# Subsidising factory farm harm

## Redirecting subsidies toward a Just Transition to feed our world

WORLD ANIMAL PROTECTION

**About World Animal Protection**
We are World Animal Protection. We're here to end animal cruelty and suffering. Forever. Putting animals first isn't just better for them, it's vital for our shared planet. It will take the combined power of people, companies, and governments to tackle the broken systems that cause animal suffering. Together, we can transform the lives of farmed and wild animals around the world.

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**Cover credit:** World Animal Protection

# Executive summary

## Context

Food and agriculture account for one third of global greenhouse gas emissions and at least 15% of fossil fuel use annually. Yet, this sector's major contributions to climate change are still mostly ignored in climate discussions and actions. This neglect and complacency have direct implications for animals in the food system, food justice and sovereignty, public health and ultimately everyone on this planet – particularly those in vulnerable communities.

Urgent action for global food system reform must be at the heart of COP30 in Belém, Brazil. Central to the discussions must be phasing out subsidies that fund industrial animal agriculture. Support must be redirected instead towards a Just Transition to equitable, humane and sustainable food systems that can feed our world.

This World Animal Protection report provides powerful evidence to support this shift as well as examples, case studies and statistics outlining the pathway toward positive change.

## Current food systems are vulnerable

Food production and agriculture are extremely susceptible to climate change. Our food systems are already afflicted by extreme temperatures, drought, variable rainfall, disease, invasive pests, and more frequent extreme weather events. These will only worsen as climate change accelerates, making multilateral action to reduce greenhouse gas emissions from food systems even more urgent.

The 2022 'Emissions gap report' by the United Nations Environment Programme states that "any climate stabilisation pathway requires a substantial reduction in emissions from food systems". The Intergovernmental Panel on Climate Change in its 'Sixth assessment report' asserts: "even if fossil fuel emissions were eliminated immediately, food system emissions alone would jeopardise the achievement of the 1.5°C target and threaten the 2°C target."

The message is clear. If we do not transform our food systems, the targets of the Paris and Kunming-Montreal Agreements, and the Sustainable Development Goals will not be achieved.

**Food and agriculture account for one third of global greenhouse gas emissions and at least 15% of fossil fuel use annually.**

**Photo credit:** World Animal Protection

## Presenting the lever for change

Because agriculture subsidies underpin global food systems, they are an essential lever for change. They were first introduced across Europe after the second world war to stabilise food supply, provide income security for farmers, and keep consumer prices low. Such measures were meant to protect rural livelihoods and rebuild economies devastated by conflict.

But now subsidies are heavily skewed toward industrialised production systems, particularly industrial animal agriculture and the feed crop monocultures that fuel it. This means they are linked to the volume of what the farmer produces and to inputs such as fertilisers, seeds, fuel or animal feed. Such an approach has disproportionately benefited large-scale operations. It has encouraged the overproduction of cheap meat and dairy products at the expense of dietary diversity, rural equity and animal welfare.

## Subsidising industrial scale cruelty

Industrial animal agriculture confines 76 billion land animals annually to intensely cruel, overcrowded facilities, a figure that continues to rise each year. Supported by subsidies, industrial animal agriculture not only perpetuates the worst animal abuses, it is also a major contributor to environmental degradation. Furthermore, through antibiotic overuse it puts human health at risk by helping create untreatable superbugs.

Subsidy support has also crowded out more diverse and resilient agricultural models. Consequently, our world's food systems are currently locked into high-emission, resource-intensive production.

In this report we quantify the immense scale of subsidies within industrial animal agriculture and highlight their catastrophic environmental, social, and economic impacts. We also propose comprehensive reform through real-world, scalable alternatives which are rooted in agroecology and high animal welfare standards. Subsidies have the power to catalyse change in our food systems. They can and should have a critical role in achieving global climate, biodiversity, health, and food justice and sovereignty.

## Creating powerful pathways

Evidence from Thailand, Kenya, Brazil and the United Kingdom (UK) show that agroecological, high-welfare farming systems are viable and profitable. However, such systems face entrenched policy and market barriers.

Thankfully, there is growing support for change from governments and international organisations. In September (2025), the United Nations Framework Convention on Climate Change's (UNFCCC) Standing Committee on Finance placed reform of harmful subsidies firmly on the agenda. There is now growing support from governments for repurposing these funds.

World Animal Protection urges Governments to carry this momentum into COP30 and deliver a concrete outcome in line with Target 18 of the Kunming-Montreal Global Biodiversity Framework. We call for commitment to identify, reduce, and ultimately eliminate unsustainable agricultural subsidies harmful to social justice, people's health, biodiversity and climate by 2030.

Funnds should be redirected to finance a Just Transition to equitable, humane, and sustainable food systems where farmers and workers are supported through training, and robust social safety nets.

Across the world, farmers, cooperatives and communities are proving that a better path is not just possible, it is already happening. By shifting to plant-rich production, integrating agroecology and prioritising high animal welfare, these pioneers are delivering healthier food, fairer livelihoods and a lighter footprint on the planet.

The time to end harmful subsidies is now.

Industrial animal agriculture confines 76 billion land animals annually to intensely cruel, overcrowded facilities, a figure that continues to rise each year.

**Photo credit:** World Animal Protection

# 1. Quantifying public subsidies to industrial animal agriculture

## Types and characteristics of agricultural subsidies

Agricultural subsidies are financial measures provided by governments to support farmers, agribusinesses, and agricultural organisations. They are intended to either stabilise income, or lower production costs (UNDP-BIOFIN, 2024). Agricultural subsidies have many forms. These may include direct payments to farmers, tax breaks, and financial support for infrastructure or technology improvements. Sometimes they act as a form of public investment (OECD, 2024a).

### Overall magnitude and trends

Agriculture as a sector receives among the highest subsidies in comparison to the fossil fuel, forestry, infrastructure, mineral mining, fisheries and aquaculture sectors (Reyes-García et al., 2025).

Government support to agriculture averaged $US842bn annually during 2021–2023 according to the 'Agricultural policy monitoring and evaluation 2024' report from the Organisation for Economic Cooperation and Development (OECD). This report reviews agricultural policies across 54 countries, including OECD members and key emerging economies.[1]

If current trends continue, government support could reach almost $US1.8tn in 2030 (FAO, 2021).

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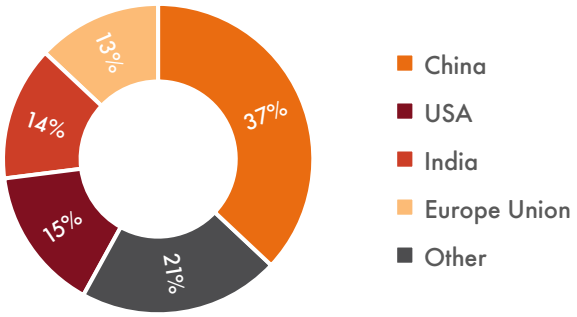
[1] Emerging market economies as per IMF, World Bank, and MSCI classifications: Asia: China, India, Indonesia, Malaysia, Philippines, Thailand, Vietnam, Pakistan. Europe: Poland, Hungary, Czech Republic, Turkey, Russia (though geopolitical factors affect classification). Latin America: Brazil, Mexico, Argentina, Chile, Colombia, Peru. Africa and Middle East: South Africa, Egypt, Saudi Arabia, United Arab Emirates (sometimes classified), Morocco

This support is concentrated in a few large economies. China, the USA, India and the EU represent 37%, 15%, 14% and 13% of the total of worldwide government support given respectively (OECD, 2024a).




Key world events have prompted sharp increases in government spending on agricultural subsidies to tackle the spikes in agricultural production costs and market prices. These events have included the aftermath of the Russian invasion of Ukraine, the COVID-19 pandemic, and the global economic crisis of 2008. Preliminary evidence suggests that overall subsidy support levels in 2022–2023, while slightly declining in nominal terms from peaks, remained significantly above the pre-pandemic levels (Amaglobeli, 2024).

