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European Farmer Perspectives and their Adoption of Ecological Practices

Points de vue des agriculteurs européens et adoption de pratiques écologiques

Perspektiven der europäischen Landwirte und Landwirtinnen und die Anwendung ökologischer Wirtschaftsweisen

Andrew Barnes, Helena Hansson, Larissa Billaudet, Gaëlle Leduc, Gordana Manevska Tasevska, Mary Ryan, Bethan Thompson, Luiza Toma, Sabine Duvaleix-Tréguer and Irene Tzouramani

The transition to ecological farming approaches

The EU Farm-to-Fork (F2F) strategy (European Commission, 2020) and the Environmental Land Management Scheme (DEFRA, 2021) are recent policy examples of a desire to promote more environmental practices within agri-food systems in both the EU and the UK. These strategies aim to encourage greater uptake of practices that reduce the negative environmental side-effects of agricultural production. Although, some farmers have for a number of years been adopting ecological approaches, such as diverse cropping mixtures and integrated pest management, the ambition set out in these policies is to ensure that ecological approaches are adopted on a larger scale to protect against biodiversity loss and meet publicly stated targets on carbon mitigation.

The typology presented by Rega *et al.* (this issue) outlines the main ecological farming approaches observed across Europe and provides a template for measuring the progress of the transformation of European agriculture. To scale up adoption of these approaches, the goals and objectives of the farming community need to be considered. This article explores the role of farmer perceptions of ecological approaches. We focus on the importance farmers place on internal and external factors in

deciding whether or not to adopt these approaches.

Farmers' decision-making is complex and shaped by external and internal forces

Our current farming approaches have evolved in response to a series of internal and external forces. Alongside variable market conditions and uncertainties over policy reforms, farming in Europe has low rates of intergenerational renewal, skills gaps and a generally low capital base. In addition, the demands of supply chain actors, including consumers, have influenced the current perceptions of farm decision-makers across Europe.

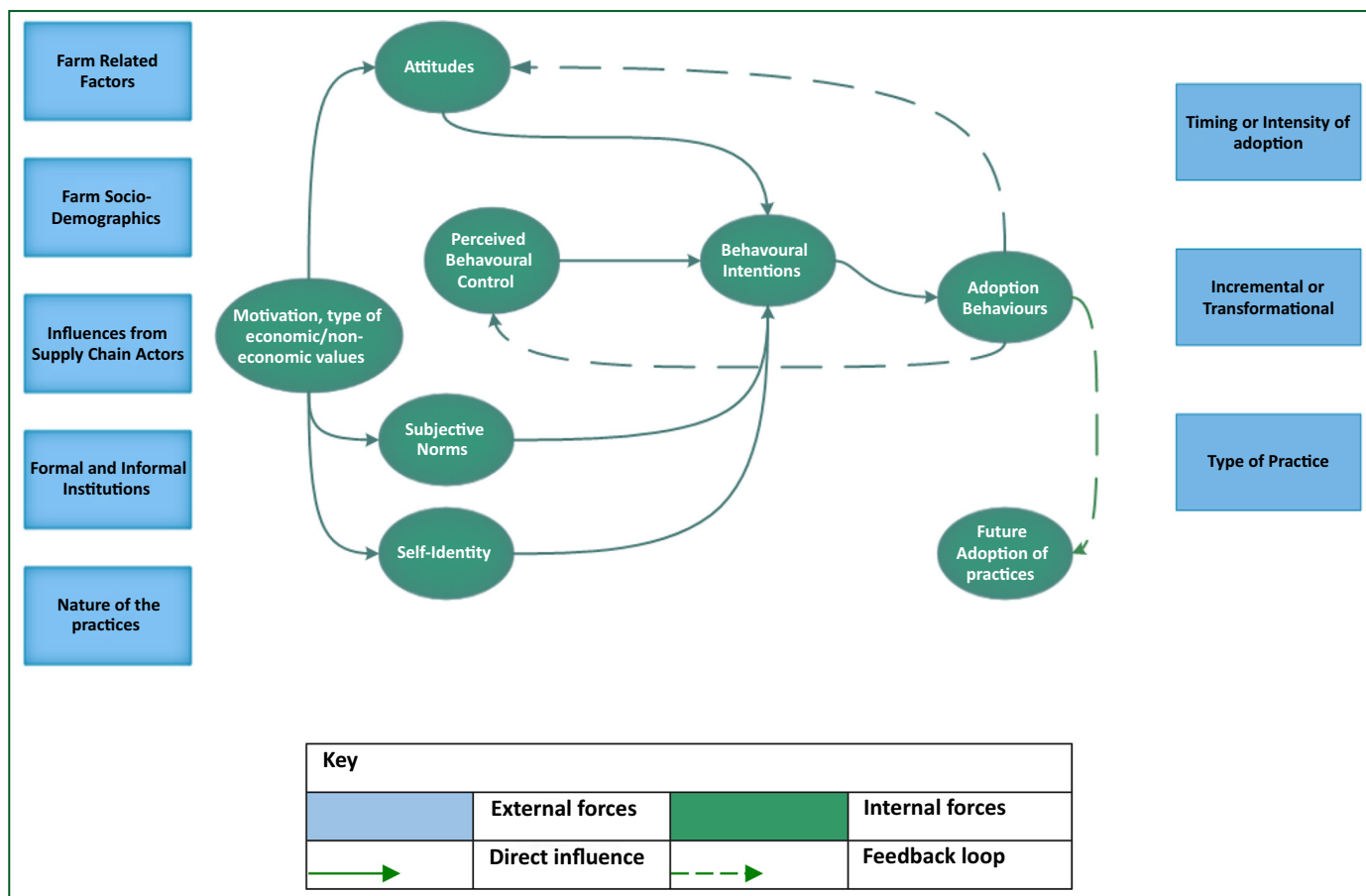
Figure 1 provides a hypothesised behavioural framework for understanding the adoption of ecological approaches at the farm level. The framework depicts the process for a farm decision-maker that leads to the intention to adopt an ecological production practice. This outlines the main internal and external drivers for this change. Based on extensive literature reviews (outlined in Hansson *et al.*, 2019) we hypothesise the process of adoption as a dynamic event, where future adoption is likely to be affected by current adoption. The framework identifies several components around the type of ecological practice which

