



Setting the standard

Shifting to sustainable food production in the UK

By Angela Francis

Summary

“To reverse widespread declines in wildlife and natural systems, we have a responsibility to produce food much more sustainably.”

Brexit has opened up a far reaching debate about what agricultural subsidies are for. The argument that all public money to support agriculture should be delivering public benefits has widespread support. Defining what is in the public’s benefit and how to deliver it will shape the UK’s farming industry and countryside into the future. And it will determine how the government will meet its commitment to leave the environment in a better state than it found it.

Farmland makes up 70 per cent of the UK’s land area and its primary purpose is food production. An agricultural support scheme that does not include more sustainable food production as a source of public benefits will not lead to the environmental improvements we need. Oases for nature surrounded by intensively farmed deserts will be worse for the environment. Public money for public goods is the right framework for the new payments system and can be as relevant to highly productive arable farming as it is to more extensive farming in the uplands.

Farming is a strategically important industry. Although the UK is not self-sufficient in food, and should not aim to be, there is an option value associated with our capacity to produce food. However, to reverse widespread declines in wildlife and natural systems, we have a responsibility to produce food much more sustainably than we do now. British farmers need support to innovate and adopt new practices that will enable them to produce food in ways that contribute to the restoration of the natural environment and meeting the UK’s carbon targets.

Developing sustainable farming practices and building profitable farming businesses, based on high environmental standards, are mutually reinforcing ambitions. The public benefits from shifting to more sustainable food production: cutting carbon emissions, improving soil health and biodiversity, improving water quality and flood resilience, can also boost the productivity and profitability of farming.

“A successful domestic policy for sustainable food production is contingent on trade strategy.”

A successful domestic policy for sustainable food production is contingent on trade strategy. A vision of farms with high welfare standards and precision agriculture, growing high quality, sustainable, low carbon food would wither on the vine faced with a trade policy that opened up market access to food produced under lower environmental standards. Farms are businesses, and no business can thrive if it is undercut in its home market. High environmental standards for production at home, along with similar standards for food imports, are essential preconditions for an agricultural policy that protects and improves the environment.

As the government develops its new agricultural support scheme, we make the following recommendations:

1

Give preference to sustainable food production. Getting good environmental outcomes from a new agriculture scheme means changing the way we produce food. The scheme should encourage the shift to sustainable food production by rewarding the public benefits of climate change mitigation, landscape protection and pollution reduction that farmers can deliver by changing what and how they produce.

2

Require good environmental reporting. The transition period between the EU's Common Agricultural Policy (CAP) and its UK-based successor must retain the requirements for environmental management and reporting or replace them with something better. Changes to regulations and agricultural support will need good reporting systems and enforcement to prevent any gaming of the system, undermining those who comply.

3

Invest in farm-based innovation. Innovation needs to happen on the farm as well as in the laboratory. Policy should support the adoption of new and environmentally beneficial practices, alongside R&D.

4

Safeguard standards in trade deals. Trade policy needs to align with domestic agriculture policy and support farmers who invest in lower carbon, resource efficient, nature-friendly farming. Future trade agreements should support high environmental standards for products made and sold in the UK.

An industry in transition

UK farming is facing challenges that could put many farms out of business. Modes of production that are low carbon, resource efficient and less damaging to nature need to be mainstreamed to reverse widespread environmental decline. Farming needs to move into profitability, remove its reliance on subsidies and attract a new generation of farmers into the industry. It also needs to identify where it can be profitable, in the face of changing markets. The UK's post-Brexit relationship with the EU is still to be settled but it is possible that access to existing EU markets will be reduced, trade deals will open markets in other parts of the world as well as introducing new competition at home. All this change has to happen while the CAP, which has shaped farming in the UK over the past 45 years, is about to change too.

We examine how policy can help farming to make this transition. We discuss the economic rationale for supporting the shift to sustainable food production in the UK, the objectives of that support, and ask what we can learn, if anything, from the CAP. We also highlight the risks to the UK's environmental ambitions if food production and environmental benefits are viewed separately. And we show where this is currently in danger of happening.

Gaps between environmental and food policy

There are two emerging threats that could undermine the capacity of the UK to move to more sustainable food production. First, food production policy and policy on the provision of public benefits might diverge, opening up space for farmers to choose specialised and intensive farming models which fail to build the skills and businesses needed for sustainable farming. Second, trade policy might allow food produced to lower environmental and animal welfare standards into UK markets, exposing UK farmers to unfair competition.

