Land Use Policy Group

The UK statutory conservation, countryside and environment agencies

Promotion of agroecological approaches: Lessons from other European countries

Mottershead, D. and Maréchal, A.

Institute for European Environmental Policy

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NATURAL ENGLAND
Cyfoeth Naturiol Cymru Natural Resources Wales
Scottish Natural Heritage All of nature for all of Scotland
SEPA Scottish Environment Protection Agency
NIEA Northern Ireland Environment Agency
Environment Agency

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http://www.sepa.org.uk/

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Executive Summary

This report reviews how agroecology has been promoted at European level. It presents two case studies on policies and programmes supporting agroecology, in France and Germany, and compares their findings with the situation in the UK.For the purposes of this report, 'agroecology' is defined as a set of agricultural practices and systems which aim to enhance natural processes and can include (but is not limited to) organic farming, integrated farm management (IFM) and agroforestry. Agroecology as a whole has recently been the subject of high level political attention within and outside the EU and increasing interest from farming and environmental stakeholders

The French Agroecology Project

France is the only EU country to base its agriculture policy around an explicit concept of agroecology. The "Agroecological Project for France" was established in 2012, shortly after President Hollande's Government took office, under the strong leadership of Agriculture Minister Stéphane Le Foll[1]. The central concept is for farming systems to be made more reliant on ecosystem functions and has been justified on both economic and environmental grounds. It has an emphasis on voluntary, bottom up approaches over regulation.

The Project acts as an umbrella for eight separate thematic plans which each focus on a different aspect of farming. Some of the plans were in existence before the Agroecology Project began:

- The Plan 'Ecophyto-II' includes measures to reduce the use of pesticides by 50% by 2025[2], on the basis of an indicator linked to the quantity of active substances used.
- The Action Plan on Seeds and Sustainable Agriculture encourages the breeding and availability of varieties suitable for low input agriculture.
- The 'Ecoantibio' Plan aims to reduce the use of veterinary antimicrobials by 25% by 2017.
- The Plan for Sustainable Beekeeping Activities introduces measures to reduce pressures on bees and encourage sustainable beekeeping.
- The Plan for Energy, Biogas and Nitrogen Management promotes anaerobic digestion and nitrogen recovery, with a target of 1,000 on-farm based biogas plants by 2020 (there were 90 in 2012)
- 'Ambition Bio 2017', the organic farming plan, aims to double the area covered by organic agriculture by 2017 compared to 2013.

[1] Following the election of Emmanuel Macron as the new President of France in May 2017, a new Agriculture Minister has been appointed, Jacques Mézard. The Minister signalled his support for the work of his predecessor on agroecology. This suggests that the new government is likely to provide continuity to the agroecology project.

[2] The initial programme's target was a 50% reduction by 2018, subsequently postponed to 2025 under Ecophyto-II.

- The Plant-based Proteins Plan for 2014-2020 sets out actions to increase France's production of plant-based proteins from legumes and other protein crops and improve forage self-sufficiency in the livestock sector.
- The Plan on Agroforestry aims to encourage the development and adoption of agroforestry systems.

There are few regulatory measures in these eight thematic programmes. Rather, actors are incentivised in various ways to change their practices through, for example, reduced tax to facilitate organic farming, demonstration farms and on-farm experiments, or the use of a system of certificates to incentivise pesticide savings by farmers and distributors, amongst other measures.

The Agroecological Project for France also builds upon the measures and instruments available under the CAP. The Project was developed between 2012 and 2014, in parallel with the CAP reform process. France's commitment to agroecology is reflected in the way it has implemented the CAP following the 2013 reforms, including active support for agroforestry in Rural Development Programmes (RDPs), and new agri-environment-climate measures to foster farm-wide agroecological approaches. Such "system" operations were introduced for arable, grassland and for mixed farming, with an emphasis on integrated crop and livestock systems at the farm level.

In addition, the objectives of the Agroecological Project guided the 2014 reform of the French agricultural law. There are two notable innovations brought in by the legislative reform that are worth highlighting due to their impact. One was in agricultural education: training for farmers was reformed while a number of teaching programmes in agricultural colleges and universities were revised to focus more on agroecological principles and practices. Teachers, lecturers and members of staff of the regional Ministry services received specific training on agroecology with a view to acting as advisors to other teaching staff in colleges and universities. The network of French Chambers of Agriculture[3] launched a plan in 2015 to develop the skills of their advisors to advise farmers on agroecological approaches. Steps have also been taken to engage the wider public including through open access events to encourage dialogue between farmers and the public, and a free online university course.

The second legislative innovation of the 2014 French agricultural law reform was the creation of the GIEE (Economic and Environmental Interest Grouping ''*Groupements d'Intérêt Economique et Environnemental*''), which aims to facilitate the emergence of collective agroecological projects involving farmers and other local actors, and to help them apply for funding. Once certified, a GIEE group may benefit from priority in the allocation of funding and/or increased support rates. Some sources report that priority access to funding is the most attractive feature to farmers of the GIEEs.

[3] In France, Chambers of Agriculture are public entities in charge of representing broadly speaking farmers, cooperatives, traders, etc. Chambers of Agriculture have delegated powers from the State to execute administrative tasks (e.g. mandatory registration of farms) and play a key role in providing information and helping farmers to manage and develop their business.

The introduction of GIEEs has strengthened and built upon an already strong culture in French agriculture of working together in self-led groups and cooperatives. The GIEEs aim to empower farmers to deliver agroecology and give them complete autonomy in deciding their agroecological objectives and initiatives. The rationale behind the GIEE is that local knowledge and a willing transition by farmers and local stakeholders are essential to the successful implementation of the agroecology project.

Le Foll's vision also relies strongly on innovation to bring about solutions, notably through a strong involvement of the research sector to support a changing agriculture. Research funding has been refocused and research programmes revised accordingly.

The progress of the Agroecology Project is monitored and evaluated against key output, result and outcome indicators. It is early days to assess the impact of the Project, but survey evidence shows that farmer awareness of agroecology is increasing (79% in 2016, up from 50% in 2014) whilst 92% of farmers are either engaged in, or planning to engage in, one or more agroecological activities. It should be noted that the measures considered to be agroecological by the survey's designers include some that are quite general in nature (for example, protecting soil from erosion). Another indicator of agroecology's implementation in France is the number of farmers declaring to be in, or about to join, a GIEE project (11%). Some 57% of French farmers knew about the concept of GIEEs in 2016, while 31% of farmers said they were willing to join a GIEE project.

The German Programme for Organic Farming

In Germany, the Federal Organic Farming Plan (BÖL) was launched in 2002 to promote organic farming and expanded in 2011 to include "other forms of sustainable farming[4]" (at which point it was renamed BÖLN). As a Federal programme, the BÖLN demonstrates that support to these sectors is a priority at the highest level of government. Its activities sit on top of measures taken by the Länder (the sixteen federal states in Germany) to encourage organic farming, including financial support through the CAP's organic farming measure and local promotional activity. The Plan does not coordinate wider German activity to promote organic and other sustainable farming, although it does coordinate research on these topics.

At its creation, the BÖL was associated with a target in Germany's Sustainable Development Strategy to increase the proportion of land farmed organically from 4 per cent to 20 per cent within ten years. The BÖL is expected to contribute, but the target, which was not met but which is still a long term goal, applies to the Strategy as a whole.

The BÖL funds research, knowledge transfer, projects to strengthen supply and demand and support for trade promotion. Since 2002, the programmes have funded around 930 research projects worth some €120m, 50 different knowledge transfer and training measures and provided promotional material and guidance to over 1,100 stalls at trade fairs.

[4] The German government provides no definition of "sustainable farming"

The BÖL was established when a new Agriculture Minister from the Green Party – Renate Künast – was given a mandate to reform "factory" farming in the wake of collapsing consumer confidence following the outbreak of Bovine Spongiform Encephalopathy (BSE) in the late 1990s. Since then, demand for organic produce from German consumers has grown strongly and steadily, but German farmers have not fully responded. With organic production still only accounting for 7% of Utilisable Agricultural Area (UAA) in 2016, the German Government has announced that it will bring forward a new action plan for organic farmers with the intention of helping them to gain greater market share. This is expected to be published in 2017.

Strategic context and policies which support agroecology in the UK

Agriculture policies in the UK have also responded to strategic pressures. A Policy Commission report following the outbreak of Foot and Mouth Disease (FMD) in 2001 led to new agri-environment schemes, and a strategy to promote organic farming in England (the Organic Action Plan for England). Furthermore, flooding in 2008 helped to underline the importance of 'catchment-sensitive' farming, whilst the global food commodity price spikes of 2008 led to a renewed emphasis on increasing production. The Foresight report of 2011[5] which explored how meeting the projected increase in global demand for food by 2050 might be achieved in a sustainable way. The Foresight report led to additional funding for research into sustainable agriculture and, in 2014, the Department for Food, Environment and Rural Affairs (Defra) and Welsh Government established a Sustainable Intensification Research Platform (SIP). One of the SIP's projects aims to develop better ways of monitoring and measuring the impact of IFM, better interventions and better ways to communicate to farmers. The Welsh Assembly Government's approach to safeguarding the interests of future generations focuses on resilient ecosystems, whilst Scotland has an ambition to be a leader in 'green' farming for which it envisages a strong role for advice and on-farm mentoring.

No UK country has an overall plan to promote agroecology although each has had a strategy for organic farming at one point or another. Only Scotland does at present. Some of these plans have targeted the commercial success of organic farming rather than its environmental benefits. The Organic Trade Board (an industry body for organic food and farming in the UK) has received funding from the EU to promote and develop organic food and farming.

The choices the UK countries have made for their implementation of the CAP have indirectly supported IFM, through cross-compliance rules on soil protection, greening measures and agri-environment schemes. All countries have included support for conversion to organic farming and Scotland, Wales and Northern Ireland also support agroforestry through their CAP policies and implementation.

[5] The Future of Food & Farming: Challenges and choices for global sustainability, Government Office for Science, 2011

Comparison between the UK, France and Germany

The absence of stronger support in the UK means that opportunities to improve agricultural land management to respond to urgent issues such as flood prevention and longer term sustainability imperatives have not been taken. Unlike Germany or France, so far, the UK Governments have not consistently set and strived towards objectives and targets for the wider adoption of agroecological approaches.

France, Germany and the UK have all identified research as a key driver of agricultural development, including the greater resilience and sustainability of farming practices and systems. However, funding in the UK appears to be lower than in France and Germany. Support for agroecology will need a new funding model when the UK leaves the EU, and one which does not rely on the creation of intellectual property or a commercial product.

France's highly structured system of agricultural education and advice has allowed it to make rapid changes in curricula and skills. This will be harder in the UK where universities and colleges have greater autonomy and the system for the provision of advice is fragmented.

The French case study demonstrates the crucial role of advice to farmers in supporting the uptake of agroecological practices. France's strong tradition of cooperative and collaborative working – exemplified in the network of Chambers of Agriculture and through the introduction of the GIEE mechanism – enables rapid knowledge sharing underpinned by a network of advisors with access to the latest research. There is no similar framework in the UK, with advice provided from numerous different sources. In these circumstances, it would be more difficult to achieve momentum across and within the different UK countries.

Under the CAP, France has introduced agri-environment measures which require a farmer to commit to changes in his/her entire farming system. In the UK this is only available for organic farming: there may be merit in considering the development of system measures for non-organic farming systems, particularly IFM and agroforestry.

Overall, no UK country has promoted the mainstreaming of agroecology into farming, although some individual practices and systems are promoted. Doing so would require a clear strategy with explicit environmental and economic objectives. The German and French experience illustrate that much can be achieved with sustained personal engagement by senior political figures, particularly during the early years of a strategy, which then needs to be kept in place for the long term and incorporating environmental criteria, training, knowledge transfer activities and financial support.

There is an opportunity for the UK Government and Devolved Administrations to integrate agroecology into future agricultural policies. Looking ahead, embracing agroecology could provide a strong focus to ensure sustainability and resilience to environmental pressures and climate change are at the heart of long term growth and competitiveness of the food and farming sectors.

List of acronyms

ADEME	French Environmental and Energy Management Agency (*Agence de l'Environnement et de la Maîtrise de l'Energie*)
BmEL	German Federal Ministry of Food and Agriculture
BÖL	Federal Scheme on Organic Agriculture (*Bundesprogramm ökologischer Landbau Landwirtschaft*)
BÖLN	Federal Scheme for Organic and other forms of Sustainable Agriculture (*Bundesprogramm ökologischer Landbau und andere Formen nachhaltiger Landwirtschaft*)
BSE	Bovine spongiform encephalopathy
CAP	Common Agricultural Policy
CASDAR	French Special Fund for Agricultural and Rural Development (*Compte d'affectation spéciale « développement agricole et rural»*)
CIRAD	French Agricultural Research Institute for Development (*Centre de coopération internationale en recherche agronomique pour le développement*)
COMAGRI	European Parliament's Committee on Agriculture and Rural Development
EAFRD	European Agricultural Fund for Rural Development
EAGF:	European Agricultural Guarantee Fund
EIP-Agri	European Innovation Partnership for Agricultural Productivity and Sustainability
EP	European Parliament
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
FMD	Foot and Mouth Disease
GAEC	(Standard for) Good Agricultural and Environmental Condition

GIEE	Economic and Environmental Interest Grouping (*Groupements d'Intérêt Economique et Environnemental*)
HSE	Health and Safety Executive
IFM	Integrated Farm Management
INRA	Institute for National Agricultural Research (*Institut National de Recherche Agronomique*)
LEAF	Linking Environment and Farming
LUPG	Land Use Policy Group
MEP	Member of European Parliament
MP	Member of Parliament
PESTLE	Political, Economic, Social, Technological, Legislative and Environmental
PNDAR	French National Programme for Agricultural and Rural Development (*Programme national de développement agricole et rural*)
PRAD	French Regional Plan for Sustainable Agriculture (*Plan Régional pour l'Agriculture Durable*)
RDP	Rural Development Programme
SFF	Sustainable Food and Farming strategy
SIP	Sustainable Intensification Platform
UAA	Utilised Agricultural Area

1 Introduction

1.1 Background

A sustainable relationship between productive, economically viable agriculture and the environment has been a goal of policymakers for decades. Environmental issues associated with agriculture include well-documented pressures including those on soils, water quantity and quality, biodiversity and habitats and greenhouse gas emissions. The UK is no stranger to these pressures.

Current incentives for sustainable farming take a variety of forms. Within the Common Agricultural Policy (CAP) – the system which has shaped UK farming over the past four decades –protective measures are both required by regulation and encouraged through voluntary payments to farmers. Currently a system of cross-compliance is in place which makes the receipt of certain area-based payments to farmers conditional on a baseline environmental (and, where relevant, animal welfare) performance. Financial incentives include payments from Rural Development Programmes (RDPs) based on the assumed extra costs incurred, or income foregone by, farmers who deliver environmental benefits. The new greening payment introduced by the 2014 CAP reform also provides payments to maintain or enhance the environmental benefits from farming systems.

It can be difficult to separate the act of improving the environment from the activity of farming itself. Is a farmer who grows nitrogen fixing crops doing so to produce legumes or to improve soil quality? What motivates farmers to improve the organic matter content of their soils – regulations, grants or their own business needs? There appears to be cases such as these where it is difficult – if not impossible – to disaggregate the environmental aspect from the activity of farming. Yet there is a risk that regulation, payments and other forms of support to farmers – depending on how they are designed – reinforce the perception that these are different activities.

This report considers incentives for sustainable farming through the lens of "agroecology" – a fluid term used in a wide variety of contexts and with a range of meanings according to the agendas of different policymakers and stakeholders. Our interest is in whether viewing farm policy through such a lens helps to break down the unhelpful distinction between environmental and economic performance.

With this in mind we examine how the concept of agroecology is being used in France, what is driving this change and how it is being received. We also look at longer established German support for organic farming – a familiar agroecological farming system – in order to draw lessons about how to encourage sustainable farming in the UK.

'Agroecology' is a term which has become more prominent recently in the debate over how to engender a more substantive shift towards more sustainable agricultural practices, and in particular how preserving or enhancing natural resources such as soils, water, air and biodiversity, and responding to climate change can be achieved hand in hand with maintaining or even enhancing farm productivity. It has been adopted by some policy

makers – most notably in France – as a potential "win, win" means of securing environmental improvements whilst maintaining productivity and economic viability.

At the same time, agroecology is used by some environmental groups in a much wider sense, encompassing not just developments in farming systems, but far reaching changes to social structures associated with the ownership and tenure of land and the distribution of raw materials and produce.

The term "agroecology" can be traced back to the 1930s and has been used over time to refer to different things, as various sources have indicated[6]. A review of the use of the term over the past 80 years by Wezel et al notes frequent confusion over its meaning, along with shifts in meaning between a science, a movement and a practice which sometimes derive from cultural differences between those employing the term. Today, the term 'agroecology' is generally taken to mean either a set of agricultural practices and systems which aim to enhance natural processes (sometimes referred to as 'light agroecology' in France), a political or social movement ('strong agroecology'), or a scientific discipline, i.e. the study of agroecosystems. As with other terms of this kind, the meaning can depend on the context, including discipline and wider background of the person concerned.

In 2015 the Land Use Policy Group (LUPG) commissioned the Organic Research Centre (ORC) and the Game and Wildlife Conservation Trust (GWCT) to report[7] on the potential role that agroecology might play in sustainable intensification[8]. A wide range of such practices was considered in the report, ranging from quite basic steps such as the adoption of a cover crop to whole farm approaches such as organic farming. Three of the best documented approaches were identified as:

- Integrated farm management (IFM): a wide category of farming practices which have in common that they make use of ecological processes for agronomic purposes. Examples include green manure, cover crops, intercropping, minimum tillage, rotations, mulch management, integrated pest management (an approach in which pest control is achieved as far as possible via ecological means, with conventional pesticide a last resort), and improved local and introduced varieties of seed and animals. Although the term IFM is sometimes used to denote farming which relies extensively on such practices and little, if at all, on artificial fertilisers and pesticides, individual IFM practices can also be undertaken as part of a more conventional approach;

[6] Wezel, A., Bellon, S., Doré, T., Framcis, C., Vallod, D., David, C., 2009 : Agroecology as a science, a movement and a practice – a review

[7] Lampkin, N.H., Pearce, B.D., Leake, A.R., Creissen, H., Gerrard, C.L., Girling, R., Lloyd, S., Padel, S., Smith, J., Smith, L.G., Vieweger, A., Wolfe, M.S., 2015. The role of agroecology in sustainable intensification. Report for the Land Use Policy Group. Organic Research Centre, Elm Farm and Game & Wildlife Conservation Trust.

[8] 'Sustainable intensification' is defined in the Foresight report on the Future of Food and Farming, as "simultaneously raising yields, increasing the efficiency with which inputs are being used and reducing the negative environmental effects of food production". The Future of Food and Farming (2011) Final Project Report.

- Agroforestry: the practice of purposively integrating trees with crop and/or animal systems; and
- Organic farming.

There is an emphasis on these three approaches throughout our report. However, agroecology is a fluid concept and the evidence of its development we have found is not limited to these approaches.