Subsidies are harmful when they lead to negative impacts on animals, the environment and health or socio-economic conditions, regardless of whether these effects were intended by design (Cox, 2025). In the EU, even subsidies considered less environmentally harmful, such as lump-sum payments to farmers and those decoupled from production, have been linked to persistent environmental concerns. Such harmful subsidies are thus misaligned with global environmental objectives and need to be more targeted and outcome-based (Heyl et al., 2022).

### Regional differences in agricultural subsidy flows

The global distribution of agricultural subsidies has shifted significantly in recent years, with emerging economies now increasingly subsidising agriculture. China and India have become the largest subsidisers, whereas the EU, USA and Japan, have seen a gradual decline in total support (OECD, 2024a).

Low-to-medium income countries have historically provided negative support due to implicit taxation of agricultural exports, but in recent years input subsidy programmes have grown, especially in Sub-Saharan Africa. For example, in Malawi (2006–2013), input subsidies accounted for nearly half of public agricultural spending (OECD, 2024a).

Emerging market economies provide a higher share of subsidies relative to GDP than advanced economies or low-income countries.

In Latin America and the Caribbean, subsidies largely benefit industrial, export-oriented farming. This limits support for sustainable approaches like agroecology (Jean-Francois et al., 2020).

India subsidises the cost of agricultural products to lower food prices; it spends more than US$22.6bn annually on input subsidies for irrigation, fertilisers and electricity. Nigeria and Mexico also provide significant support for seeds and fertilisers targeting staple crops such as maize and wheat (Ding et al., 2021).

### Local differences in agricultural subsidy distribution

Agricultural subsidies often allocate payments per unit of production or input. This leads to unintended distributional effects disproportionately benefiting wealthier producers due to higher output and resource ownership.

Targeting subsidies would improve equity, but this is not generally done due to conflicting priorities and higher administrative costs (Amaglobeli, 2024). In the EU, poorer regions with more full-time farm workers receive fewer subsidies per worker than wealthier regions, raising concerns about equity and rural development.

Internationally, EU subsidies have also hurt low-income countries where subsidised exports have displaced local producers. This hinders the development of resilient local food systems, particularly in Africa. (Heyl et al., 2022).

Similar trends are observed globally. In Brazil, public credit programmes have favoured large farms over smallholders. While in Indonesia, COVID-19 relief subsidies for palm oil biodiesel producers primarily supported large producers (Ding et al., 2021).

And in the USA, larger industrial operations, such as concentrated animal feeding operations (CAFOs) have consistently received higher levels of support through United States Department of Agriculture direct payments (Hulagu & Ikizler, 2021). These patterns highlight the need for better targeting and equity in subsidy design to ensure that public resources support public goods more effectively.

The explicit rationale for subsidies may include supporting all farmers and ensuring food security. However, the practicalities of policy design, political economy, and market structures often channel a larger share of these benefits towards already established and larger agricultural entities (Ding et al., 2021; Koplow & Steenblik, 2022).

## Types of animal agriculture subsidies

Governments are starting the process of aligning agricultural policies with global climate and biodiversity goals. This is evidenced by commitments such as COP28 and the Kunming-Montreal Framework (OECD, 2024a). But the bulk of subsidies still go to emission-intensive commodities, particularly to farming animals (FAO, 2021; Kortleve et al., 2024; Roseman, 2025).

Current subsidy systems favour industrial animal agriculture by lowering costs for inputs such as pesticides and fertilisers. This often encourages their overuse and environmental harm.

In addition, market price supports give industrial producers an artificial advantage (Hulagu & Ikizler, 2021). This makes it harder for agroecological and smaller-scale farmers, who depend less on subsidies yet provide greater environmental benefits, to compete (van der Ploeg et al., 2019). Public investment in agroecology remains minimal, making up just 1–1.5% of total agricultural and aid budgets (HLPE, 2019).

Progressive subsidies directly target the transformation of animal farming; they aim to reduce environmental impact and enhance animal welfare. For instance, in the Netherlands the national termination scheme for livestock farming locations, provides subsidies to farmers wishing to stop their pig, turkey and dairy cattle operations (Rijksdienst voor Ondernemend Nederland, 2025).

Germany expanded subsidies for organic farming, domestic protein production, and higher animal-welfare livestock systems, while introducing mandatory husbandry labelling and stricter transport rules (OECD, 2024a). Costa Rica's payments for ecosystem services programme pays small and medium-sized farms that integrate trees with crops or pastures. These provide animals with greater outdoor protection and improved welfare which leads to increased forest cover and conservation (Ding et al., 2021).

And in the EU, farmers receive significant funding through so-called "eco-schemes" and environmental payments. But the funds are not necessarily used for ecological or environmental purposes. Linking global physical input–output datasets with public EU subsidy data reveals that 82% of agricultural subsidies support animal-based foods (38% directly to farmed animals and 44% to feed crops), which provide only 35% of dietary calories (Kortleve et al., 2024). This skews support towards farmed animals, hindering a shift to more sustainable plant-based systems and missing a long-term strategy for reducing emissions.

Farmed animals and feed production are the major drivers of greenhouse gas emissions, deforestation and habitat loss. This means current subsidy models are failing to deliver food security and environmental protection (Barbosa, 2024).

China's broader market interventions stabilise the farmed animal sector. For example, to stabilise prices during market fluctuations, the government can release pork from reserves. Since September 2022, more than 127,000 tonnes have been auctioned nationally reflecting policies to encourage herd rebuilding after an outbreak of African Swine Fever in 2019–2020 (OECD, 2024a).

Brazil's market-based model may appear less distortionary, but it favours industrial scale agriculture and fails to protect smallholders or build climate resilience (Ding et al., 2021). Brazilian subsidies correspond to 79% of the estimated amount of all taxes collected along the beef chain. The subsidies granted were US$3.1bn per year while the amount of tax collected in the industry was $3.8bn (Leitão et al., 2020). This demonstrates a clear misalignment between public spending and public interest, particularly in the context of the climate crisis.

Current subsidy systems favour industrial animal agriculture by lowering costs for inputs such as pesticides and fertilisers. This often encourages their overuse and environmental harm.

# 2. Impacts of subsidies: environmental, social, and economic dimensions

Agricultural subsidies are pivotal in shaping the future of our food systems. However, in their current form, they often incentivise practices that undermine environmental sustainability, compromise animal welfare, and exacerbate social and economic inequalities.

Subsidy flows shape entire food systems; they influence what is produced, how it is produced, and who benefits. Their impacts are felt across economies, societies and ecosystems, affecting the health and welfare of people and animals.

Quantifying subsidies reveals their magnitude. Assessing their impacts exposes the full extent of the costs they impose on people, animals and the planet.

## Environmental impacts

Agricultural subsidies for industrial animal production have far-reaching environmental and animal welfare consequences. Instead of fostering equitable, humane and sustainable food systems, they lock public funds into systems that intensify pollution, destroy habitats, and fuel climate breakdown, while entrenching animal suffering.

### Subsidies cause pollution and water quality degradation

Agricultural subsidies often promote the intensification of production, which frequently leads to the excessive use of chemical pesticide and fertilisers - particularly nitrogen-based inputs. The rapid expansion of intensive livestock production has led to increased nutrient balance issues (OECD, 2024a). This contributes to soil degradation, water contamination, air pollution and harm to aquatic ecosystems (Cox, 2025; Damania et al., 2023a; Reyes-García et al., 2025).

### The destructive impact of industrial animal agriculture

Often the biggest beneficiary of subsidies, industrial animal agriculture is resource-hungry and indifferent to the fate it inflicts on animals. Animals are frequently bred for efficiency. They are kept in overcrowded, unnatural and unsanitary environments where they suffer from stress, injury and disease and have minimal opportunities to engage in natural behaviour (Hulagu & Ikizler, 2021). Industrial animal agriculture also increases the risk of zoonotic diseases and contributes to antimicrobial resistance (IPES FOOD, 2019).

