



The
Wildlife
Trusts

Regenerative and Agroecological farming

How and why regenerative and agroecological farm practices can solve our nature and climate crises



Why we need new farm systems



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We are in the midst of two inextricably linked crises, the climate emergency and the steady decline of nature. These dual crises are inseparable. The climate crisis is already contributing to nature's decline and the loss of our wildlife and habitats, whilst degraded and exploited natural systems are not able to provide the nature-based solutions that are a critical part of the answer to reducing our emissions and adapting to future changes.

The agricultural sector has a key role to play in securing nature and climate recovery

Farmland accounts for around 70% of land use in England¹, and over 80% of land use in Wales, so the agricultural sector has a key role to play in securing nature and climate recovery. However, farming is currently not working for wildlife or the climate and often not for the farmers and growers too. **Annex 1** provides more details of the issues which The Wildlife Trusts see as critical.

We cannot solve one crisis without tackling the other – nature's recovery is vital for tackling climate change and as research reports confirm, we can implement nature friendly farming whilst producing enough nutritious food and tackling climate change – including the National Food Strategy², IDDRI data³, and the RSPB research on land use.⁴ The Wildlife Trusts own research based on using Maximum Sustainable Outputs using detailed financial analysis of 165 farm business accounts, shows it can work well for farmers too.⁵ Organic systems have demonstrated viability alongside biodiversity outcomes. Many farmers who identify as nature friendly are working hard to deliver nature outcomes as they produce food.

The Wildlife Trusts wants to support regenerative and agroecological and nature friendly farming approaches as solutions to these issues, where they work to improve the complex, natural systems on which they depend.

This paper explores what these farm systems look like, proposes new objectives for the industry alongside government and market support, to help achieve our goals of nature recovery and climate action in farming, and the principles which should underpin this transition.

What do regenerative and agroecological farming mean?

The following describe these two overarching approaches and there is a growing body of information and research to draw on. A recent Defra-funded analysis of different farm systems recently identified 16 farm practices in the UK that are used to varying extents in the different farm approaches.⁶

Regenerative farming

Regenerative farming can be a valuable approach to restore natural farm systems and deliver nature and climate outcomes in productive farmed land. As a phrase it has been used since the 1980s, but it is only recently that it has gained more profile and a far bigger following in the past 10 years. As the name suggests, it is an approach to farming that can allow the land, the soil, water, nutrients, and natural assets to regenerate themselves as opposed to farming that depletes these natural resources.

A high level of ambition and transparency to deliver nature friendly farming is needed

Much focus is on the soils and on potential for carbon storage and payments. As the basis for most food production, putting soil health higher up the agenda is very welcome as improving soil health also leads to many other benefits (see *The Wildlife Trusts' document on [The Importance of Healthy Soils](#)*) including increased soil carbon storage, greater soil resilience to flooding and drought, improved nutrient retention and recycling, and improved soil biota that improves plant health and supports biodiversity up the food chain. The term regenerative farming currently lacks a formal, independent definition, and can mean different things depending on who is using it, and what the context is. There are many elements given the need for flexibility, but commonly it involves some mix of the following farm tools⁷ (and see Annex 2):

- limiting soil disturbance;
- maintaining soil cover;
- fostering agricultural diversity and rotations;
- keeping living roots in the soil; and
- integrating livestock and arable systems.

But not all 'regen' farmers may be using all these, the tools do not automatically mean it's a good farm system overall, and they do not guarantee nature protection or recovery, nor reduction of harmful inputs. Glyphosate herbicides used for weed management (and as a crop desiccant for harvest) in absence of ploughing is one such issue. Without ploughing, weeds can be a significant issue and for some farmers and specific soil types and conditions no or min tillage is not suitable. But glyphosate, the most widely used pesticide globally, is known to be harmful to wildlife and soil. Other low- and high-tech tools are available and are used successfully by farmers, including organic, such as new electro-thermal mechanical approaches, shallow drilling and longer rotations.²

There is a spectrum of regenerative agriculture and a risk potentially of corporate "greenwashing" without adequately supporting farmer delivering of significant biodiversity benefits. A high level of ambition and transparency to deliver nature friendly farming is needed in regenerative systems alongside fair deals for farmers.