would affect adoption rates. For example, agro-forestry will have significant long-term consequences for land use, whereas integrated pest management on one enterprise will allow more flexibility.

“ Des interventions ciblées permettraient de reconnaître l'hétérogénéité de la population agricole européenne et d'encourager le renforcement des approches écologiques. ”

In this framework, farmers' attitudes towards specific ecological approaches are at the core of the adoption decision. These attitudes are driven by the farmers' perception of how difficult these practices are to integrate within their current system (referred to as *perceived behavioural control*) and of how other farmers and agencies think about them adopting an ecological production practice (*subjective*

Figure 1: A behavioural model for ecological practice adoption



Adapted from: Hansson *et al.* (2019).

Box 1: Methods and data collection used

The **LIFT quantitative large-scale farmer survey** was administered to participants across 12 European countries or regions, namely Austria, Germany, Greece, England, France, Hungary, Ireland, Italy, Poland, Romania, Scotland and Sweden in the autumn of 2019 to the spring of 2020. We received responses from over 1,600 farmers. The questionnaire consisted of a number of sections which covered: the characteristics of farming systems, the adoption of ecological practices and detailed motivations and attitudes towards their adoption. The survey also included an evaluation of the economic impacts of adoption. See Tzouramani *et al.* (2020) for further details.

An in-depth qualitative study of Swedish, French and Irish conventional and organic farmers was undertaken to study farmers’ decision-making using the **Means-End chain (MEC)** approach. MEC assumes a hierarchical relationship within decision-making which links the perceived attributes of a practice to the consequences of these attributes and, finally, to the desired end-states achieved, taking the consequences of the attributes into account.

MEC was used here to study the drivers of farmer’s decisions to run conventional or organic farms. Individual farmer interviews were used to elicit a detailed understanding about which attributes of farmers characterise their decision to run either a conventional or organic farm, what consequences they perceive from those attributes and why those consequences are important to the farmers. Based on this study we gained in-depth understanding about drivers of conventional and organic farming. We were also able to contrast findings across the three countries where data were collected.

Structural Equation Modelling (SEM) was used and applied across the 12 countries or regions. This is a quantitative approach which tests the causality between observed or constructed (referred to as ‘latent’) variables, such as ‘identity’, with the intention to adopt a particular practice or set of ecological approaches.