### Subsidies drive deforestation, habitat loss, and climate change

Subsidised production of commodities such as soybeans (mostly used for animal feed), palm oil and beef drive approximately 14% of global deforestation through cropland expansion (Cox 2025). Agricultural subsidies in richer countries can drive tropical deforestation elsewhere. For example, livestock subsidies in the USA increase demand for soybeans as feedstock, which then drives deforestation in Brazil (Reyes-García et al., 2025). Globally, deforestation linked to agricultural subsidies led to the release of 4.3 bn tonnes of carbon over a 20-year period. This is equal to 1.4% of annual global $CO_2$ emissions (Damania et al., 2023a).

### Fisheries subsidies are depleting our oceans

An estimated US$22bn per year in harmful fisheries subsidies contributes to overfishing, and the depletion of fish stocks, particularly in international waters. These subsidies are linked to increased $CO_2$ emissions from fuel-intensive high seas fishing fleets (Villasante et al., 2022).

### The toll on biodiversity and water security is severe

Industrial animal agriculture and animal feed production systems degrade marine ecosystems through nutrient pollution. And land conversion for pasture and land crops continues to be a leading driver of habitat destruction and species extinction (IPES food, 2019).

Subsidised production of commodities such as soybeans (mostly used for animal feed), palm oil and beef drive approximately 14% of global deforestation (Cox 2025).

## Social impacts

Agricultural subsidies undermine social justice. By funnelling public money into industrial animal agriculture, subsidies entrench inequality, undermine rural livelihoods, and worsen public health outcomes.

### Deepening inequality at home and abroad

Current subsidies disproportionately benefit large-scale agribusinesses. They widen income disparities between industrial and smallholder, or traditional farmers (Moreddu, 2011).

Opportunities for marginalised rural populations are limited by the present subsidy system. People's access to resources is restricted and more inclusive and locally appropriate food systems are undermined. (Damania et al., 2023a).

The high land demand for animal feed crops and pasture created by how subsidies are currently allocated intensifies competition for land. It also affects food security, rural livelihoods, and ecosystem health (Roe et al., 2021).

### Industrial models displace communities and erode labour rights

Poor labour conditions in industrial animal agriculture have been well documented in the EU, the USA, and Brazil (Mitidiero Junior & Goldfarb, 2021). Exploitative conditions have a disproportionate impact on vulnerable populations, particularly migrants.

These conditions include illegal employment, overcrowded accommodation, long working hours, low pay and wage fixing, illegal wage deductions and job insecurity (CBD and World Animal Protection 2024). In the EU, the European Federation of Food, Agriculture and Tourism Trade Unions estimates that about 4 million agricultural workers face such challenges (EFFAT, 2020).

When subsidy allocation favours large-scale production, small farms and traditional communities are at risk of displacement, such as in recent public investment by the African Development Bank in industrial agriculture (AFSA, 2014). Conversely, supporting smallholders and climate-resilient farming, could reinforce forced acquisition of land and land use change on a scale equivalent to the size of Uganda (Bjornlund et al., 2022).

### The rural workforce is shrinking - young people are leaving agriculture

Agriculture's share of global youth employment fell from 43.6% in 2001 to 30.5% in 2021. Overall, agri-food systems' share of global employment dropped from 52.2% in 2000 to 39.2% in 2021 (FAOSTAT), reflecting a shift away from rural livelihoods.

Subsidies specifically targeted at young people could help keep them in the sector. But such subsidies need to be tightly linked with an equitable, humane and sustainable food system and combined with training in agroecology, technology and market access.

### Public health suffers as a hidden cost

Agricultural subsidies have significant implications for public health. Subsidies are estimated to contribute approximately 17% of all nitrogen pollution. The associated health impacts may reduce labour productivity by 2.7% to 3.5% in affected regions (Damania et al., 2023a).

Additionally, agricultural producer supports have been linked to a 14% increase in global deforestation. This in turn has been associated with an additional 1.3 million to 3.8 million malaria cases annually across 73 countries. These have incurred billions of dollars in public health costs worldwide (Damania et al., 2023a). In Brazil for every US$1 spent on the purchase of pesticides, Brazil's public health system may incur costs of up to US$1.28 (Tygel Alan et al., 2023).

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## Economic impacts

Current agricultural subsidies are shaping markets to weaken local food systems, entrench corporate power, waste public resources and sideline more humane, sustainable and equitable alternatives.

### Subsidies undermine local economies, food justice and sovereignty

Different forms of agricultural subsidies have adversely affected local food systems. They facilitate cheap food imports, support donor-driven initiatives, and promote international institutional policies that often suppress local prices, prioritise export-oriented production, and limit domestic agricultural support (Said et al., 2025).

In the EU, the export of highly subsidised, high-value-added products such as dairy, pig meat, and wine, contributes to distortions in global agricultural markets. It drives down international prices and weakens domestic agricultural sectors in importing countries (Kortleve et al., 2024).

### Public funds are diverted beyond intended beneficiaries

Around 12% of EU Common Agricultural Policy (CAP) subsidies, originally intended to bolster local food security, ultimately support food consumption abroad. For example, through animal products export, China benefited from more indirect CAP subsidies than the Netherlands, and the USA received more than Denmark (Kortleve et al., 2024).

In the USA, taxpayers effectively "pay twice": first through public funding of agricultural subsidies, and again through inflated food prices driven by market consolidation (Roseman, 2025).

### Corporate influence can distort policy and markets

Large agribusinesses dominate and benefit from agricultural subsidy programmes. They use public funds to support vertical integration, expanding their business operations to take direct control over several stages in the production or distribution of a product, and consolidate market power. These practices marginalise smaller producers, suppress wages, and increase costs for consumers (Roseman, 2025).

The influence of agribusiness is deeply entrenched. The US sector spent US$3.25bn on lobbying from 1998 to 2023, often exceeding the annual expenditure of the fossil fuel industry (Posner, 2021; Roseman, 2025).

In Brazil, the meat industry lobbied the National Congress to obtain supports which led to negative impacts on wider Brazilian society. This is limiting social and economic development and concentrates benefits within a small group (Corcioli et al., 2022).

It is clear the current architecture of agricultural subsidies is not only inefficient but actively harmful. It entrenches cruel and unsustainable food systems, undermines equity, and delays the urgent transition toward more equitable, humane and sustainable models of production.

Redirecting public funds toward agroecology and small-scale, high welfare, climate resilient farming, would represent one of the most impactful policy reforms for human health, animal protection and environmental integrity.

This shift must be fair. It must protect the rights and livelihoods of those currently dependent on the existing food system, while building a sustainable future system that benefits people, animals and the planet alike

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Photo credit: World Animal Protection

# 3.The case for action

## The UK case: from direct payments to public money for public goods

The UK has started the process of transitioning its subsidies to the so-called Environmental Land Management (ELM) system. ELM is designed to incentivise farmers and land managers to deliver public goods such as improved biodiversity, carbon sequestration, and higher animal welfare standards (Defra, 2020).

In England, the £2.4bn annual farm budget is being reallocated toward these outcomes. And ELM funding is projected to rise by 150%, from £800m in 2023–24 to £2bn in 2028–29 (Spending Review 2025: A Commitment to Farming – Farming, 2025).

The main outcomes from 2024 are outlined below (DEFRA, 2024).

- Direct payments to farmers phased out: complete phase-out by 2027; funds redirected to environmental and welfare schemes. 50, 000 farm businesses are now taking part in the schemes.
- Sustainable farming: there has been broad participation from small farmers – it includes a focus on agroforestry and peat protection.
- Landscape recovery: large-scale projects that restored 250,000 hectares.
- Animal health and welfare: includes free veterinary visits and animal health tests, and new disease control support.
- Climate action: £400m per year for tree and peatland protection. Slurry management grants are also now available to establish agroforestry systems.
- Biodiversity: new actions for habitats, water, and invasive species control.