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Agroecological farm system approaches

Unlike regen, the [agroecology model](#) is a systemic, whole farm approach but is also about more than the farm. Agroecological approaches cover the underlying research base and post farmgate actors i.e. supply chain fairness and appropriate scales of production. A set of Agroecology principles have been agreed by the global small farmer organisations and the FAO without being overly prescriptive, as farming cultures, systems and environments differ widely.⁸ Approaches to farming that fall under the umbrella of agroecology can include: organic farming, biodynamic farming, agroforestry and permaculture. See Annex 3 for a summary of these principles, which include:

- Mitigate and adapt to climate change – reducing emissions, recycling resources and prioritising local supply chains.
- Working with wildlife and agro-biodiversity – managing the impact of farming on wildlife and harnessing nature to do the hard work for us, such as pollinating crops and controlling pests.
- Putting farmers and communities in control – giving power to approaches led by farmers and communities and adapting techniques to suit the local area – and its specific social, environmental and economic conditions.

Organic farming and its legal standards, developed over 30 years and are recognised and rewarded as a whole system approach that reduces inputs, enhances nature, and delivers high animal welfare and healthy food. In organic systems for example, the diversity of arable plant species is found to be up to 95% higher, field margin plant species up to 21% higher, farmland bird species up by 35%, and pollinators by 23%. A recent analysis suggested that if 10% of UK farmland was organic pesticide use would drop by 1,541,563 kg (12.8% of total pesticide use) and fertiliser use by 65,000 Tonnes.⁹

Standards have been developed over 30 years and are recognised and rewarded



Moving the objectives

Removing the barriers and helping farmers onto the agroecological or regenerative transition will mean broadening farm related objectives and the policies that support them.

Supporting multiple outcomes

All farms have the capacity to deliver multiple outcomes alongside food, and in fact they always have. This needs to be recognised. To deliver the public and wider benefits such as nature, community engagement, or carbon storage, many of these need to be effectively rewarded by governments or private markets. One issue that needs independent baselines and government is measurement. As with carbon, the lack of a robust carbon calculator is an issue as one researcher put it *“One of the things that’s holding all this back is everybody’s trying to find the holy grail of calculating carbon and actually, we’re still some distance away...”*¹⁰

Prioritising some land for nature

Whether, and what, farmers grow both matter. For nature to ‘rest, recover and repopulate’ at landscape scale we do need to have more high-quality habitat integrated through the farmed landscape. In some areas, an appropriate approach may be to reduce farming practices altogether or make a significant land use change where the sustainable production of food for commercial purposes is no longer possible. This could be caused by climatic changes, such as increased flooding or drought (hay cropping and grazing in floodplain meadows for instance or pelludiculture instead of crops to allow rewetting on peatland water tables). Or it could be driven by shifting dynamics in finance streams for agriculture. Regenerative and agroecological agriculture should recognize that some areas will need to be used primarily to deliver aims other than food production, to support long-term sustainability and resilience of wider farm systems.

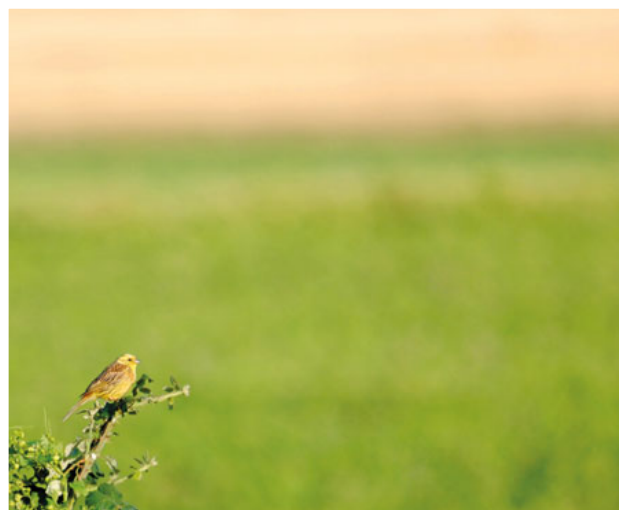
Regenerative and agroecological agriculture should recognize that some areas will need to be used primarily to deliver aims other than food production

Yields no longer overriding.

Associated with this is the contentious issue of yields and whether they can and must be maintained in regenerative but not in organic and similar systems. It is a misleading and inadequate comparison in so many ways, not least because it is not often true, but also ignores the reality that maintained or higher yields are no longer a priority outcome. We produce enough food globally to feed at least 10 billion. At least 30% of the food produced is wasted in the supply chain and we use an even higher proportion highly inefficiently in feeding pigs, poultry, dairy cows and also to cars as biofuel. We now need to address these wasteful systems via demand side measures and change what we grow, where and how. Our Sweet Spot report showed an approach, based on Maximum Sustainable Output (MSO) where farmers’ incomes have been maintained or even enhanced through nature-based farming with reduced costly inputs and a new approach to yields.¹¹

Flexible but ambitious

For many farmers the lack of prescriptiveness has been an asset of regenerative agriculture. It has enabled farmers and food growers to begin a journey of change which involves significantly more than a simple change in crop rotation design or soil management plans. It has provided an entry point and launch pad for farmers and growers to take the first few steps along the path of a mindset shift towards an approach to farming which is better for the environment; a journey they might not otherwise have embarked on if it was encumbered by rigorous and taxing requirements and standards.