UK farming is heading for a very different future, but its route and destination remain unclear. Some things are certain. The argument that the public money that supports agriculture should be delivering public benefits has been endorsed by senior figures within the government. This is consistent with the direction of EU and UK policy on agriculture since the 1980s. Defra's recent consultation paper, *Health and harmony: the future for food, farming and the environment in a Green Brexit*, confirms that public money for public goods will be the guiding principle for the UK's new agricultural support scheme.¹

The public goods the Environment Secretary Michael Gove says the government should pay for are those that deliver environmental protection and enhancement. The government expects the new agriculture scheme to support "planting woodland, providing new habitats for wildlife, increasing biodiversity, contributing to improved water quality and returning cultivated land to wildflower meadows and other more natural states".² This helpfully builds on the success of agri-environment and countryside stewardship schemes. However, a new scheme has to avoid being seen solely in terms of environmental benefits that happen alongside rather than as part of farming.

The consultation paper says it wants "farmers and foresters to integrate their plans for the production of environmental goods with plans for the production of food and timber" but it does not set out how it will support the public benefits that result from farmers shifting to more sustainable food production.

The paper also proposes that reporting on cross compliance standards should be scrapped as part of the transition to a new agriculture support scheme and sets no date for a replacement system. Cross compliance sets minimum legal standards and funding conditions on animal and plant health and welfare, and on the agricultural and environmental condition of land. While these standards are generally considered insufficient to effectively protect environmental assets, getting rid of the requirement for reporting and monitoring would remove a fundamental tool for managing and improving farming practice.

"A new scheme has to avoid being seen solely in terms of environmental benefits that happen alongside rather than as part of farming."

Finally, proposals in the consultation paper increase the risk that production and consumption standards could be different; Defra are expecting domestic producers to maintain high standards whilst increasing UK consumers' access to cheap food produced abroad. Domestic policy to improve the environmental standards of food production needs to be underpinned by complementary trade policy.

Competition can lead to innovation, so UK farmers should be encouraged to compete domestically and with the 12 million farmers in Europe from whom the UK currently imports 30 per cent of its food. Competition from major agricultural exporters such as the US, Australia, and New Zealand could undermine innovation, particularly environmental innovation, in areas where they are operating to noticeably lower environmental standards. For example, the partial ban on cheap pesticides that damage bee populations was calculated to cost UK oilseed producers £18.8 million.³ Competitors from markets that permit their use would, therefore, have an inbuilt cost advantage over UK farmers. (We will be publishing the results of our research into the implications of different trade scenarios for UK food and agriculture later in the year.)

Where does sustainable food production fit?

Recent proposals, including from Rural Investment Support for Europe (RISE), Bright Blue and Wildlife and Countryside Link (WCL), all address the public benefits associated with the shift to more sustainable food production.^{4,5,6} They recognise that current farming practices are far from delivering the optimal level of public benefits and say that the government has a role in addressing this failure.

We are not proposing a separate scheme to support the environmental benefits associated with more sustainable food production, that would not be desirable or probably even possible. However, it is helpful to distinguish between different categories of farming and land management and the environmental public benefits they can deliver, to ensure they are all included in whatever new scheme is developed. Crucially, the new scheme and the transition to it must ensure an absolute increase in environmental benefits from all land uses to achieve the net gains aspired to in the government's 25 year environment plan.⁷

Potential environmental benefits from different land uses

Land use	Environmental public benefit potential for climate, water and biodiversity
<p>In production</p> <p>Fields and farm buildings for livestock, crop and feed and activity that is central to production</p>	<p>Reduced pesticide and fertiliser pollution, improved soil quality, reduced soil compaction and erosion, increased crop variety and rotation, and reduced energy use.</p>
<p>Alongside production</p> <p>Land integrated within the farm setting and activity that happens alongside production</p>	<p>Retaining or creating field margins, hedges, riparian strips, wooded areas, ponds, reed beds or peatland in and alongside land used for production.</p>
<p>Separate from production</p> <p>Land taken out of production</p>	<p>Larger areas of land designated as coastal wetlands, woodland or nature reserves.</p>

“The Committee on Climate Change classifies 80 per cent of the carbon abatement measures that could be achieved by agriculture as win-wins.”

It is important to distinguish between the environmental benefits from the positive provision of ecosystem services alongside or separately from production, and those that come from reducing the negative impacts of farming, through innovation and the adoption of new practices. We will return to this point later on page nine.

The provision of environmental goods and services from land and food production can complement each other. There are sustainable farming methods that farmers could take up, particularly related to soil health, that are less expensive, increase yield and extend the productive life of their land. The Committee on Climate Change classifies 80 per cent of the carbon abatement measures that could be achieved by agriculture as win-wins as they could be delivered whilst reducing overall costs to farmers.⁸ Even taking some land out of production can be done with no loss to yield and can even improve productivity. Pywell has found that removing up to eight per cent of an arable area and replacing with wildflower margins, increasing pollinators and crop pest predators, improved yield of flowering crops by up to a quarter.⁹ And, on wind pollinated crops like barley and wheat, there was no reduction in yield, even after factoring in the land out of production.