The ELM scheme shows that subsidy reform is possible. However, current implementation risks falling short through insufficient finance. Payment levels often do not cover the real costs of transition, particularly in agroforestry and habitat creation (DEFRA, 2024), and grant rules frequently restrict grazing to sheep, excluding pigs and poultry despite evidence of their ecological benefits (Chanarin et al., 2022; Saraev et al., 2022). To deliver meaningful change for farmers, animals, and the environment, reforms must ensure that payments cover the costs of transition and ensure ecological benefits are recognised. It should also support innovation, and recognise the wider benefits of equitable, humane, and sustainable farming.

## Redirecting agricultural subsidies in the EU and Brazil

To illustrate how such a transition is possible, we modelled two scenarios, one in the EU and one in Brazil where subsidies to industrial animal agriculture are cut by 50% to show the impact and opportunity of shifting support away from harmful practices and toward sustainable alternatives.

Our analysis drew on two key studies: Corcioli et al., (2022) on Brazil's agricultural credit, and Kortleve et al., (2024) on the EU's Common Agriculture Policy (CAP).

We assumed that halving the subsidies would also half the number of industrially-farmed animals in the EU and Brazil. On this basis we calculated the size of subsidies that could be redirected towards a plant-based diet and equitable, humane and sustainable agriculture. We also calculated the water and land use savings. We recognise that in practice the impact might vary in different geographies.

We calculated the number of industrial animals farmed per year in both Brazil and the EU. Industrial farming's consumption of water and land (World Animal Protection 2025) was extrapolated from additional studies on water and land use (Poore & Nemecek, 2018).

We took this focus because industrial animal agriculture drives land degradation, water scarcity, and forced acquisition of land through its intensive demand for feed and resources (Roe et al., 2021). In contrast, agroecological systems integrate animals into diverse cropping systems using marginal lands and pastures, reducing reliance on crops for feed and external inputs, while reducing water and landuse(FAO, 2018; Houzer E. & Scoones I., 2021; Sijpestijn et al., 2023).

Drawing from these considerations we assumed that redirecting subsidies from industrial agriculture to agroecology will directly improve financial efficiency and resource use.

## A clear case for action in the European Union

The EU's average annual agricultural financial support for 2021–2023 is: US$107.191bn (OECD, 2024a). Approximately 82% (US$88.5bn) of this is directed toward industrial farming (Kortleve et al., 2024). This equates to US$197.54 per person (based on a population of around 448 million people) in yearly taxpayer contributions to industrial animal agriculture per year.

Photo credit: World Animal Protection

Shifting subsidies away from industrial animal production unlocks the following major economic, social, and environmental gains.

- Financial efficiency: US$44.25bn annually could be redirected toward plant-based diets and equitable, humane, and sustainable farming systems.
- Water security: it would save 25,928,405 megalitres of water per year, that could be redirected to support ecosystem services.
- Land use: 19,432,000 ha per year – equivalent to twice the size of Portugal – could be redirected to support ecosystem services.

## A clear case for action in Brazil

Rural credit is the main source of financing for agriculture in Brazil. Operating credit[2] represented an average of 62% of the volume of rural credit resources applied to Brazilian agriculture from 2013 to 2020. From this a substantial US$ 17.33bn was allocated to commercial agriculture.

Approximately 75% of this is directed toward the cattle production chain, amounting to US$12.83bn annually (Corcioli et al., 2022).

This equates to US$63.2 per person (based on a population of approximately 203 million people) in yearly taxpayer contributions to the industrial cattle and dairy production chain per year.

It is important to note that these figures focus only on attributable subsidies to operation costs of the cattle production chain. The broader agricultural financial support (Plano Safra[3] and general agro-industry tax exemptions) is much larger. A portion of it indirectly benefits animal agriculture through feed production and shared infrastructure, but there is a lack of transparency. The exact figures for animal production are not reported.

Shifting subsidies away from industrial cattle chain production unlocks the following major economic, social, and environmental gains.

- Financial efficiency: US$12.83bn annually could be redirected toward plant-based diets and equitable, humane, and sustainable farming systems.
- Water security: saving 14,518,963 megalitres/year that could be redirected to support ecosystem services.
- Land use: freeing 11,61,000 ha per year that could be redirected to support ecosystem services.

This equates to US$63.2 per person (based on a population of approximately 203 million people) in yearly taxpayer contributions to the industrial cattle and dairy production chain per year.

[2] In the context of Brazilian agriculture these rural credits are used io acquire essential production supplies for each agricultural cycle. These supplies include items such as seeds, pesticides, fertilisers, medicines, and animal feed. Operating costs, in 2022 were around R$ 93 billion (US$17.33 at R$ 1 = US$ 0.19),
[3] The Plano Safra is a Brazilian public policy primarily focussed on providing subsidised credit for rural producers.


Photo credit: World Animal Protection

# 4. A just and humane path: scenarios and solutions for food system transformation

Across the world, farmers, cooperatives and communities are proving that a better path is not just possible, it is already happening. By shifting to plant-rich production, integrating agroecology and prioritising high animal welfare, these pioneers are delivering healthier food, fairer livelihoods and a lighter footprint on the planet.

In the following case studies, we explore examples that show how redirected subsidies could amplify success stories already underway. More details are presented in the annex.

Well-designed subsidy reform can prioritise small-scale farmers, socio-economically disadvantaged households and women (Ewert et al., 2023), while supporting agroecology to advance economic development, food security, climate, and biodiversity goals (Ding et al., 2021). By promoting diversified and resilient farming systems, agroecology improves rural incomes, land productivity, and nutrition (FOLU, 2019).

To increase agroecology's global reach, investment in research and development, farmer training, and disseminating sustainable practices is critical. (HLPE, 2019)

By promoting diversified and resilient farming systems, agroecology improves rural incomes, land productivity, and nutrition.

## In Kenya...

***Two farms demonstrate innovative mixed farming and pasture-based systems that improve livelihoods, soil health, and animal welfare.***

In Kiambu and Murang'a counties in Kenya, farms run by Samuel Nyanja and Joseph Mwangi Mwaura demonstrate the power of diversification. They combine indigenous chickens, goats, cattle, and bees with crops like maize, avocado, banana, and kale.

Both farmers enhance sustainability and resilience by recycling organic waste, avoiding chemical inputs, and maintaining more than 20% natural habitat. They also promote equity through fair wages, and safe working conditions, while engaging young people via training and jobs. They also foster knowledge sharing.

**Key lesson** Agroecology provides food security, stable income, and jobs, while reducing chemical dependence and improving animal welfare.

Photo credit: World Animal Protection

## In Thailand...

***The World Animal Protection Farm Champion initiative promotes high welfare local broiler chicken production following agroecological principles.***

Pluto and Rai Kuen Rang farms show how agroecology and high animal welfare in Thailand deliver strong environmental, economic, and social outcomes. By integrating crops and animals, recycling all organic waste, and eliminating synthetic chemicals, the farms regenerate soils and biodiversity.

Both apply the Five Domains of Animal Welfare Framework. This has ensured high animal welfare, mortality rates below 1% and no disease outbreaks. The farmers also promote equity through shared decision-making, fair wages, and safe working conditions, while engaging youth via training and jobs. Rai Kuen Rang Farm uses social media, markets, and collaborations with chefs to highlight its social value and sustainable practices.

**Key lesson** Small-scale, diversified systems can outperform conventional broiler chicken farming in profitability, sustainability, and animal welfare.

Photo credit: World Animal Protection

## In the UK...

***A 'woolly' pig farm works as a bolt-on enterprise to a woodland operation.***

Brodoclea Woodland Farm integrates Mangalitsa – woolly – pigs into a woodland agroforestry system. The pigs are rotated across 21 paddocks that support carbon capture, biodiversity, and timber production. Raised outdoors with minimal disease and negligible mortality, they achieve high welfare standards. These reduce veterinary interventions and associated costs.

Direct sales of the pigs' meat fetch twice the price of conventional pork. However, profitability remains challenged by high fencing costs and lack of supportive grant structures. The price differential between their high-welfare pork and factory-farmed alternatives could be eliminated with ecosystem service payments of just £113 per acre.