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Public and Private support is essential



The market – i.e. buyers at the farmgate, intermediaries and end retail or food service – will also need to support the transition. This will be harder given their long reliance on cheap prices, just in time logistics, and exacting standards. They will need to set fair prices and decent contracts, to stop making unreasonable demands on timings, or specification (such as produce shape, size or colour) and should support farmers with free advice, and properly reward with market access.

Of major concern is the risk that large scale, corporate-led 'regenerative' programmes dominate without adequately supporting farmers, and with a level of 'greenwashing' in food markets or carbon credits. The imperative in the food industry remains strong to drive up yields, to keep raw material costs low, and secure profits in a highly competitive, increasingly processed food system. This would undermine the whole transition so must be avoided. Effective Government regulation of supply chain behaviour as well as marketing and labelling, carbon and nature 'offsetting' schemes and codes is vital.

Supermarkets and the rest of the food industry need to support the agroecological transition.

The Wildlife Trusts see regenerative and agroecological agriculture as a direction of travel, not an absolute definition or end point. They are systems of farming principles and practices that seek to rehabilitate and enhance the entire ecosystem of a farm and aim to improve and restore the natural assets and resources used, rather than destroying or depleting them. But this restorative system is not an easy transition for many farmers, given past and present public policy and market drivers pushing them into an extractive land use approach.

Government policy now needs to support *all* farmers and sectors into and along the transition with strong incentives, far great access to independent advice, and a clear regulatory baseline. These should be delivered alongside a set of strong rules to stop supply chain abuse which present a barrier to farmers from farming with nature, and new global trade policies that do not undermine our farmers by driving imports to lower standards.

Effective Government regulation of supply chain behaviour as well as marketing and labelling, carbon and nature 'offsetting' schemes and codes is vital

Principles for nature friendly farming systems

The following should underpin farm and food policy and wider policy areas such as climate, land, planning, rural development and health to deliver a farm sector resilient and able to meet wider goals alongside food and other market outputs:

1. **Prioritise both nature and climate outcomes alongside food** – as the focus on yield is reduced (acknowledging the harm produced by overproduction and consumption), markets and governments must refocus on delivering healthy foods and diets and cutting food waste whilst protecting and restoring nature and tackling climate. Diversity on farm is a key element in delivering these outcomes and this means more diverse supply chain and market responses. The link to environment targets such as nature recovery and climate mitigation is key.¹²
2. **Sector based approaches** – each type of farm will have different needs and so regenerative or agroecological approaches will need to be flexible and ambitious to meet those needs. Sectors previously largely unrepresented in CAP or Agri environment in the past such as horticulture, pigs and poultry, hard to reach farmers and others will need particular support for the transition.
3. **Authenticity and Transparency** – There is much debate on the need for a formal ‘regen’ or ‘agroecology’ standard and food label – to provide transparency and to avoid corporate ‘greenwashing’, so that consumers can trust that the product is from a regenerative farm. However, a flexible approach meaning farmers can ‘belong’ to something less prescriptive may provide a strong funnel towards deeper commitment. Another ‘in-out’ standard might alienate farmers on all sides. Forms of outcome measurement such as the Global Farm Metric¹³ may be more suitable. There is compelling evidence that whilst some legally based, important certified labels – like free range eggs and organic, for example – do work, have third party accreditation and drive markets towards better outcomes, But the legal status of such standards is key here as is the need to assess how many labels consumers can be expected to follow.
4. **Fair dealing** – the transition for farmers is not easy and any demands and accreditation should ensure farmers can make a living and ensure good worker conditions. New standards must spread the risk and benefits fairly. They should provide the transparency needed to ensure all those in the chain, having costs and profits involved with a product (from producer to consumer), pay their way and are fairly rewarded. Government rules to ensure this are vital and long overdue.
5. **Continued transition** – we need to maintain the direction of travel for farmers to be able to apply a whole system approach that genuinely delivers for nature restoration and climate resilience. Our Sweet Spot report showed that there can be business dividends for farmers working with nature and that comes with time and experience and taking risks that should be supported by the public and market.



