

Some implications of Brexit for UK agricultural environmental policy¹

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Summary

Brexit would pose challenges to the existing provision of agricultural and environmental goods from farmland. Existing trade agreements would need to be renegotiated, the outcomes of which would determine what and how crops and farm animals are grown and managed. Agriculture would have little claim to the Brexit “dividend”. And given UK Treasury and Defra support for open markets and the transfer of direct payments to agri-environment schemes (AEs), it may struggle to retain its current level of support. Exposed to open trade, UK farmers would lobby strongly for the removal of cost increasing regulations to allow them to compete on a level playing field with producers in countries which have lower environmental and animal welfare standards. Cross compliance would most likely remain in some form, perhaps reverting to Codes of Practice, but the unpopular “greening measures” would most likely go. The future of AES would depend principally on the size of its budgetary, and on future farm profitability. Should farm profitability fall, Payment for Ecosystem Services (PES) may well become preferred by to AES, because PES compensatory payments are not constrained by World Trade Organisation rules. However, PES agreements are not suitable in every circumstance. Falling farm profitability should reduce farmland value, and might lead to land abandonment in marginal areas. This would create opportunities for innovative environmental schemes, such as natural or managed rewilding. Financially buoyant conservation trusts would have opportunities to add to their already substantial owned conservation land reserve.

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1. Introduction

The UK referendum on 23th June will decide if the UK remains a member of the EU. A decision to leave the EU will have far reaching consequences for UK agriculture because all the trade agreements negotiated with and by the EU will need to be renegotiated. And because agriculture is the single largest recipient of EU spending, through Pillar I direct payments to farmers, and Pillar II rural development, which funds each devolved territories' agri-environment schemes (AES).

The impacts of Brexit on the environmental management of farmland is considered in two Section. Section 1 briefly reviews key trade and budgetary issues, and establishes the current dependency of UK agriculture on the Common Agricultural Policy (CAP) subsidy payments. Section 2 considers the future of the environmental conditionality attached to Pillar I Basic Payment Scheme (BPS) "direct" payments: namely, cross compliance and "greening measures", and the future of AES payments - which are made from the Pillar II budget. It considers the impact of Brexit on the compensatory payments made to participants of AES to assess the potential benefits of Payment for Ecosystem Services (PES) agreements, which may be particularly attractive should Brexit result in lower farm profitability.

2. Section 1: Impact of trade and financial flows on farm production systems and standards

2.1 Brexit and trade

Much has already been written and discussed about the possible impacts of the twin issues of trade relationships and budgetary consequences following the decision to exit the EU on the UK economy (House of Commons (2013); Rickard, (2016)). But these issues are also central concerns for the future of land based environmental payments, a topic that has received little scrutiny.

Should the UK vote to leave the EU, it would fall out of the EU's bilateral trade agreements with more than 50 countries around the world (Buckwell 2016: p 29). Article 50 of the Treaty of the European Union allows two years to negotiate new trading relationship. The Treaty itself is silent on the nature of these future relationships. The complexity of these negotiations will bring with it corresponding uncertainty that is likely to have at least a short-term detrimental impact on agri-food investment because the EU is the UK's largest single market for farm products. But it is, in turn, a large market for EU products. Although the UK runs a trade deficit in agricultural products with the EU, and although the UK is a large market for EU products, it accounts for a smaller share of total EU exports than the EU does for total UK exports. In proportional terms therefore the EU market is more important for the UK than the UK is for the EU.

The EU is a Customs Union. As such it applies a common external tariff (and non-tariff barriers) on each imported commodity by “tariff line”, regardless of where the good originates or where it is landed, though considerable tonnages of some commodities are exempt from tariffs under preferential access agreements (the “within tariff quotas” agreed in various negotiations conducted by General Agreement on Tariffs and Trade (GATT) and its successor organisation, the World Trade Organisation). Tariffs are taxes on imports. Matthews (2015) presents a table summarising the 2,067 tariff lines, the simple (i.e. unweighted) average of which is 14.8% (ranging from 0 to 197%). Should the UK exit and be unable to negotiate preferential trading terms, UK agriculture will no longer be sheltered by these import taxes, and all its exports into the EU will be subject to these tariffs. The trade negotiations will therefore affect the markets into which UK produce is sold, resulting in new trade routes being created and existing ones being diverted. The net effect of these changes is difficult to estimate, but the eventual renegotiated trade agreements will determine not only what farmers produce but how they produce it (Rickard, 2016). That is, they would directly affect how land is managed.