**Key lesson** Silvopasture with pigs can transform single-use woodlands into multifunctional landscapes that deliver food, ecosystem services, and animal welfare benefits.

Photo credit: World Animal Protection

# Case study outcomes

## Capacity building and policy impact

- **Supportive policies,** financial incentives, and investments to sustain welfare improvements and farm profitability are emphasised.
- **Shared decision-making,** fair wages, asset ownership, and safer working conditions are promoted.
- **Training and job opportunities** to include young people are provided.
- **Community and policy platforms** to promote social value, diet, and farm practices are used.

## Advancement of circular economy and local production

- **Cost savings and environmental benefits** are achieved through significant adoption of input efficiency strategies and waste reduction techniques.
- **Organic waste recycling,** composting, and sustainable resource management are integrated into farming operations.

## Holistic benefits from animal welfare interventions

- **Welfare-focussed practices** have led to healthier animals, improved productivity, enhanced ecosystem health, and higher market value for animal products.
- **Ongoing animal welfare training** for farmers is a clear need. This is to ensure best practices across various species.

## Examples to learn from

- **Value of mixed farming and strong social connections.** Farms with diverse crops and animals, and strong ties to local markets and communities, show better ecological balance and resilience.
- **Low antibiotic use and local breeds support good animal health.** Emphasising local breeds, minimal antibiotic use, and herbal treatments fosters animal health and sustainability.
- **Rotational grazing and natural materials improve outcomes.** Regenerative grazing and use of natural, local materials for bedding and enrichment promote better welfare and environmental outcomes.
- **Peer learning and community networks are key.** Participation in knowledge-sharing networks helps spread innovation and strengthens local food systems.
- **Supportive policy and training are crucial.** Targeted support, investment, and ongoing farmer training are essential for transitioning to equitable, humane, and sustainable farmed animal systems.
- **Need for improved welfare metrics.** There is a clear need to integrate animal welfare assessments into agroecological evaluations to identify and address welfare gaps.

# 5. Policy pathways: a Just Transition in food and farming by redirecting subsidies

## The case for change – climate, costs and crisis

The challenges posed by industrial animal production, make an urgent fundamental shift in food systems essential. This shift must be grounded in social justice and the rigorous integration of established high animal welfare standards.

The transition to just, humane, and sustainable food systems will bring multifaceted benefits. It will improve profitability for farmers – particularly smallholders – provide consumers with healthier, accessible and ethically produced food, improve the lives of farmed animals, and safeguard environmental health (FOLU, 2019) 'The roadmap for a Just Transition away from industrial animal agriculture' outlines the steps to make this happen (CBD and World Animal Protection 2024).

Current agricultural subsidies do not serve the public good. They lock food systems into cycles of dependency, environmental harm, economic inequity and poor animal welfare.

This section discusses the possibilities when these subsidies are reimagined. In direct response to the challenges posed by industrial animal production, it promotes an equitable, humane and sustainable food system transition.

Such a reimagined subsidy system makes nutritious foods accessible to all. It upholds human rights, particularly of traditionally marginalised groups, including women and girls, Indigenous populations, people of colour, and people with disabilities, and protects the environment and animals.

This approach ensures that food justice, including people's control over their food, aligns with food security objectives. It guarantees that all workers across the food system live with dignity and receive a living income (CBD and WAP, 2024).

On human health grounds alone, there should be a significant reduction in consumption of animal products in high-consumption countries such as the USA and those in Europe. And those animal-sourced foods produced should be sourced from small and medium-sized diversified farms using high welfare standards, strong worker protections and agroecological practices (CBD and World Animal Protection, 2024).

Climate change is driving threats to food security and deepening inequality. This demands solutions that can deliver multiple benefits. Redirecting harmful subsidies will reduce climate change and foster positive changes that unlock progress across these global challenges.

The following developments and trends support the need for subsidy redirection and systems reform.

**Redirecting harmful subsidies will reduce climate change and foster positive changes that unlock progress across these global challenges.**

### Biodiversity

Under target 18 of the Kunming-Montreal Global Biodiversity Framework, governments committed to identifying, reducing or eliminating incentives harmful to biodiversity, including agricultural subsidies, by 2030 (CBD and World Animal Protection, 2024). Following through on these commitments is essential to halting biodiversity loss caused by land conversion, pollution and high emission industrial farming practices.

### Climate action

COP28 called for accelerated efforts to phase out inefficient fossil fuel subsidies, recognising their role in causing environmental harm. Industrial animal agriculture is heavily dependent on fossil fuels, both for synthetic inputs and for energy-intensive production and transportation. Also, at COP28, 160 countries adopted the Emirates Declaration which committed them to adapt and transform agriculture and food systems to respond to climate change.

### Climate finance

Climate funding for mitigation and adaptation remains deeply inadequate, particularly in the Global South. Meanwhile trillions of dollars continue to support activities that undermine environmental and social goals. Reforming these harmful subsidies could unlock domestic resources, helping to close the climate finance gap and strengthen national ownership of climate action.

### Food security

Despite improvements in 2024 (Miriam Wiemers, 2024) global hunger levels remain higher than they were before the COVID-19 pandemic. Food insecurity continues to deepen in several regions, especially driven by changing weather patterns.

It is projected that 512 million people could be chronically undernourished by 2030; nearly 60% of these will live in Africa (Miriam Wiemers, 2024). Reforming subsidies can redirect support toward more diverse, climate-resilient and locally appropriate food systems that are capable of feeding populations sustainably, humanely and equitably.

### Public health

In 2025, Member States of the Seventy-eighth World Health Assembly adopted the 'Draft global plan of action for climate change and health'. The plan encourages countries to pursue climate mitigation efforts in ways that also promote and protect human health. This includes adopting more sustainable agricultural practices, improving diets in low-income populations, and encouraging healthier and more environmentally friendly food consumption among higher-income groups.

Reforming subsidies can help catalyse these changes by aligning agricultural support with public health goals.

### International law

The International Court of Justice has issued an advisory opinion confirming that nations can be held legally responsible for their greenhouse gas emissions. These obligations extend beyond emissions to include fossil fuel production and subsidies. The court also recognises that under the UN climate treaties such as the Paris Agreement, countries are legally bound to implement measures that both mitigate emissions and adapt to climate change.

Agriculture accounts for 15% of annual fossil fuel use (Global Alliance for the Future of Food, 2023) and accounts for 34% of global greenhouse gas emissions. These figures highlight the urgent need to redirect subsidies away from fossil fuel-intensive industrial animal agriculture toward equitable, humane and sustainable food systems (Shukla et al., 2022).

Continuing to fund the continuation of the current food system is no longer viable. Redirecting subsidies is a powerful policy tool. It will help meet global commitments on sustainable development, climate, biodiversity, health and food security, while building more just and resilient societies.

At COP28, 160 countries adopted the Emirates Declaration which committed them to adapt and transform agriculture and food systems to respond to climate change.

## The road to Belém: putting food and farming at the heart of COP30

Urgent subsidy reform must be central to conversations and consequent actions at COP30 in Belém, Brazil. Food and agriculture are not given the attention they need at the climate discussions. This neglect has direct implications for nutrition, access to food, health, and well-being of almost every person on this planet, especially for those in vulnerable communities.

We urge Governments to take the following urgent action at COP30:

### Make transparency a catalyst for reform

Require countries to include full disclosure of agricultural subsidies in their Nationally Determined Contributions (NDCs) and national climate action plans. They should specifically list harmful subsidies, proposed reforms, and just transition plans away from industrial animal agriculture.

### Use technical expert forums for policy exchange

During COP30, highlight best-practice pathways where public funding has been successfully reallocated toward equitable, humane and sustainable farming systems.

### Link subsidy reform with UN climate finance

With the lack of climate finance high on the COP30 agenda - redirecting subsidies from destructive agricultural systems could both help reduce greenhouse gas emissions and help the transition toward equitable, humane and sustainable food systems.