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Annex 1

Key Issues in farming with nature

Reliance on the routine and widespread use of artificial pesticides and fertilisers

The development of synthetic chemical fertilisers and pesticides combined with the rapid intensification of agricultural systems in the UK during the 20th century has led to a dramatic increase in the level of artificial inputs applied across the countryside. This has led to the dominance of farming systems which rely on these ecosystem-disrupting inputs to maintain high levels of food production. The outcome has been a dangerous degradation of our ecosystems and the accumulation of chemicals in our soils, waterways, and coastal waters.¹⁴

Intensive livestock farming

Intensive¹⁵ management of animals is the greatest source of agricultural Greenhouse Gas (GHG) emissions in the UK agricultural sector. Intensive production of animal products is also a leading cause of environmental harms, both in the UK and overseas. Overgrazing of sensitive habitats, pollution arising from poor nutrient management, and land take for feedstocks all have significant detrimental effects on UK wildlife.

Systematic degradation of soil health

Soils are under increasing threat from factors such as climate change and land use change, with intensive agriculture one of the leading causes of soil degradation.¹⁶ In England and Wales alone, the cost of declines in soil health is estimated to be £1.2 billion every year.¹⁷ Declines in soil health leads to increased risk of soil erosion and soil loss, decreased resilience of agricultural crops to pests and diseases¹⁸, and increased contribution to climate change through loss of soil carbon, as well as heightened exposure to the impacts of climate change.

Climate change and the biodiversity crisis are the two greatest threats to the long term food security in the UK

Pollution

Water pollution is one of the greatest and most widespread threats to species and habitats in the UK, including those within protected areas. Reporting on the health of our freshwater habitats under the Water Framework Directive shows that in England and Wales, only 14%¹⁹ and 46%²⁰ of rivers respectively meet the standards for good ecological status, and in Northern Ireland, only 31%²¹ of waterbodies are classified as good or high quality. This is largely a consequence of intensive agricultural practices alongside excess nutrients from wastewater.

Climate change mitigation and adaptation

In addition to being a leading contributor of GHG emissions, agriculture is one of the sectors most vulnerable to the impacts of a changing climate.^{22,23} Climate change will have significant impacts on the natural systems that underpin our current farming practices. Floods, droughts, wildfires, increased pest pressures, and ecosystem collapse are some of the priority risks which farm systems in the UK face, and must adapt to.

Land use change & food security

The UK Food Security Report 2021²⁴ acknowledges that climate change and the biodiversity crisis are the two greatest threats to the long term food security in the UK. Achieving the UK's legally binding targets to reach net zero GHG emissions by 2050 and to halt and reverse biodiversity loss is therefore critical to secure UK food security. All of the credible models for achieving net zero propose land use change for nature to some degree^{25,26} and so require that some land is removed from intensive agricultural production and instead restored for nature to sequester carbon.



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Annex 2

Regenerative principles – Groundswell

Groundswell's 5 Principles of Regenerative Agriculture

1. Don't disturb the soil.	Soil supports a complex network of worm-holes, fungal hyphae and a labyrinth of microscopic air pockets surrounded by aggregates of soil particles. Disturbing this, by ploughing or heavy doses of fertiliser or sprays will set the system back. Min and no till systems still disturb the soil but cause more minimal disruption.
2. Keep the soil surface covered.	The impact of rain drops or burning rays of sun or frost can all harm the soil. A duvet of growing crops, or stubble residues, will protect it.
3. Keep living roots in the soil.	In an arable rotation there will be times when this is hard to do but living roots in the soil are vital for feeding the creatures at the base of the soil food web; the bacteria and fungi that provide food for the protozoa, arthropods and higher creatures further up the chain. They also keep mycorrhizal fungi alive and thriving and these symbionts are vital for nourishing most plants and will thus provide a free fertilising and watering service for crops.
4. Grow a diverse range of crops.	Ideally at the same time, like in a meadow. Monocultures do not happen in nature and our soil creatures thrive on variety. Companion cropping (two crops are grown at once and separated after harvest) can be successful. Cover cropping, (growing a crop which is not taken to harvest but helps protect and feed the soil) will also have the happy effect of capturing sunlight and feeding that energy to the subterranean world, at a time when traditionally the land would have been bare.
5. Bring grazing animals back to the land.	This is more than a nod to the permanent pasture analogy, it allows arable farmers to rest their land for one, two or more years and then graze multispecies leys. These leys are great in themselves for feeding the soil and when you add the benefit of mob-grazed livestock, it supercharges the impact on the soil.



Annex 3

United Nation Food and Agriculture organisation

Agroecological Principles²⁷

Diversity: diversification is key to agroecological transitions to ensure food security and nutrition while conserving, protecting and enhancing natural resources.

Co-creation and sharing of knowledge: agricultural innovations respond better to local challenges when they are co-created through participatory processes.