ORC/GWCT concluded that agroecology had the potential to:

- Maintain or increase productivity, with the exception of organic farming where yields per hectare may be substantially reduced due to restrictions on the use of agrochemical inputs – however organic system productivity with respect to other inputs including labour, and in terms of resource use (other than land) per unit of food produced, may be similar or better;
- Reduce non-renewable energy consumption, both on a per unit of land and a per unit of product basis – although the benefits per unit of product are not as high in the organic case due to the lower yields;
- Maintain or increase biodiversity and the output of related ecosystem services – with appropriately designed and managed agroforestry and organic systems offering potentially greater benefits than integrated systems;
- Maintain natural capital in the form of soil and water resources as a result of reduced use, careful management (e.g. reduced or zero tillage) and reduced or restricted use of potentially polluting inputs;
- Maintain or increase the profitability of farming systems through more efficient input use reducing costs, diversifying the range of outputs and, in the organic case, developing specialist markets with premium prices to help compensate for the lower yields.

The ORC/GWCT report concluded that, *"overall, there is a clear case that agroecological approaches can make a substantial contribution to sustainable intensification, but this needs to be supported by an improved knowledge system (including training, education, advice and research with active farmer engagement), as well as by policy drivers, such as those adopted in the French agroecology action plan, to encourage change."*

This report has been commissioned by SNH on behalf of the Land Use Policy Group to follow on from the ORC/GWCT work, to examine the policy drivers which have supported change in France and Germany and consider the implications for embedding agroecological approaches into agricultural practices in the UK. France and Germany were chosen as countries to examine as they have given particular prominence to policies which promote elements of agroecological farming. The lessons we draw from the French and German experience fall into two main types: those concerning the circumstances (political, economic, etc.) which appear to have favoured the adoption of policies to promote agroecology, and those relating to the design of the policies themselves.

We draw on relevant findings from the ORC/GWCT report since they are one of the foundations for a narrative about the framing of agroecology and the policy drivers influencing the adoption of agroecological approaches.

This report is structured into four sections:

- Section 1 introduces the concept of agroecology and the methodology used in the study;
- Section 2 describes the promotion of the agroecology policy in France;
- Section 3 describes the German federal programme which supports organic agriculture alongside other types of sustainable farming;
- Section 4 draws lessons from the experience of France and Germany.

1.2 Methodology

This is a desk-based study looking at two European countries as case studies in agroecological policy. Information about each country's policy drivers has been obtained from relevant government, stakeholder and expert sources. This evidence has been used to carry out a PESTLE (political, economic, social, technological, legislative and environmental) analysis of the drivers for each country's policy towards agroecology. In order to ground the analysis, we tested our understanding of the drivers operating in each country with a small number of experts via telephone interviews. As well as examining the policies in place, we have also reviewed the available evidence on the impact of French and German efforts to promote agroecology.

1.3 Choice of case study countries

In determining the case studies to be examined, we sought examples of countries which are making a visible effort to transform farming in the direction of agroecology. We looked for countries in Europe which had gone beyond the basic support of certified organic farming via the CAP (which all Member States except the Netherlands provide) to promote organic farming as well as those promoting other types of agroecological practices through a wider range of policy instruments.

France fits this criterion most closely. Since 2012/13, agricultural policy in France has aimed to promote "agroecology". There is an agroecology action plan which contains measures to encourage greater take up of different approaches, including elements of IFM, agroforestry and organic farming. In Germany the Bundesprogramm Ökologischer Landbau und andere Formen nachaltiger Landwirtshaft (BÖLN) has a predominant focus on organic farming although it was recently broadened to cover other forms of sustainable farming. Following discussion with the LUPG Steering Group, we felt that both countries would offer useful lessons for the UK about the policy drivers that have influenced the adoption of agroecological approaches.

1.4 Overall UK context – Brexit

This report was commissioned before the UK's EU Referendum on 23 June 2016. Whilst the case for agroecology is unaffected by the UK's impending departure from the EU, leaving the CAP could remove a number of modest incentives to agroecology such as the requirements under "greening" for crop diversification (which may encourage greater use of crop rotation), for ecological focus areas (which can incentivise inter alia the growing of legumes and the use of catch and cover crops) or some of the rural development measures such as the optional measure promoting organic farming. These incentives may be retained or strengthened in whatever farm policies the UK governments put in place after Brexit, but that is not a foregone conclusion. There are also non-CAP EU legal instruments, such as the Sustainable Use of Pesticides Directive (Directive 128/2009), which can encourage aspects of agroecology. Here, again, there is uncertainty over whether similar instruments will continue to exist in the UK in the future.

Although farm policy in both France and Germany operates within the funding framework of the CAP, the main focus of this report is on measures taken at the national level such as research, knowledge sharing and advice and market development. National choices about how the CAP is implemented in France in particular are also relevant, including the design of agri-environment climate measures around an agroecological approach. Although the UK will operate outside the CAP in the future, it will face similar choices to those we study in this report and the examples of France and Germany therefore remain relevant.

1.5 Overall context – agroecology internationally and in the EU

1.5.1 Agroecology internationally

European efforts to promote agroecology sit in a broader international context. Agroecology is practiced in a wide range of locations across the globe, and considerable efforts are taking place to encourage its further growth especially in developing countries where it is seen as particularly relevant. A 2014 Symposium organised by the Food and Agriculture Organisation of the United Nations (FAO) on Agroecology for Food Security and Nutrition[9] brought together senior policymakers from around the globe – including several agriculture ministers and the then European Agriculture Commissioner Dacian Cioloş – and experts, to share experiences, pledge political support and plan future action. Regional workshops have since taken place in Latin America and the Caribbean, Africa and the Asia Pacific region.

An important output of the FAO symposium is a collection of case studies prepared for the FAO and published in 2016 which describes agroecological projects in 23 countries in five continents[10]. The studies range from an experiment in Mexico in which integrated whole farm approaches were developed, tested and transferred to farmers, to trials of single measures such as the incorporation of legumes into a soybean/rice rotation in China.

[9] http://www.fao.org/about/meetings/afns/en/

[10] Stephen R Gliessman for the FAO's Family Farm Knowledge Platform http://www.agroecology.org/CaseStudies.html

Another relevant report is "From Uniformity to Diversity", published in June 2016 by the International Panel of Experts on Sustainable Food systems (IPES)[11] which identifies the benefits of moving from an industrial paradigm for agriculture towards "diversified agroecological systems". Prominent in the international discourse about agroecology is the concept that agroecology can be more than an agronomic concept or a set of agricultural practices. For some, agroecology also denotes a social movement seeking to give ordinary people a greater say in how the food they eat is produced. This can be done in a variety of ways: encouraging small scale production; creating communal seed banks, involving consumers in the planning of production at the local scale, to name but three. This approach to the definition of agroecology is sometimes referred to as "strong" agroecology by its proponents. Although there are examples[12] of agroecology as a social movement within Europe, it is not the subject of this report.

1.5.2 Agroecology in Europe

Within Europe, the concept of agroecology is the subject of political attention at the highest level. The 2016 report[13] "A European Vision for Sustainability" by the European Political Strategy Centre (EPSC), and led by President Juncker's Adviser for Sustainable Development Karl Falkenberg, is a wide ranging critique of European environmental performance. It discusses at length the case for integrating agroecological practices to a greater extent within the CAP post-2020.

Within Europe, agroecological farming is already established to varying degrees. 5.9% of the Utilisable Agricultural Area (UAA) in the EU was farmed organically in 2014, with Austria (20.3% of its UAA in 2015) having the highest proportion and Malta the lowest (0.25% in 2015). The UK, with just 2.9% of its UAA under organic farming, is well below the European average[14]. The countries with the largest areas under organic farming are Spain (1.97 million ha in 2015), Italy (1.49 million ha), France (1.32 million ha) and Germany (1.06 million ha). Figure 1. shows the change in land area under organic farming for the UK and our two case study countries since 2002.

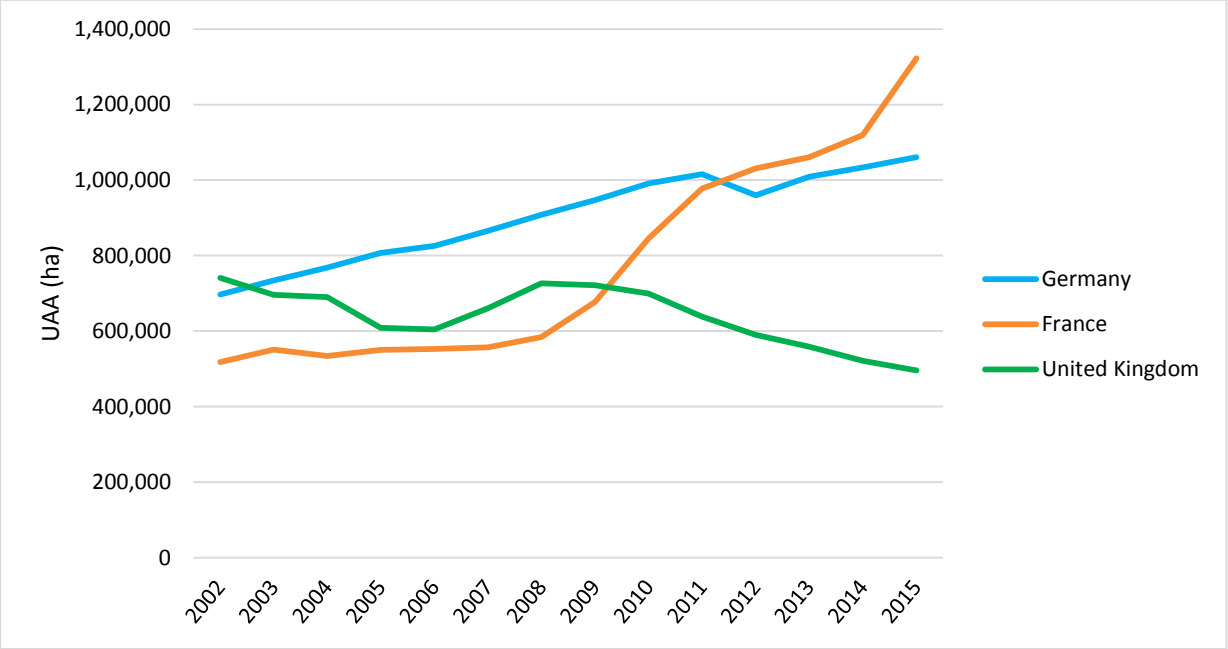
[11] http://www.ipes-food.org/images/Reports/UniformityToDiversity_FullReport.pdf

[12] See, for instance, the case study of production and consumption in a region of the Spanish Basque country at https://foodfirst.org/wp-content/uploads/2013/12/BK19_3-Basque-Food-Sovereignty_Fall-2013.pdf

[13] Falkenberg, K. (2016) Sustainability Now! A European Vision for Sustainability, European Political Strategy Centre Notes, EPSC Notes, Brussels.

[14] Eurostat, 2016. All figures in this paragraph correspond to areas fully converted and under conversion to organic farming.

Figure 1: Area of land under organic farming in France, Germany and the UK



Source: Eurostat: Organic Crop Area

Between 2002 and 2011, the total organically farmed area in the UK fluctuated for about a decade at around 700,000 ha, before declining over the past four years to about 500,000 ha in 2015. Organic farming in Germany steadily increased from about 700,000 ha in 2002 to 1,015,600 ha in 2011, after which the area farmed has remained broadly stable. In France, area farmed organically plateaued at around 550,000 ha between 2002 and 2008 but has more than doubled between 2008 and 2015, overtaking both the UK and Germany with 1,323,000 ha in 2015.

There is a wide range of different types of agroforestry across the EU, including traditional agroforestry systems with livestock, often of high nature and cultural value, such as those in Spain (*dehesas*) and Portugal (*montado*); intercropping and grazing in high value tree systems (e.g. olive, apple); modern alley cropping for arable systems[15]. Reliable estimates of its extent are difficult to obtain, but a literature review published in 2015 for the EU's AGFORWARD project[16] found evidence that agroforestry covered some 10.6 million hectares, of which 6.9 million hectares was Mediterranean oak pasture, with intercropping of fruit and nut trees accounting for a further 2.8 million hectares.

Statistical information about the uptake of IFM practices is scarce. However, in 2010 it was estimated[17] that 1.1% (1.15 million hectares) of European arable farmland was farmed using

[15] List condensed from ORC-GWCT (2015)
[16] AGFORWARD: Preliminary stratification and quantification of agroforestry in Europe (den Herder and others, 2015)
[17] Derpsch, R., Friedrich, T., Kassam, A., Hongwen, L., 2010. Current status of adoption of no-till farming in the world and some of its main benefits. International Journal of Agriculture & Biology: 3(1).

a no tillage system. There is, of course, a wide range of other "integrated" practices, and it is not the case that only systems incorporating "no tillage" can be considered to be integrated.

In terms of the drivers for the growth of agroecology in Europe, EU law helps to encourage the development of organic farming by restricting the use of the term "organic" to produce from farms certified as meeting specific, high standards of agronomy and husbandry. European Council Regulation No 834/2007 on the organic production and labelling of food requires produce marketed as organic to be produced (where relevant) using a set of strictly defined farming practices covering, inter alia, the use of tillage techniques which increase organic matter in the soil, the avoidance of chemical fertilisers and the avoidance of synthetic pesticides. In March 2014, the Commission published a proposal to update the Regulation to take account of rapid growth in the size of the European market for organic food. The main features of the proposal are tighter controls – including checks on retailers – to prevent fraud, and simplified certification requirements to encourage the participation of smaller farmers.

Organic farming is widely supported (by 27 out of 28 Member States, the exception being the Netherlands which prefers to offer a tax subsidy) through Member States' and Regions' Rural Development Programmes (RDPs). Support is provided via a dedicated organic farming measure which enables Member States to compensate those converting to organic farming for the costs involved – which cannot be recouped via premium pricing during the conversion period, as the farm is not yet certified. Member States may offer continuing support – usually at a lower level – once the conversion is complete. The EU has established per hectare limits for such support which a Member State may only exceed if it can produce a justification. There is a 75% maximum co-financing rate – compared to the 53% ceiling which applies to most other expenditure for most Member States [18] – which means that Member States need to contribute less of their own funds to support organic farming.

Some Member States also provide support to organic farming by paying for research and helping to develop markets, for example through promotional or information campaigns. In 2015 for example the Danish Government published an Organic Action Plan[19], with a target of doubling the area of Danish farmland being used for organic production from its 2007 level by 2020. The plan includes export promotion measures; encouragement of organic purchases by public bodies; a greater emphasis on organics in agricultural training and education; funding for innovation, demonstration, sales promotion and advisory services in the organics sector; and continued funding via the CAP for conversion to and maintenance of organic production.

Agroforestry is less widely supported through the CAP, with 21 out of 118 RDPs not funding forestry at all, let alone the agroforestry sub measure. Where support for agroforestry is offered, it can cover the establishment of trees, the clearance of areas between trees for the establishment of pasture or cropping, and associated requirements such as the

[18] EU Regulation 1305/2013, Article 59

[19] http://en.fvm.dk/fileadmin/user_upload/FVM.dk/Dokumenter/Landbrug/Indsatser/Oekologi/7348_FVM_OEkologiplanDanmark_A5_PIXI_English_Web.pdf

provision of watering facilities for livestock. As with organic farming there is a high co-financing rate – 75% for most Member States. Information on the extent to which the regional governments in France and Germany support agroforestry through their RDPs is available in Annex 1. The EU's 7th Research Framework Programme is also funding AGFORWARD, a four year programme of coordinated research intended to characterise and identify systems of agroforestry within Europe and make policy recommendations for their support.

Organic farming and agroforestry can both be supported via tailor-made measures available through the CAP's Rural Development Programme. Support can also be provided for IFM practices although there is no measure devoted solely to that purpose. Practices such as the provision of refuges to support natural predators and reduce reliance on pesticides, the introduction of cover crops, and the introduction of legumes into a rotation can be funded under the agri-environment-climate Measure of the Rural Development Regulation. More specifically, a number of RDPs contain agri-environment-climate sub measures specifically designed to encourage integrated production and in some Member States there are industry led certification schemes that include these types of production methods, similar to those for organic farming. France's integrated fruit production scheme for instance requires the planting of varieties suited to the soil and climate, a period for the trees to establish themselves before harvesting starts after 3-4 years, and the use of integrated pest management. In the Czech Republic, the Integrated Production Certification scheme requires crop rotations and nutrient management[20]. Under the main CAP direct payment scheme it is worth noting that Member States can choose to allow farmers to count land under cover crops or nitrogen fixing crops towards their 5% Ecological Focus Area obligation under green direct payments. Member States can also make available coupled payments to support leguminous crops.

The CAP also contains "soft" measures relevant to the promotion of agroecology. The aims of the new European Innovation Partnership (EIP) for agriculture include "working towards agroecological production systems and working in harmony with the essential natural resources on which farming and forestry depend". Using resources provided by Member States from their RDPs, the EIP seeks to encourage collaborative working between scientists, advisers, farmers and others. Finally, the CAP regulations require Member States to offer a Farm Advisory Service covering, at least, cross-compliance; greening requirements; RDP measures to improve economic performance; obligations under the WFD; requirements for integrated pest management; farm safety; advice for first-time farmers. The regulation provides that advisers must be suitably trained, but does not otherwise specify how advice is to be provided (for instance on a one-to-one basis, in groups, or online) or whether advice on agroecological practices relevant to cross-compliance and greening should be available.

Regulation of inputs used in farming can act as a driver towards both integrated and organic practices. For example, under EU Directive 2009/128/EC on the sustainable use of pesticides all Member States are required to develop National Action Plans, which, amongst other

[20] Hart, K., Menadue, H. Environmental Certification Schemes and their equivalents with the CAP Greening Proposals, unpublished.

things, include the promotion of Integrated Pest Management. The German government has integrated its target to increase organic farming into its National Action Plan for pesticides[21].

Within the UK, all the constituent countries support organic farming through their RDPs. In Scotland the industry has been developing Organic Action Plans in close collaboration with the Government. All countries except England also offer specific support to agroforestry, although in some cases they are modest. Scotland's RDP, for instance, budgets €1.2 million for agroforestry with a target to cover 300 hectares.

[21] The Directive required Member States to draw up National Action Plans (NAPs) by November 2012. The plans were required to set objectives and targets to *"reduce risks and impacts of pesticide use on human health and the environment and to encourage the development and introduction of integrated pest management and of alternative approaches or techniques in order to reduce dependency on the use of pesticides*".

2 France – the agroecology policy: a new strategic direction for agriculture

2.1 The Agroecological Project for France

In 2012, shortly after President Hollande's government took office, the French Minister for Agriculture, Stéphane Le Foll, announced his ambition to foster a different sort of agriculture with the slogan "Agriculture – Producing differently"[22]. This announcement set the tone for the development of the "Agroecological Project for France", which in turn informed the direction of the 2014 reform of the French national law for the future of agriculture, food and forestry[23], in which the promotion of agroecology is enshrined. In the same year, the Ministry of Agriculture formalised the Agroecological Project for France with the adoption of a more concrete Action Plan for Agroecology[24].