### Support workers and communities to enable a Just Transition

Discuss the specific needs of those working in agriculture in the context of a Just Transition away from industrial animal agriculture. This could include providing training, social protection and income support.

### Link to healthy diets and consumption patterns

In dicussions around climate and health – use subsidy reform to incentivise the production and accessibility of nutrient-rich plant-rich foods and reduce dependence on overproduced, cheap industrial meat and dairy.

### Ensure fair, resilient and responsible food systems

Discussions around agriculture should focus on subsidy reform to enable strong social, environmental and animal welfare outcomes. Targeted support for diversified farming systems can build resilience to climate shocks while improving rural livelihoods.

### Take advantage of a triple win

The stakes at COP30 are high. Harmful agricultural subsidies are blocking the global transition to equitable, humane and sustainable food systems. Without powerful subsidy reform and redirection we will not meet our 1.5°C target, halt biodiversity loss, or secure resilient food systems. Subsidy reform offers governments a triple-win opportunity: advancing climate and nature goals, improving animal welfare, and creating a fairer food economy for farmers and consumers.

# 6. Conclusion

The current system of agricultural subsidies is inefficient and deeply harmful. It perpetuates unsustainable and inhumane food systems, exacerbates inequality, and delays essential transitions. Shifting subsidy funds towards agroecological practices, small-scale, and climate-resilient farming is one of the most impactful policy reforms for human health, animal welfare, and environmental integrity.

The current system channels nearly a trillion dollars annually into supporting industrial agriculture practices. It is a primary driver of environmental degradation, social inequality, and immense animal suffering. By artificially propping up a model of industrial animal agriculture dependent on fossil fuels, it undermines global climate targets, biodiversity commitments, and public health.

Our analyses of subsidy redirection for Brazil and the EU show how tens of billions of dollars and vast natural resources can be released to support a more sustainable future.

COP30 in Belém is a critical turning point. It is an opportunity to finally place the transformation of food systems at the heart of the climate agenda. The summit must move beyond recognition of the problem and catalyse actionable policy change. This requires embedding subsidy reform directly into the core mechanisms of the UNFCCC, including National Determined Contributions (NDCs) and climate finance.

## Moving the world to a Just Transition

The direction is clear. Governments must commit to a just transition by phasing out harmful subsidies by 2030, in line with the Kunming-Montreal Framework. Public funds must be redirected towards equitable, humane, and sustainable alternatives.

This means prioritising support for equitable, humane and sustainable systems that enhance resilience, protect livelihoods, and restore ecosystems. The current UK reforms shows that such a transition, while challenging, is possible and leads to a more sustainable and innovative agricultural sector.

Ultimately, continuing to fund the very systems that fuel the climate crisis is an untenable paradox. Reforming agricultural subsidies is not merely an environmental or agricultural policy issue. It is one of the most powerful levers available to simultaneously address climate change, halt biodiversity loss, improve public health, and advance social justice.

The success of COP30 and the achievement of our global climate and sustainability goals hinge on our collective courage to seize this opportunity.

COP30 in Belém is a critical turning point. It is an opportunity to finally place the transformation of food systems at the heart of the climate agenda.

**Photo credit:** George Munga

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# 8. Annexes

## Glossary of terms

| | |
|---|---|
| **Agroecology** | Agroecology aims to truly benefit communities. Agroecological principles are based on solidarity, and on circular, and regional economies within ecological boundaries. Agroecology prioritises the rights of small-scale food producers. It is a movement with worldwide equality and social justice for all people at its core.<br><br>According to the leading movement of small farmers & farm workers La Via Campesina, agroecology refers to a way of life that supports life-enriching systems and opposes life-alienating systems. Agroecological practices work with nature and not against it, cherishing synergies between living beings and prioritising traditional farmer knowledge and participatory, transgenerational, and experiential learning processes. |
| **Equitable, humane and sustainable food systems** | Equitable, humane and sustainable food systems are those where alternative and animal proteins are produced in ways that protect human rights, the environment and animals. Such systems ensure food justice and food sovereignty. They enable food security and guarantee dignity and sustainable livelihoods to food workers, smallholder farmers and small-scale fishers.<br><br>Within equitable, humane and sustainable food systems, animal proteins are produced in ways that meet farmed animals' physical, environmental and behavioural needs. These systems also require sustainable resource use and benefits flowing across the value chain to local communities. |
| **Food security** | Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. |
| **Intensive animal agriculture** | Intensive animal agriculture, also known as factory or industrial animal farming, maximises output from a relatively small land areas through heavy use of inputs like fertilisers, antimicrobials, and machinery. This farming approach typically requires significant capital investment and can produce very high yields per unit of land. However it is usually associated with low resilience to environmental change, poor animal welfare and environmental degradation. |
| **Just Transition of the animal production system** | Just Transition refers to shifting the global system of protein production from industrial animal production to a system based on agroecological practices that produce equitable, humane and sustainable proteins. Achieving a Just Transition will alleviate animal, human and environmental suffering on a global scale.<br><br>The production of 'just protein' is embedded throughout the entire supply chain from farm to fork. Its production protects and empowers smallholders by adhering to agroecological principles.<br><br>Just protein production is the reverse of industrial animal agriculture which maximises corporate profits at the expense of workers, animals, public health and the environment. |
| **Smallholders or smallholder farmers** | Definitions for smallholders, smallholder farmers or small-scale farmers, can vary from country to country and usually depend on the exact size of the farm. For this paper the terms apply to small-scale farmers, pastoralists and forest keepers who farm or manage areas ranging from less than one hectare to 10 hectares.<br><br>The farmers within this definition work independently of multinational agribusiness corporations and may or may not own the land they work. They also often rely on labour from family members and retain some of the food they produce for household consumption. |

## Methodology details

**Table 1.** Analysis of subsidy redirection and impact on industrial animal production, their water and land use in Brazil and the EU with references.

| Category | Brazil | EU | Reference |
|---|---|---|---|
| Annual agricultural support (TSE, 2021–2023) per year | US$10,596m | $US107.19bn /year | OECD 2024 |
| Rural credit 2013–2020 per year | US$17.33bn | | Corcioli 2022 |
| Plano Safra (agricultural plan) for entrepreneurial agriculture 2024 | US$103.24bn | | Governo Federal |
| Federal tax exemptions for Agro-industry and agro-pastoral activities 2024 | US$31.63bn | | Sumauma |
| Share going to industrial animal production | 75% of rural credit to cattle-dairy, soybeans, and corn | 82% to industrial animals and feed | Brazil: Corcioli et al.,2022 – EU: Kortleve 2024 |
| Industrial animal production subsidies per year | US$12.83bn | US$88.5bn | Calculated |
| Per capita industrial animal production subsidy per year | US$63.2 | US$197 | Calculated |
| Redirect 50% subsidies per year | US$6.41bn | US$44.25bn | Calculated |
| Number of industrial animals (million per year) based on data from 2020 | 6,355 | 6,327 | World Animal Protection Factory Farming Index (FFI) |
| Water use for industrial animals (ML/year) based on data from 2020 | 29,037,927 | 51,856,809 | World Animal Protection (FFI) |
| Land use for industrial animals (thousand hectares/year) based on data from 2020 | 23,234 | 38,864 | World Animal Protection (FFI) |
| Water saved (ML/year) assuming a 50% reduction of industrial animal's production | 14,518,963 | 25,928,405 | Calculated |
| Land saved (thousand hectares/year) assuming a 50% reduction of industrial animal's production | 11,617 | 19,432 | Calculated |

## Water and land use calculation

We applied an adapted methodology based on Poore & Nemecek (2018) – a significant meta-analysis of food systems research which offers product-specific data (meat, milk, eggs) on water and arable land use. This approach provides a standardised framework for quantifying land and water use in animal agriculture, while addressing data gaps and regional variation. We then linked these indicators to the number of industrial animals in each country.