The SEM was used here based on the responses to the LIFT large-scale farmer survey. A set of behavioural models was tested both at the country level and the overall EU level to assess the influence that behavioural determinants have on the current adoption of individual and sets of ecological practices, along with future adoption behaviour. We report the main findings of the EU level analysis here.

norms). Another influencing factor is how farmers identify themselves (*self-identity*), specifically how they

balance economic with non-economic motivations for production decisions.

The adoption decision is also embedded in a complex system of external influencing factors. These

include the environment surrounding farming, including consumers and other supply chain actors. Examples include requirements for carbon auditing and imposing particular quality standards. The nature of the ecological practice will influence its adoption. For example, whether the practice is a small-scale change or affects the whole farm. Within the framework there are also positive and negative feedback loops, which reflect the farmer's experience of implementing a particular practice. These would seem critical to ensuring uptake, as a positive experience using these approaches would lead to an increasing intensity of adoption by the farmer. Moreover, this would also support the promotion of these practices within the social networks of the farmer, thus challenging conventional norms within farming communities. We use this framework to explore farmers' perceptions and the importance they place on the internal and external factors for

adopting ecological approaches (See [Box 1](#) for methods used).

Findings on drivers

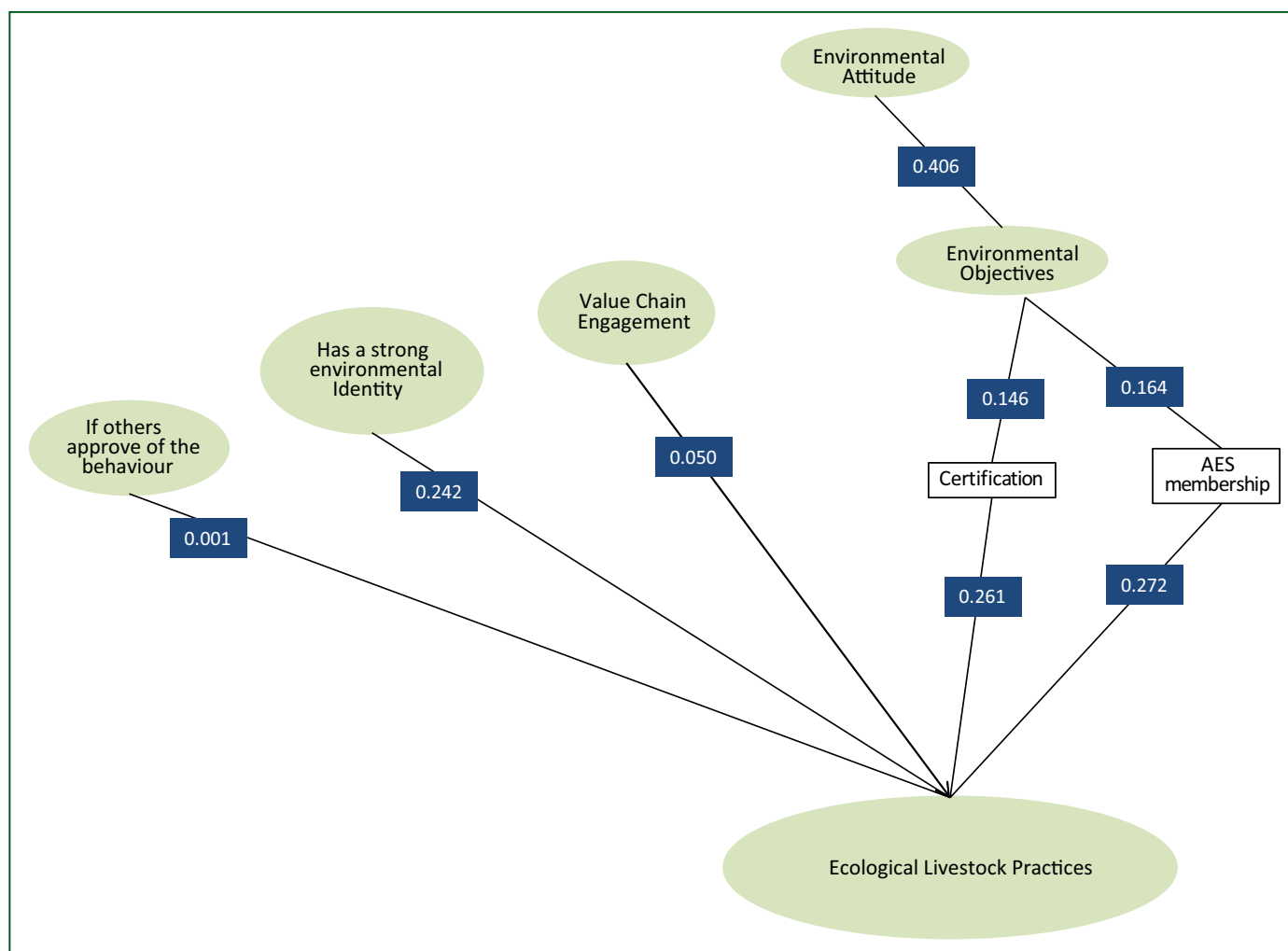
Figure 2 shows the results from a structural equation model on ecological practice adoption. The lines represent causal relationships between a latent variable – which is constructed from responses to the questionnaire – and an outcome variable. The figures in blue boxes show the magnitude of the effect on the outcome from these latent variables. For brevity we only focus on positive coefficients from the SEM.