There are several alternative trading positions the UK may aim to establish through negotiations (House of Commons, 2013; Buckwell 2016). But should the UK be unable to secure acceptable agreements, as an independent member of the World Trade Organisation it would fall back to the World Trade Organisation Most Favourable Nation terms. In 2014 the average Most Favourable Nation tariff on dairy imports into the EU was 36%. Therefore, as a non EU member, UK producers and dairies will need to reduce costs by up to 36% to hold on to their existing markets. However, continuing EU market access would most likely be conditional on adherence to current, and any new, production and animal welfare standards (among others). Thus the UK would gain little benefit but lose its ability to shape these new standards.

As a member of the EU, UK production is regulated by the same directives that apply to all other EU member states. This produces a “level playing field” across member states, so, for example, common animal welfare and food hygiene standards prevent a company undercutting its competitors by reducing standards. Businesses often use the argument that the lack of common standards undermines its international competitiveness to lobby against the introduction of cost increasing regulations. Therefore, unprotected by import tariffs, businesses would place considerable pressures on the UK government and Regional Assemblies to reduce or withdraw cost increasing regulations. Booth *et al.* (2016) estimated that the “100 most expensive EU-derived regulations currently cost the UK economy £33.3bn a year (2014 prices)” (p 87). An estimate which “is not the total cost of EU rules to the UK economy” because many regulations are not subject to impact assessments, impact assessments do not capture costs related to indirect effects, or any

one-off cost (p. 87).² Several environmental directives, for example the Water Framework Directive, the Nitrate Pollution Prevention Regulations, and animal welfare regulations are included on this list.

The EU has “exclusive legal competence” over trade matters (H. M. Government 2014). This means that EU law is superimposed on the law of each member state (FitzGibbon 2016). Brexit would mean the Trade in Endangered Species and Invasive Alien Species Directives would no longer apply to the UK. The problems posed by these threats to wildlife and biodiversity are, like many environmental issues relating to global public goods, best addressed at a multinational, global or continental, scale, rather than by separately by individual nations. Following Brexit, coordinating transboundary collaborative actions involving EU states would become more difficult.

Should the UK exit the EU, the two key environmental directives, the Bird Directive and the Habitat Directive, would also no longer apply to the UK - unless compliance was a requirement for continued access to EU markets. However, these directives have been converted into UK law. And as the UK is a signatory to The Bern Agreement would continue to apply, although EU Directives apply higher standards than the Bern Convention (Baldock *et al.* (2016)). Moreover, Brexit would reduce pressure to comply with these commitments because the EU Commission has powers to impose financial penalties for non-compliance, whereas the Bern Agreement is unenforceable. Brexit would also make it easier for the UK to change national legislation (see Ostrom and Cox (2010) for a general discussion of this issue). For example, it could revise the species on the endangered list, which are currently identified on the basis of European not UK scarcity.

The UK could therefore use the freedom Brexit affords to shape policies to better suit itself. But it would lose its ability to shape EU policy, cross-boundary policy and action coordination would become more difficult, and regulatory oversight loosened. Pressure from UK business to be allowed to compete on a “level playing field” would likely result in the withdrawal of or substantial revisions to many existing environment and animal welfare regulations.

2.2 EU financial flows to the UK and the Brexit “dividend”.

In 2015 the UK contributed £12,918 billion to the EU (net of the rebate). Of this, £4,445 billion was returned in spending commitments, leaving a deficit of £8,473 billion. This so-called Brexit “dividend” has varied from £4,336 billion in 2009 to £10,465 billion in 2013. This raises two questions:

² The list of the top 100 costly regulations is available at:
www.openeurope.org.uk/intelligence/britain-and-the-eu/top-100-eu-rules-cost-britain-33-3bn/

how would Brexit alter the current distribution of the EU budgetary spending across the UK? And how would the Brexit dividend be spent?