### Land use

- **Feed crop disaggregation** – Land used for animal feed is broken down by the top five feed crops, with detailed data on crop type, origin, and land share.
- **On-farm and fallow land** – Temporary pasture on farms is treated as productive land, reducing calculated fallow requirements.
- **Pasture data gaps** – Major data gaps exist for ruminant grazing in Africa and parts of Asia. This means land use and emissions are potentially underestimated. The study adjusts global totals using FAOSTAT data to align with observed pasture areas.

### Water use

- **Freshwater withdrawals** – Includes irrigation (direct and feed-embedded), livestock drinking water, aquaculture ponds, and processing water, with geographic traceability of feed crops.
- **Scarcity weighting** – Assumes all irrigation water is consumed (not returned to watersheds), applying AWARE (Available Water Remaining) factors by location. This may overestimate actual water stress, but reflects current data limitations.

Our methodology offers a detailed, spatially precise framework for assessing animal agriculture's resource use. This enables more accurate policy and sustainability assessments.

## Detailed case studies

Agroecology and animal welfare are often treated separately, yet they share common goals for equitable, humane and sustainable food systems. In the following sections we present case studies that show how agroecology can be effectively combined with high animal welfare.

To guide the collection and analysis of case studies, we applied two complementary frameworks – the 13 Agroecology Principles and the Five Domains of Animal Welfare.

### The 13 Agroecology Principles

These principles, agreed by the FAO High Level Panel of Experts on Food Security and Nutrition in 2019, provide a comprehensive blueprint for the holistic design and management of sustainable food systems. Their application extends well beyond environmental considerations; they embed a wide spectrum of social, cultural, and economic dimensions.

Key elements include:

- diversity (e.g. incorporating diversified broiler chicken breeds and varied farm ecosystems)
- co-creation of knowledge (strengthening collaboration between farmers and researchers)
- synergies (optimising interactions between farmed animals, crops, and soils)
- efficiency (maximising resource use)
- recycling (closing nutrient loops and reducing waste)
- resilience (developing robust farming systems capable of withstanding environmental and economic shocks).

The principles also emphasise:

- human and social values (ensuring fair and dignified livelihoods for farmers)
- culture and food traditions
- responsible governance (promoting participatory and inclusive decision-making)
- the circular and solidarity economy
- supporting local markets and fair trade
- sound land and natural resource management.

### The Five Domains of Animal Welfare

The Five Domains of Animal Welfare Framework is an internationally recognised model for assessing animal welfare. It is the blueprint for creating environments that lead to good animal welfare outcomes. The framework identifies four physical domains (nutrition, health, environment, and behavioural interactions). These collectively influence the fifth domain: the mental state of an animal, which is considered the ultimate measure of welfare outcomes.

This model recognises that each physical domain can contribute to either positive or negative experiences for animals, and that the cumulative effect of these experiences determines overall welfare status.

Photo credit: World Animal Protection

## Case study

### Developing agroecological farming in Thailand – Pluto and Rai Kuen Rang farms

Pluto and Rai Kuen Rang farms have both successfully implemented agroecological principles

They show how diversified, small-scale farming systems, integrating farmed animals and crops, can be economically competitive, environmentally superior, and provide significant social benefits compared with conventional, intensive farming. Each one prioritises animal welfare – through the Five Domains of Animal Welfare Framework. They also achieve high resource efficiency and foster biodiversity.

Both farms face challenges. Farmers in Thailand find it hard to take advantage of opportunities because of high costs due to land value and self-employment and an inability to attract the investment upon which growth depends.

However, their diversified revenue streams and strong sustainability credentials present substantial opportunities for future growth and impact.

#### Main themes and key insights

**A. Social equity and community engagement principles**

The farms contribute positively to social outcomes.

- **Equity** – Both promote equal decision-making and asset ownership; they also offer fair wages and low-risk conditions for workers.
- **Youth engagement** – Both focus on including young people through training and job opportunities.
- **Community participation** – Their work in this area is evolving and developing. Each farm engages in community and policy platforms. And Rai Kuen Rang Farm effectively uses social media to promote social value and diet. It also connects with consumers at pop-up markets and restaurants and collaborates with chefs to showcase farm products and practices.

### B. Environmental principles

Both farms show how comprehensive implementation of agroecological practices leads to significant environmental benefits.

- **Waste recycling** – 100% organic waste recycling is standard practice on both farms.
- **Water management** – Rainwater harvesting and wastewater reuse are implemented.
- **Chemical reduction** – Both farms operate with zero chemical herbicide, pesticide, and fertiliser use. Rai Kuen Rang Farm employs innovative biological pest control methods, such as calendula (marigold) cultivation.
- **Energy use** – Pluto Farm generates 50% of its energy from on-farm renewables. Rai Kuen Rang Farm produces a smaller share via solar panels.
- **Biodiversity and resilience** – Both cultivate diverse perennial and cover crops, practice intercropping (growing two or more crops at the same time), green manuring, and maintain ponds and agroforestry systems.
- **Soil health** – Both farms demonstrate regenerative methods. For example, they grow cover crops to protect the soil and no burn practices are used. The result is healthy soil in contrast to the degraded soils typically associated with high-input monocultures.

### C. High animal welfare principles

A core tenet of the farms is their commitment to high animal welfare. Their approach aligns with the Five Domains of Animal Welfare Framework and is outlined below.

- **Nutrition** – Both farms provide their animals with balanced, nutritious feed. Rai Kuen Rang Farm grows 30% of feed on the farm; Insects, such as black soldier flies, and plants including wolffia, watercress, and spinach are also used as chicken feed. Both farms report a similar Feed Conversion Ratio (FCR) of 2.5–2.7.
- **Enrichment and physical environment** – The chickens have outdoor access and space for natural behaviours. Housing is clean and ventilated with consistent access to outdoor pasture. Rai Kuen Rang Farm provides enrichment like "perches, raised platforms, vertical panels inside the pens, and/or pecking devices".
- **Health** – Both farms report good health outcomes. These include mortality rates of less than 1% and no injuries or downgrades at the slaughterhouse. Rai Kuen Rang Farm is proud that it has had "zero disease outbreak in the last three years".
- **Human–animal interaction** – Each farm emphasises humane handling, low stress and positive farmer-animal relationships. Rai Kuen Rang Farm explicitly states that there are no painful procedures carried out on its farm.

### D. Economic viability and diversification principles

Despite their small scale, both farms demonstrate strong economic performance. This is largely due to diversification and premium pricing.

**Summary table: Economic costs and revenues**

| Category | Pluto Farm $US | RKR Farm $US | Conventional broiler ($US per year, est. per 4,000 birds) |
|---|---|---|---|
| **Revenue – animals** | 12,357 | 9,731 | ~ 9,638.55 |
| **Revenue – crops and trees** | 803 | 2,582 | 0 |
| **Revenue – rice** | 803 | 2,471 | 0 |
| **Total revenue** | 13,964 | 20,296 | 9,638.55 |
| **Feed costs** | 6,179 | 35,081 | ~5,560 |
| **Chick purchase** | 2,471 | 1,112 | ~1,730 |
| **Seeds (crops)** | 93 | 617 | 0 |
| **Other operating costs** | 927 | 62 | 772.32 |
| **Total costs** | 9669 | 9793 | 8,063 |
| **Net profit** | 4294 | 1,1584 | 1,575 |

## Conclusion

Pluto and Rai Kuen Rang farms demonstrate that agroecological farming, combining environmental stewardship, high animal welfare, and social equity, is a desirable and economically viable model. Their success, particularly Rai Kuen Rang's integration of agroecological-tourism and educational activities, further enhances resilience and community value.

Rolling out similar farming models across Southeast Asia and beyond requires strategic investment, targeted policy support, and sustained promotion of their social and economic benefits.

Photo credit: World Animal Protection

Photo credit: World Animal Protection

## Case study

### Putting principles in practice – agroecological farming in Kiambu and Murang'a counties, Kenya

These case studies examine the agroecological practices, economic performance, and animal welfare standards of Samuel Nyanja's farm in Kiambu County, Kenya and Joseph Mwangi Mwaura's farm in Murang'a.