Farming and social motivations are strong drivers for the adoption of more sustainable practices

Figure 2 shows a structural equation model for livestock farmers. This is based on the LIFT large-scale farmer survey and shows the causal links between some of the aspects outlined

in the behavioural model above and the adoption of ecological practices for livestock production. For brevity we focus on the positive and significant coefficients between adoption and these causal factors. Environmental attitudes are strong predictors of ecological practice adoption. These attitudes will shape environmental objectives and tend to lead to membership of agri-environmental schemes or ecological certification, e.g. a LEAF Marque or organic certification, for their produce. Another influence will be subjective norms, namely whether the farmer feels that other farmers will approve of their adoption of ecological approaches. This only has a slight causal effect compared to others within the SEM and may reflect low acceptance of these practices within the farming community. Identifying as an environmental farmer is a strong predictor of ecological practice adoption, as is engagement within the value chain. This latter effect means

Figure 2: A structural equation model for adoption of ecological livestock practices



that farmers who have positive experiences working with buyers and engaging in post-farmgate practices will tend to be more likely to adopt ecological practices.

Decision-making towards ecological approaches results in more complex reasoning

All the interviewed farmers (both conventional and organic) held financial, business and productivity motivations. These were verbalised in common phrases such as 'maintaining the business' or 'earning a living'. Nevertheless, there were divergences between organic and conventional farmers. While conventional farmers used phrases such as 'preserving tradition', 'responsibility' and 'supporting the family', organic farmers verbalised more social motives such as 'morality' and 'care for others'. Overall, conventional farmers identified wider and more numerous economic or production type motives to justify their choice of farming system compared to organic farmers. Conventional farmers sometimes tended to base their reasoning on explicit economic motivations such as 'having less costs', 'making best use of resources', or to 'free up time'. Organic farmers tended to show a more complex train of thought with longer chains of different motives which may indicate that organic farmers are more reflective on their activity. Accordingly, the conventional farmers' reasoning did not reach the more terminal personal values, i.e. the desired end-states that a farmer strongly wants to achieve, as much as those adopting organic systems.

There will be lock-in effects from past decisions which limit options for the future

We also find that past engagement and experience in ecological practice adoption predicts uptake of more ecological practices. This may be reflective of a lock-in effect where the acquisition of tacit



Growing companion crops supports soil health and productivity © Zach Reilly

knowledge around a practice supports increased adoption of the practice. Conversely, those farmers who have not adopted ecological practices face a greater barrier in adoption due to this lock-in effect (Barnes *et al.*, 2022a).

“ Gezielte Maßnahmen würden den großen Unterschieden in der europäischen Landwirtschaft Rechnung tragen und die Verbreitung ökologischer Wirtschaftsweisen fördern. ”

Environmental certification or accreditation schemes, whether privately funded through the supply chain or through agri-environmental support schemes, require commitments that will lock-in farmers to a particular practice. Concerns were expressed by the interviewed farmers in relation to tying up land with commitments or practices that are not easy to switch out of. This would restrict potential opportunities that may occur when markets or policies change, e.g. the

