

## After CAP: Lessons for a post-Brexit Britain from agricultural support models around the world

There has been much debate about possible future models for agricultural support in the UK. Farming Minister George Eustice has specifically mentioned three different systems as possible models: A light touch, market oriented approach, as exemplified by New Zealand and Australia; A grant-focused, 'sector protection' approach, seen in the Swiss and Norwegian systems; and a risk-based system predicated on crop insurance, as used across North America. Friends of the Earth has explored these three options to inform further debate:

- **New Zealand – market orientation led to intensification to the detriment of water and soils:** The removal of subsidies was followed by an initial decrease in unsustainable use of fertiliser and pesticides, but this appeared to be correlated primarily to a lack of funds to afford to invest in these inputs rather than a change in mindset. Once the initial economic hit had passed, the primary concern of increasing profitability led to a return to – and a growth in – the use of environmentally damaging inputs, alongside an increase in average farm size, intensification of methods, and a threefold growth in dairy production. To support ongoing profitability, the development of strong environmental regulations was sacrificed, and subsidy removal destroyed a key lever for government to influence farmer behaviour for the better. The overall impact has been dramatic increases in water pollution, climate-changing emissions and soil erosion.
- **The USA - agricultural insurance led to risk taking with the environment:** The key impact of this model was to encourage risk taking amongst farmers anxious to develop maximum yield possibility - in the knowledge that they would be financially compensated for any unsuccessful risks taken to achieve this. As with the NZ system, the US sacrificed environmental regulation to encourage high volume production, while insurance was structured to maximise potential profits by focusing on cash crops. This led to increases in the cultivation of unsuitable and marginal land, a focus on monoculture production and high fertiliser use which have combined to damage soils, destroy biodiversity and increase emissions.
- **Switzerland – a complex and stagnated approach to environmental subsidies led to loss of momentum in pollution reduction:** The use of payments to influence behaviour in order to protect the social and economic benefits associated with farming while also improving environmental outcomes was initially successful. However, the attempt to combine a productionist imperative focusing on food security with a desire for environmental stewardship led to a somewhat polarised system fraught with unintended interactions between protections and subsidy, and unforeseen reactions from the farming sector. As farmers moved to take advantage of financial support to work on unproductive land and to intensify in more productive areas, legislation and innovation stagnated. Environmental issues therefore increasingly 'fell through the gaps' in this complex system, leading to increasing concerns around nitrate pollution and a lack of progress in reducing Ammonia and other pollutants.

This summary offers a guide to the key features and environmental impacts of each system, along with lessons for the UK on the possible adaptability of these models to the post-Brexit British context.

### Lessons from the New Zealand market-oriented approach to farm support

As generally understood, under a market-oriented approach UK farmers would see the removal of agricultural subsidies and trade barriers, alongside a focus on increasing production and export opportunities in order to ensure that the sector remained profitable. This is seen by some as offering an opportunity to cut requirements for public funding, improve access to cheap food from new import markets, and increase the contribution of UK farming to GDP through improving access to global markets.

However, the transition to a market oriented approach would not be economically or environmentally painless. In the short-term, if the UK adopted a similar approach to New Zealand, we could expect to see some farmers leave the sector and others consolidate and intensify to remain competitive. In the longer term, this could lead to similar consequences to those currently suffered in New Zealand – namely increased specialisation based on global trade prospects rather than domestic food needs (which has, in NZ, led to dramatic increases in dairy production at the expense of arable farming), increases in agricultural emissions and damage to soils and watercourses due to compaction, pollution and fertiliser run-off.

Any attempt to mimic the ‘success’ of the NZ model would also be hampered by marked differences in the legislative framework, land use, population and economic requirements between the UK and NZ. Higher land availability, more versatile soils and the NZ climate – alongside lower animal welfare regulations and ‘light touch’, regionally interpreted environmental protections - mean that livestock can be produced with far fewer inputs, saving on costs and fulfilling a national need for foreign currency via export relationships.

### Headline environmental outcomes from the NZ model:

- High levels of water and soil pollution:
  - Nitrous oxide emissions from agriculture increased by 27% between 1986 and 2002, and Nitrogen leaching from agricultural soils increased 29% from 1990 to 2012<sup>1</sup>.
  - Despite an initial dip, fertiliser use increased by 113% between 1986 and 2002
  - Overgrazing has damaged soil quality, increasing runoff and contributing to pollution of watercourses. More than 75 percent of soils under dairying are badly affected by compaction<sup>2</sup>.
  - According to the National Institute of Water and Atmospheric Research, 90% of lowland rivers are polluted by farming, either with animal effluent, or fertiliser run-off. The Parliamentary Commissioner for the Environment has named nutrient run-off from dairy farms as a major contributor to poor water quality<sup>3</sup>.
- Loss of biodiverse land:
  - Biodiversity has decreased, leading to pollinator decline<sup>4</sup>The rate of conversion of indigenous grassland to exotic pasture (i.e. former grassland sown with non-indigenous species or managed as ‘improved pastures’) in the South Island increased by 67% from the period between 1990–2001 to 2001–2008<sup>5</sup>
  - In 2009, Greenpeace reported that over 25% of the nation’s plantation was at risk of deforestation due to demand for additional dairy land<sup>6</sup>
  - New Zealand's species extinction rate is among the highest in the world. More than half of amphibians and about a third of mammals, birds, fish and reptiles are threatened<sup>7</sup>.