The largest share of the total EU budgetary expenditure, about 40%, is paid to the agriculture sector. Table 1 shows the allocation of EU Common Agricultural Policy spending across each devolved territory in the UK between 2014 and 2020. About 75% of the budget has through the CAP's Pillar I Basic Payments Scheme (BPS), and will continue to be, at about £3 billion/year. Table 2 shows the structure of UK expenditure under the CAP between 2010 and 2014 (Buckwell 2016: Table 6, p 32).

Table 1. Total UK CAP allocations for 2014-2020 (approximately, non-inflation adjusted)

	Pillar I (€ millions)	%	Pillar II (€ millions)	%
England	16,421	65.5	1,520	58.9
Northern Ireland	2,299	9.2	227	8.8
Scotland	4,096	16.3	478	18.5
Wales	2,245	8.96	355	13.7
Total UK allocation	25,100		2,600	
These data exclude the transfer of €1,694 billion from Pillar I to Pillar II.				
Downing, E. (2016) EU Referendum: Impact on UK Agriculture Policy. House of Commons Briefing Paper, No. 7602, 26 th May, 2016. www.parliament.uk/commons-library/intranet.parliament.uk/commons-library				

Table 2. Structure of UK expenditure under the CAP, 2010-2014

£ million	2010	2011	2012	2013	2014	%2014
Pillar I total	2,945	2,879	2,678	2,794	2,523	75
<i>Of which</i> Direct payments	2,798	2,805	2,600	2,685	2,313	69
Market support	85	4	46	34	30	1
Pillar II total	785	886	868	916	831	25
<i>Of which</i> Agri-environment	515	534	520	525	503	15
Less favoured areas	138	123	121	93	91	3
UK co-financing contribution	345	318	274	285	208	6
Total UK CAP expenditure	3,730	3,764	3,546	3,710	3,353	100
Exchange rate used (£/€)	0.86	0.87	0.8	0.84	0.78	
(Source: Buckwell (2016): Table 6; p 32)						

Agriculture in the UK 2015 (Defra 2016; Table4.2: p 24) states that UK farmers received £3,334 billion of uncoupled direct and agri-environment subsidy payments in 2013, and provides a provisional estimate for 2014 of £2,933. The per hectare payments farmers receive is related to the type of land they farm, and is presented in Table 3. The direct payments are a significant proportion of the farmers' total income. In 2014/5 the same source stated that half of farmers in England failed to cover their costs of production from market revenue (Defra 2015). Even after all support payments are included in farm revenue, almost 20% of farms in England failed to achieve a positive Farm Business Income (Defra 2015), which is Defra's preferred measure of financial performance, but one that makes no allowance for the farmer and spouse's salaries (Franks 2009). Livestock farmers are particularly dependent on BPS payments for their financial viability.

Table 3 The Basic Payment Scheme payments and additional greening payment paid 2015

Basic Payment Scheme payments, and value of greening component paid in 2015				
	BPS/ha		Greening rates/ha	
	€	£	€	£
Non-SDA (Seriously Disadvantaged Areas)	171.83	125.66	76.19	55.72
Upland SDA	170.60	124.76	75.64	55.31
Upland SDA moorland	45.07	32.96	19.99	14.62
Support payments are set in Euros, the exchange rate used to convert these in to sterling values for 2015 was €1 = £0.73129				
(Source: Defra (2016) https://www.gov.uk/government/news/2015-basic-payment-scheme-entitlement-values-and-national-reserve-confirmed)				

The question arises, how would the UK's national parliaments distribute these subsidy payments should they be released from European control? For example, the Devolved Assemblies would be released from the EU Commission's goal of equalising direct payments/ha across all member states by 2028. Assurances have been provided by both sides of the Brexit debate that payments to farm businesses would continue, but it is unlikely there would be no changes. For example, the £265 million of payments financed directly from the UK's exchequer as co-financing of Pillar II payments would be particularly vulnerable (Table 2).

The UK has for a long time been in the forefront of the campaign to totally phase out direct payments. In 2005 the HM Treasury report *Vision for the Common Agriculture Policy* (2005) argued for the removal of all price supports measures, including export refunds and other production or consumption subsidies (para 1.31; p 16). It described a "sustainable CAP" as supporting Pillar II objectives and it called for a considerable reduction in total spending by the EU on agriculture to bring spending into line with other sectors (p 16). During the most recent reform negotiations, Defra commented that there was "little rationale" for direct payments, because "they are not targeted on any particular market failure, and provide little value for money for the taxpayer",

but that “other forms of public expenditure can usually demonstrate greater benefits than direct payments” (reported in Buckwell, 2016: p 33).