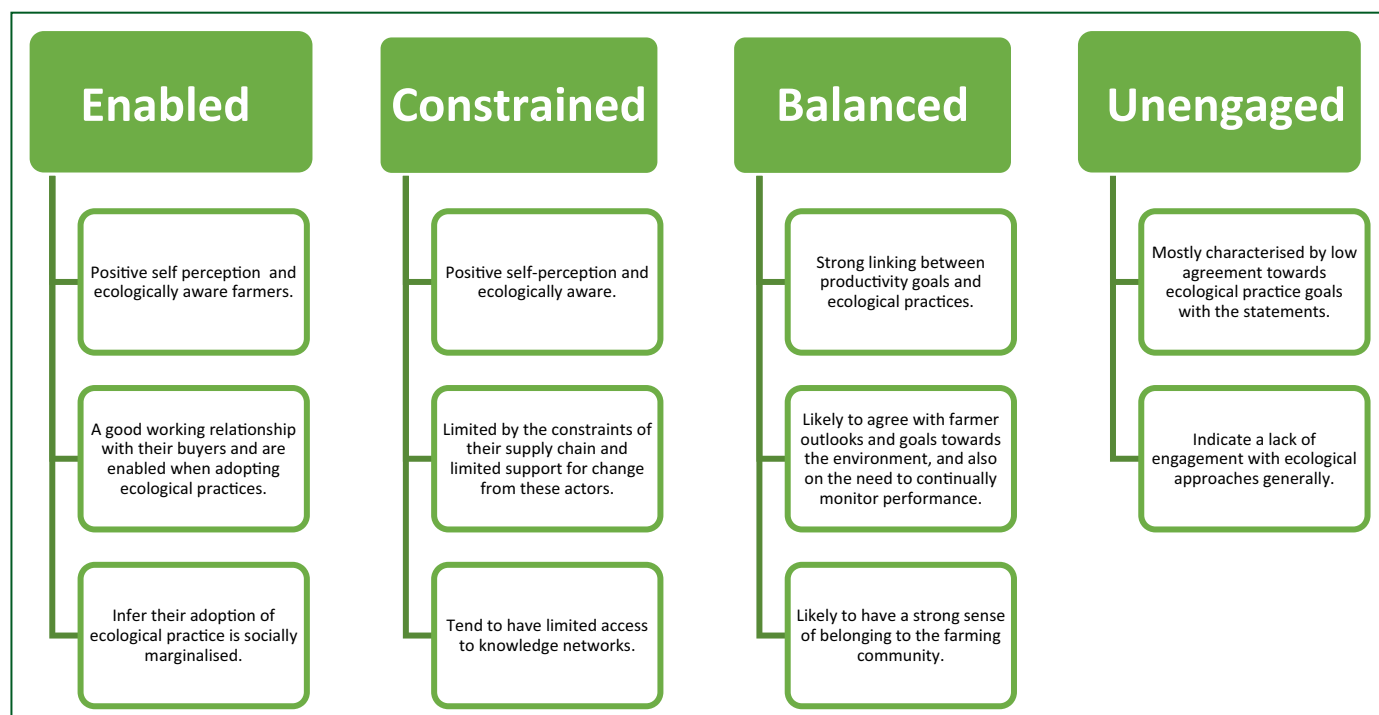
expectation that cereal prices could increase will be a disincentive for further ecological practice adoption. Moreover, institutional lock-in effects also occur around tenure and the restrictions placed by landowners on their tenants. Tenancy agreements tend to restrict longer-term activities and, in some cases, prescribe specific agricultural activities which limit ecological practice adoption (Borremans *et al.*, 2018). For example, using agricultural land for woodland planting may not be permitted or desired by the land owner, despite it being seen as an attractive option for the farmer.

Ecological self-identities can form within the farming community

Figure 3 shows our classification of farmer perceptions towards ecological approaches, which was developed based on the perceptions, values, motivations and attitudes towards ecological farming practices specified by farmers in the large-scale LIFT survey. Farmers were classified into four types based on their responses to sets of statements around external and internal forces.

The 'enabled' farmers hold positive views towards ecological practices

Figure 3: IIFT classification of four types of ecological perception found within European farming



Source: Barnes *et al.* (2022b).

and are very much at the adoption end of the decision-making framework outlined in Figure 1. They are trying practices and approaches which are also supported by their relationships within the supply chain. The motivations for adoption are mostly driven by their environmental values but tend to be reinforced by support and encouragement from the buyers of their produce. This group also identified themselves as socially marginalised from other farmers, perhaps as their approaches were not seen as compatible with the traditional perceptions of conventional farming (Sereke *et al.*, 2016).