### Lessons from the Swiss ‘sector protection’ approach

Moving to a system that looks to protect the farming sector and environment through a programme of government payments would seem to offer the least disruptive option for UK agriculture. With the CAP as a basis, such a system would be familiar to farmers and yet could be delivered in a far more progressive manner by moving away from payments for land ownership and towards payment for environmental goods.

However, the Swiss experience demonstrates that such an approach is not without its pitfalls. Early efforts to integrate sustainability into the core funding programme may have stifled ongoing improvement of environmental enhancement schemes, supported the continuation of counterproductive production incentives and developed a complacency which has worked to dissuade innovation around both cross compliance mechanisms and farming techniques. If the UK were to adopt the Swiss system as it stands, immediate action would need to be taken to implement and improve upon the most progressive of current environmental approaches, and a clear process for reviewing and updating standards would need to be immediately put in place to prevent future stagnation.

The Swiss approach offers some degree of autonomy to individual provinces on required action while offering national policy direction and funding. This, alongside the Swiss focus on developing specific schemes relevant to

<sup>1</sup> [http://www.mfe.govt.nz/sites/default/files/media/Environmental%20reporting/our-fresh-water-2017\\_1.pdf](http://www.mfe.govt.nz/sites/default/files/media/Environmental%20reporting/our-fresh-water-2017_1.pdf)

<sup>2</sup> <http://www.radionz.co.nz/news/national/287590/farming-damaging-environment-report>

<sup>3</sup> <http://rivers.greens.org.nz/more-info>

<sup>4</sup> [NRC, 2007](#)

<sup>5</sup> [Weeks et al, 2012](#)

<sup>6</sup> <http://www.greenpeace.org/new-zealand/Global/new-zealand/report/2009/6/new-zealand-farming-and-climat.pdf>

<sup>7</sup> <http://www.stuff.co.nz/environment/90613205/Farming-emissions-and-waste-putting-NZs-green-reputation-at-risk-OECD-says>

farmers operating on use of upland and mountainous areas and low quality arable land, could offer a template for a UK increasingly aware of the importance of devolved decision-making and the diverging needs of different producers.

However, where the Swiss system currently offers major benefits (for example, around animal welfare), these are underpinned by national legislation. Major drawbacks (currently particularly relating to nitrate pollution) are inextricably linked with the interplay between different elements of a complex and fragmented system of payments leading to often unintended consequences, against a background of weak and often outdated (by EU standards) national environmental legislation. Hence for a UK system of payment for 'public good' to be successful, such 'goods' would need to be defined and protected by the legislative system, regularly updated in line with best practice and supported by the simplest available funding structure to ensure success.

### Headline environmental outcomes from the Swiss model:

- Support for overall emissions reduction:
  - Between 1990 and 2015, overall Swiss GHG emissions decreased by 10%. Agricultural greenhouse gas emissions dropped by 7.3%, mainly due to reduced stocks of cattle and higher production efficiency<sup>8</sup>.
- Stagnation in progress around pollution reduction:
  - Nitrogen levels continue to be significantly affected by agricultural inputs. While the amount of nitrogen entering agricultural soils decreased from almost 300,000 tonnes in 1990 to just over 250,000 tonnes in 2000, in the 14 years since it has remained at around 250,000 tonnes. Efforts to increase nitrogen fixing through crop growing have also decreased in efficacy since 2000<sup>9</sup>, leaving an average 95,000 tonne/year nitrogen surplus.
  - In 2011, active substances contained in pesticides exceeded WPO levels in 2% of groundwater measuring stations. Levels were particularly elevated in agricultural areas<sup>10</sup>.
  - While ammonia levels decreased slightly between 1990 and 2000, the decline has stagnated since the turn of the century. Between 2000 and 2015 Ammonia levels have varied between just under 3 ug/m<sup>3</sup> and just under 4 ug/m<sup>3</sup><sup>11</sup>, despite efforts to cut emissions.
  - Levels of phosphorous entering agricultural soils decreased from 45,000 tonnes (1990) to just over 30,000 tonnes in 2000. Reductions since this point have been disappointing, with average annual rates of around 38,000 tonnes<sup>12</sup>.
- Impacts on animals and biodiversity:
  - Pesticides are linked to a 40% decline in high-risk bird populations between 1990 and 2015<sup>13</sup>.
  - While animal welfare rules are otherwise strong, livestock density is the 3<sup>rd</sup> highest in Europe and production of poultry, equids and small ruminants has increased substantially since 1990<sup>14</sup>.

### Lessons from the USA 'Insurance focused' approach

The US model appears very attractive on the surface as it suggests that ongoing payments to farmers would be shifted to a model offering financial support only in times of need. By removing direct subsidies, it is argued, the US has also freed farmers from state bureaucracy and allow them to adopt more productive and profitable techniques.