A scheme which ignored the potential to provide environmental benefits from changing food production, the dominant land use in the UK, would fail. Undoubtedly, some farmers would take the opportunity to be rewarded for providing public goods on some of their land. But, without advice and incentives to navigate these changes, many more farmers may decide to focus exclusively on food production rather than redesign their business to produce food alongside the public goods the government wants. A new scheme that engaged fewer farmers than intended, could lead to environmental oases surrounded by areas of intensified production.

As well as not leading to adequate environmental outcomes, allowing food production to pursue a specialised and intensive path would be damaging economically. UK farming would lose a cost-based competition with large scale commodity farmers abroad, even if it were to reduce its standards, which the government’s consultation paper rules out. Disadvantaging UK farmers by exposing them to unfair competition will not deliver the environmental public goods the government wants to support. A thriving UK farming sector is vital and farmers should be encouraged to find ways to compete on the basis of the high quality and affordability of their food production.

Protecting value for the future

Half of the food we eat comes from overseas, and much of UK farm output is exported, particularly to Ireland, the US, France and the Netherlands.^{10,11} Food security is not achieved by domestic production but by trade links and transport systems that connect the UK to the rest of the world.

However, importing food exposes the UK to the volatility of world markets. Increasing reliance on imports would raise significant geopolitical risks. It also limits the country's ability to decarbonise its food supply through production standards and support for innovative farming practices. The government must consider the impact of a new scheme – as well as trade policy – on the capacity of UK farmers to engage in environmentally beneficial practices. Farming capacity, ie the ability to produce food sustainably, has an 'option value'.

The importance of considering 'option values'

Option values are a value on assets that, once lost, would be very difficult to recover. They allow policy makers to factor the irreversibility of a decision into an assessment of costs and benefits. A historic building or an ecosystem has an option value because, if it were destroyed, say as part of a new housing development, it could never be recovered. The UK's capacity for more sustainable food production has a similar option value, in that it would take a long time to rebuild if lost.

Consideration of option values is particularly helpful in the context of an industry, like agriculture, which is in transition. Given the challenges that food production is facing globally, the UK's ability to produce food sustainably has the potential to become more important in the future. This is especially true in the context of climate change. Sustainable agriculture is likely to be increasingly valued by the food supply chain as trade begins to factor in the carbon intensity of production.

What if sustainable food production is not supported?

Leaving farming to the market is worse for the environment

As the example over the page shows, New Zealand offers a cautionary tale. It is one of the few countries in the world that has attempted a pure market farming model. It removed subsidies which promoted a very rapid commercial reshaping of farming businesses – mainly focused on sheep and dairy farming – which has been highly productive but extremely environmentally damaging. Water quality, nature and recreation have been negatively affected in what were pristine natural environments.

The consequence of removing farm subsidies without first putting in place new regulation and incentives for sustainable food production was much worse environmental outcomes. In changing its subsidy regime, the UK should support models of farming that make commercial sense for the UK, in a global market context, and which enable us to increase the absolute level of environmental goods and services delivered in the UK.

New Zealand – a pure market food production model



In 1984 the New Zealand government stopped subsidising farming. Coupled with changes to financial regulations and exchange and interest rates, this had an immediate impact with around five per cent of commercial farmers being declared bankrupt between 1985 and 1989. After an adjustment period, farmers found a way to be competitive in the world market. Using their own judgement about where to invest their time and money has resulted in an increase in real farm incomes. Farm productivity has also increased. There are now half the number of ewes than there were before 1984 but the weight of lamb produced is the same because of increases in lambing per ewe and the average weight of lambs.¹²

The end of subsidies – which had supported high stocking rates, the use of fertilisers and farming on marginal land – initially had some positive environmental effects. However, over time, those farmers left in business increased the intensification of farming, causing soil compaction and erosion, high levels of pollution in water bodies within agricultural areas and a decrease in biodiversity. New Zealand, which was already dealing with invasive predators, now also has degraded and fragmented habitats. This has contributed to one of the highest species extinction rates in the world. Within the Organisation for Economic Co-operation and Development (OECD) New Zealand has the highest share of greenhouse gas emissions from agriculture at 49 per cent and its emissions per capita are the fifth highest in the world.¹³