2.3. Summary Section 1

The UK has used its influence as a net financial contributor to the EU to shape the CAP whenever possible towards these long-term goals. Released from EU constraints, therefore, it would likely aggressively pursue an open market, free trade policy, with direct payments phased out, but enhanced agri-environment payments. This would place UK farmers into direct competition with the world's lowest cost producers. Though such a future agricultural policy is likely to find less support among the Scottish and Welsh Devolved Assemblies, and would face fierce resistance from farming lobbies, the transfer of funds from direct payments to AES would be welcomed by many conservationists. A principal concern of all would be how much of the direct payment budget would actually be transferred to the AES budget.

The net impact of a free-trade, reduced support regime on land use is difficult to assess. Farm profitability would certainly fall, resulting in lower land values. There would be considerable pressure on UK governments to withdraw or substantially revise cost increasing legislation, which may adversely affect the reputation of UK food. It is possible that considerable areas of marginal farmland would cease to be cultivated. Lower land prices would offer opportunities for either natural or managed rewilding, perhaps through redesigned AES or by conservation land purchase by conservation organisations. The increase in the use of contracting has already resulted in many farmers reducing and others expanding the area of land they manage, a trend not captured by the Annual Farm Census data on farm size. This trend towards larger farmed units would continue, but through land sales rather than the use of contractors, as indebted farmers liquidate their assets to pay off borrowings. Farms are also likely to become increasingly specialised.

2. Section 2: Impact of Brexit on the environmental management of farm land

2.1. The financing of agri-environment payments

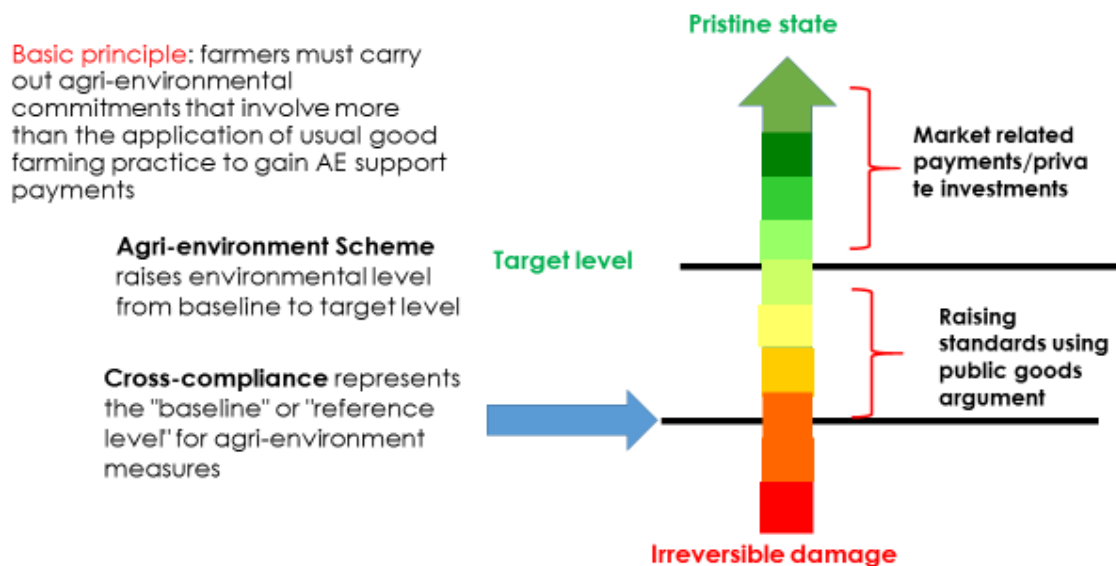
The Basic Payment Scheme (BPS) payments direct payments are financed through the Pillar I budget. Entitlement to these payments is dependent on adherence to cross compliance regulations, with an additional 30% attached to compliance with “greening measures”. Agri-environment schemes are financed through the Pillar II budget, which is co-funded by member states from their own National budget. Table 2 shows the funding available for each Pillar in between 2010 and 2014, Table 4 shows the funds earmarked for Pillar II measures in England between 2014 and 2020. In the UK, some €585 million of Pillar II funding will be sourced from the UK treasury of this time period.