#### Main themes and key insights

**A. Social equity and community engagement principles**

Both farms are part of a knowledge hub for organic agriculture, coordinated by Biovision Africa – a not-for-profit organisation. They contribute positively to the following social outcomes.

- **Equity** – Many young people are employed on both farms and are paid fair, local wages.
- **Youth engagement** – Both farms focus on youth inclusion through training and job opportunities.
- **Co-creation of knowledge** – Farmers participate in field schools and demonstration plots, community-based peer-to-peer learning and engagement with farmers. This fosters grassroots innovation and localises problem-solving.
- **Participation** – A farmer-researcher-NGO network equips farmers with science-based, locally adapted knowledge on ecological farming. This helps them improve yields, reduce input costs, and become more resilient to climate shocks.

### B. Environmental principles

- **Resource efficiency** – Samuel Nyanja implements an extensive rainwater harvesting system. He also uses biogas technology to convert manure into energy and fertiliser. Although more than 50% of feed is imported in Kenya, Mr Nyanja aims for self-sufficiency in feed production.

  Joseph Mwangi Mwaura reduces his farm's reliance on external inputs such as fertilisers. He does so by using composted manure for soil enrichment, recycling livestock waste, and optimising water use. He is also planning to improve irrigation efficiency.

- **Biodiversity and resilience** – Samuel Nyanja farms animals among diverse crops. He maintains more than 20% of the farm area as a natural, biodiverse habitat with woodland and ponds. His farm aims to build resilience through diversified income streams (eggs, milk, poultry, vegetables, honey).

  Joseph Mwangi Mwaura farm's biodiversity is enhanced by the presence of different species of animals – farmed and wild, plants, trees, and ponds.

- **Environmental sustainability** – Samuel Nyanja's rainwater harvesting and his use of biogas technology, contributes to his farm's sustainability.

### C. High animal welfare principles

- **Nutrition** – Both farmers provide their farmed animals with balanced and nutritious feed. The animals have continuous access to feed and can choose what they want to eat.

- **Enrichment and physical environment** – Animals have outdoor access and space for natural behaviours.

- **Health** – Both farms report high health standards, with no disease outbreaks in three years and a mortality rate of less than 1%.

- **Human-animal Interaction** – The farmers emphasise humane handling, low stress and positive farmer-animal relationships. Pain relief is given to the animals before any painful procedures are conducted.

### D. Economic viability and diversification principles

Despite their small scale, both farms demonstrate strong economic performances, largely due to diversification.

- **Diversified production and revenue** – Samuel Nyanja operates a diversified farm with more than1,000 laying hens, 25 indigenous Kenbro Kienyeji chickens, five dairy goats, and six Friesian cows. He grows crops including maize, avocado, mango, blue gum wood, and sweet potatoes. He also keeps bees for their honey and pollination services.

  Joseph Mwangi Mwaura's farm has 45 animals at any one time. These consist of a poultry flock of 30 Kenbro Kienyeji chickens, five Friesian cows, and 10 great alpine dairy goats. Mr Mwaura sells eggs and milk and expects to have two poultry flocks per year. His farm also has several trees of banana, plantain from which he sells the fruit, and grevillea which attract pollinators. His diversified approach not only helps spread risk,but also maximises the farm's profitability and sustainability.

- **Economic stability and employment** – Samuel Nyanja, generates a sustainable net annual income of US$8,190. This provides a stable income for his family. He employs a permanent and a casual worker. His income comes from a diverse stream of eggs, milk, poultry, and honey.

  Joseph Mwangi Mwaura beyond supporting his family, generates an annual net profit of US$2,987. This is enough to employ one permanent and one casual worker. A combination of family labour and paid employment ensures that the farm can manage its operations efficiently while contributing to the local economy by providing jobs.

- **Opportunity cost and expenses** – Samuel Nyanja's annual expenses exceed US$13,291. Income is generated from vegetables, fruits, and animal products (milk, chicken meats, and eggs). The farm receives government subsidies of US$10,741 and he benefits from land and buildings ownership.

  Joseph Mwangi Mwaura's annual expenses are US$4,957.87. Income is generated by selling chickens, milk, eggs, fruit and vegetables. He receives government subsidies of US$ 4,383.03 and is waiting for the county government to provide him with county water for irrigation. This will save him the expense of pumping water using electricity.

## Conclusion

Both Samuel Nyanja and Joseph Mwangi Mwaura's farms exemplify successful agroecological models in Kenya. They demonstrate how diversified, sustainable practices can lead to stable incomes, job creation, and significant environmental benefits.

The success of the farms is linked to sustainable practices such as no chemical fertilisers, no pesticide use, and no routine/prophylactic use of antibiotics. This is in sharp contrast with industrialised farming systems.

Both work to ensure the welfare of animals on their farms. However, both farmers share animal welfare challenges. These include feed sourcing and ensuring consistent enrichment and ideal physical environments for their animals.

Despite these considerations, the overall welfare of animals on their farms is higher than that of animals in factory farming systems. And comparative data strongly reinforces the argument for agroecological approaches over industrialised methods, particularly regarding ecological footprints and animal well-being.

These case studies provide valuable insights into practical applications of agroecology and its potential for fostering resilient and equitable food systems.

**Photo credit:** World Animal Protection

Photo credit: World Animal Protection

## Case study

### Farming in woodland – Brodoclea Woodland Farm, Scotland

Brodoclea Woodland Farm is a pig farm in North Ayrshire, Scotland within an existing woodland operation. It practices agroforestry over 174 hectares and farms Mangalitsa pigs, a 'woolly' variety which are rarely kept in the UK. The farm's products are meat, and timber, and carbon is captured in new woodland

The pigs are mob grazed. This involves short duration, high density grazing with a longer than usual grass recovery period. Mob grazing is expected to lead to improved soil, healthier animals and lower costs on food, fuel and labour. At Brodoclea the pigs are moved between 21 paddocks of mixed woodland to forage.

The farm is located in a Future Forest Company (FFC) woodland. This carbon capture enterprise offers tree planting and carbon credits to investors and corporate sponsors. The woodland has also been supported by a Scottish Woodland Creation grant.

Brodoclea has two members of staff employed by the FFC. Because they are employed at a managerial level, their wages are higher than the market rate for agriculturalists. The business's target is to support 75% of one employee's wage and 50% of the other.

The farm sells directly to consumers through its website. It charges UK£6.20/kilo, around double the rate for conventional pork products, and also sells pigs to conservation projects. The pigs were not originally in the woodland's business plan and have been retroactively added as an additional revenue stream.

### Animal health and welfare

- Brodoclea invests in a veterinary plan to cover any pig health issues and conducts its own pig welfare assessment.
- No veterinary callouts have been required in recent years. This is attributed to the breed's resilience and the farm's good biosecurity.
- Pig mortality is negligible – there has been one loss in four years.
- The farm also invests in some fencing to keep the pigs secure. Because pigs can break fencing, specialised solutions are needed on the farm. Electric fencing was trialled, but was ineffective due to grass growth earthing the wires.
- Brodoclea built strong larch fencing with high-tensile Rylock, partly milled from onsite timber. At UK£30 per metre, fencing is a costly aspect of pig farming.
- Although the paddocks are not fully secure, the pigs stay near because they are fed daily.

### Profitability at Brodoclea

- The pig enterprise is near break-even.
- Brodoclea currently keeps 200 pigs; but higher stocking density is possible without compromising animal welfare.

Price difference between Brodoclea pigs and factory-farmed pigs: GBP 3.10/kg. With smaller size pigs the farm would need GBP 434 more per pig to reach parity.

### Conclusion

Their agroecological approach has added new income streams to otherwise single-use woodland. The farm provides high-welfare animal production, more resilient native food, and ecosystem services. Brodoclea recently won the Best Agroforestry Award 2024, a testament to their innovative and sustainable practices. The potential here is that woodland pigs could be a bolt-on enterprise to other woodland uses, providing high-welfare animal production, more resilient native food, and ecosystem services.

**Photo credit:** World Animal Protection

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