However, moving to such a model would directly remove many of the UK government's current opportunities to support sustainable farming practices through the provision of financial incentives, and in some cases could encourage deregulation. Current US laws around animal welfare, pollution and food safety are significantly weaker

<sup>8</sup> <https://www.agroscope.admin.ch/agroscope/en/home/topics/environment-resources/climate-air-quality/carbon-sources-and-sinks-in-agricultural-soils/swiss-national-greenhouse-gas-inventory-agriculture.html>

<sup>9</sup> [Environment Pocket Statistics 2016, p21](#)

<sup>10</sup> [Environment Pocket Statistics 2016, p30](#)

<sup>11</sup> [Ammoniak-Immissionsmessungen in der Schweiz 2000 bis 2015 Messbericht](#)

<sup>12</sup> [Environment Pocket Statistics 2016, p22](#)

<sup>13</sup> <https://www.bfs.admin.ch/bfs/de/home/statistiken/raum-umwelt.assetdetail.530993.html>

<sup>14</sup>

[https://www.hafl.bfh.ch/fileadmin/docs/Forschung\\_Dienstleistungen/Agrarwissenschaften/Nachhaltigkeitsbeurteilung/DUE\\_Art\\_EMILI\\_fulltextT.Kupper.pdf](https://www.hafl.bfh.ch/fileadmin/docs/Forschung_Dienstleistungen/Agrarwissenschaften/Nachhaltigkeitsbeurteilung/DUE_Art_EMILI_fulltextT.Kupper.pdf)

in the US than the UK, mitigating against perceived risks to the economy and food security through a compensatory, rather than a precautionary, framework. The US experience suggests that moving to a farm insurance offer would also fail to deliver the savings we might anticipate, as significant funding is required to subsidise premiums and support payouts, in addition to investment in structuring and administering insurance schemes.

By transferring responsibility for risk management to individual farmers, insurance models mitigate against the use of legislation to guide or circumscribe action, and encourage risk taking behaviour. Offering a financial safety net tied to potential profit on specific crops, has encouraged farmers to increase the potential value of their harvest by investing heavily in chemicals to maximise the potential of monoculture focused farms. It has also promoted risk taking behaviour - including the cultivation of poor quality or marginal land – by farmers aware that they are eligible for compensation should these practices fail. The US system relies on managing financial risk for farmers, but does not factor in the environmental risks posed by farming practice.

More recently, some areas in the US have seen success with additional financial incentives for the adoption of sustainable techniques including organic production methods, the planting of cover crops and use of no-till or strip-till techniques. However these incentives represent only a minor part of the wider system, and their introduction is too recent to draw firm conclusions around positive impact.

#### **Headline environmental outcomes from the US model:**

- Incentivising the planting of marginal and environmentally sensitive lands to maximise profit
  - Between 2008 and 2012 at least 2,500 wetland acres were converted to cropland in 13 of the top 35 disaster payment counties. Thirteen counties out of the top 35 had at least 2,500 acres of highly erodible land converted to cropland<sup>15</sup>.
- Higher applications of fertilisers and pesticides
  - One 1993 study found higher rates of fertiliser and pesticide use on farms that had greater participation in crop insurance schemes,<sup>16</sup> while by 1998 Hennessy concluded that ending FCIP would reduce nitrogen fertiliser use by 7-10%<sup>17</sup>.
  - Currently, 5.6 million tonnes of nitrogen is applied to corn crops alone each year, contributing to water pollution and ecosystem destruction<sup>18</sup>.
  - Greenhouse gas emissions from agriculture have increased by approximately 8% since 1990<sup>19</sup>.
- Increased levels of monocultures when only one specific crop is insured
  - By 2014, 35% of subsidies (\$2,841 million) were directed towards growth of feed grain – thus offering an indirect subsidy to livestock producers and supporting the growth of intensive, environmentally damaging feedlot systems.
  - Between 2006 and 2011, the amount of cropland devoted to growing corn in America increased by more than 13 million acres. It now uses more land than any other crop – 97 million acres – and 5.6 cubic miles of irrigation water<sup>20</sup>.
  - 1.3 million acres of grassland and prairie were converted to corn and other uses in the western Corn Belt between 2006 and 2011, presenting a threat to the waterways, wetlands and species.<sup>21</sup>

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<sup>15</sup> <http://www.ewg.org/research/crop-insurance/environmental-consequences>

<sup>16</sup> Horowitz J. and Lichtenburg E, 'Insurance, moral hazard, and chemical use in agriculture', American Journal of Agricultural Economics, vol.75(4), 1993

<sup>17</sup> Hennessy, D., 'The production effects of agricultural income support policies under uncertainty', American Journal of Agricultural Economics vol.80(1): 1998

<sup>18</sup> <https://www.scientificamerican.com/article/time-to-rethink-corn/>

<sup>19</sup> <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#colorbox-hidden>

<sup>20</sup> <https://www.scientificamerican.com/article/time-to-rethink-corn/>

<sup>21</sup> <https://www.scientificamerican.com/article/time-to-rethink-corn/>