Synergies: building synergies enhances key functions across food systems, supporting production and multiple ecosystem services.

Efficiency: innovative agroecological practices produce more using less external resources.

Recycling: more recycling means agricultural production with lower economic and environmental costs.

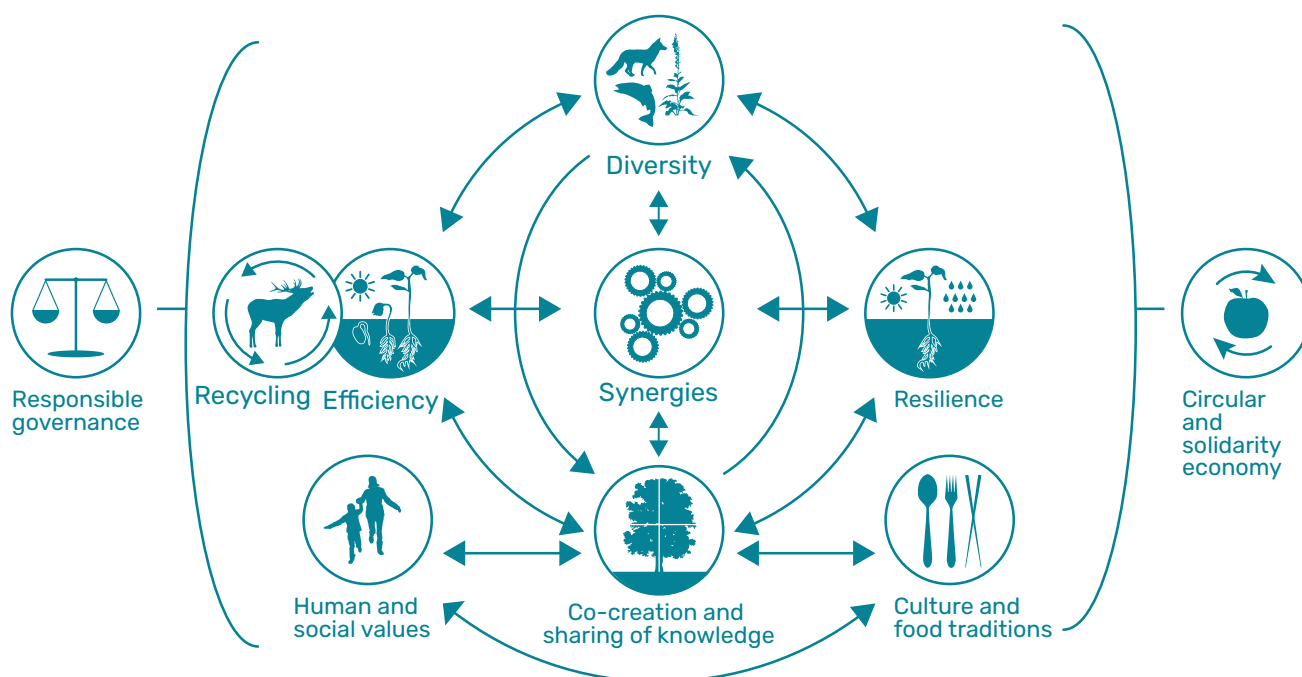
Resilience: enhanced resilience of people, communities and ecosystems is key to sustainable food and agricultural systems.

Human and social values: protecting and improving rural livelihoods, equity and social well-being is essential for sustainable food and agricultural systems.

Culture and food traditions: by supporting healthy, diversified and culturally appropriate diets, agroecology contributes to food security and nutrition while maintaining the health of ecosystems.

Responsible governance: sustainable food and agriculture requires responsible and effective governance mechanisms at different scales – from local to national to global.

Circular and solidarity economy: circular and solidarity economies that reconnect producers and consumers provide innovative solutions for living within our planetary boundaries while ensuring the social foundation for inclusive and sustainable development.



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The Wildlife Trusts are a federation of 47 charities, 46 individual Wildlife Trusts and a central charity, the Royal Society of Wildlife Trusts. Together we have more than 900,000 members, 39,000 volunteers and 3,600 staff across the UK. We share a vision of nature in recovery, with abundant, diverse wildlife and natural processes creating wilder landscapes where people and nature thrive.



Wildlife Trusts care for – and have restored – some of the most special places for wildlife in the UK. Collectively we manage more than 2,300 nature reserves, operate 123 visitor and education centres and own 29 working farms. We undertake research, we stand up for wildlife and wild places under threat, and we help people access nature.

We work with businesses who are committed to being nature positive and take action to help restore 30% of land and seas for nature by 2030.

The Wildlife Trusts

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