based proteins through programmes that increase the price parity and affordability of plant-based foods, increase available funds for these foods in assistance programmes, and provide grants for innovative programmes such as produce prescriptions. Governments can also use their own purchasing power through procurement programmes that focus on plant-based foods. In 2022, Brazil changed the classification of domestically produced plant-based milks, zeroing their tax rate and closing the price gap between it and dairy milk[206].

Accountability and governance

- **Align trade policies with food and agriculture policies and goals.** As domestic consumption shifts towards diets within planetary and social boundaries, governments must ensure that corresponding production shifts are not offset by increased exports; if production shifts faster than consumer demand, similar measures must be taken to ensure it is not offset by increased imports of industrial meat, dairy and seafood. Trade policies must also be brought into line with the principles above.
- **Integrate food and nutrition security in development goals and outcomes.** Diets within planetary and social boundaries advance food and nutrition security while improving public health, mitigating pollution and increasing community resilience, making them a critical part of meeting several SDGs.
- **End government-supported promotions of industrial animal proteins.** The public resources used to provide financial, administrative help and advertising

or other support for promoting animal proteins, such as the US commodity checkoff programmes that provide research and marketing for sectors such as beef and dairy, should be eliminated or shifted to plant-based foods and food produced using agroecological practices.

- **Track and report consumption-based emissions for food and agriculture using a comprehensive lifecycle analysis.** The Coolfood Pledge, an initiative of the World Resources Institute, works with institutions to set a target of reducing food-related emissions by 25% by 2030, using a peer-reviewed methodology that accounts for both agricultural supply chain emissions and carbon opportunity costs (e.g. land-use change)[207].
- **Hold corporations accountable for overproduction and food waste**. The FAO estimates that more than one-third of food produced for human consumption is lost or wasted at an annual cost of over $1 trillion US, with an additional $700 billion US in environmental costs and $900 billion US in social costs.[208] Agricultural policies that distort the market incentivise overproduction and shift the environmental and social burden of food waste onto individuals and communities. Instead, corporations should be held accountable for the externalised costs of overproduction and improving supply management and distribution.
- **Regulate marketing of meat and dairy.** In 2015, the WHO's International Agency for Research on Cancer classified consumption of processed meat and red meat as 'carcinogenic' and 'probably carcinogenic' respectively[209]. More recently, the WHO issued a guideline in 2023 recommending mandatory regulations for marketing food high in saturated fatty acids to children under the age of 18[210]; the HEART UK Association states that foods high in saturated fat include beef, lamb, pork, oily fish and dairy[211].
- **Advance regulatory frameworks to ensure accountability and transparency in the alternative protein sector.** Proactively addressing regulatory issues for the growing alternative protein sector can help protect workers, encourage open sourcing, and ensure accountability for potential environmental and social impacts related to scaling up the industry. Additionally, strengthened regulatory and antitrust rules should be put in place to prevent market consolidation or anti-competitive behaviour.

Dietary Guidance and Procurement

- **Align FBDGs with the Paris Agreement and other sustainability priorities.** Integrating environmental goals with dietary recommendations can play a significant role in improving public health and food security. The Danish Government recently updated its FBDGs to reduce its climate footprint by 70% by 2030, reducing the suggested intake of meat from 500g to 350g per week and

recommending at least 100g of plant-based protein come from legumes (e.g. chickpeas, lentils and beans) each day[212].

- **Update national/federal, state and municipal government procurement policies to emphasise diets within planetary and social boundaries, food waste reduction and purchasing culturally-appropriate and regional and seasonal foods.** In France, the current French school catering regulations require meals without meat or fish to be served at least once a week (i.e. four to five meals out of 20) in all nurseries and primary schools[213]. Several major cities including Copenhagen, Lima, Paris and Seoul have joined the C40 Good Food Cities Accelerator, making a commitment to align procurement with the Planetary Health Diet, with an emphasis on organic foods, a reduction of food loss and waste by 50%, and support for an increase of healthy plant-based food consumption [214].
- **Update policies governing procurement programmes to support the prioritisation of sourcing from producers with strong worker protection agreements and high environmental protection and animal welfare standards.** Government procurement programmes should be allowed and encouraged to prioritise working with producers that ensure safe workplaces, livable wages, and other worker protections, including the ability to sign agreements with Worker-driven Social Responsibility programmes. Procurement programmes should also prioritise producers that uphold strong, science-based environmental protection commitments and practices as well as high animal welfare standards throughout their supply chain.
- **Increase availability of culturally appropriate, plant-centred meals in all public and private institutions' food policies and programmes (e.g. schools, hospitals, prisons).** Provide financial and technical support to help embed plant-centred menus into school food programmes and procurement policies, including the development of traditional and culturally-diverse meals to ensure inclusivity. The Healthy Future Students and Earth Pilot Program Act introduced in the US would create a voluntary grant programme to help schools purchase more plant-based foods, train food service staff, and market healthier, climate-friendly, and culturally appropriate plant-based options to students[215].
- **Promote consumption of local foods produced using agroecological practices.** School meal programmes and other procurement policies should prioritise and incentivise sourcing foods from producers using agroecological practices while reducing the proportion of industrially-produced foods.
- **Provide government funding and technical assistance to help institutions shift towards culturally-appropriate, plant-centred food service.** Incentivise and provide support for institutions to update procurement policies to emphasise inclusive, plant-centred menus and better plant-based options.

Public Education

- **Create public education initiatives to build support for diets within planetary and social boundaries and reconnect with traditional foodways.** Government agencies, community groups, schools, and the media all play an important role in educating the public. Policymakers should help facilitate collaboration between agencies, educators, experts, grassroots groups and community-led initiatives. Programmes to raise awareness about the health benefits of diets within planetary and social boundaries and the importance of shifting away from meat- and dairy-heavy diets in high-consuming countries can help improve public health, build skills around plant-rich cooking for families and chefs, reclaim ancestral food systems, increase familiarity with traditional and regional foods, and strengthen community buy-in for dietary shifts.
- **Engage health and nutrition professionals in promoting healthy diets within planetary and social boundaries.** Although they are often relied upon for dietary advice, doctors often lack training in nutrition and dietitians are rarely trained in the overlap between health and diets within planetary and social boundaries. Closing these education gaps will increase public understanding of the benefits of dietary shifts and how to achieve them.
- **Expand environmental and nutrition education programmes in schools.** There is a close relationship between childhood nutrition and academic performance[216]. In addition to providing universal healthy, sustainable meals, schools can educate children on healthy eating, local food systems, traditional foodways, and the environmental impact of food to help instill lifelong habits and dispel industry-driven misperceptions about food and nutrition. Educational programmes can include classroom lessons and hands-on learning through school gardens and building cooking skills.
- **Develop gender-sensitive training programmes to improve access to plant-based agriculture for women farmers.** Address the gender gap in agriculture to increase plant-based production by supporting women farmers in accessing resources, technical assistance, and markets for plant-based production with training programmes that address gender-specific experiences.
- **Add environmental-impact labels to food.** Requiring food labels to disclose environmental metrics such as the greenhouse gas emissions associated with production would increase public awareness about the impacts of different foods. Researchers found that climate information on menus had a positive influence on both customers and restaurants[217].

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