Following the election of Emmanuel Macron as the new President of France in May 2017, a new Agriculture Minister has been appointed, Jacques Mézard. The Minister signalled his support for the work of his predecessor on agroecology. This suggests that the new government is likely to provide continuity to the Agroecology Project.

Figure 2: The former French Minister for Agriculture, Stéphane Le Foll, with the slogan "Agriculture – Producing differently" in the background

Source: http://vigne.reussir.fr/; Credit: © C. de Nadaillac

The Agroecological Project for France involves harmonising and coordinating the actions of a number of existing thematic programmes (see below) but also introduces more cross-cutting national initiatives – notably agricultural education – and contributes to outline the French government's implementation choices for the CAP in the period 2014-2020. This chapter describes the details of the changes and innovations it introduced.

[22] *Agricultures – Produisons Autrement*

[23] Loi n° 2014-1170 du 13 octobre 2014 d'avenir pour l'agriculture, l'alimentation et la forêt. https://www.legifrance.gouv.fr/eli/loi/2014/10/13/AGRX1324417L/jo/texte, adopted in October 2014

[24] http://agriculture.gouv.fr/le-plan-daction-global-pour-lagro-ecologie, adopted in July 2014

For the French Ministry of Agriculture[25], agroecology is "*a way to design production systems that rely on ecosystem functions. Agroecology seeks to amplify those functions while reducing pressure on the environment (e.g. reducing greenhouse gas emissions or pesticide use) and preserving natural resources. Agroecology is about using nature as a production factor to its maximum potential within the limits of its renewal capacity*." Agroecology in these terms would thus involve – in the French government's view – using a set of techniques which make sense on the farm as a whole (a systemic approach) while thinking strategically at territorial (i.e. geographical region) level. Agroecology aims to reintroduce diversity in agricultural production systems and therefore in landscapes, and to put knowledge at the heart of decisions, while also considering the socio-economic context and farmers' situation and future ambition during the transition. The concept in France's plan involves going beyond standard efficiency gains with the intention of rethinking and redesigning production systems to align them with agroecological principles.

The Agroecological Project aims to facilitate and accelerate the transition towards more sustainable farming systems which combine environmental practices, economic performance and collective dynamism at the local level (in 'territories')[26]. The Project, which Le Foll describes as being the way "*to turn the environment into a competitive asset*"[27], is based on 12 fundamental principles (see Annex 2). These were developed on the basis of recommendations made by a consortium of research institutions and universities commissioned by the government in September 2012. The consortium was asked to identify "*good agricultural practices and knowledge available, in France and abroad, on innovative production systems that enable a better management of natural resources*" in order to prepare for the 2014 reform of agricultural legislation[28].

In October 2013, the Agroecological Project for France was refined in the context of a seminar on agroecology and research convened by the French National Agronomic Research Institute (INRA)[29]. A third component, the social dimension, was added to the two pronged (economic and environmental) approach. Agroecology has been a priority for INRA's work since 2010.

[25] http://agriculture.gouv.fr/quest-ce-que-lagro-ecologie; see also Annex 3.

[26] Press release "Les nuits de l'agroécologie". http://agriculture.gouv.fr/sites/minagri/files/160621_dp-nuit-ae-v5.pdf

[27] http://www.gouvernement.fr/action/la-loi-d-avenir-pour-l-agriculture-l-alimentation-et-la-foret

[28] Agreenium, May 2013. This government-mandated mission was carried out by Agreenium, a national consortium of public agricultural research institutions and universities. The report's recommendations included: the development of robust technical baseline and data collated in an integrated information system to identify and characterise systems achieving 'double performance', and on the basis of which new training programmes and educational curricula could be revised; appropriate financial incentives to relieve farmers from the increased costs agroecological practices may incur; the creation of GIEEs. A second mission took place in parallel to identify the factors enabling the development of new agricultural models and to sketch out what form the collective territorial actions envisaged by Le Foll could take.

[29] https://colloque6.inra.fr/agro_ecologie_recherche - organised by INRA under the patronage of the Ministry of Agriculture. INRA – the French National Agronomic Research Institute – has included agroecology as a priority research topic since 2010.

The objectives of the Agroecological Project are as follows:

1. To revise agricultural educational curricula;
2. To foster collective initiatives (in particular through the economic and environmental interest groupings ("GIEE" – explained below));
3. To reduce pesticide use;
4. To provide better training to farmers (including a farm-level, agroecological diagnosis tool);
5. To financially help farmers with the transition to agroecology;
6. To support organic agriculture;
7. To engage and create synergies among local stakeholders;
8. To reduce antibiotic use;
9. To promote seed selection for sustainable agriculture;
10. To increase soil organic matter (notably through the 4 per 1000 initiative[30]);
11. To support beekeeping activities,
12. To promote agroforestry.

The Action Plan for Agroecology establishes a set of cross cutting actions needed to achieve the Agroecology Project's objectives. These actions include steering and managing the Agroecological Project itself (e.g. setting up of a steering group, evaluation indicators and the regional implementation of the Project); engaging researchers to work alongside and train farmers; providing financial support to emerging agroecological initiatives through the CAP; fostering innovation; and promoting agroecology in overseas territories and internationally.

The links between the Agroecological Project (and its Action Plan) and other policies already in place are complex. The Project and Plan appear to have been developed autonomously as a result of a strong political initiative (see Section **2.2**), only subsequently being woven into existing legislative instruments – which they also shaped to some extent.

The Action Plan brings together eight rather diverse and detailed thematic programmes, the majority of which pre-dated the Agroecological Project (adopted in July 2014) although some have since been revised, while a few were created as a result of the Project. The programmes are as follows, in chronological order:

- The Plan 'Ecophyto-II': this was first introduced (as 'Ecophyto I') in 2007/08 and subsequently revised in 2015. The programme aims to reduce the use of pesticides by 50% by 2025[31], on the basis of an indicator linked to the quantity of active substances used. Key features include the provision of training to farmers to use pesticides responsibly (it is mandatory to have the training certificate, *certiphyto*, to

[30] Launched in the aftermath of the COP21 conference on climate in Paris in 2015, the 4 per 1000 initiative argues that a 4‰ annual growth of the carbon stock stored in agricultural and forest soils worldwide would curb the current increase in CO_2 emissions. The objective of the initiative is to demonstrate that soils have a crucial role to play in climate change mitigation. http://4p1000.org/understand

[31] The initial programme's target was a 50% reduction by 2018, subsequently postponed to 2025 under Ecophyto-II.

purchase plant protection products); the expansion of the Ecophyto pilot farm network, *DEPHY*, to 3,000 farms to test and disseminate good practice; the publication of a regular monitoring bulletin to alert farmers about the local pest situation; and a programme to monitor sprayers used on farms. In July 2016, a 5-year pilot system was launched within Ecophyto-II whereby distributors of plant protection products are incentivised to take action to reduce farmers' pesticide use through a system of 'pesticide saving certificates'[32];

- The Action Plan on Seeds and Sustainable Agriculture: launched in May 2011, this includes dissemination to farmers of information on intellectual property rights; measures to ensure that traditional varieties (which may be best suited to local conditions) are available on the market; and measures to encourage the breeding of plant seed varieties for lower input agriculture, including environmental criteria;
- The 'Ecoantibio' Plan, which aims to reduce the use of veterinary antimicrobials by 25% by 2017: launched in November 2011 for the period 2012-2017, the planned actions include awareness raising and the promotion of good practice to avoid the build-up of antimicrobial resistance (hygiene rules, design and maintenance of buildings, implementation of biosecurity measures and monitoring); development of alternatives to antimicrobials (vaccine research, quick diagnosis methods, alternative medicines, new livestock raising techniques). There are also measures to improve the ways antimicrobials are used, including updated prescribing rules, information for vets and better information provided with products to customers;
- The Plan for Sustainable Beekeeping Activities: launched in February 2013, the plan was extended for two more years in January 2016. Its objectives include: improving bee health in particular by introducing measures to reduce the impact of pesticides, diseases and non-native species; promoting pollinator habitats (notably through the creation of Ecological Focus Areas under Pillar 1 of the CAP); training and facilitating the setting up of new beekeepers; and supporting research which will assist in the development and re-structuring of French honey production;
- The Plan for Energy, Biogas and Nitrogen Management, to promote anaerobic digestion and nitrogen recovery. Implemented in March 2013, the plan aims to: 1) improve nitrogen management by using more organic sources of nitrogen and reducing France's reliance on mineral nitrogen; and 2) systematically develop biogas production on medium sized farms to increase farm income, the target being 1,000 on-farm based biogas plants by 2020 (there were 90 in 2012);
- 'Ambition Bio 2017', the organic farming plan, aims to double the area covered by organic agriculture by 2017 compared to 2013. Launched in May 2013, the plan intends to develop organic production by improving the rate of public support for

[32] Based on volumes of sales, a distributor has to acquire a number of 'pesticide saving certificates' to demonstrate action has been taken to promote pesticide reduction amongst farmers. Independent experts assess those actions for the allocation of certificates.

organic farming, reducing the tax burden on organic farms, strengthening the support available with funds from local water agencies in certain target zones, and facilitating access to land for new entrants. It also aims to restructure the organic farming sector by developing specialist supply chains (e.g. cooperatives, food processing), coordinating various sources of funding available and developing multi-annual contracts with farmers. Other objectives include developing market share and overall consumption of organic foods (via communication on the environmental benefits of organic farming, around the theme "organic and local" and by setting a 20% organic food target for public sector catering). The plan aims to boost research into organic farming especially through applied research and projects (using notably EIP-Agri, Horizon 2020 and the CASDAR fund[33]) and to improve the training and education of organic farmers and food processors. This is done through a stronger focus on the specifics of organic farming in agricultural colleges, specialised modules in undergraduate/graduate degrees, and changes in farmers' training. Finally, the Government aims to ensure that legislation is adapted to the needs of the organic sector (notably by contributing to the revision of the EU Organic Regulation);

- The Plant-based Proteins Plan for 2014-2020: launched in December 2014, this plan sets out actions to increase France's production of plant-based proteins from legumes and other protein crops and improve forage self-sufficiency in the livestock sector through various CAP and national instruments (including the organic farming plan '*Ambition Bio 2017*'). It also includes research elements (coordination of existing research, redefining priorities, developing and monitoring a coherent 10 year research programme), training/education actions (promoting better-performing varieties, ways to optimise the reduced use of inputs, protein crop health and quality, etc.), better governance (a merger of existing professional associations) and dialogue with sectoral farming associations (cereal growers in particular). The objectives of this plan go wider than the promotion of agroecological practices, and some of the measures it contains may be in tension with that objective. This is explored further in Box 3 below;
- The Plan on Agroforestry: launched in December 2015, the plan aims to improve the understanding of agroforestry systems, the legislative framework and support to agroforestry, to develop specific advice and training/education for agroforesters, and to increase the economic value of agroforestry produce. Agroforestry as a system is also to be promoted at the international level.

There are few regulatory measures in these eight thematic programmes. Rather, actors are incentivised in various ways to change their practices through, for example, reduced tax to facilitate organic farming or the use of a system of certificates to incentivise pesticide

[33] Special Fund for agricultural and rural development (Compte d'affectation spéciale « développement agricole et rural»), financed by a tax on farm businesses.

savings by farmers and distributors. The Agroecological Project also aims to facilitate the emergence of bottom up initiatives, as explained further below.

Box 1: Targets and expected impacts of France's Plan for Agroforestry

Agroforestry has been a research topic for decades in France[34]. Agroforestry has been granted support under Pillar 2 of the CAP since the previous programming period 2007-2013 under measure 222[35]. The rationale for this was that, by re-introducing trees on agricultural land, agroforestry would contribute to meeting France's greenhouse gas emissions commitments (through carbon sequestration), to the development of renewable energy production, soil protection, water quality and availability, the conservation of biodiversity and enhancing landscapes. While the targets for the 2007-2013 period were to provide support to 600 farmers to help them set up 3,000 ha of agroforestry systems, in practice only 207 beneficiaries planted some 1,257 ha of agroforestry.

This lower result can partly be explained by a late introduction of the measure (in 2009 only) in 12 regional RDPs (out of 27 regions) and without complementary national funding[36]. In the current programming period, regions of France were encouraged by the Ministry to support agroforestry through sub-measure 8.2[37] of Pillar 2. Some 16 regions now offer support to agroforestry including, in seven of them, support for both set-up and maintenance costs. This sub-measure is co-financed by national funds[38].

The Plan on Agroforestry launched in December 2015 aims to provide an overarching framework to raise awareness and understanding of the benefits of agroforestry systems and coordinate its promotion at various levels (education, in legislation, internationally, etc.). Understanding is to be enhanced by developing specific statistics, documenting the costs and benefits of switching to agro-forestry systems in different technical contexts and to promote research and development for the sector. Actions to raise awareness about agroforestry include additions to curricula, specific advice to farmers and events aimed at national, regional and local civil servants or other relevant actors. Other actions to promote agroforestry internationally will be carried out in relevant international fora, such as the FAO, at EU level through the European Agroforestry Federation (EURAF) or the European Innovation Partnership (EIP) network. The Ministry also plans to strengthen the use of existing policy support mechanisms for agroforestry and make recommendations for future policy development. It also highlights the multiple forms agroforestry can take (hedges/trees around the field, rows of trees in arable fields, trees on pastures, etc.). Targets have not been set in the absence of a more precise inventory of agroforestry systems in France; however, a steering group has been appointed to define monitoring and evaluation indicators for the Plan. At the time of writing, these had not been published.

[34] For instance, the European research project SAFE (Sylvoarable agroforestry for Europe), coordinated by INRA between 2001 and 2005, is said to have laid down the ground for the development of agroforestry policy in the EU.

[35] This provided compensation for set-up costs only.

[36] http://agriculture.gouv.fr/sites/minagri/files/e_cavailles_20151214_ppt_mesureagroforesteir_pdr-1.pdf

[37] Submeasure 8.2 covers the costs of establishing and (for a maximum of 5 years) maintaining systems of agroforestry.

[38] The maximum aid may cover 80% of set-up costs and 100% of maintenance costs (with a combination of EAFRD and state aid).

While the thematic programmes constitute one aspect of the Agroecological Project for France, it also builds upon the measures and instruments available under the CAP. Indeed the Project was developed between 2012 and 2014, in parallel with the CAP reform process. In its early phase, the Project is believed to have shaped some of the French choices for the implementation of the CAP 2014-2020[39]. The CAP instruments used in France to promote agroecology include mostly Pillar 2 measures, notably the agri-environment and climate Measure, the organic farming Measure and the cooperation Measure to support EIP[40] groups and short supply chains, among others (see Annex 1 for the CAP instruments most commonly used in France). In particular, the suite of agri-environment-climate sub-measures developed by the French government for the regions to offer in their RDPs contains some options aimed at fostering a farm-wide agroecological approach. An example of such a whole farm sub measure (for cereal and protein crop growers) is set out in Box 2.

Box 2: France's agri-environment-climate sub measure "Système de grandes cultures"

France's agri-environment-climate operation "Système de grandes cultures" is targeted at arable farmers with predominantly cereal and/or protein crops. It aims to promote lasting change in the farming system, with the following characteristics:

- A range of crops planted at any one time, with the use of long rotations, legumes and alternate winter and spring planting;
- Reduced use of nitrate fertiliser with particular attention paid to the risk of losses from bare soils;
- A reduction in the use of pesticide products, achieved through greater resilience to threats. This is to be achieved through longer rotations, more crop diversity, changes to the dates and density of sowing and better management of landscape features (trees, hedges, banks, etc.) that support fauna and flora which play a useful agronomic role. There are two levels of pesticide reduction proposed to farmers.

The payment for this package varies from €90/ha up to €235/ha, depending on the region where farmers are located and the level of commitment they choose. Specific requirements include:

- Limiting the principal crop to 60% of the farmed area in year 2 and 50% in year 3;
- Growing at least four different crops in year 2 and five in year 3;
- Including at least 5% legumes by year 2 (and up to 10% depending on regional decisions by year 3);
- A ban on growing straw cereals on the same land in successive years;
- A ban on growing other crops for three successive years;
- A reduction in the frequency of pesticide treatments compared to an index calculated to take account of the characteristics of the farming system being used;
- Specific rules for the use of nitrogen fertilisers; and
- Near total ban on the use of nitrogen fertiliser on legume crops.

There are similar "system" operations for grassland farming and for mixed farming (with an emphasis on recoupling crop and livestock systems on the farm).

Source: French National Framework for Rural Development

[39] This is due to timing considerations and the fact that the agroecology project is supported by a variety of instruments and not exclusively using CAP funds; personal communication, July 2016

[40] European Innovation Partnership for Agriculture

France's agri-environment-climate operations are defined at national level, with the regions choosing from a menu set out by the national government. There is also active support for agroforestry in RDPs. A total of 16 regions in France (out of 27) opted to implement the agroforestry measure in their regional RDPs. Even though no national framework was proposed for this measure in the French Rural Development National Framework document[41], the Ministry chose to co-finance the agroforestry measure, to promote its use by the regions (see also Box 1). Some thematic programmes highlight the way in which different CAP instruments (Pillar 1 and Pillar 2) can be used to contribute to the Agroecology Action Plan's objectives, as shown in Box 3 for the Plan for Plant-based Proteins. In some instances, examination of the CAP implementation choices reveals that there can be cases where some measures are not fully coherent with the Agroecology Project (end of Box 3).

Box 3: CAP instruments used to advance the Plan for Plant-based Proteins

The Plan for Plant-based Proteins relies on funding from the CAP to increase the acreage of protein crops and legumes in France. The Ministry of Agriculture adopted many of the options available to Member States to promote proteins. These are as follows:

- Under the 1st Pillar of the CAP, some €49 million of coupled support is available for protein crops (mostly to crops such as peas, lupins, field beans, but also soya and forage legumes such as alfalfa, clover, and sainfoin). This level of funding represents payments of about €100-200/ha for these crops;
- In addition, another coupled payment (with a budget of € 98 million) incentivises the production of forage legumes on livestock farms and a further € 4 million is spent on legume seeds. The forage legumes payment is available in addition to agri-environment-climate support to help mixed farms become more self-sufficient in feed;
- France also chose to include nitrogen-fixing crops (often legumes) in the list of Ecological Focus Areas options through which the requirements of greening direct payments can be met;
- In Pillar 2, the objectives of the plant-based protein plan were taken into account in the design of the system-level agri-environment and climate sub measures (AECMs). In particular, the measures specific to arable systems require farmers (amongst other requirements, e.g. on pesticide use) to grow a minimum of 5% of legumes, rotate crops annually and reduce the use of mineral nitrogen. All of which points to greater production of plant-based protein.
- The crop diversification obligation within Greening is also intended by the Government to encourage protein crops in rotation with other crops which are currently often cultivated as monocultures. Soya in rotation with maize is given as an example of such synergistic rotations. This would be a modest boost to agroecology if it were to occur.
- However, in contrast with some of the other measures which promote more sustainable approaches, France has introduced an equivalence scheme to the crop diversification obligation for maize farmers which may disincentivise the use of rotations. Under the equivalence scheme, maize farmers can provide winter cover instead of diversifying their crops, which makes it considerably less likely that maize/soya rotations will happen in practice.