Water quality is now a major concern for the New Zealand government due to increased nutrient input from fertilisers and animal waste. The concentration of nitrates increased by 55 per cent in monitored rivers between 1994 and 2013 and was ten times higher on pastoral land than on rural land not under agriculture. Between 1990 and 2012, the quantity of nitrogen leached from agriculture increased by 29 per cent, mainly due to the increase in dairy cattle and the use of nitrogen fertiliser. E.coli was also found in rivers, with concentrations 9.5 times higher in lakes in agricultural areas, making some areas unsuitable for swimming. This pollution from agriculture may be affecting native freshwater species in New Zealand, as three quarters of fish and one third of invertebrates and plants are currently at risk of extinction.¹⁴

This entirely market led approach to food has failed to encourage good environmental practices and protect biodiversity. It has also created a powerful lobby group who see environmental regulation as acting against their business interests. Bills relating to biodiversity protection face steep opposition from private landowners and, in 2011, the National Policy Statement for Indigenous Biodiversity, addressing environmental problems, failed to pass into law.¹⁵

“Businesses do not always take up new practices even when they are empirically better.”

Markets do not deliver environmental innovation and new practice

As the New Zealand example shows, without support for higher environmental standards in production, there is often not a sufficiently attractive business case for environmental innovation or improving the sustainability of farm practices. These changes are sorely needed to enable UK farming to shift to lower carbon, resource efficient and nature friendly farming. The question is, what level of good environmental practice should be required by law and what should be incentivised by government?

Hodge argues that, where they are not already in law, basic cross compliance standards should be underpinned by legislation and dealt with by regulation.¹⁶ The polluter pays principle, which the consultation paper supports, can deal with practices which fall below the minimum standards required by law. Beyond that, it is worth considering the best way to encourage the farming industry to invest in new practice and capacity building that will deliver more environmental benefits from farming. Should it be a carrot or a stick?

The carrot requires the establishment of a reference level for good practice and its effectiveness can be increased if government keeps this reference level under continuous review, raising standards as better methods become mainstream. Economic theory would say that a stick, if it were used, should be applied to consumers so they pay the full cost of food production. Given the limited market power of farmers in the food system, it would be naïve to think that applying costs to producers would result in them being passed up through the supply chain to consumers. In isolation, it would only serve to make UK produced food more expensive and put many farms out of business.

The argument is not that we should compensate UK farmers for higher regulatory standards. RISE argues convincingly that the cost of higher standards can be balanced out by benefits in terms of quality and reliability, and that it is an empirical matter whether standards justify compensation.¹⁷ But there are genuine public goods associated with going beyond minimum legal standards of production that should be rewarded, in the same way as public goods delivered on land alongside or separate from production. Other barriers associated with moving to higher environmental standards – lack of information, inertia in the system and risk of failure – also mean businesses do not always take up new practices even when they are empirically better. These barriers mean advice and further incentives are justified in supporting a shift to sustainable farming.

“Public goods are not the only type of market failure to consider in relation to sustainable food production.”

Market failures

‘Public good’ has become an over-used and abused term. Its definition has been stretched to mean ‘all things that are good for the public’ often in an attempt to justify continued direct payments to farmers. For the purposes of our argument, things like rural vitality and food security, although legitimate policy concerns, are not public goods. As with urban vitality or social cohesion, these are broad policy objectives and cannot be considered in narrow market economic terms.

Government intervention to secure environmental benefits from land has mostly been discussed in terms of ‘real’ public goods. Biodiversity, climate stability, water quality, flood resilience and unique landscapes are all ‘public goods’ because they are inherently public, in that society at large benefits when they are provided, and they are hard for private markets alone to deliver. But public goods are not the only type of market failure to consider in relation to sustainable food production.

Market failures that prevent sustainable food production systems being delivered and justify government intervention include:

Negative externalities

Externalities occur when the price of a product does not capture all the costs associated with its consumption or production. Pollution is an example of a negative externality. The prices of goods or activities that cause pollution do not reflect the full cost to society. This encourages us to consume them at higher levels than we should or produce them in ways that are not best for society.

Positive externalities

The carbon holding capacity of a field with high soil quality or attractive farming landscapes are both positive externalities. The price for agricultural goods produced do not reflect all of these types of benefits gained from their consumption or production, meaning farmers are not encouraged to deliver environmental goods and services as much as society would like.

Public goods

Public goods are not provided by private markets because they are ‘non-excludable and non-rival’ in their use. Lighthouses and streetlights for example, benefit everyone who uses them without reducing anybody else’s benefit and it is very hard to exclude people who have not paid for them from using the service. This so called ‘free-rider problem’ makes very difficult for private companies to provide public goods and they tend to be supported by the government instead.

Property rights

Clean water and fish stocks are ‘commons’, ie they are not owned by anyone. If access is not regulated or limited, these resources tend to be over-exploited in the so-called ‘tragedy of the commons’.