Table 4. Pillar II budget: The Rural Development Programme (RDP) for England, 2014-2020 (€).

Total 2014:2020 budget of €4 056 million	
	€3 471 million from the EU budget including €1 694 million transferred from the UK envelope for CAP direct payments
	€495 million of national co-funding
	€90 million of national funding top-ups
The five biggest RDP measures in budgetary terms (public allocation).	
€2 900 m	allocated for Measure 10: Agri-Environment Climate
€323 m	Productive and non-productive investments
€218 m	Forestry
€174 m	Leader
€107 m	Farm and business development
European Commission (2015) Factsheet on 2014-2020 Rural Development Programme of England (United Kingdom) http://ec.europa.eu/agriculture/rural-development-2014-2020/country-files/uk/factsheet-england_en.pdf	

Greening measures are designed to raise environmental standards above the benchmark set by cross compliance, while agri-environment schemes are designed to deliver a higher “target” level of environmental goods (Figure 1).

Figure 1. Role of agri-environment schemes in raising environmental standards



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(Source: Hart K. et al. (2011): Figure 2.3, from Cooper et al. 2009)

Environmental standards above the “target” level can be provided by a combination of:

- Market related payments, where consumers support higher environment and animal welfare standards directly through the retail price.

- By the work of conservation trusts, such as Royal Society for the Protection of Birds, through for example, private investments.
- By voluntary actions at the farmers own expense, and/or
- By voluntary measures supported by threat of penalties, such as the Voluntary Pesticide Initiative.

If under a new British Agricultural Policy (BAP) farm profitability and therefore farmland values did fall, there may be scope for an increased role for conservation trusts. According to the Lawton Report (2011) there are 3,314 sites covering 185,425 ha managed by voluntary conservation organisations in the UK. The majority of this land is already owned and managed by the National Trust, RSPB, Wildlife Trusts and Woodland Trusts. However, as land owners these organisations currently receive CAP payments. For example, the RSPB "the fourth largest recipient of EU payments, receiving £7 million in 2014, not all for conservation work" (Meek, 2016).

2.2. Pillar 1: Environmental conditionality attached to entitlement to the Basic Payment Scheme Agricultural (non-trade issues) and environmental and climate change policy is a "shared competency" (H M Government 2014: p 47). In these areas EU legislation is not imposed on EU member states, rather each member state introduces regulations that deliver EU Commission's targets. "Shared competency" illustrates the concepts of proportionality and subsidiarity. "The former limits EU intervention into what is necessary to attain the objectives of the treaties all member states have signed and the latter provides that the EU may act only if an individual member state cannot otherwise achieve what it wants in areas outside the EU's exclusive competence" (FitzGibbon 2016; p 40). It must therefore be remembered that should the UK decide, perhaps for domestic reasons, such as protecting the reputation of UK food, to "gold plate" EU legislation, by, for example, far exceeding its requirements for animal welfare, then that cannot be blamed on the EU Commission.

Pillar I BPS payments are linked to two forms of environmental conditionality: cross compliance and "greening". Cross compliance requires farmers to comply with 13 Statutory Management Requirements and 7 Good Agricultural and Environmental Practice production standards. The former are legal requirements whose future will be vulnerable to any bonfire of regulations that may accompany Brexit. The latter are low level compliance practices, which had been applied to UK farmers as Codes of Practice for many years.

"Greening" is a voluntary measure which attaches 30% of the BPS payments to observance of specific land use activities. The payment value for 2015 are set out in Table 3. The EU Commission negotiated a comprehensive list of "environmental beneficial activities", and allows each member state to design its greening measures selected from this list (Hart 2015). As a result, the

majority of UK arable farmers now have to commit at least 5% of their land to greening-eligible activities, which includes conditions on crop rotations, to claim this share of their BPS payment.