[41] France opted for a regional implementation of Pillar 2 which allowed regions to make different decisions with respect to rural development measures. For some measures however, it was felt that national coordination was needed and the design of a number of measures were designed in the National Framework document. This includes the type and design of options to be made available under the agri-environment Measure (Measure 10 of the RDP) as well as e.g. M8.5 which provides support for investments improving the resilience and environmental value of forest ecosystems, but not the agro-forestry measure (Measure 8.2).

Some of the measures in the Plan on Plant-Based Proteins will also contribute to the objectives of other action programmes. For instance, the agri-environment-climate sub-measures and coupled payments relevant to protein crops are also part of the organic farming plan. The Plant-based Proteins Plan would also contribute to the objectives of the Energy, Biogas and Nitrogen Management Plan, by increasing the availability of organic sources of nitrogen. Greater availability of legume seeds is also an objective of the Plan for Seeds and Sustainable Agriculture, whilst more complex crop rotations could also contribute to pest management strategies, and thus to the objectives of the Ecophyto Plan.

In addition to the thematic programmes and the CAP measures, the objectives of the Agroecological Project also guided the 2014 reform of the French agricultural law (see Annex 3). This provided the Project with the necessary legal basis. The legislative reform brought in two notable innovations. One was in farming education. Educational programmes and training for farmers were reformed to encourage the adoption of agroecological practices and systems. Economic and Environmental Interest Groupings ("GIEEs")[42] were also created to encourage greater collaboration and cooperation among farmers and between farmers and other types of local actors.

The new educational and training programmes aim to raise awareness and skills about agroecology in the farming community and among the general public. Specifically, since 2014, a number of teaching programmes in agricultural colleges and universities have been revised to focus more on agroecological principles and practices, not only for students but also amongst teaching staff. The changes are part of a horizontal programme named "Teaching how to produce differently"[43]. Teaching materials and modules have been revised for various technical diplomas ("Brevets de Technicien Supérieur", "Certificat professionnel d'aptitude agricole"), professional *baccalauréat* (A-levels equivalent) diplomas ("baccalauréat professionnel « conduite et gestion de l'exploitation agricole »") and qualifications ("Brevet professionnel « responsable d'entreprise agricole »"). The latter two are particularly important since they form the minimum educational levels required to receive support to set up a farm. In addition, in 2014/15, some 135 teachers/lecturers and members of staff of the regional Ministry services received specific training on agroecology with a view to acting as advisors to other teaching staff in colleges and universities.

Support for the development of new training programmes for farmers (or the revision of existing programmes) mostly comes from the national CASDAR fund, a fund for applied research to enhance agricultural and rural development.

[42] Implementation rules defined by Decree n°2014-1173 of 13 October 2014
[43] "Enseigner à produire autrement"

Box 4: Examples of training programmes for advisers from the Chambers of Agriculture

The network of chambers of agriculture[44] launched a plan in 2015 to train their advisers to develop their skills to advise farmers on agroecology. Advisers in this network collectively attended some 33,000 hours of training in 2015.

The topics covered in the new training programmes to advisers include for instance[45]:

- Helping farmers to change their practices;
- Agroecology in the livestock sector: how to produce differently;
- Design of innovative integrated crop systems; and
- Enabling the implementation of GIEE projects.

For example, the 3 day programme on 'enabling the implementation of GIEE projects' includes training on the objectives of GIEEs and their linkages with the 2014 agriculture law reform; an analysis of existing GIEEs and some of the projects they have funded; the role of the Chambers of Agriculture's advisers in supporting the development of GIEE projects; methods to advise and help a group to build a successful proposal; project management; how to handle unsuccessful bids.

Source: Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt, 2015.

The Ministry of Agriculture and the network of technical agricultural institutes[46] have also developed an online advisory tool whereby farmers (or their advisers) can run an agroecological assessment of their farms by answering a set of questions tailored to the type of production. The results can then be benchmarked. Another module identifies possible agroecological practices the farmer could explore and details their performance potential.

Communication and awareness raising events carried out during 2015 include regional, open access events for farmers, national level conferences and the production of leaflets to explain agroecology to the wider public. One example is the "Night of Agroecology", a series of regional events across France and a national conference held in Paris, which took place on 23 June 2016. The objective was to enable dialogue between farmers involved in agroecological initiatives and the public. In a similar vein, three Ministries (agriculture, education and economy) collaborated in early 2015 to launch a free online university course (Agreenium-IAVFF) and their first Massive Open Online Course on agroecology as a voluntary e-learning tool.

The second legislative innovation of the 2014 French agricultural law reform, the creation of the GIEE[47], aims to facilitate the emergence of collective projects involving farmers and

[44] In France, Chambers of Agriculture are public entities in charge of representing broadly speaking farmers, cooperatives, traders, etc. Chambers of Agriculture have delegated powers from the State to execute administrative tasks (e.g. mandatory registration of farms) and play a key role in providing information and helping farmers to manage and develop their business.

[45] http://www.resolia.chambres-agriculture.fr/domaines-de-formation/productions-agricoles/agroecologie/

[46] This network (ACTA – *réseau des instituts des filières animales et végétales*) regroups 15 national and recognised technical institutes by sector, e.g. the Institute for fruits and vegetables, the livestock technical institute, the forestry technical institute, etc.

[47] Implementation rules defined by Decree n°2014-1173 of 13 October 2014

other local actors, and to help them apply for funding and implement their agroecological 'project'. The other actors include chambers of agriculture, agricultural research or technical institutes, agricultural colleges, cooperatives, food processors, environmental NGOs, local government, etc. The idea is that agroecology must be based on local knowledge and a willing transition by farmers/local stakeholders. Although the GIEE is a new concept, the legislation allows existing groups to apply and be labelled a 'GIEE' if the project is in line with the criteria of the regional sustainable farming plan[48]. The first GIEEs were officially recognised in February 2015; in September 2016, there were about 300 GIEE projects. Once certified, a group may be prioritised in the allocation of funding and/or benefit from increased support rates. Funding may come from the EU (EAFRD, European Regional Development Fund (ERDF), European Social Fund (ESF), European Agricultural Guarantee Fund (EAGF), Horizon 2020/EIP-Agri), state aid (e.g. the CASDAR[49] fund on agricultural and rural development, EAFRD co-financing), regional aid or support from the water or environment agencies (ADEME).

Box 5: Examples of GIEE groups and projects

1. *Achieving feed self-sufficiency through crop diversification*: in this GIEE in **Brittany**, 10 farmers committed to include legumes in their crop rotations. While feed production is the primary objective, farmers in this GIEE also aim to improve their environmental performance by reducing the need for synthetic inputs thereby improving water and soil quality. The risks and finances are collectively managed by the existing CUMA (the legal structure for farmers' groups in France) so that investments in new equipment and technical knowledge about animal feed are shared.
2. *Nitrogen management and acquisition of a biogas plant on farm*: in this project in **Aquitaine**, 15 livestock and mixed farmers and 5 arable farmers decided to purchase a biogas plant to add value to slurry by producing energy. They also planned actions to improve nitrogen management on farms, with transfer from livestock to arable farmers, and reuse of the biogas digestate. ADEME helps the project by sharing knowledge and experience while subsidies supported part of the investment costs.

Source: Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt, 2015.

Both of these examples show the key roles which cooperation and knowledge sharing play in spreading appropriate agroecological practices among farmers.

The marked shift in French policy towards the promotion of, and support for, agroecology has happened for a number of reasons. The following section discusses these using a PESTLE framework for our analysis. PESTLE stands for Political, Economic, Social, Technological, Legislative and Environmental and is a tool for the systematic analysis of policy development and implementation against these key criteria.

[48] The regional sustainable farming plans (*Plan Régional d'Agriculture Durable* - PRAD), created in 2010, aim to set out and detail the national strategy for farming and food policies in the regions, taking into account the territorial specificities and the economic, social and environmental challenges in the region.

[49] Special Fund for agricultural and rural development (*Compte d'Affectation Spécial pour le Développement Agricole et Rural*).

2.2 Analysis of the drivers

The 'PESTLE' analysis focuses on the Political, Economic, Social, Technological, Legislative and Environmental factors that are likely to have been influential in the introduction of the Agroecology Project.

*A strong **political** will/leadership*

The Agroecology Project was initiated by the Socialist Party government of François Hollande, more specifically by the Minister for Agriculture Stéphane Le Foll who has held that position since 2012. Before his appointment as Minister for Agriculture, Stéphane Le Foll had a long involvement in agriculture policy, including as an MEP and member of the Agriculture Committee (COMAGRI) group of the European Parliament group between 2004 and 2012. In 2006, he set up a small think tank, Groupe Saint-Germain, through which he developed his vision[50] for a 'common agri-environmental policy' which would reconnect the economic, social and environmental aspects of agriculture and provide 'ecological added value' as well as a new legitimacy for such a policy. Given his long history as a proponent of agroecology, Stéphane Le Foll is seen by many[51] as a specialist Minister with an in-depth knowledge of agricultural issues and a personal ambition to change the status quo. He has been the central driver of the Agroecological Project in France. As a result, however, a commonly cited risk to the implementation and likely impact of the agroecology policy is the likely durability of its political support.

Beyond Le Foll's individual motivation on the topic, the Agroecology Project was also shaped by two major political initiatives by the new government in 2012[52]:

- the French Environmental Conference[53] (September 2012), where the new government expressed its ambition of becoming a nation of environmental excellence, to pave the way to tackling key global environmental challenges, inter alia climate change, resource scarcity and global biodiversity loss. These statements of ambition are likely to have been influenced by a number of factors, including the government coalition with the Green Party ("*Europe Écologie Les Verts"*);
- The National Pact for growth, competitiveness and employment (November 2012) which aimed at reinvigorating French firms' competitiveness to ensure growth and jobs.

*Using the **economic** rationale as a trigger for change towards agroecology*

The Agroecological Project in its first phase focused solely on achieving 'win-wins' - ecological and economic. The slogan associated with this phase - 'Agriculture - Produce differently' - reflected the strong political willingness to find a new approach to economic issues facing the agricultural sector, to respond to growing societal and environmental concerns (as well as a way to depart from the approach of the previous government). The concept of the dual objectives ('win-wins'), and in particular the idea of turning the

[50] Groupe Saint Germain, undated. *Parce que le monde change, il est vital de repenser le projet de l'agriculture*.
[51] Personal communication, July 2016
[52] Personal communication, July 2016
[53] http://www.developpement-durable.gouv.fr/La-conference-environnementale,29505.html

environment into an economic asset rather than seeing it as a constraint, was intended to appeal to a broad spectrum of stakeholders.

The Agroecology Plan also promotes a bottom up approach and puts great emphasis on collaborative initiatives by farmers grouped in GIEEs, as opposed to a more stringent regulatory framework (see *Social factors*). This clearly found resonance among farmer groups in a context of difficult economic times in various sectors (poultry, pig and dairy notably). In fact, the summer of 2012 was marked by the near bankruptcy of the poultry agribusiness Doux (one of the largest firms in this sector in the EU), threatening the viability of many farms in its supply chain and customer base, and by increased pressure on many sectors due to feed price volatility and the gradual phasing out of milk quotas in the dairy sector which had begun in 2010. This was then exacerbated by the Russian ban on EU agricultural products from August 2014 along with slowing demand from China.

The bottom up approach may also have been seen as an effective way to foster change in a context of significant public budget cuts over that period in France which affected the resources available for legislative controls[54].

***Social** considerations at the heart of the concept*

The October 2013 seminar convened by INRA to discuss the agroecology project agreed that, in addition to its economic and environmental roles, the successful promotion of agroecology required a strong social dimension. The existing ways for farmers to work together – which already included a culture of working via self-led associations and cooperatives – were subsequently strengthened by the introduction of the GIEEs. The salient features of this new structure are that all of its projects must be agroecological and must also be in conformity with regional sustainable farming plans. In return, GIEE projects enjoy priority access to funding. A GIEE gains recognition as such when it is successful in one of the regional funding competitions for the first time.

The Agroecology Project therefore puts a stronger emphasis on the social aspects of farming and the GIEEs are particularly emblematic of this renewed recognition. While many types of farmer groups exist in France[55], GIEE projects are for the most part led by farmers who are already familiar with working in groups or cooperatives. However, alongside farmer groups, initiatives by other types of agricultural associations also came forward in response to the regional calls for projects, - showing that the intended flexibility of GIEEs has been successful to some extent. . The GIEEs aim to empower farmers (or other groups) to deliver agroecology and give them complete autonomy in deciding their agroecological objectives and initiatives. The structure enables participants to use their own knowledge and experience to find tailored and appropriately-scaled solutions. Besides recognition, autonomy and visibility, some sources suggest that a key motivational driver for project

[54] Personal communication, July 2016

[55] e.g. CUMA (*Coopérative d'utilisation de matériel agricole*) is a common type of such farmers' group. They enable farmers to jointly purchase and share agricultural equipment, e.g. combine harvesters.

applicants is the priority allocation of financial aid which members gain when a group is a GIEE[56].

***Technology** embedded as part of the agroecological solution*

Technology does not appear to have been an important driver of the Agroecology Project in France. However, Le Foll's vision relies on innovation to bring about solutions[57] notably through a strong involvement of the research sector – applied research in particular – to support a changing agriculture (see also section 2.3 for the main farmer unions' positions). Focussed research is thus part of the French agroecological vision and research programmes have been revised accordingly. The farmers' union FNSEA attaches great importance to a contribution from technological innovation.

In addition to the EU funds and research networks, such as the European Agricultural Fund for Rural Development (EAFRD) and the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-Agri), the Agroecology Project uses the national CASDAR[58] fund for applied research for rural and agricultural development. The way CASDAR funds are used is defined by the National Programme for Agricultural and Rural Development (PNDAR) which, for the period 2014-2020, aims to develop and disseminate production systems with strong economic, environmental, health and social performance – closely mirroring the Agroecology Project's objectives. The PNDAR focuses on three themes:

- Improving farmers' (and food processors') autonomy and competitiveness by reducing the use of agricultural inputs;
- Diversifying agricultural models and production systems at field scale (e.g. agroforestry or intercropping), farm level (through mixed farming) or on a wider scale to improve the resilience of these systems and minimise environmental and economic risks;
- Improving the capacity to manage risks and guide farmers and rural actors in a region.

While CASDAR funds and PNDAR are relatively recent tools in France (they were created in 2006), the PNDAR is delivered through contracts agreed with long established networks. For this period, two contracts have been agreed with the network of Chambers of Agriculture and the Network of Agricultural Technical Institutes.

In parallel, the Ministries of Agriculture, Research and Economy launched a new research programme in 2016 titled "Agriculture-Innovation 2025"[59], structured around four themes:

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[56] http://www.lafranceagricole.fr/actualites/agroecologie-giee-un-outil-pour-que-les-agriculteurs-reprennent-la-main-et-soient-reconnus-1,0,14635244.html

[57] Personal communication, July 2016

[58] The Special Fund for agricultural and rural development (*compte d'affectation spéciale « développement agricole et rural »* – CASDAR) is a national French fund focusing on applied research. Its allocation is defined in the National Programme for agricultural and rural development (*Programme national de développement agricole et rural* – PNDAR). Its budget is financed by a tax on all French farms, which in 2015 amounted to €137 million.

[59] http://agriculture.gouv.fr/sites/minagri/files/160229_agriculture_innovation.pdf - The government's research programme has built on a foresight report on the same topic mandated to four heads of agricultural research institutes and universities in France (Bournigal J.M., Houllier F., Lecouvey P., Pringuet P., 2015).

- Soils, agriculture and climate;
- Agriculture at the centre of the National Research Strategy: this includes multi-disciplinary themes with a focus on biotechnologies and genetic improvement through selection, systems biology, biocontrol, climate issues, big data, etc.;
- Precision agriculture and digital technology;
- Setting up of "living laboratories", or on-farm experiments, to foster innovation at local/regional level between farmers, enterprises and actors involved in research and education. Two pilot projects will be funded in 2016, one in an area in Aquitaine on agroecology in arable systems and one in Brittany on sustainable livestock systems.

While agroecology is not explicitly part of the Agriculture-Innovation 2025 research programme, its principles are visible, especially in the "living laboratories" and in the focus on biocontrol and soils.

Legislative framework: *helping to enable the Agroecological Project*
The 2014 reform of the French Agricultural Law introduced a series of statements about the Government's role in promoting and establishing agroecology. The Law now states that public bodies will promote agroecological systems and seek to make them permanent and that the State will encourage farmers to adopt innovative practices and systems. To help with this, it will support those engaged in the development of biocontrol measures and expects the process of market authorisation to be speeded up. The Government will also facilitate interactions between social scientists and agronomists to develop better means of knowledge sharing to facilitate the transition towards agroecology. These provisions are an expression of the French government's determination to pursue a vigorous policy towards agroecology

Breaches on a considerable scale of controls designed to implement the water framework and nitrates Directives on farmland are also likely to have been an enabling factor facilitating the adoption of the Agroecological Project in France, as explained below. Farmers have criticised what they see as legislative 'dogmatism' (see Section 2.3) and the Project is, in part, an attempt to boost compliance with the legislation by providing funding, knowledge and better collaboration tools to farmers.

Deteriorating state of the ***environment*** *and growing societal concerns*
A range of wider politically relevant environmental factors also facilitated the implementation of the policy and associated programmes, but without being key drivers[60]. Such factors included global challenges in the context of the then forthcoming COP21 in Paris (climate change); and water issues, with the 2013 judgement[61] by the European Court of Justice establishing that France had failed to fulfil its obligations in relation to the Water Framework Directive[62]. With 55% of its UAA in Nitrate Vulnerable Zones (NVZs), France also

[60] Personal communication, July 2016
[61] http://curia.europa.eu/juris/document/document.jsf?text=&docid=138392&
page Index=0&doclang=fr&mode=lst&dir=&occ=first&part=1&cid=316494
[62]http://www.journaldelenvironnement.net/article/la-directive-cadre-sur-l-eau-parent-pauvre-de-l-europe,56407

faced significant nutrient leaching issues, which in turn were a sign of poor soil condition and unsustainable farming practices. In 2011, a nationwide report on soils found that 17% of the country's soils were threatened by erosion and pollution from phosphate[63]. Biodiversity decline was and is also a major societal concern, as illustrated by the press coverage of the adoption of the new French biodiversity law in July 2016[64]. The impact of pesticides, notably neonicotinoids, on the decline in bees and pollinator populations was also of public interest and is recognised in the plan on sustainable beekeeping activities.

The key message from Minister Le Foll on 'producing differently' was effective in developing a consensus amongst many rural stakeholders and wider French society. 'Producing differently' signals that change is needed - a message which is easy to agree with. The agroecology concept, which later set the direction of travel, is equally wide in scope and subject to varying interpretations. The ambiguity of these terms is thought to have contributed to the political acceptance of the project in a first phase by different interest groups. Furthermore, it can reasonably be assumed that the 'soft' regulation approach promoted in the thematic programmes contributed to their quick adoption or revision. However, throughout the fine-tuning of the agroecology project, diverging understandings emerged which sparked some criticism from both farming unions and environmental groups. These are further described in Section 2.3.