Information failures and merit goods

People do not have perfect information about all the production and consumption options available to them. Information about new buyers and markets, and how to access them, is hard to find for all businesses, especially small ones. And even when we know things are good for us, like advice, training and investment in new skills, we do not value these ‘merit goods’ as much as we should. If the government does not intervene, we tend to invest less to enhance our capacity than is beneficial for society.

“Interventions need to avoid creating distortions that would be worse than doing nothing.”

Knowledge spill overs

Knowledge acquired by an innovative farmer spills over into the wider farming community, benefiting everyone. Because benefits leak into the whole industry, reducing the innovator's advantage, industry investment is hindered. There is an in-built preference to follow rather than lead to avoid the upfront cost of innovation and risk of failure. When this behaviour is replicated across a sector, it becomes a barrier to investment in new practice like agri-tech. This is why innovation and research and development are supported with patents and grants.¹⁸

Addressing market failures

The ability to address market failures in environmental goods and services is further complicated by the fact that many of them are affected by a number of failures at the same time. Ecosystems like soil deliver multiple benefits, some of which can be considered private, like the fertility benefits and land value which accrue to the farmer and landowner. However, soil also has climate regulating and biodiversity benefits which we all benefit from, but which the farmer is not rewarded for.

Market failures can be addressed through a range of interventions such as regulation, tax, subsidies, advice or government provision. Government intervention is not without its problems, as has been shown with the direct payment component of the CAP. Interventions need to avoid creating distortions that would be worse than doing nothing. To avoid a worse outcome than the market failure itself, any intervention must be well targeted and well run, and continually evaluated to ensure it is generating benefits which outweigh the costs.

A critique of CAP

Even the most ardent supporters of the EU would struggle to argue that the CAP is a well designed and effective intervention. The prospect of replacing it with something better is undeniably a good thing. The UK has been part of the CAP since 1973 and a system very like it is likely to be in place in some form in the UK post-Brexit, as part of an extended transition until 2022 to give stability and certainty to farmers. It is, therefore, still helpful to be familiar with what it is and what it does.

The UK currently receives 70-80 per cent of the payments it gets back from the EU in the form of CAP payments and, in 2015, these were worth £3.1 billion to UK farmers.

The CAP is extremely complex, with a wide range of measures encompassed in its two pillars (see below).¹⁹ The vast bulk of expenditure (91 per cent) is termed Pillar 1 and consists of direct payments to farmers. Most of the payment is based on the area of land 'available' for agricultural production. Other payments are focused on specific groups, such as young farmers or smallholdings, and some are conditional on environmental management.

The other category of expenditure, Pillar 2, supports rural development (nine per cent) and, with co-funding from national governments, it provides payment for managing the environment through agri-environment schemes. The rural development component includes programmes that support farming and forestry productivity and the rural economy.

The CAP has been criticised on the basis of its cost which is around 40 per cent of the total EU budget, and for the distortions it creates in agricultural markets in the EU and overseas. As well as this it is criticised for, effectively, redistributing money from low income urban households to more affluent large landowners.²⁰ The other important area of complaint is the failure to address environmental damage associated with farming. The standards for 'greening payments' and 'cross compliance', which have tried to introduce a link between payments and the adoption of certain environmentally beneficial farming practices, have been criticised for being set too low and having an enforcement regime too weak to deliver the benefits intended.²¹

Agri-environment schemes have been the most successful element of the CAP in delivering environmental benefits. However, they have tended to focus on environmental outcomes delivered separately from or alongside production rather than in the course of it. Producing food whilst reducing emissions, pollution and resource intensity is an increasingly pressing challenge that any new agriculture support scheme must now address as well.

The main policy measures under the Common Agriculture Policy

	Purpose	Environmental requirements	UK budget ²²
Pillar 1			
A number of compulsory elements and some voluntary ones, which can be implemented at the discretion of the member state.			
Compulsory:		The greening payment sets three conditions:	€25.1 billion 2014 -20 (91 per cent)
The Basic or Single Area Payment Scheme	Continuation of historic income support	1. the retention and protection of permanent grassland so that it makes up no less than five per cent of all agricultural land	
Greening direct payment (up to 30 per cent deduction to the basic payment if conditions not met)	Support for permanent grassland, ecological focus areas and crop diversification	2. diversity of crops on holding over ten hectares, the so-called 'three crop rule'	
Young farmers scheme	Support for young farmers in their first years of business	3. ecological focus area to provide habitat for species in decline.	
Voluntary:			
The redistributive payment	Support for small and medium-sized farms		
Areas with natural constraint	Support for farmers in disadvantaged or mountainous areas		
Limited coupled support	Support for potentially vulnerable sectors identified by the member state		
Small farmers scheme	To simplify payments to small farmers		