Depending on one's point of view, "greening measures" are either an example of the principle that the European Commission establishes a common goal and framework and allows each member state to design their own scheme based on those options on the list that best suits its own circumstances, or as a typical EU compromise. Either way, greening is almost universally disliked. Farmers dislike being restricted in the use of their farmland and would prefer to receive their entire BPS payment with no constraints attached. There is little evidence that the package of practices are clearly targeted or will deliver value for money, two priorities established by the European Court of Auditors (2011). So conservationist would generally prefer the greening budget to be transferred to the Pillar II and used to expand the more demanding agri-environment programme. Given its limited support, it is unlikely greening measures would survive Brexit - unless they became a condition of EU market access.

Perhaps the unpopularity of greening measures is recognised by the EU Commission. Greening has not worked out as it had initially intended, and it is currently conducting a "Fitness Check" as part of its Biodiversity 2020 commitments. This is a comprehensive policy evaluation (across all sectors) to "identify excessive regulatory burdens, overlaps, gaps, inconsistencies and/or obsolete measures which may have appeared over time, and to help to identify the cumulative impact of legislation," (EU Commission 2015: p 1): it is part of the CAP's simplification agenda. Its environmental review will focus particularly on the protection of the EU fresh water resources. The UK had commissioned its own review of agricultural regulations. The Macdonald Report (2011) assessed the challenge that the UK "gold plated" EU regulations. As a result, it has already removed several regulatory burdens from UK farmers, for example, cross compliance rules have been simplified, nitrate directive paperwork reduced and livestock movement regimes streamlined.

2.3. Pillar II: agri-environment measures

Although initially generally unpopular among farmers, AES now attracts wide-spread participation (Table 5). Its support in England is, perhaps in part, a result of the "broad and shallow" tier introduced into Environmental Stewardship Scheme (2005-2015). This implemented a recommendation in the Curry Report (2002) to design a scheme that was able to deliver a wider spread of biodiversity and landscape gains that could complement the targeting of areas of special conservation value. The "broad and shallow" tier was a non-competitive, basic entry level tier designed for mass take-up which adopted a whole farm approach. In the majority of cases,

and contrary to the EU Commissions rules, the payments made for this tier more than adequately covered farmer's compliance costs (Wallis and James 2006).³

Table 5. Environmental Stewardship facts and figures (as at 2 June 2014)

Scheme	Area (ha)	% of UAA	- /+ % in UAA since 1 March 2010	Number of Agreements	-/+ of Agreements since 1 March 2010	Annual Value (million)
CSS*	35,357	0.4%	-3.5	1,330	-9,256	£8.0
ESA*	38,206	0.4%	-4.6	672	-6,414	£3.2
ELS	6,040,367	65.0%	11.4	45,101	7,374	£167.6
OELS	313,046	3.4%	-0.7	2,110	-580	£20.3
HLS (Combined with ELS/OELS**)	1,141,889	-	-	11,760	7,802	£185.5
HLS (Standalone)	139,934	1.5%	0.7	1,563	997	£26.0
Total HLS	1,281,823	-	-	13,323	8,799	£211.5
UELS	1,324,215	-	-	7,959	7,959	£96.9
Overall Total	6,566,910	70.7%	3.3	51,885	-7,879	£410.6

(Source: (Natural England, 2014))

**Countryside Stewardship Scheme and Environmentally Sensitive Areas Scheme, both now closed to new applicants*

** *Most land in HLS is already accounted for in ELS or Organic Entry Level Scheme (OELS).*

Numbers in italics not included in overall total. UAA is Utilisable Agricultural Area, by which is meant farmland and associated land such as woodland and scrub. Annual Value: for CSS and ESA, the figures relate to the annual value of live agreements in the current agreement year. For ES, the figures relate to the first year value of the agreements (the value may vary in other years).

According to EU Commission and World Trade Organisation rules, AES compensation payments cannot be larger than the profit forgone, including transaction costs, and direct costs farmers incur, a rule negotiated during the Uruguay Round of the World Trade Organisation. Unless the UK withdrew from the World Trade Organisation, which is most unlikely, this payment constraint would remain. It would therefore be difficult to change the basis of agri-environment payments. But what would happen if farm profitability fell to zero and areas of marginal farmland was no longer cultivated? An AES compensation based on costs incurred and a profit foregone of £0 would not be attractive to farmers. Conservationists would need to consider how these compensation payment rules could be amended should there be evidence that a managed landscape delivers more public goods than an abandoned one.