Compared to previous agricultural political projects attempted in France – for example, the sustainable agriculture policy in the early 2000s - some commentators see the success of Le Foll's approach as being the mobilisation and engagement of civil servants in the Ministry of Agriculture and in the regions, as well the support gained from the research sector (e.g. INRA, CIRAD). The emphasis on joint, collaborative and collective initiatives and the objective of 'win-wins' also helped to break down the polarised views of environmental groups and farmer unions and cooperatives.

The initial acceptance of the Agroecology Plan by a broad range of agricultural stakeholders has developed into a more nuanced picture, in which some tensions have arisen, in subsequent years. The next section provides an overview of the diverging views since 2013 and the impact of the Plan.

2.3 Experience and impact to date of the agroecology policy in France

This section presents the data available on the impact to date of the Agroecology Project and summarises the main French stakeholders' reactions, by topic, to the agroecological plan. It seeks to highlight the diverging interpretations by different interest groups of its likely impact on the ground.

Monitoring and evaluation is one of the actions of the Action Plan on Agroecology adopted in 2014. It relies on the work and guidance of a steering group, composed of 20 members from different interest groups (chambers of agriculture, farmers' unions, environmental

[63] Gis Sol. 2011. *Synthèse sur l'état des sols de France. Groupement d'intérêt scientifique sur les sols*, 24 p. http://www.actu-environnement.com/ae/news/bilan-etat-sols-france-gissol-inra-14170.php4

[64] *LOI n° 2016-1087 du 8 août 2016 pour la reconquête de la biodiversité, de la nature et des paysages*

NGOs, etc.). The steering group developed key output, result and outcome indicators in 2014 (further elaborated in 2015) to assess the economic, environmental and social performance of farms and monitor the progress of the transition towards agroecology[65] (see Box 6). Information iscollected through a series of existing statistical surveys and where necessary, the steering group is to identify gaps in data and report these to the statistical departments. The steering group also relies on external studies for more in-depth analyses. For example, a study was launched in early 2016 to assess the extent to which RDPs in regions have taken agroecology into account.

Box 6: Selected indicators for assessing progress on implementation of the Agroecological Project

The suite of indicators published by the French government as part of its 2015 progress report on the Agroecological Project is broad in nature. Output and result indicators include for instance:

- Numbers of officials trained and the total days' training undertaken;
- Numbers of hits on the agroecology section of the Ministry website, and the number of visits on which ten or more pages were read;
- Numbers using an online diagnostic tool;
- The extent to which research funding available to CASDAR is targeted at agroecological themes (100%);
- Numbers of farmers reporting themselves to be aware of agroecology; already engaged in an initiative or considering becoming so; and/or engaged in a collective initiative;
- Extent to which RDP and direct payments funding is supporting agroecological activity, for example through agri-environment climate sub measures, support for organic farming and investments with an agroecological focus (the Government's description of its indicators does not make clear how this will be assessed). The area benefitting from coupled payments to support protein crops is being used to indicate the level of support from direct payments;
- Numbers of GIEEs established, and their characteristics.

Outcome indicators cover three themes as follows:

- Farm viability, e.g. agricultural value-added, debt, average labour time;
- Efficient use of inputs and natural resources, e.g. indicators of soil status such as organic matter content and the degree of erosion; and,
- The protection of agro-ecosystems and fight against climate change, e.g. GHG emissions, farm bird population, water quality indicators.

Source: Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt, 2015.

The 2014 agricultural law and the Agroecological Project brought an unprecedented prominence to the agroecological concept in France[66]. The term agroecology is now widely used by the farming unions (albeit with an emphasis on economic aspects). Survey evidence shows that a large majority of farmers are both aware of the concept of agroecology and are carrying out practices considered to be agroecological by the Government. A survey[67] undertaken for the Agriculture Ministry shows that farmers' awareness of agroecology as a

[65] Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt, 2015 (a)
[66] Personal communication, July 2016
[67] BVA, 2016

concept has increased (79% in 2016, up from 50% in 2014 and up to 86% amongst farmers less than 40 years old) and that a majority (92%) of those interviewed are engaged in or planning to join one or more "agroecological initiatives" such as reducing agrochemical inputs (76%), improving soil quality and limiting soil erosion (72%) or preserving water resources (61%). Other areas of engagement include enhancing natural pest predators, increasing farms' energy and input independence, and increasing added-value to existing production. However, it should be noted that the measures considered to be agroecological by the survey's designers include some that are quite general in nature (for example, protecting soil from erosion) and farmers themselves report a lower level of engagement when questioned specifically about the concept of "agroecology". Another indicator of agroecology's implementation in France is the number of farmers declaring to be in, or about to join, a GIEE project (11%). Some 57% of French farmers knew about the concept of GIEEs in 2016, while 31% of farmers said they were willing to join a GIEE project.

To date, some 300 GIEEs have been recognised by the Ministry of Agriculture. These cover over 300,000 ha of UAA and involve 4,000 farmers. Those figures amount to only about 1% of the UAA in France, but figures have been steadily increasing. 60% of the GIEE projects are primarily concerned with livestock sector issues while a quarter mainly concern arable crops, although a majority of GIEE projects encompass more than one type of production. Some of the themes include economic efficiency, soil conservation, feed self-sufficiency, closed loop systems, diversifying crop rotations, nitrogen management, promotion of legumes and biodiversity amongst others[68].

The process of adoption of the Agroecological Plan has not been without its challenges, despite Le Foll's careful presentation of the Agroecological Plan as both an economic and an environmental policy. The comments and statements reported in the next few paragraphs cannot provide a representative picture of the positions held by different stakeholders at different times, but give some indication of the shifts in opinion which took place as the Plan was introduced.

Initially very sceptical about the project[69], the main French farmers' unions, such as the *Fédération nationale des syndicats d'exploitants agricoles* (FNSEA – National Federation of Farmers' Unions), the *Jeunes Agriculteurs* (JA - Young Farmers) and *Coop de France* (cooperatives of France), reacted in mixed ways to its launch. For instance, in the early days of the Agroecological Project (2012), farmers' unions commented on the plan as being a step in the right direction as it was seen to encourage collective approaches and innovation whilst being, in the Unions' own words, "not in opposition to productive systems". Representatives of the agricultural sector appear to have embraced the agroecology plan as compatible with current modes of production and potentially offering technological improvements – such as improved genetics. In early 2015, the FNSEA's president anticipated that the "mainstreaming of agroecology" announced by the Agricultural Minister that year would primarily result in the development of new technologies, including in the field of genetic innovation, which would enable farmers to reduce the environmental impacts of

[68] http://agriculture.gouv.fr/sites/minagri/files/160229_plaquette_etat_des_lieux_giee_sia_2016.pdf
[69] Personal communication, July 2016

farming[70]. In September 2013, however, an FNSEA spokesperson was complaining that teaching schoolchildren about agroecology was inappropriate unless they were also taught about other ways of farming "without exception"[71]. Farmers also appear to have hoped the Project would result in an end to "regulatory dogmatism" which they associated in particular with the implementation of the Nitrates Directive[72].

Some environmental groups on the other hand initially complained about the Agroecological Project's emphasis on new technologies, and that it was insufficiently concerned with improving farmers' use of biological processes. In their view, this relative emphasis could contribute to maintaining the status quo whereby production and productivity prevail at the expense of the environment[73]. For those who see agroecology as a social movement, the Project was seen to lack the necessary root and branch reform of both agricultural systems and their associated social systems for production, distribution and ownership.

Nonetheless, although it is the result of a compromise between different interest groups, the French Agroecology Project appears mostly to be viewed as a worthwhile approach which is initiating changes in farming practices in a way which should bring both economic and environmental benefits.

In addition to these reactions to the Plan as a whole, stakeholders reacted to particular elements of it. The new legislative aspects were praised by some stakeholders. For example the 2014 agriculture law introduces a reduction in the minimum area threshold for new entrants to agriculture, which had been considered to be a barrier to new entrants and, as a result, favouring the expansion of established farms[74]. Other positive points include better rules to limit the use of antimicrobials in livestock farming and the involvement of Anses (the French food safety agency) in the evaluation of pesticide safety before market authorisation (previously under the Ministry of Agriculture's remit, see also Annex 3).

Some representatives of civil society consider that the actions planned in the Ecophyto Plan, which aims to reduce the use of pesticides, will not be enough to meet its objectives. The Ecophyto II Plan included in the wider agroecology framework revises its predecessor Ecophyto I, putting the target for a 50% reduction in pesticide use by active ingredient back from 2018 to 2025. It is, perhaps, unsurprising that critics should be sceptical about Ecophyto II after the failure of its predecessor was ascribed to poor implementation.
However, the Government's view is that its inclusion in the wider agroecology framework, with the parallel promotion of agroecological practices, will provide farmers with the knowledge and means to reduce their pesticide use. For some environmental NGOs on the

[70] http://www.terre-net.fr/actualite-agricole/politique-syndicalisme/article/plus-de-50-des-exploitations-agricoles-converties-a-l-agro-ecologie-205-107402.html
[71] Reported in Farming Online, 4 September 2013
[72] http://www.lafranceagricole.fr/actualites/directive-nitrates-fnsea-ja-apca-et-coop-de-france-disent-oui-al-agroecologie-mais-non-au-dogmatisme-1,0,86484058.html
[73] Caplat J., 2014 and http://loup.fne.asso.fr/fr/loi-d-avenir-agriculture-foret-fne-rappelle-ses-demandes.html?cmp_id=33&news_id=658)
[74] http://www.natureetprogres.org/revue_nature_progres/articles/article49.pdf

other hand, further regulatory approaches should have been adopted at the same time[75,76,77].

[75] *Agir pour l'Environnement* (NGO) thinks the law should have gone further, banning aerial spraying and imposing a 200 meter buffer zone next to residential areas http://www.agirpourlenvironnement.org/communiques-presse/loi-d-avenir-agricole%C2%A0-prenez-des-mesures-contre-les-pesticides%C2%A0-3814

[76] A group of farming union and NGOs including *Confédération paysanne* (farming union, member of *Via Campesina*), *les Amis de la Terre* (Friends of the Earth) and *LPO* (Society for the Protection of Birds) proposed amendments to the Pesticides chapter to ensure that «natural preparations of low concern» continue to be allowed and ensure they cannot be subject to patents. This request emerged from concerns about options available to farmers willing to use alternatives to pesticides. Low concern natural preparations include preparations or decoctions of e.g. clay, nettle, white vinegar, whey, etc. http://www.aspro-pnpp.org/wp-content/uploads/2012/01/proposition-damendements-LAAF-ASPRO-PNPP-Conf%C3%A9d%C3%A9ration-Paysanne-Les-Amis-de-la-Terre-et-la-LPO.pdf

[77] Personal communication, July 2016

3 Germany – a federal programme for organic and sustainable farming

3.1 The German BÖLN programme

In Germany, the term 'agroecology' is not specifically used to promote more sustainable agricultural systems and practices. However, a federal scheme which now promotes organic farming and other sustainable forms of agriculture has been in place since 2001. This is the 'Bundesprogramm Ökologischer Landbau under anderer Formen nachaltiger Landwirtschaft' (BÖLN[78]). It evolved from a previous scheme, the Bundesprogramm Ökologischer Landwirtshaft (BÖL) which focused only on organic farming. Neither was concerned explicitly with agroforestry[79].

As a federal scheme, BÖLN demonstrates that support to the organic farming sector is a priority at the highest level of government, with the State aiming to add value to the support to farmers provided by the Länder. The latter provide financial support directly through the CAP's organic farming measure in their Rural Development Programmes. For the CAP period 2014-2020, the Länder collectively have budgeted nearly 1.5 billion euros for this support.

The BÖLN scheme complements this support and aims to strengthen and grow the organic sector as well as sustainable agriculture and food industries in Germany. The main objectives of the scheme are:

- Research projects on production, processing, marketing and support;
- Knowledge transfer to target groups, including the exchange of knowledge between researchers and farmers;
- To strengthen both the supply of and demand for organic and sustainable products; this includes, for instance, advisory services to help farms to convert to organic farming;
- To provide information services about, and participate in industry trade fairs for organic farming and other forms of sustainable agriculture. For example, BÖLN attends the international Green Week exhibition held annually in Berlin.

Competence for the activities which BÖLN carries out is shared between the Federal Government and the Länder. In practice, this means that the BÖLN offers services such as advisory services and participation in trade fairs only where the relevant Länder has chosen not to do so.

The BÖLN scheme is funded by the Federal Ministry of Food and Agriculture (BmEL). At its launch in 2001, its forerunner, the BÖL, had a budget of about €36m a year, which declined to €20m by 2004 and to €16m for the years 2007 to 2012. Since 2013 the budget has been €17m per annum. The programme operates under the German sustainable development

[78] *Bundesprogramm ökologischer Landbau und andere Formen nachhaltiger Landwirtschaft*

[79] Small scale pilot projects and support to agroforestry through RDPs do exist in Germany, but this is not supported at federal level.

strategy[80] (which is currently being updated)[81]. Different national Directives govern the different objectives of the BÖLN scheme as above. They were renewed in 2015 and 2016 for the period until 2020[82].

The forerunner to the BÖLN, the BÖL, was launched in late 2001. Its objectives were to strengthen organic farming, to increase the market share of organic products and to ensure quality standards. The scheme focused on research and on the promotion and marketing of products from specific agricultural systems (mainly organic farming), which was intended to increase the attractiveness of these practices to farmers. The scheme was developed by the Federal Ministry of Food, Agriculture and Consumer Protection in close consultation with a steering group of external experts, representatives of the German organic farming associations and stakeholders from science, industry and government. It developed on the basis of a 'vulnerability' analysis in 2001. The Scheme was initially set for a period of two years but has since been renewed several times.

The BÖL's initial budget of €35.8m was divided between information to consumers (38%), research and development (32%), an internet portal (6.5%), promotional activities at trade fairs (4.5%) and a network of 200 demonstration projects (2%). An evaluation in 2004[83]noted that the BÖL had funded over 180 three hour taster courses in organic farming for conventional farmers, as well as weekend seminars targeted at younger conventional farmers. By 2004, the programme had enhanced the skills of around 120 vets, 120 agricultural consultants and 150 leaders of farmers' collectives. Training in the presentation and selling of organic produce had been provided to over 1,300 staff working in health food shops, and a similar number working in mainstream food stores. The evaluation also found that material for agricultural technical colleges was in preparation and research had been commissioned. Competitions for schoolchildren, farm visits and tasting events have been organised in an attempt to improve customer perceptions of organic produce.

According to the German Agriculture Ministry[84], since the start of the programmes, the BÖL and BÖLN have funded around 930 research projects worth some €120m. This is over one third of the total budget over that period of €315m. In addition, the programmes have funded over 50 measures including knowledge transfer and training events, among them several hundred one- and multi-day seminars for representatives of the food supply chain. The programmes have also produced support guidelines to assist around 1,100 stalls at trade fairs, supported information and sales promotion projects.

The extension of the BÖL to other forms of sustainable farming (besides organic) in 2011/12 was the result of a decision by the German Bundestag on 26 November 2010 which broadened the remit of how the BÖL's funding was to be spent. The decision was effected through the intervention of a single Member of the Bundestag and without debate on its

[80] Die Bundesregierung, undated. *Unsere Strategie fur eine nachhaltige Entwicklung*
[81]Die Bundesregierung, 2016. *Deutsche Nachhaltigkeitsstrategie - Neuauflage 2016*
[82] https://www.bundesprogramm.de/was-wir-tun/projekte-foerdern/forschungs-und-entwicklungsvorhaben/
[83] Abschlussberitcht der Evaluation des Bundesprogramms Ökologischer Landbau, GIB, September 2004
[84] Source: BÖLN website https://www.bundesprogramm.de/fileadmin/2-Dokumente/brosch%c3%bcren/igw16boeln_faktenflyer_RZ_160106.pdf

merits[85]. Reflecting this change, the German government published a series of guidelines for research and information on sustainable agriculture but without defining the term 'sustainable agriculture' itself. The guidelines referred to agricultural practices that are "economically viable and socially responsible" while "[seeking to lower its] environmental impact and ensuring animal welfare"[86]. Despite these changes, an evaluation of the BÖLN in 2012 did not find that resources had been redirected towards non-organic farmers, although some projects with application beyond organic farming are now being funded[87].

Sectoral stakeholders are actively involved in the selection of priorities for BÖLN, which was perceived by the sector to be a major strength of the programme in the 2012 evaluation. For sustainable agriculture, these themes include: resource efficiency, halting biodiversity loss, livestock husbandry practices aiming at the sustainable management of natural resources, animal welfare and product quality[88]. For organic farming, research themes also cover a wide range of issues, including cross-cutting issues (e.g. greenhouse gas emissions in organic systems), crop production (e.g. quality of organic products, adapted varieties), animal-friendly rearing systems, nature conservation and biodiversity (e.g. maximising the conservation benefits of organic farming), storage, collection and processing of organic products, and the marketing of organic products.

The BÖLN and its predecessor are not strategic plans like the French Agroecology Plan. The BÖLN does not coordinate wider German activity to promote organic and other forms of sustainable farming although it does coordinate research on these topics. The BÖLN's activities are intended to contribute to the achievement of Germany's sustainable development objective that 20% of farmland should be farmed organically, but this wider objective is not one to which the BÖLN itself is held to account. Evaluations of the BÖLN, as discussed below, have focussed on the effectiveness with which research is targeted, and the effectiveness of individual interventions, rather than the achievement or otherwise of strategic goals for organic farming as a whole.

3.2 Analysis of the drivers

This section examines the Political, Economic, Social, Technological, Legislative and Environmental drivers behind the introduction, development and renewal of the BÖLN scheme and its predecessor, the BÖL, in Germany since 2001. While the political, economic, social and environmental factors are examined individually, these are in practice very much intertwined. We found little evidence of the overt promotion of IFM or agroforestry, two agroecological practices that could have been explicitly targeted as "other forms of

[85] Pers. Comm. The record of the Bundestag's proceedings contains no record of any debate.
[86] https://www.bundesprogramm.de/was-wir-tun/projekte-foerdern/informations-und-absatzfoerderung/informations-und-absatzfoerderung/infos-und-absatzfoerderung-nachhaltige-landwirtschaft/
[87] Personal communication
[88] *Richtlinie zur Förderung von Forschungs- und Entwicklungsvorhaben sowie von Maßnahmen zum Technologie- und Wissenstransfer für eine nachhaltige Erzeugung, Verarbeitung und Vermarktung von landwirtschaftlichen Produkten*, July 2015

sustainable farming". The following section is therefore largely an account of Germany's promotion of organic farming.

The BÖLN scheme appears to have been strongly driven by ***political*** factors. It was introduced under the impetus of Renate Künast, who was Minister for Consumer Protection, Food and Agriculture between 2001 and 2005 in the federal government. A member of the Green Party, Ms Künast had a strong personal ambition to develop organic farming in Germany.