	Purpose	Environmental requirements	UK budget ²²
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Pillar 2

The Rural Development Programme (RDP), covering a wide range of support, with at least 30 per cent of the budget reserved for voluntary measures that are “beneficial for the environment and climate change.”²³

Programme priorities are set at national level. The England RDP has three areas of support (see right).	Managing the environment	Agri-environment schemes include:	€2.6 billion 2014 - 20 (nine per cent)
	Increasing farming and forestry productivity	Entry level, higher level or countryside stewardship which aim to achieve environmental benefits. They compensate farmers for environmental delivery based their income forgone and costs incurred.	
	Growing the rural economy		

Cross compliance

CAP recipients are required to meet statutory management requirements (SMRs) and maintain good agricultural and environmental conditions (GAEC). SMRs relate to animal and plant health and welfare and GAECs to soil structure, organic matter and erosion issues. Some cross compliance standards are minimum legal standards already required by European and national legislation, others are requirements of funding.

Making the shift to sustainable food production

The CAP has not supported a shift to sustainable food production and, by allowing loss making farm businesses to continue, it has reduced the impetus for change. The new UK support scheme proposed will rightly be focused on the delivery of environmental benefits from land management. However, as currently proposed, it risks overlooking the potential of sustainable food production to contribute to environmental delivery and the turnaround in the economic performance of the farming industry.

We have shown there are environmental and economic benefits to changing the approach to food production, and that a shift to sustainable farming practices will be necessary to maximise the delivery of public goods overall. If farming is to survive and thrive in the UK a new scheme needs to:

- **Support the take up of sustainable farming practices:** To encourage the farming industry to build its capacity to adopt new practices that impose less cost on the wider environment and keep soils in a condition to support food production into the future.
- **Encourage profitable farm businesses:** So the farming industry can attract new entrants and retain good business managers with the skills to run diversified businesses, based on high environmental standards, which deliver both environmental public goods and food. Support should not prop up uncommercial or unsustainable production.

Supporting sustainable farming practice

How is farming performing environmentally?

In 2001, a major study attempted to weigh up the environmental impacts associated with UK agriculture.²⁴ It found that agriculture generates positive externalities relating to landscape and aesthetic value, water supply, nutrient fixation, soil formation, biodiversity, flood control and carbon sequestration. The public benefits of these in the UK could amount to £20-60 per hectare of agricultural land, or around £0.2-0.6 billion. However, the negative externalities affecting the environment (water and air pollution, soil degradation, biodiversity and landscape losses) and human health (pesticides, nitrates, micro-organisms and disease agents) outweighed the benefits by a large margin. The costs associated with these were thought to amount to over £200 per hectare of agricultural land, or around £2.3 billion, putting the net cost of UK agriculture to society at between £1.6 and £2.1 billion.

In the UK, around ten per cent of all greenhouse gas emissions come from agriculture although it accounts for only 0.7 per cent of GDP.^{25,26} Agriculture's share of GDP has halved since 1990, but the sector's share of UK emissions has increased during a period when most other sectors of the economy have been reducing their emission levels. Consequently, the relative intensity of greenhouse gas emissions from agriculture has risen significantly. The Committee on Climate Change's analysis of the UK's carbon budgets shows it is likely to miss its target for a 4.5MtCO₂e reduction from agriculture in 2022 and Defra has no plans that will address the widening policy gap to 2030.²⁷

The number of farmland birds declined by around a quarter between 1990 and 2012 across the EU, but the decline was greater in the UK, at around a third, over a similar period.²⁸ More generally, there has been deterioration in other environmental indicators, such as numbers of butterflies and water quality, also linked to agriculture.²⁹ The conservation status of all agricultural grassland habitats in the UK was judged to be "unfavourable", which was the worst reported record in the EU.³⁰

In 2007 the European Commission failed to get support for a directive providing a similar protection for soil as exists for air and water quality. The CAP's requirements on soil quality have had little effect and land management practices which degrade soils are widespread. Up to 2.2 million tonnes of topsoil are being lost in the UK each year.³¹ In the East Anglian Fens, there is an annual soil loss of 10-21mm.³² This is not only environmentally damaging but commercially threatening, potentially reducing the future of arable farming in the Fens to as little as 25 more harvests.³³

There is also considerable good practice amongst farmers, the food and drink industry and retailers, but it is not sufficient to change the overall picture of an industry not yet working in harmony with nature. The UK has considerable expertise in both agri-technologies, agronomics, soil science and environmental management. If the farming industry maintains and builds on the UK's existing environmental standards – which, although high in global terms, are clearly not high enough to reverse natural decline – it has the potential to turn these trends around.