³ Wales and Scotland introduced their own schemes in 2005. In Wales, Tir Cynnal, Tir Gofal, Tir Mynydd and the Organic Farming Scheme, which were introduced in 2005, were merged into Glastir in 2012. The Rural Stewardship was introduced in Scotland in 2005.

In addition to employing the principle of subsidiarity in allowing member states to design their AES, participation in agri-environment programmes is voluntary. This places the emphasis on working with farmers when designing schemes and environmental management options. However, concern has been expressed over the effectiveness of environmental measures. For example, the European Court of Auditors (2011) criticised them for failing to be "sufficiently evidence-based" and for not focusing "payments at specific environmental problems" (p 8). In addition, it concluded that many AES failed to establish clear targets, and as a result their environmental benefits could not be assessed. Perhaps this lack of effectiveness has contributed towards the continuing decline of many biodiversity indicators. As a signatory of the Convention on Biological Diversity the UK would remain committed to improving 41 short-term and 44 long-term biodiversity goals and targets; currently 10 of these short-term and 13 long-term measures are classified as "declining" status (JNCC (2016)).

Many environmentalists would agree that there is much that is unsatisfactory about how the EU manages land to support and enhance environmental goods. HM Government's (2014) Review of the balance of competences (agriculture) between the UK and the EU notes "the majority of respondents argued that the CAP remains misdirected, cumbersome, costly and bureaucratic" (p 5) but concludes that "the advent of agri-environmental schemes had been beneficial across Europe and provided a regime for conservation that might not otherwise exist" (p 5). Brexit might provide a "field laboratory" which could measure and assess the environmental change as environmental regulations are withdrawn.

2.4. *Payment for Ecosystem Services (PES)*

The UK's White Paper *Making Space for Nature* supports the increased use of Payment for Ecosystem Services (PES). PES agreements switch the costs of introducing environmentally friendly farm management practices to the beneficiaries of the changes (Dunn 2011). However, PES agreements cannot be applied in all circumstances: beneficiaries must be identifiable, and be willing and able (or could be made) to pay, it must be possible to establish measureable targets, and effective environmental management practices must be available.

Unlike AES, however, PES compensation payments are not restricted by EU Commission legislation or World Trade Organisation agreements. This means they can be related to the value of the environmental management for the beneficiaries rather than to profits foregone and costs incurred by the farmers. Therefore PES compensation payments should fall as AES compensation payments will should farm profitability fall following Brexit. In addition, there is no statutory limit on the length of PES agreements. If Pillar I and II budgets dwindle, these twin characteristics may incentivise their wider use. However, although existing PES do deliver a range of environmental

benefits they are designed to prioritise the delivery of a single environmental goal. Ultimately, the use of PES is most likely depend on a combination of funding available for Pillar II.

2.5. Some additional environmental impacts of Brexit

How food production systems change following Brexit will depend on the terms attached to the negotiated trade agreements. This is a complex area, but should border protection be removed, the pressure to withdraw all cost increasing legislation will intensify. As will demands to be allowed to use similar cost reducing production methods as their competitors. For example, the UK government has assessed "GMOs as being safe" so, it argues, GMOs should be allowed to be cultivated in the UK (HM Government 2014: p 61). Competitiveness will also be given as a reason to use currently prohibited hormones to boost beef and milk production. UK government would also regain control of pesticide legislation. This would allow it to impose the Prime Minister's Business Taskforce recommendation that the EU hazard based cut-off criteria for active substances protocols be replaced by assessment based on scientific risk assessments alone (HM Government 2014; p 60). It is likely there would be many other areas where current production systems would change, risking the reputation for high standards of UK produced food.