Figure 3: Renate Künast, former German Minister for Consumer Protection, Food and Agriculture (2001-2005)

Source: Wikimedia commons

The appointment of a member of the Green Party as Minister of Agriculture was symbolic at the time when Germany (as the rest of the EU) faced "a wave of public disquiet over the Government's handling of the Bovine Spongiform Encephalopathy (BSE) crisis and the effects of intensive farming methods".[89] Alongside the BÖL scheme, Ms Künast introduced a target for organic farming to cover 20% of all agricultural land in Germany within 10 years[90] i.e. by 2011, with an interim target of 10% by 2006. These targets were included as part of the German National Sustainability Strategy. Although the targets were not directly linked to the BÖLN programme, the programme was nonetheless expected to contribute to their fulfilment.

The 20% target was not met. In the target year of 2011, just 6.1% of land was being used for, or in the process of conversion to, organic farming, and that figure has stayed fairly stable since then. In Section 3.3, we discuss the action Germany is now taking in an attempt to achieve the original target.

Economic considerations have contributed to the increase in organic farming area (see Section 1) in Germany since 2001, facilitated by the activities undertaken under the BÖLN scheme (e.g. information, research, developing markets). Market demand has been a critical

[89] https://www.theguardian.com/environment/2001/mar/03/organics.uknews

[90] Personal communication, July 2016 and https://www.euractiv.com/section/agriculture-food/news/new-eu-regulation-could-curb-organic-farming/

driver, as in several other countries. Demand from German consumers for organic produce rose from €2.05bn to €5.85bn between 2000 and 2008[91], largely driven by retailers.

Direct funding to farmers for organic conversion and maintenance has been available in Germany since 1994. In 2005, however, a small number of Länder placed a moratorium on new funding commitments to organic conversion owing to uncertainty about the availability of future funding from the CAP, whose seven year funding envelope was to end in 2007. The majority of Länder followed suit in 2006, with funding being restored once the terms of the new CAP were settled. **Figure 1** in Section 1 shows a reduction in the rate of growth in organically farmed land in Germany from 2010 onwards. Given the time lags involved in finalising a funding package for a farmer, and the time needed for organic conversion, it is possible that the reduced rate of growth is, at least in part, attributable to the moratorium.

Consumer demand is currently particularly strong in Germany for organic dairy products, making conversion to organic an attractive option for conventional dairy farmers, hit by the low prices resulting from oversupply due to the ending of milk quotas and the Russian export ban. For example, organic milk prices in Germany at the farm gate in May 2016 were nearly 43 euros/100 kg compared to 23 euros for non-organic milk. Organic dairy farms have improved their yields (7,000 L/y/cow) which are about 20% less than yields found in conventional dairy herds (8,000-9,000 L/y/cow on average). Adding the financial support made available by the Länder, organic dairy farms in Germany find themselves often more profitable than conventional ones, especially on grassland systems where less feed is required[92] (see also Section 3.3).

The high prices achievable for organic milk in Germany are ascribed to consumer willingness to pay a premium for the animal welfare benefits of organic farming. There do not appear to have been such strong drivers in the organic fruit and vegetables sector[93]. In other sectors, BÖLN's policies have contributed to less impressive results. For example, organically produced cereals account for only 4% of all cereals produced in Germany. By contrast, the market share of organic milk is currently between 10-15% (compared to 7-8% in the UK) and it is believed to have strong prospects for growth in the near term[94].

Social factors have played an instrumental role in the creation of the BÖLN scheme. As seen above, Renate Künast was appointed in response to the strong public reaction to the outbreak of BSE in Germany and elsewhere in the EU and in the wake of concerns over the foot and mouth disease outbreak in the UK in 2001. These factors led to increasing demand for organic food and greatly facilitated the adoption of Künast's plan. An aspect specific to Germany at the time, which the BÖL sought to address, was "the lack of an effective distribution system for organic produce"[95] to consumers, as most organic produce was only distributed through specialist health food shops. The market promotion of organic products supported by BÖL led larger retail chains to recognise the gap in consumer demand and

[91] Source: DG Agri quoting organic-world.net
[92] Personal communication, July 2016.
[93] Personal communication, July 2016.
[94] Personal communication, July 2016.
[95] https://www.theguardian.com/environment/2001/mar/03/organics.uknews

respond accordingly. By 2008, the most recent date for which information is available, supermarkets were estimated to be selling almost half of all organic produce in Germany, with discounters having a presence in the market and specialist shops accounting for around 30% of sales[96].

Social factors have thus been a strong driver for the adoption of more 'agroecological' practices in Germany, organic farming in particular. A relatively small group of German farmers had converted to organic practices since the 1960-70s but it was only with events leading to the BÖL scheme that strong growth began. Health concerns continue to be a strong driver for organic food demand in Germany today.

Technological, legislative and environmental factors other than health are not considered to have been significant drivers, although they have played an enabling role. Technology was needed to help farmers willing to convert to organic farming and extensive research was initiated with the BÖL scheme, and subsequently revisited as the scheme evolved. There is, however, no indication that any one technological factor acted as a driver for increased organic production.

Consumer fears created by BSE and foot and mouth disease almost certainly do not account for the longevity of Germany's organics programme. Food safety is given little prominence in the section of the Agriculture Ministry's website dealing with organic farming. Instead, the environmental benefits for water and soils, and animal welfare benefits are highlighted[97]. The extension of BÖL into BÖLN to cover 'other types of sustainable agricultural practices' in 2011/12 demonstrates the evolving rationale of the scheme from a response to a collapse in consumer confidence in 2001 to a continued and widely supported component of Germany's sustainable development plan.

3.3 Experience and impact to date of the BÖLN programme

As described earlier, the German federal scheme for ecological (organic) farming and other forms of sustainable agriculture (BÖLN) was initially established as the BÖL in 2001 for a period of two years but has since been renewed several times.

The target in the German sustainable development plan is to increase the percentage of farmland in Germany which is farmed organically to 20%. The original target to do so by 2011, within a decade of the BÖL's creation, has not been achieved. Organic farmland has steadily increased in Germany over the past 15 years, from about 670,000 ha in 2002 to 1,060,300 ha in 2015, but the proportion of land farmed in this way has hovered around the 6% mark since 2011. By contrast, consumer demand has grown strongly, from €1.48 billion in 1997 to €7.91 billion in 2015[98].

The BÖLN is not judged against the 20% target, but is expected to support its achievement. Evaluations of the scheme took place in 2004 and 2012. The 2004 evaluation was wide-

[96] Source: DG Agri: An Analysis of the EU Organic Sector, June 2010 citing figures ORA, Ecozept, Biovista (2008)
[97] http://www.bmel.de/EN/Agriculture/SustainableLandUse/_Texte/OrganicFarmingInGermany.html
[98] AMI data

ranging and concluded that the scheme had achieved a great deal in a short time and in difficult circumstances, but cast some doubt on the effectiveness of measures targeted at consumers. It suggested that efforts to increase the market share of organic produce might instead be focussed on the retail chain, with the aim of attracting some of their marketing budgets. The evaluation in 2012 concentrated on the effectiveness of research spending. It concluded that "research funding via the BÖL has made a major contribution to the solution of practical problems as well as the further development of the [organic] sector". The evaluation team also stressed the importance of a balanced programme of research covering all production sectors as well as knowledge transfer mechanisms and market development techniques.

The reasons for Germany's slower than expected progress towards the target announced by Künast in 2001 are far from clear. There are some indications that German farmers themselves thought the original target to be unrealistic. They feared that consumer worries about food safety would not quickly translate into lasting preferences for organic food. The findings of the 2004 evaluation indicate that BÖL was indeed struggling to influence the final consumer at that time. However, consumer demand for organic produce has now subsequently outstripped German farmers' ability to supply[99].

Two main reasons seem to explain the more recent slowdown in organic farming growth (outside the dairy sector). The promotion of biogas under Germany's Renewable Energies Law has made some conventional crops comparatively more attractive – notably maize – and led to an increase in rental prices for agricultural land especially in the Northern States where agriculture is more intensive[100]. Second, in 2012/13, German organic farmers were concerned about negotiations on the revision of EU organic legislation. In 2014, the European Commission published proposals which were seen by the sector to put some organic farmers at risk[101]. The argument put forward was that the proposed new organic requirements were "unrealistic" and could result in compliance failure by some farms and their conversion back to conventional agriculture.

The German government is currently preparing a refreshed organic action plan, which it intends to launch in 2017. In the meantime, the 20% target has been incorporated – without a target date – into Germany's national action plan for sustainable pesticide use. The new strategy is intended to enable German organic farmers to capture a higher proportion of the strong domestic consumer market for organic food. The BÖLN is expected to continue but as part of a wider strategic framework bringing together the actions of the Federal Government and the Länder.

[99] https://www.euractiv.com/section/agriculture-food/news/amid-growing-demand-german-organic-farming-suffers-first-decline/

[100] Personal communication

[101] http://www.bmel.de/SharedDocs/Pressemitteilungen/EN/2014/328-SC-EU-Agrarrat-Oekolandbau.html

4 Comparison with the UK and lessons learned

This chapter sets out the policy context within which UK agriculture has developed in recent years before describing how agroecological practices are already promoted in the four UK countries' policies and drawing comparisons with the French and German approaches. Finally, the chapter considers what lessons can be drawn from the French and German examples for the UK as the four countries revise and build on their policies for agriculture and the farmed environment in the light of the outcome of the referendum on the UK's membership of the EU.

4.1 UK Agricultural Policy context

The strategic picture of developments in agriculture policy in the UK in recent years is a complex one, not least because agriculture is a topic on which the Devolved Administrations have competence. Some of the salient developments most relevant to the promotion of agroecology are described in the following paragraphs. Although many of the milestones are reports or other documents published by the UK government in relation to the English situation, and thus not directly relevant to agriculture in Scotland, Wales or Northern Ireland, the more significant UK reports such as the Curry Commission[102] and the Foresight report[103] have clearly had an impact well beyond England.

As in Germany and France, agriculture policy in the UK has been shaped in part by external events. The epidemic of BSE between 1986 and 2001 and the serious outbreak of Foot and Mouth disease (FMD) in 2001 caused great damage to both farming and the rural economy, prompting the UK government to establish a Policy Commission[104] under the chairmanship of Sir Don Curry, a former chairman of the Meat and Livestock Commission. The Commission, whose remit covered England, reported in early 2002. Its recommendations were wide ranging and had a particular focus on helping the farming industry and the rural economy as a whole to recover after the devastation of the Foot and Mouth outbreak. They also included more research into organic and IFM systems with a view to reducing the risk from pesticides.

The Government's response to the Curry Commission was the "Strategy for Sustainable Farming and Food – Facing the Future[105]" (SFF). The SFF acknowledged the need to respect and live within the biological limits for natural resources (especially soil, water and biodiversity). It introduced the concept of "entry level" agri-environment schemes to broaden participation, and declared that the (UK) government was committed to a multi-objective approach as well as the more targeted 'higher-level' schemes. The SFF also acknowledged the role that existing demonstration farms were playing in demonstrating organic and IFM systems, and announced that the Environment Agency was to pilot new catchment-based Flood Management Plans. The SFF was accompanied by an industry-led

[102] Curry et al, 2002: Farming and Food – a sustainable future. Report of the Policy Commission on Food and Farming
[103] Foresight. The Future of Food and Farming (2011). Final Project Report. The Government Office for Science, London
[104] ibid
[105] Defra 2002: The Strategy for Sustainable Farming and Food- Facing the Future

Action Plan[106] to develop organic food and farming in England, published by Defra in 2002 and discussed further below.

Agriculture policy throughout the UK has been shaped by the CAP since the UK joined the European Economic Community in 1973. The UK's own ambitions – in particular towards the EU's budget – have led it to develop a series of principles on which it believes public policy towards agriculture should be based. In 2005, as part of preparations for a forthcoming review of the CAP, HM Treasury and Defra published "A vision for the common agricultural policy"[107]. The central elements of the vision were that farmers would in future receive support from taxpayers only for providing societal benefits that the market could not deliver. The UK government based its attempts to secure a rapid and complete reduction in income support payments to farmers – an objective not necessarily shared by the Devolved Administrations - on this vision. Its relevance to this report is that it helped to establish the UK's place within Europe as a strong supporter of payments to farmers for environmental public goods, which is reflected in high spending on the environment in UK RDPs (particularly so in England). The UK government has also worked hard to promote the concept of "ecosystem services" along with the value of maintaining biodiversity, as set out in the 2011 White Paper "The Natural Choice – securing the value of nature"[108] This restated the Government's aim to achieve competitive agriculture, fisheries and food sectors which use and protect natural resources in a sustainable way and meet the needs of consumers.

External events helped to shape policy again in 2008, for example when serious flooding and drought in England resulted in the Government publishing "Future Water", a strategy for water resource management[109]. This noted that farming was a significant contributor to diffuse water pollution, acknowledged the success of an initiative to provide farmers with advice on catchment-sensitive management, and promised to continue to work with farmers through the provision of advice, guidance and funding for good management.

Sharp rises in global prices for a number of food commodities in 2007 and 2008 led to riots in some parts of the world and action by policymakers at global level. This included the G20's first ever meeting devoted to agriculture which took place in Paris at the end of 2011 under the chairmanship of Stéphane Le Foll's predecessor, Bruno Le Maire. The UK Government's response was Food 2030 (2010)[110], its vision for a sustainable and secure food system. This provided a strong emphasis – in the light of perceived shortages – on producing "as much food as possible" whilst highlighting that UK agriculture had already in recent years increased yields whilst reducing both fertiliser use and GHG emissions. The report called for inter-governmental cooperation over research, innovation and knowledge sharing on methods to reduce the food sector's contribution to climate change and other environmental impacts of production. It announced an industry-led plan to reduce GHG emissions, and promised support for anaerobic digestion.

[106] Defra 2002: Action Plan to develop organic food and farming in England
[107] HM Treasury and Defra, 2005. A vision for the Common Agricultural Policy
[108] HM Government, 2011: The Natural Choice – securing the value of nature. CM 8082
[109] HM Government, 2008: Future Water
[110] HM Government (2010): Food 2030

To contribute to this debate, the UK government commissioned a report from its Government Office for Science to examine how the necessary increase in global food production could be achieved whilst respecting the scarcity of resources such as water, energy and land and without breaching environmental limits. The report - Foresight, the Future of Food and Farming (2010)[111] – developed the concept of "sustainable intensification" - understood as growing more, whilst using fewer inputs and with a reduced impact on the environment. The authors acknowledged that the new ways of farming needed to put sustainable intensification into practice would be very knowledge-intensive and would require a "revitalisation" of extension services in both high- and low-income countries. Mindful of the constraints on land availability in the UK and globally for additional food production, the report described a need to manage land for multi-functional uses including flood prevention. Recognition of the role which farmland management might play in flood prevention is a regular theme in policy reports in the UK in the last two decades. Evidence indicates that practices such as agroforestry, woodland planting, hedgerows, buffer strips and conversion of sloping arable land to grassland can all play a part[112].

The Foresight report has been particularly influential in promoting the case for new technology. The UK government heeded its recommendations for additional research. In 2009 it created the Sustainable Agriculture and Food Innovation Platform, funded by Defra and the Biotechnology and Biosciences Research Council, with a budget of up to £90m over five years. Led by the Technology Strategy Board, the Platform's funding priorities were:[113]crop productivity (including adaptation to climate change and addressing the loss of some herbicides, pesticides and fungicides); crop nutrition and management (including minimisation of nutrient losses through better handling of inorganic fertilisers and more recycling of organic nutrients); sustainably increasing the productivity of the livestock sector; waste reduction and management (including farm-scale mixed systems); and GHG emissions reduction. Calls for research on topics relevant to agroecology included, in 2010, crop protection, and in 2011 sustainable protein production. In 2014, the Government established a Sustainable Intensification Platform (SIP), with a project dedicated to IFM which is discussed further in section 4.2.2 below.

The need for effective transfer of new knowledge has long been recognised. In the EU, a mechanism – the European Innovation Partnership (EIP) – was introduced in 2011 to encourage better knowledge exchange between researchers and practitioners. Relevant here is the EIP set up for agricultural productivity and sustainability. Alongside a coordination function in Brussels, Member States may choose to fund research and knowledge transfer via "operational groups" (the setting up of which can be funded via the CAP) comprising, for example, researchers, advisers and farmers. The concept behind the groups is that research and knowledge transfer is a participative rather than linear process, in which farmers and others contribute, and help to test new ideas rather than being passive recipients of new research packaged as advice. EIP operational groups are well-

[111] ibid

[112] See, for example, Wheeler, N., Francis, A., George, A., 2016. Smarter Flood Risk Management – investing in resilient catchments. Green Alliance.

[113] From its 2011 brochure

suited to the development and spread of agroecological practices. All four countries of the UK fund such groups from their RDPs. Scotland – which funds its monitor farm network[114] as an operational group – is expecting to fund 50 such groups during the period from 2014 to 2020, Wales 45, England 20 and Northern Ireland five.

Foresight and other reports had identified the need for more and better advice to farmers as they strove to produce more sustainably, using techniques which were either innovative or at least new to the farmer. In 2010 a report to the UK Parliament by Lord Richard Taylor[115] recommended that effort currently spent on inspection be redirected into the provision of advice on compliance and production. Lord Taylor recommended a network of advisers on crops and livestock, and the outreach capacity of the Animal Health and Development Board should be strengthened.

Recent strategy documents – just like the Curry Commission report 15 years ago – have continued to stress the need for agriculture and the agri-food industry to contribute to economic growth. "Going for Growth"[116] published in 2013 by the Northern Irish Agri-food Strategy Board contains a variety of suggestions for improving farmers' incomes through the development of new markets, removal of obstructions and costs such as charges for government services. Of relevance to this report is that it acknowledges Northern Ireland, with its plentiful rainfall, as "an excellent place for growing trees" which could provide farmers with an additional income. In October 2016 an expert group presented Northern Ireland's Agriculture Minister with a "Sustainable Agricultural Land Management Strategy"[117]. The strategy proposes a number of measures to reduce pollution from nutrients and improve biodiversity, including soil status mapping, real time monitoring of catchments, and increased use of agroforestry.

In 2015, the Welsh Government consulted on a new Strategic Framework[118] for Agriculture. The consultation document set out a vision of an industry that is forward looking, using best practice to safeguard and enhance soil, water and the natural environment. In January 2016 the Welsh Government announced that the framework would be taken forward by an independently chaired partnership group of stakeholder and government representatives. In 2015 Wales also introduced (via the Wellbeing of Future Generations Act)[119] a new mechanism in the form of a Commissioner for Future Generations whose role is to ensure that Welsh public bodies discharge their duties in a manner which will further sustainable development. One of the Government's published sustainable development goals is "a resilient Wales" which is defined to mean "a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social,

[114] The monitor farm network is a network of farms, across Scotland, in all sectors, which are run by farmers, for farmers, and which enable farmers to share knowledge and experience.
[115] Taylor, Lord Richard, 2010. Science for a new age of agriculture.
[116] Agri-food strategy board, 2013. Going for Growth
[117] Gilliland, J. et al., 2016. Delivering our future, valuing our soils. Expert Working Group. DAERA.
[118] Welsh Assembly Government, 2015. A Strategic Framework for Welsh Agriculture WG 25369
[119] Wellbeing of Future Generations (Wales) Act 2015, available at http://www.legislation.gov.uk/anaw/2015/2/contents/enacted

economic and ecological resilience and the capacity to adapt to change (for example climate change)".