“In the UK, around ten per cent of all greenhouse gas emissions come from agriculture.”

How a new scheme can support sustainable farm practice

Support for the shift to more sustainable farming practices would be part of a scheme rewarding farmers for delivering public goods from land that is in production, land given over to hedgerows, riverbanks and ponds alongside productive land, and larger areas completely set aside for nature. The first thing any scheme like this requires is a working regulatory and enforcement regime that is periodically reviewed to raise legal standards as better environmental practice becomes mainstream.

As we have already discussed, because externalities mean the price of food does not reflect the full environmental costs, intervention is needed to shift towards new, more environmentally friendly farming practices. Payments for good practice, ie environmental delivery beyond an agreed reference level, would encourage farmers to go beyond minimum standards.

Under a new support scheme, farmers would be able to identify the environmental improvements they can make, including changing what they produce and how it is produced, as well as where they could provide public goods alongside production. Farmers would be encouraged to choose the changes that also had diversification and profitability benefits for their wider business.

Environmental improvement options could be based on an independent audit identifying changes to farm practices that would deliver the most beneficial outcomes for each farm. Outcomes would be assessed against national criteria and regional priorities. As such, reducing winter maize production in the south west, or reducing sheep stocking levels upland of flood prone catchments could be prioritised if they were considered to be good for environmental management of the local area. Engagement in a scheme that improved the environmental standards of food production beyond the reference level could be further encouraged by setting participation as the qualifying requirement for agricultural tax reliefs.

To shift to truly sustainable food production, pioneering businesses need to be supported. More ambitious and innovative environmental practice could be accessed on the basis of a qualifying business plan and supported via co-investment or match funding. The government's consultation paper's proposals to support more research and development are helpful but it should be accompanied by backing for early adopters. Their experience, knowledge, skills and new practices will filter through to the wider farming sector.

This scheme would sit within an overall support scheme paying for public goods. WCL's proposals have both comprehensive and targeted elements and RISE's idea is to support agri-environment and climate type measures accessible to most farmers as well as higher level environmental payment for more significant green investment. Both proposals set out a mechanism that could support public benefits arising from a shift to more sustainable food production.

Encouraging profitable farm businesses

How is farming performing economically?

Agriculture is declining in importance when compared with other sectors of the UK economy. Value added in agriculture has fallen from 1.5 per cent of UK GDP in 1995 to 0.7 per cent in 2013.³⁴ Labour productivity, the value added per person employed, is also significantly lower in agriculture than in the rest of the economy. Productivity gains have also been slower than in the rest of the economy in recent years, widening the productivity gap. In 1990, farm labour productivity was about 16 per cent lower than the rest of the economy. By 2013 it was 43 per cent lower.³⁵ In terms of jobs, agriculture accounts for around 1.2 per cent of total employment in the UK, down from 1.7 per cent in 1995.³⁶

Economic indicators for agriculture in the UK, 1995 and 2013³⁷

	1995	2013
Share of GDP	1.5%	0.7%
Labour productivity relative to the rest of the economy	-16%	-43%
Share of labour income	0.7%	0.6%
Share of total employment	1.7%	1.2%
Income from farming	£7.4 billion	£5.5 billion

As these figures show, overall, UK farming is struggling. It is beset by low farm incomes and is failing to attract new entrants. Even considered from a narrow perspective of the business, dominant farming practices are suboptimal for farmers, sometimes, as in the case of soil degradation in the Fens, undermining their ability to operate as going concerns.

One of the many negative consequences of the CAP, and one of the most difficult to unpick, is its effect on the commercial culture of farming. It is hard to say what the impact would have been without subsidies, but it has allowed farmers to focus on maximising production rather than profit margins. In an agricultural context, productivity tends to focus on the quantity of output per hectare or per animal or per unit input. However, productivity in a wider economic sense has a value as well as a volume component.

Analysis of farm business income in England shows between 40-60 per cent of farms, across all sectors – including cereals, dairy, grazing livestock, pigs, poultry and horticulture – make less than £25,000 a year even after allowing for direct payments. Farms are diversified businesses, 64 per cent of them already generate income from direct sales of produce, agri-environment schemes, tourism, letting property and generating energy. In the case of grazing livestock, this is offsetting losses from the agricultural side of the business.³⁸

OECD country comparisons show that, between 2004 and 2009, England's average ratio of farm outputs to inputs was lower than those of Italy, Germany, Denmark and the Netherlands.³⁹ Although the UK has some of the most productive farms in the world, others only survive because of subsidies. The CAP supports these low and high productivity farmers equally and prevents uncommercial producers leaving the industry to make way for new entrants. This problem is exacerbated by delayed retirement and lack of succession planning, resulting in too few farms being available to attract a new generation of young, entrepreneurial farmers.⁴⁰

“The UK’s new scheme should encourage and enable environmental reporting as a route to demonstrate high environmental standards and differentiate the quality of British produce in the market.”