2.6. Summary Section 2

The future for land-specific, agri-environment payments is more certain than the future of direct payments and border protection. This is because, since their introduction across EU member states in 1994, their design has been based on the twin principles of subsidiary and farmers' voluntary participation. This means member states already have considerable freedom to decide how to design schemes to deliver EU Commission targets. As a result, the key issue will not be the design of agri-environment schemes, which will continue to be based on scientific evidence, the need to persuade farmers to participate, and political expediency, but their budget. In particular: (i) there would be a direct threat to the co-funding contribution from the UK Treasury, (ii) but this may be offset in part or entirely by moving a proportion of the Basic Payment Scheme ("direct payments") budget to the agri-environment budget, (iii) the impact of Brexit on farm profitability and through that on land values, and (iv) the role Payment for Ecosystem Services (PES) plays in the resulting policy mix.

The total annual BPS budget is considerably larger than the agri-environment budget, which in turn is larger than the UK's co-funding contribution (Tables 1 and 2). So Brexit could result in substantial funds moving from BPS payments to agri-environment payment, which would be in line with previously Treasury and Defra preferences. This would not necessarily stop the current interest in replacing agri-environment schemes contracts with PES agreements because PES switches the costs from the taxpayer to the beneficiaries of the environmental management. Neither AES nor PES add to farmers' production costs because their compensation payments are designed to

cover any additional costs incurred: if they do not many fewer farmers would participate in these schemes (Seibert *et al.* (2006)). If farm business profitability falls, PES may find support among farmers because their compensation payments are not subject to the EU Commission regulations or World Trade Organisation rules. As a result they can be based on the value of the management changes to the beneficiaries rather than the farmers' costs incurred and profit foregone when adopting environmentally friendly farming practices.

3. Conclusions

UK Government has consistently argued that direct support payments should be considered transitional payments and be phased out over time, for border protection be removed, and for an increase in the budget for support of Pillar II objectives, such as the provision of public goods. Reform to the CAP along these lines has been resisted by the majority of EU member states, led by those with more numerous and militant farmers. Shorn of the support of their continental counterparts, it is likely UK agricultural policy would develop in this direction albeit with resistance from the Devolved Assemblies. Farmers in England at least would most likely receive lower, perhaps no, direct payments. This would imply that Pillar I environmental conditionality would also go (or be reconverted to Codes of Practice): it is unlikely "greening measures" would survive Brexit. They are disliked by the majority of farmers and conservationist, albeit for different reasons. However, the UK may not be able to make these changes if access to EU markets was made conditional on the continuing use of EU-equivalent practices.

A transfer of budget resources from Pillar I to Pillar II and an expanded AES programme would generally be welcome by conservationists, as AES require farmers to undertake more demanding environmental management than cross compliance imposes. However, even outside the EU, as an independent member of the World Trade Organisation, the UK would have little scope for altering the basis of AES compensation payments. And through the principle of subsidiarity, it already has powers to tailor make AES to best address its own environmental characteristics, issues and problems. For budgetary reasons, it is likely the UK would seek to increase the use of PES agreements, and as these schemes do not need to comply with AES compensation payment rules, they may gain more support from farmers and conservationists.

If the UK government introduces an open market on agricultural goods, the economic pressures to withdrawing environmental regulations to lower production costs would be hard to resist, resulting in an overall reduction in environmental protection. Markets would adjust, as would land use practices as farmers compete against low cost producers - but it is not clear how long these changes would take. The need to gain economies of scale and economies of scope would increase in the number of larger farms and to more specialist farms respectively. These changes

would have direct impacts on environmental outcomes from farmed land. There would be some opportunities under this scenario from lower land prices resulting from reduced farm profitability. How these opportunities are developed would be an important determinant of the overall impact of Brexit on the provision of public goods from farmed land.

By adopting the principle of subsidiarity the EU Commission has avoided the "panacea trap", the assumption that there is a "best" way, a simple cure-all for addressing environmental problems (Ostrom and Cox 2010). They recognise that environmental governance systems need to fit the diversity of ecological systems at multiple spatial and temporal scales. As a result, environments are typically governed by a multitude of authorities, each responsible for some aspects of environmental management, with varying degrees of overlap between them. This has led to a wide range of different environmental schemes across member states, which can look messy and be hard to understand. This complex, multi-tiered system is particularly evident for transboundary resources. But Ostrom and Cox (2010) argue that legal and governance complexity adds to the protection offered to environmental resources. Brexit would make it simpler for the UK government to revise and withdraw environmental protective legislation, and there would be considerable pressure brought to bear on them to do this from the business community.

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