The Scottish Government also set out a new strategic direction in 2015. A discussion document – "The Future of Scottish Agriculture"[120]- set out a vision of Scotland as a world leader in green farming, to be achieved in part through mentoring and on-farm advice on best practice. The Scottish Government envisioned a future in which farmers would combine environmentally and commercially successful management in the running of their businesses, supported by education and training.

Taken overall, the strategies and action plans published by the four governments show a consistently strong appreciation of the need for production to respect environmental limits; of the role of knowledge, best practice and advice in helping to achieve this; and of the need for the necessary changes in agriculture to be supported by research and training. However this is in the context of agriculture policies and strategies where there are other significant drivers.

4.2 UK policy instruments which encourage agroecological farming practices

Although no overall "agroecological plan" exists in either England, Scotland, Wales or Northern Ireland, a range of policy initiatives exist which, to an extent, promote agroecological farming practices. These range from regulatory requirements and incentive payments to advice and voluntary initiatives. This section sets out the range of policy instruments which encourage some of the key agroecological farming practices and systems, namely organic farming, IFM and agroforestry.

4.2.1 Organic farming

Each of the four UK administrations has at various times in the last decade had a strategy or action plan to promote organic farming. Although Scotland is the only country which still has such a plan, all four countries have also consistently provided financial assistance to organic farming from their RDP as well as other support.

England published an organic farming action plan in 2002 as part of its response to the Curry Commission. This set a target for the share in the domestic market for organic food which English farmers should aim to secure. The target was set at 70 per cent based on this being similar to the share of domestic producers in the market for non-organic food at the time. This was to be achieved by 2010. Measures included strengthening of certification, collaboration with retailers, an emphasis on domestic organic produce in public procurement, limited additional funding for research, and the introduction of maintenance payments via the RDP for organic farmers to complement payments for conversion which already existed. The Plan also proposed to map how research funding was being spent on organic farming. No update to the plan was ever made.

[120] Scottish Government, 2015: The future of Scottish agriculture

An action plan[121] – "Organic Futures" – for organic farming in Scotland, was published by the Scottish government in 2011 and revised in 2013. The plan promised better guidance and advice to tackle a relatively low success rate (when compared with other types of application) for organic farming in applications for RDP funding. It also promised that a target for organic farming would be included in Scotland's RDP. The 2014 RDP includes a target that 13,000 hectares of land will be converted to organic farming between 2014 and 2020, and 50,000 hectares maintained. The action plan drew attention to recent research demonstrating the importance of cooperation to economic growth, and to the importance of innovation, but contained no specific proposals to advance these goals beyond sharing the research itself. In 2016 the Scottish government published the much more ambitious "Organic Ambitions – Scotland's Organic Action Plan 2016-2020[122]. This noted that the area of land farmed organically in Scotland had been falling since 2004 although the number of individual producers had begun to recover in 2014. No target was set, but the Plan set out 16 specific actions (under the headings knowledge, strength, skills and resilience) intended to secure a more vibrant future for the industry.

The organic food strategy group of the Welsh Agri-food Partnership – a body supported by the Welsh Development Agency – had set a target in 1999 to increase the share of production which is organic to 10% by 2005. This was reviewed by the Welsh Assembly's Agriculture Committee in the light of a hiatus in progress during the Foot and Mouth outbreak. Their report[123], published in 2002, expressed concern that the target might be pursued for its own sake – irrespective of consumer demand – and recommended that a future target for Welsh organic production should be expressed in terms of equivalent market share (like the target in the English Plan). In 2005 the group published a second Action Plan calling on the Welsh Assembly Government to fund growth in organic farming at a sufficient level to encourage the conversion of 10 – 15% of farmland by 2010. There has been no further Welsh action plan since then.

Northern Ireland had an Organic Action Plan from 2001 to 2006. The plan noted that organic farming was at a very low level – just 0.3% of farmland and 100 farms – in 2000 and set out a series of 10 actions designed to achieve a "significant increase" by 2006. However, Figure 4 shows that this did not occur, despite the inclusion of funding for organic conversion and maintenance under the RDP.

The rates of support for organic conversion and maintenance provided by the four countries from their RDPs[124] are shown in Table 1 which also shows the national funding rates for France and Germany.

The table shows that payments for maintenance are in all cases higher in France and Germany than in any of the four UK countries. Under CAP rules, funding rates must be set

[121] The Scottish Government, 2011. Organic futures: an action plan for organic farming in Scotland

[122] The Scottish Government, 2016. Organic Ambitions – Scotland's Organic Action Plan 2016-2020. Available at www.gov.scot

[123] National Assembly for Wales, 2002. The future of organic farming in Wales

[124] Scotland funds organic farming from its agri-environment climate scheme; Wales does so through Glastir Organic and England via its Environmental Stewardship Scheme

at a level which is no greater than the additional cost to a farmer of becoming and remaining an organic farmer, plus any income foregone as a result of doing so.

In addition to its direct funding from the RDP, organic farming is exempted (as is the case in the rest of the EU) from the CAP's greening requirements.

Table 1: Organic farming funding rates (£/hectare/year, £1 = €1.20)[125] for conversion (C) and maintenance (M)

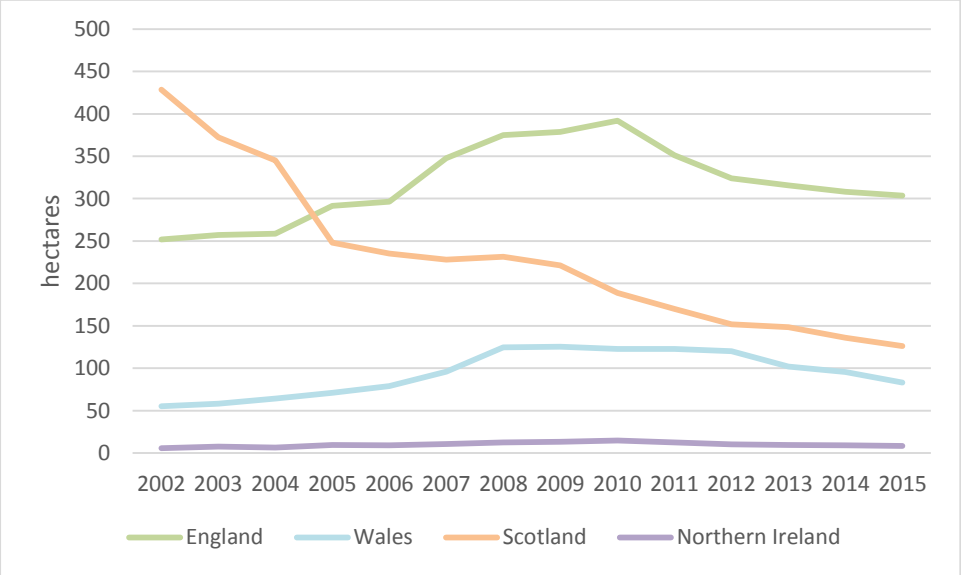
	Arable		Improved Grassland		Rough Grazing		Fruit/Horticulture	
	C	M	C	M	C	M	C	M
Germany	208	175	208	175	-	-	792	625
France	250-375	133-208	108	75	37	29	750	500
England	175	65	75	40	50	20	400-450	200-300
Scotland	280	65	145	55	12.5	8.5	400	200
Wales	130	65	-	-	15	15	600	400
Northern Ireland	149	53	144	53	9	8	358	197

Source: Rural Development Plans 2014-2020

The results of these policy instruments in terms of hectares farmed organically are shown in Figure 4. This shows that organic farming increased in England and Wales in the years leading up to the 2008 financial crisis before declining thereafter. By contrast, the level of organic farming in Northern Ireland changed very little between 2002 and 2015. In Scotland, the number of hectares of land farmed organically has fallen significantly over the same period, with the steepest decline between 2002 and 2005.

[125] Welsh figures in "arable" column are for enclosed lowland.

Figure 4: Hectares of land farmed organically or in conversion 2002-2015



Source: Defra Organic Farming Statistics 2015

4.2.2 Integrated Farm Management

The concept of IFM has been developed since the 1980s by NGOs including the Game and Wildlife Conservation Trust and LEAF[126] (Linking Environment and Farming) and brings together soil management, crop health and protection, and landscape and nature conservation with other factors including social and farm management ones. LEAF is now the main organisation promoting IFM in the UK, including knowledge exchange, public engagement and the development of market opportunities through the LEAF Marque standard. Research into IFM is supported in the UK by the SIP which was established after the Foresight report (see above). The SIP is a multi-partner research programme comprising farmers, industry experts, academics, environmental organisations, policymakers and other stakeholders. The SIP has access to five farms where it can test new approaches in realistic conditions, and in seven different landscape areas. It is funded by Defra and the Welsh Government although participation is broader and includes, for instance, the James Hutton Institute and Scotland's Rural College.

The promotion of IFM is one of the SIP's explicit aims. The SIP's first project – begun in 2014 – is called "integrated farm management for improved economic, environmental and social performance". Delivered by a consortium of 30 partners, it aims to develop improved indicators and methodologies to measure the economic, environmental and social performance of farms; identify and develop farm level management interventions; and investigate better ways to communicate with farmers and support their decisions. It also aims to better quantify the outcomes of IFM techniques, develop innovative ones and guide more farmers to adopt IFM.

[126] http://www.leafuk.org/leaf/about.eb

Integrated Pest Management (IPM)[127] is a practice associated with IFM which is promoted explicitly by the UK's National Action Plan for Pesticides. The plan is a requirement of the EC's Sustainable Use of Pesticides Directive, which also requires the UK government to promote IPM. The UK's National Action Plan has been implemented through a voluntary initiative, largely funded by the Crop Protection Association, in which representatives of the pesticide industry, farmers, environmental groups and NGOs participate. UK government involvement is via the Health and Safety Executive (HSE), which regulates the use of pesticides. The Initiative has drawn up some guidelines for IPM, but HSE report that there is also unmet demand for advice on broader approaches to integrated farming.

Whereas the SIP and the Action Plan for pesticides explicitly seek to support IFM (or IPM which is an element of it) there are other policy instruments which do so indirectly. The four UK administrations have each made choices about how they implement elements of the CAP which help to determine the extent to which a farmer will choose to adopt (or continue with) agroecological practices such as cover crops, the growing of legumes in a rotation etc. The elements within the CAP which have the greatest impact are greening, the agri-environment climate Measure and cross-compliance. Support for agroforestry via RDPs is also available in Scotland Wales and Northern Ireland. These measures and their potential impact on IFM are explained below.

Cross-compliance is a set of rules which must be observed by farmers claiming land-based payments from the CAP[128]. All Member States are required to include in their cross-compliance rules requirements for soil cover, the prevention of soil erosion and the preservation of soil organic matter, plus the protection of landscape features which may include hedges, trees and buffer strips as part of the standards of Good Agricultural and Environmental condition (GAEC). Depending on how the detailed rules are framed by Member States, there are opportunities through cross-compliance to encourage aspects of IFM (for example crop rotation and the addition of organic matter to soil) although the UK countries, like the majority of Member States, set rules to prevent damage (for example from the removal of landscape features) rather than to encourage better practice.

The four UK countries set their own cross-compliance rules. The choices they have made for the soils and landscape features elements of cross-compliance, which are particularly relevant to IFM, are as follows:

- England[129] requires soil cover (unless one of a series of exemptions and derogations applies) through either grass or vegetation, cover crops and green manures such as legumes, trees or other crops, or crop stubble or residues. Like Scotland (and the majority of EU Member States) it limits its cross-compliance measure for soil organic matter (GAEC6) to controls on burning. Hedges are protected from pesticide and herbicide use under GAEC7. Trees which are not already protected by a tree

[127] A technique whereby pest control is achieved as far as possible through cultivation techniques and the encouragement of predators, seeking to minimise the use of artificial pesticides.
[128] Where a Member State has opted to introduce a "small farmers' scheme" those participating in it are exempt from both cross-compliance and greening requirements.
[129] Defra, 2017. The guide to cross-compliance in 2017, available at www.gov.uk

preservation order or a requirement for a felling licence must not be felled between 1 March and 31 August.

- Scotland requires soil cover after harvest until the end of winter through the retention of stubble or sowing with grass or a cover crop; preventing overgrazing or poaching around watercourses, watering points and feeding areas; the provision of alternative measures such as a sediment fence to prevent soil erosion if a cover crop cannot be sown; and comply with the Muirburn code which seeks to ensure the retention of soil organic matter through controlled burning of heather. There are rules to protect hedges from the use of pesticides and fertilisers, and to protect trees and hedges from cutting during the bird breeding season;
- Wales's cross-compliance rules[130] for soil cover require sowing to take place within 10 days of the preparation of a seed bed (which, being finely tilled, is at risk of blowing away) and the provision of an unploughed strip at the bottom of slopes to prevent erosion. There are rules to deter overgrazing, the creation of ruts and the working of waterlogged land. Heather and grass burning is limited to certain seasons and must be carried out in line with a management plan. Hedges are protected.
- Northern Ireland – which has a low proportion of arable land – seeks to limit soil erosion through overgrazing, and feeding of livestock within broadleaved woodland is banned under the rule it has set to limit soil erosion.

The UK's administrations could have used cross-compliance more proactively to support IFM. Ireland, for example, requires soil testing[131] of land under continuous cultivation followed by compulsory one-to-one advice from an accredited farm advisor where organic matter falls below a threshold. Remediation may then involve incorporating stubble, adding manure or compost, growing cover crops or adopting low or no-till techniques. It is fair to point out that the UK countries are by no means alone in failing to make the most of cross-compliance. Despite the emphasis placed by the agroecology project on soil improvement, for example, France's cross-compliance standard for conserving soil organic matter is the bare minimum allowed by the EU regulation – a ban on stubble burning. The need to satisfy stringent EU audit requirements is a factor which weighs heavily with Member States when determining the complexity of rules to set. In addition, farmers cannot be paid via the agri-environment climate Measure for actions which they are required to carry out by cross-compliance. It is likely, therefore, that France's decisions on cross compliance also reflect a wish to be able to incentivise farmers through rewards rather than rules.

In addition to cross-compliance, the choices each administration makes as to how to implement "greening" will have an impact on the likely uptake of IFM practices by farmers. There are three greening requirements of which two apply to arable land and one to

[130] Scottish government, 2017. Guide to cross-compliance in 2017, available at https://www.ruralpayments.org/publicsite/futures/topics/inspections/all-inspections/cross-compliance/detailed-guidance/good-agricultural-and-environmental-conditions/ Welsh Government, 2017. Cross-compliance – current rules and guidance, available at http://gov.wales/topics/environmentcountryside/farmingandcountryside/farming/crosscompliance/cross-compliance-rules-guidance-2017/?lang=en

[131] Department of Agriculture, Food and the Marine, 2017 Cross-compliance – soil organic matter, available at https://www.agriculture.gov.ie/farmerschemespayments/crosscompliance/soilorganicmatter/

permanent grassland – land which has been out of a crop rotation for more than five years. The measure for permanent grassland[132] restricts ploughing and is intended to keep land out of the arable rotation. It can be implemented at the level of the individual farm in which case it will operate to prevent a livestock farmer from converting permanent grassland into land on which to grow fodder crops. However, all four UK countries have implemented the rule at national level thus giving individual farmers freedom to convert permanent grassland unless the constraint set at national level is in danger of being breached. Member States can also (as Scotland has done)[133] require better management of nutrient inputs to the grassland. It is for arable farms, however, that greening is likely to have the greatest impact on the type of farming practices used.

Greening requires the majority of arable farmers (depending on the size of their farm) to diversify their crops (the Commission's original intention, which was frustrated by administrative problems, having been to require rotation) and to keep five per cent of their arable land as ecological focus area (EFA). Ecological focus areas can be provided in a wide variety of ways – depending on which EFA elements a Member State has chosen to make available to its farmers. All four UK administrations allow fallow areas and areas planted with nitrogen-fixing crops to qualify as EFA, whilst England and Scotland also allow catch crops and green cover. All except Scotland currently accept hedges or wooded strips, and Scotland has announced that it will do so from 2018. Across the UK as a whole, over 98 per cent of the total EFA area (before weighting factors are applied) is represented by nitrogen-fixing crops, cover and catch crops and fallow land. The greening payment is thus supporting three practices which can form part of an IFM approach, although such an approach would go far beyond the minimum needed to comply with greening using these practices. For example, the greening rules as applied everywhere in the EU except the Netherlands currently allow the use of pesticide on both nitrogen-fixing and catch and cover crops, which severely limits the extent to which beneficial insects are encouraged.

Support for a number of practices relevant to IFM is also available from the RDPs. Individual practices for which agri-environment climate payments may be made include:

- Planting unsprayed root crops without direct drilling (Wales);
- Improved nutrient management through planning and soil sampling (Wales);
- Unsprayed spring sown cereals or legumes (Wales);
- Stubbles followed by green manure in an arable rotation (Scotland);
- Beetle banks (Scotland, England);
- Two year sown legume (England);
- Creating new hedgerows (Northern Ireland);
- Low-input grassland management (Wales).

[132] The greening measure for permanent grassland requires Member States to ensure that the ratio of permanent grassland to arable land remains within 5 per cent of a reference ratio set for 2015. Member States can choose whether to implement this ratio at national level or more locally, including at the level of the individual farm. Permanent grassland can be ploughed, but must then be re-seeded with grass. In addition, Member States must designate areas of environmentally sensitive permanent grassland which may not be ploughed at all.

[133] Using an "equivalent practice" (article 43(3) of regulation 1307/2017)

Individual measures on this list are similar to some of those in the French National RDP. However, there appears to be no equivalent to the French *'système'* (system) measures described in Chapter 2. These encourage a farmer to convert his entire farming system to one based on agroecological principles.

4.2.3 Agroforestry

Agroforestry is supported through the RDP by Scotland, Wales and Northern Ireland but not England. Administrations which supported agroforestry through their RDP during the 2007-13 programming period are allowed to choose whether it counts towards a farmers' ecological focus area. Of the three UK administrations which were eligible to do this, only Northern Ireland has chosen to do so. Scotland provides an initial grant of up to £3600/hectare, with maintenance payments thereafter of up to £84/hectare, to farmers who sign 20 year contracts to plant and grow broad leaved trees on permanent pasture on which they will also keep sheep. According to Scotland's RDP, the aim of its scheme is to establish around 300 hectares of agroforestry by 2020 at a cost of €1.2million. Northern Ireland's RDP identifies "a need to integrate afforestation with agricultural practice" and its scheme provides an initial grant of £1572/hectare and five yearly maintenance payments of £65/hectare for silvicultural (sheep) schemes. Wales' RDP also offers support of up to £3600/hectare with maintenance payments at £60/year. It is notable that France also had a modest target (3000 hectares) for agroforestry in the 2007-13 period and has set no target under its 2015 plan so far. In Germany there are no targets.