How a new scheme can encourage profitable farm businesses

It is time to ask some very big questions about what can be produced sustainably and profitably in the UK. With a relatively expensive cost base and a constrained geography, it is unlikely the UK’s farming future lies in global commodity production. The UK has around 200 thousand farmers and an average farm size of about 80 hectares, whereas the US has two million farmers and an average farm size of 180 hectares.^{41,42} If the UK attempted to compete on the same terms, pressure would increase for large areas of monocrop production or livestock to be kept permanently in sheds. Both would have major implications for our physical and social geography and be incompatible with protecting and enhancing the environment and the animal welfare standards set out in the government’s consultation paper.

The UK is cost competitive in some crops like barley but, for most products, other routes to competitiveness will have to be found. Increasing the profit margin from UK food production through differentiation and building markets based on environmental and animal welfare standards, quality, reliability and the unique characteristics of British or regional products is one obvious route.

UK horticulture is a good, profitable business model. Fruit, vegetable and flower production represents three per cent of UK farming but is responsible for 20 per cent of the value. It is unusual in receiving some of its financial support from the CAP in the form of match funding for innovation and technology development. This has encouraged long term investment planning for businesses, reduced reliance on low cost labour and encouraged producer co-operation in marketing, packaging and selling to increase profit margins. To get similar benefits across the farming sector, match funding sustainable innovation should form part of the UK’s new support scheme.

Schemes like Red Tractor and LEAF also show the benefit of independent advice and assurance which have been the foundations of stronger supply chain relationships and a way to access better prices than available in commodity markets. They also provide systems to support improved traceability and environmental management increasingly required by the food sector. The UK’s new scheme should encourage and enable environmental reporting as a route to demonstrate high environmental standards and differentiate the quality of British produce in the market.

This data would also underpin the development of private markets for environmental goods and services from farmland, enabling water companies, infrastructure operators or corporate off-setters to purchase improvements to water quality, flood risk protection or carbon sequestration in ways that are cost effective and verifiable.

Business advice, regulation that encourages environmental monitoring and reporting, and match funding for sustainable innovation should all form part of the UK new support scheme. All of this needs to be accompanied by a long term framework for government support and a trade policy that maintains high standards for production and consumption. There are opportunities for farmers to redesign their businesses to deliver more public goods, supported by government, the food supply chain, and other purchasers of public goods. But farmers will not be able to take them if they have to compete in their own market with lower standards of production.

Conclusion

The significant sums of public money invested in agriculture under the current CAP system do not support a farming system that performs well economically or environmentally. However, there is a case for state support for a shift for sustainable food production as part of a wider scheme focused on the delivery of environmental public goods.

The UK's funding regime should encourage profitable farming businesses based on high standards, which provide food at lower environmental cost to society whilst also providing wider ecosystem services, such as habitats, biodiversity, carbon sequestration, landscape and climate change resilience.

Two important factors will ensure that this new scheme can deliver. First, the transition process to a new scheme should not take UK farming two steps backwards before moving forwards. Removing cross compliance standards, which ensure basic animal welfare and soil quality, as has been proposed, sends the wrong signal about the type of farming the government wants to encourage and support.

Until a new agriculture support scheme is in place, agriculture in the UK will still be supported with direct payments. The danger is that, in a transition period without cross compliance's requirement to demonstrate even a minimal level of environment management, good farms will be undercut by those which do not comply, leading to a deterioration in animal welfare and environmental standards.

The second factor is that government proposals must set out a pathway for continuous environmental improvements in farming practice. The UK's new agricultural support scheme is in danger of overlooking the public benefits of higher environmental standard farming and allowing increased specialisation, intensification and unsustainable methods of production. This risk will be heightened if farmers have to compete with other countries with lower environmental standards.

The new farm support scheme should be designed to help UK farmers meet the challenge of sustainable food production in a way that also mitigates climate change and contributes to the enhancement of the natural environment. To achieve this it should:

- Ensure no there is no gap between existing cross compliance and greening requirements and a new and improved environmental reporting system.
- Reward the environmental benefits that result from sustainable food production.
- Encourage innovative and entrepreneurial farmers to build businesses around sustainable food production.
- Support sustainable farming by setting consistent standards for UK food production and consumption.

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Green Alliance

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