4.3 Comparison between the UK, France and Germany

4.3.1 Leadership

In France and Germany, there has been a clear political drive to promote agroecology and organic farming respectively, based on powerful and urgent drivers, including the reduction of pesticides (France) and restoring consumer confidence in food (Germany). To date no such issue has led to a similar level of political attention being paid to driving forward an agroecological initiative in any of the four UK countries, with the exception, perhaps, of the response to the BSE and FMD crises, which was not wholly environmental.

Senior politicians in both France and Germany have provided strong, personal leadership to agroecology. Stéphane le Foll in particular has been a visible proponent of the concept since long before he took office, and once in office made it the cornerstone of his agriculture policy. Over a number of years he has made regular speeches and visits to promote it, and instigated events involving the widest possible segments of society – such as the *Nuits de l'agroecologie* – to raise its profile and garner support. Renate Künast provided equally strong leadership when establishing Germany's organics programme. One of the key messages from both Le Foll and Künast has been that a move to more agroecological farming is as much an economic as an environmental necessity.

This level of engagement by senior Ministers contrasts with the picture in the UK. For example, the 2002 English Organic Action Plan came about as part of the political response to the BSE and FMD crises – just like the BÖL in Germany. However, it and a number of

other UK plans are owned not by a single Minister or even a government department but by an action group containing stakeholders and sometimes led by them. There can be strengths in this approach, in terms of engagement and buy-in to the initiative, and it is consistent with the light touch, deregulatory approach generally favoured by the UK government when addressing environmental and other issues. But it can also leave lines of accountability unclear which is likely to lead to promised actions not being carried out and targets not met.

4.3.2 Targets and support

In terms of target setting, there appears to be quite a notable difference in the approach taken in the UK compared with Germany and France. For example, looking at targets set for the organic sector, France and Germany work towards a doubling of the land area under organic farming and an increase to 20% of UAA respectively, whereas - with the exception of the Second Welsh Organic Action Plan – there is a conspicuous absence of a prominent commitment by UK governments to increase the hectares of land under organic management. Rather, there is a greater focus on commercial opportunities such as market share. Moreover, the target in the Second Welsh Plan – which is expressed in terms of land coverage rather than market share – is framed as a recommendation to the Welsh Government rather than a commitment by the plan's owners or the Government itself[134]. France's targets in its Agroecological Plan include intermediate ones (numbers of grants, targeting of research) as well as key output indicators such as soil organic matter content and nutrient balance. Finally, no UK country has had in place an action plan for organic farming for the whole of the period from 2002 to the present day, as has Germany.

As well as political support, organic farming requires adequate financial support. Rates of funding for organic conversion (see Table 1) in the UK are within a similar range to those in Germany and France, but funding for maintenance is markedly lower. In theory such funding rates should reflect the income foregone and additional costs associated with organic farming, and any differences between French, German and UK rates should reflect differences in that income and those costs. It is beyond the scope of this report to investigate how the UK rates were set, or whether higher rates would lead to an increase in organic farming in a way which offered cost-effective benefits to society[135]

A number of high profile reports[136] have noted the potential for land management practices and agroforestry in particular to contribute to the management of flood risk. Despite this, and despite the urgency and cost of flood risk management in the UK, levels of support for agroforestry are low (a 300 hectare target over seven years in the case of Scotland) or even, as in England, non-existent (via the RDP). UK ambitions for agroforestry are less than those

[134] The relevant section of the plan says that the Welsh government should "continue to provide organic farmers with conversion aid and maintenance payments in order to support the growth of land under organic management to 10 -15% by 2010".

[135] Dr Bruce Pearce, Deputy Director of the Organic Research Centre told a seminar convened whilst this report was being written that he considered them to be too low.

[136] For instance, the Foresight and Food and Farming Strategy reports described above.

of France, which has published a separate plan, but appear to be greater than in Germany where no targets at all have been set.

Another key difference between France and the four UK countries is that France has introduced agri-environment climate sub measures which require a farmer to commit to change his/her entire farming system, for example, by introducing legume rotations and targets for the reduction of pesticide and herbicide use across the whole of an arable farm. There is no equivalent to these "système" measures in the UK.

Neither France, Germany nor any of the four UK countries have fully exploited the scope for cross-compliance rules to require basic agroecological practices – for example, for the maintenance of soil organic matter. It is not yet possible to establish the extent to which additional agroecological activity is happening as a result of greening.

4.3.3 Research

France, Germany and the UK all identify research as a key ingredient of the successful promotion of agroecology. The UK's Sustainable Agriculture and Food Innovation Platform and Sustainable Intensification Platform operate in similar fashion to the BÖLN's research programme, identifying relevant priorities and issuing calls for proposals, and the SIP has a project for IFM. However, the evaluators of the BÖLN in 2012 observed[137] that funding for organic research in the UK was at a very low level – 0.08 euros per hectare compared to 0.47 in Germany and 0.16 in France. Whilst funding per hectare is not a perfect measure of relative expenditure, and organic farming is only part of the equation, the very large gap between Germany and the UK (and, to a lesser extent, France) is worthy of further investigation. ORC/GWCT found that the research needed to underpin agroecology frequently involves knowledge-related outcomes and public goods, both of which posed challenges where funding mechanisms assumed a product and/or intellectual property as the anticipated outcome of research. They suggested that the EIP model of operational groups linking researchers, farmers and others could provide a better model for the support of agroecology provided sufficient resources were designated.[138]

4.3.4 Advice and knowledge exchange

France, Germany and the UK all place a strong emphasis on the importance of farm advice in helping farmers to take up new and innovative techniques. The French case study demonstrates the crucial role of advice to farmers in supporting the uptake of agroecological practices. France has been able to make rapid changes to both advice provision and the training of farmers and farm advisors thanks to its well-established network of chambers of agriculture, supported by regional offices of the Government, and the government's ability to effect rapid changes in universities' courses and other curricula. France's strong tradition of cooperative and collaborative working – exemplified in the

[137] Organic Research Evaluations, 2012. Evaluation des Bereichs Forschung und Entwicklung im Bundesprogramm Ökologischer Landbau

[138] ORC/GWCT ibid

network of chambers of agriculture and now built on through the introduction of the GIEE mechanism – enables rapid knowledge sharing underpinned by a network of advisors with access to the latest research.

Arrangements in the UK for the provision of advice and the sharing of knowledge are more complicated[139]. ORC/GWCT found that agroecology was poorly addressed in most college and university courses. In the absence of a cadre of suitably trained advisors, advice in the UK is provided from numerous different sources, with a matrix of public, private and voluntary support. A report for the European Commission by the James Hutton Institute[140] in 2013 found that "Overall, and especially in England, there has been an organisational evolution towards the privatisation and commercialisation of knowledge production and transfer. NGOs, public and private actors compete for the provision of agricultural advice"[141]. There have been attempts to improve the availability of advice, including Defra and charitable foundation funding to support the expansion of an organic farming information hub to cover the breadth of agroecological practices. But ORC/GCWT make the point that the French plan seeks to tackle deeper-seated issues through the redesign of college and university courses.

In these circumstances, it is likely to be more difficult in the UK than in France to ensure that farmers have access to the advice required for a rapid uptake of agroecological practices, and it will take longer to achieve due to the necessity of more consensual discussions between each of the UK governments, providers of university and college courses and the many private and voluntary bodies involved in the provision of advice.

It is striking that France modified its initial vision of agroecology shortly after its inception to add a further, social dimension involving a new mechanism for grass roots cooperation focused on agroecology. The fact that it was found necessary to introduce the GIEE shows that the French Government considered that having an established social infrastructure was not enough on its own to support the spread of agroecology. Nonetheless, the GIEE groups rely on French farmers' longstanding tradition of working through collective and cooperative arrangements and many GIEE groups (not all) were set up by actors who also work together under other group forms. UK farmers do work in collaborative ways. A survey of 244 farmers carried out by the SIP found that almost all were cooperating in at least one activity, with membership of buying or producer groups, and sharing labour or machinery, the most common forms of cooperation. These cooperative activities have come about for a variety of reasons including competitiveness and the need to contain costs. Agroecology has not so far been a strong driver although the SIP has a major project aiming to harness the power of collaborative working to drive change at the landscape scale.

[139] Prager, K., Thomson, K., 2014. AKIS and advisory services in the United Kingdom. Report for the AKIS inventory (WP3) of the PRO AKIS project. htttps://www.proakis.eu/publicationsandevents/pubs

Overall, the comparison between the UK countries, France and Germany suggests that, at a strategic level, the UK government has not promoted the mainstreaming of agroecological approaches into farming practices to date, despite a general aspiration towards a more sustainable agriculture and food system. Although some individual agroecological practices are required or incentivised via CAP measures and investment in research on IFM is taking place, there has not yet been the same degree of political engagement with these initiatives which characterised the early years of the BÖL in Germany and the Plan for Agroecology in France.

4.4 Looking ahead: the potential to promote an increased use of agroecological farming practices in the UK

There is, as discussed above, a range of differences and similarities between the French, German and UK experiences. A number of lessons can be drawn. First is the importance of a clear strategy, containing explicit environmental targets as part of economic objectives, which is supported and championed at Ministerial level in a manner which clearly signals the Minister's personal commitment to the achievement of the plan. Political cycles mean that Ministers will move on, but the experiences of Le Foll and Künast show that much can be achieved in a short time.

However, while Ministers can spearhead an initiative, importantly these initiatives do have to become embedded in the way the farming sector operates to become mainstreamed in the longer term. Linked to this, the German case study highlights the importance of sustained support within an evolving but consistent strategic framework. This suggests that if the UK governments wish to see an increase in organic or other agroecological farming practices, they will have to put in place and retain a long term strategy, accompanied by sufficient advice, training, knowledge exchange, basic environmental standards and some element of financial support where required (both transitional and in the longer term). The merits of applying a "système" type of approach – using public funding to encourage wholesale change besides organic may be worth further consideration. As a precursor to this, funding a number of strategically placed farms within the UK to act as demonstration farms for agroecology, could help raise awareness of the merits of these types of farming practices among the farming community.

A large part of the framework through which the administrations in the UK currently support agroecological farming practices will in the near future need to be replaced as the UK leaves the EU and the CAP and designs its own arrangements to support agriculture, rural communities and the environment in future. Those arrangements may differ from administration to administration. There is an opportunity for the UK to learn from France which has tackled wider issues including education, training and additional measures to encourage cooperation as well as core agriculture policy tools such as rules and financial support. Indeed, Brexit offers both opportunities and threats to the pursuit of agroecology in the UK. The principle of rewarding farmers for the provision of public goods – and, in particular, environmental public goods – should form a key rationale for public support to farmers. Embedding agroecological principles into farming systems so that they become the new norm provides an opportunity to put the UK's farming sector onto a more sustainable footing to make it more resilient in the longer term in the face of challenges such as climate

change. It is also likely that in the UK and Europe the need to rely on quality assurance standards will remain an important part of food production. This shows the importance of the market and of working at different levels, for example also on education, to achieve a step change.

Embracing agroecological principles as a fundamental element of any future strategy for farming and the farmed environment in the UK would send a clear signal that ensuring environmental sustainability, natural resource protection and resilience to climate change are fundamental to the long term growth and competitiveness of the food and agricultural sectors in the UK. To do so, however, will require a high level of political support and buy in from farmers as the key actors to put these principles into practice on the ground. Alongside this political commitment and buy-in from the sector, an appropriate framework of regulations - to set a baseline standard for farming and food production, incentives for good practices and positive management, and advice and knowledge exchange, will need to be put in place to make this a reality.

Annex 1 Spending by France and Germany on the CAP Rural Development measures for agroforestry, agri-environment climate measures and organic farming

This Annex presents information on the percentage of their Rural Development Programme budget each French or German region has allocated to the agri-environment climate and organic Measures for 2014-2020, and also indicates which French regions are funding agroforestry. Agroforestry is available in Pillar 2 as a sub-measure of the Measure on forestry investments (Measure 8) which means it is not possible to isolate budget figures for agroforestry only. The table nonetheless indicates (with an 'x') whether the sub-measure is available in the regional or national RDP.

France

Table 2: Rural Development Programmes in France using the agroforestry sub-measure, and share of budget allocated to the agri-environment and climate, and organic farming, Measures.

	Support for establishment and maintenance of agroforestry systems *Measure 8.2*	Agri-environment and climate *Measure 10*	Organic farming *Measure 11*
FR_GUADELOUPE	x	6%	0%
FR_MARTINIQUE	x	5%	0%
FR_GUYANE	x	1%	1%
FR_REUNION		5%	1%
FR_MAYOTTE	x	3%	0%
FR_ILE-DE-France	x	16%	10%
FR_CHAMPAGNE-ARDENNE		20%	7%
FR_PICARDIE	x	23%	7%
FR_HAUTE-NORMANDIE	x	13%	10%
FR_CENTRE		23%	6%
FR_BASSE-NORMANDIE	x	13%	8%
FR_BOURGOGNE		13%	6%
FR_NORD-PAS-DE-CALAIS	x	22%	8%
FR_LORRAINE	x	14%	7%
FR_ALSACE		26%	10%
FR_FRANCHE-COMTE		6%	5%
FR_PAYS DE LA LOIRE	x	24%	13%
FR_BRETAGNE		17%	8%
FR_POITOU-CHARENTES	x	29%	9%
FR_AQUITAINE		8%	6%
FR_MIDI-PYRENEES	x	5%	5%
FR_LIMOUSIN	x	7%	2%
FR_RHONE-ALPES	x	6%	5%
FR_AUVERGNE	x	5%	2%
FR_LANGUEDOC-ROUSSILLON		12%	7%
FR_PACA		16%	4%
FR_CORSE		5%	3%
Total	***16***		

Germany

Table 3: Rural Development Programmes in Germany using the agroforestry sub-measure, and share of budget allocated to the agri-environment and climate, and organic farming, Measures.

	Support for establishment and maintenance of agroforestry systems *Measure 8.2*	Agri-environment and climate *Measure 10*	Organic farming *Measure 11*
DE_BADEN-WURTTEMBERG		32%	13%
DE_BAYERN		40%	14%
DE_BRANDENBURG/BERLIN		7%	13%
DE_HESSEN		4%	28%
DE_MECKLENBURG-VORPOMMERN		13%	13%
DE_NIEDERSACH./BREMEN		19%	8%
DE_NORDRHEIN-WESTFALEN		28%	12%
DE_RHEINLAND-PFALZ		25%	20%
DE_SAARLAND		15%	13%
DE_SACHSEN		17%	4%
DE_SACHSEN-ANHALT		15%	6%
DE_SCHLESWIG-HOLSTEIN		17%	13%
DE_THURINGEN		26%	4%
Total	***0***		

Annex 2 Infographics on the 12 key principles of agroecology (in French)

Annex 3 The 2014 French law for the future of agriculture, food and forestry

The October 2014 French law "for the future of agriculture, food and forestry" (*Loi n° 2014-1170 du 13 octobre 2014 d'avenir pour l'agriculture, l'alimentation et la f*orêt[142]) sets out the basis of the Agroecological Project for France, a concept for French agriculture introduced in 2012 by the Ministry of Agriculture Stéphane Le Foll.

Article 1 specifies the policy's ambition as follows: "*[to ensure] access to food […] produced under conditions enabling the protection of the environment*" and "*to develop agricultural production and food processing industries and combine economic, social […], environmental and health performance to meet the double challenge of competitiveness and ecological transition, in a context of international competition."* The law thus reflects the three-pronged objective of the Agroecological Project which is to enable French farms to achieve economic, environmental and social performance.

The 2014 French law for the future of agriculture, food and forestry is structured around 6 headings, as follows:

1. economic and environmental performance of agriculture and food sectors;
2. protection of agricultural and forest lands and generational renewal;
3. food policy and animal and plant health;
4. education, training, research and development in agriculture and forestry;
5. forest policy;
6. provisions for overseas *départements* (regions).

In this Annex, we present the main changes brought about by this reform[143]. The implications of the changes most relevant to agroecology are discussed in Section 2 of the report.

Under *Economic and environmental performance of agriculture and food sectors*, the main innovations include: the creation of GIEEs which provide a structure for farmers and other local actors to implement agroecological project/actions collectively; the strengthening and improvement of the governance rules of co-operatives; the strengthening of rules governing commercial contracts along the supply chain (which are mandatory in some sectors) and the creation of a mediation service to solve disputes; and, the strengthening of the legal means available to managing bodies to protect their quality schemes (e.g. protected geographical indications) and origin schemes.

Under *Protection of agricultural and forest lands and generational renewal*, the role of the regions in the governance of agricultural policy is reinforced by introducing co-steering between the State and Regions in the development of the Regional Plans for a Sustainable Agriculture (*Plans Régionaux de l'Agriculture Durable* – PRAD) – an overarching strategic document setting out the regional priorities for agriculture, as well as the food industry,

[142] https://www.legifrance.gouv.fr/eli/loi/2014/10/13/AGRX1324417L/jo/texte
[143] http://agriculture.gouv.fr/la-loi-davenir-en-actes

which provides guidance on funding allocation e.g. under the RDPs (which are implemented at the regional level in France). Other measures are introduced, for instance to better protect agricultural land from urbanisation and to make rules to new entrants more flexible to facilitate generational renewal in agriculture.

Food policy and animal and plant health introduces a number of measures in relation to:

i) Food policy, with the revision of the national food policy to tackle priority issues: food waste, social justice in relation to food and food education especially for young people. The law also sets the legal basis for the development of territorial food projects (*Projects Alimentaires Territoriaux* – PAT) which aim to get different regional actors of the food supply chains together (from farmers and processors to consumers) to foster regional projects promoting local food.
ii) Animal and plant health: the reform introduces the legislative improvements needed to implement the Ecophyto-II Plan and the Ecoantibio Plan seeking to reduce the use of pesticides and antibiotics, respectively. Other measures include the publication of the results of official hygiene controls in food businesses (e.g. restaurants) and the transfer of competence relating to fertilisers and pesticides marketing authorisations to the French food safety authority, Anses (previously a competence of the Ministry of Agriculture).

Under *Education, training, research and development in agriculture and forestry,* the main measure concerns the adoption of the Plan "Teaching how to produce differently" (*Enseigner à produire autrement*) which aims to support the transition towards agroecology through education (e.g. changes in curricula/diplomas to include agroecology, training of teaching staff). This also involves the creation of the French agricultural, veterinary and forestry institute (IAAVF) to unlock synergies between education and research and deliver excellence in land-based education.

Forest policy sets out the legal base to enable the creation of 'GIEE' in forestry. Strategically, it also introduces a National Programme for Forestry and Wood Products and a specific support fund to the forestry and wood sectors.

Finally, measures were developed for French overseas territories, including a new governance body in charge of defining an agricultural development policy strategy to help the implementation of CAP measures and promote GIEEs.