A second farmer type also holds a positive perspective towards ecological approaches but perceive themselves to be ‘constrained’ in terms of access to knowledge and networks which could support their decisions. These farmers also identified that their supply chain relationships are limiting their choices for ecological adoption. This contrasts with the previous type who felt they had positive and supportive relationships with their buyers and other supply chain agents.

The ‘balanced’ type is more multifunctional in nature, applying equal weight to

productivity and ecological motivations. These farmers tended to demonstrate a strong farmer identity related to food production but also linked this with the adoption of ecological practices, such as winter cover crops to protect soil quality.

“ Targeted interventions would address the heterogeneity of the European farming population and encourage scaling up of ecological approaches. ”

A final ‘unengaged’ farmer type had low levels of engagement towards ecological practices, as well as towards the purpose of employing ecological practices on the farm.

Implications for the future

These findings have important implications for the ability to achieve

a more sustainable agri-food production system.

A more targeted approach would recognise farmers’ heterogeneity.

Overall, we find that farmer decision-making is complex and is shaped by responses to both external and internal forces. We find a significant amount of heterogeneity when we explore farmer motivations, perceptions and attitudes across the studied European farming systems. This will have consequences for how policy and markets intervene to address ambitions for meeting environmental and societal goals. The classification of ecological farming perceptions through our typology helps to capture some of the heterogeneity that we have observed. This may be an approach which supports more targeted messaging and helps to tailor interventions to particular groups, such as developing demonstration networks that tackle the main concerns expressed by these types.

A co-ordinated approach between the public and private sectors would lead to a change in perceptions and norms towards ecological approaches.

The SEM and our typology both highlight the nature of engagement with supply chains towards the

adoption of practices. Where farmers had developed trusting relationships with buyers this leads to a stronger intention to adopt ecological approaches. Hence, the relationship between producers and buyers will either prevent or enable greater adoption of ecological practices. For example, we identified a type of farmer who wishes to adopt more ecological approaches but feels constrained by the requirements of the supply chain they deliver to.

Given the strong influence of the supply chain a co-ordinated approach is needed. The European Commission's F2F strategy has ambitions to support a sustainable agri-food chain. The main route of the strategy seems to be through competition rules for collective initiatives and seeking agreements with food companies on reducing both the environmental footprint and energy consumption within agri-food production (F2F, Sect. 2.1). Accordingly, this must support transition for the whole agri-food system by addressing imbalances in power between producers and other supply chain actors, such as input suppliers and buyers of produce. The industry itself is promoting initiatives to support transitions, for example the adoption of carbon accounting tools or environmental audits.

Promoting access to training and demonstration would provide motivation to adopt more ecological approaches. The SEM, the MEC and the typology all showed peer-to-peer learning to be a strong influence on the uptake of ecological approaches. The framework for agricultural advice should aim to provide support for practices that will be beneficial for the environmental sustainability of the farm, as well as overall financial sustainability. One growing aspect of European research policy is the establishment of networks of farmers through a 'living lab' approach and agroecological living labs are being proposed as part of European Partnerships under Horizon Europe (European Commission, 2021). These will aim



Cattle grazing within woodland demonstrating a silvopastoral system © John Holland

for collaborative on-farm experimentation between farmers and researchers, testing and improving on ideas as well as helping to promote these practices further.

However, other aspects of agricultural knowledge and innovation systems need to be addressed for greater ecological practice uptake. Advisors are trusted brokers who help support on-farm decisions. Enabling their

ability to integrate and promote ecological practices requires targeted approaches, such as through recognised environmental training. Moreover, a finding of the MEC is that the role of agricultural education and training should aim to support skills for agri-environmental and forest management. This will offer a route to change and develop subjective norms around ecological practices for new entrants currently in education.



Species rich grassland supports biodiversity with extensive grazing © Helen Bibby

The gaps identified in skills, training and advice for these practices should be a focus for operationalising the F2F strategy. This widens the focus to include advisory networks and the influence of non-governmental agencies which promote more nature-based approaches. The dynamic nature of our behavioural model suggests that support is not only needed to initiate adoption but also to encourage more intensive adoption of ecological practices, e.g. covering more areas of the farm or more practices within the farm

(Thompson *et al.*, 2022). Hence, recognising that these farmers are at different stages of an ecological adoption cycle may be a way forward to supporting a transition to ecological practices as a 'norm' rather than a 'niche'.

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Summary

European Farmer Perspectives and their Adoption of Ecological Practices


 Delivering an agricultural policy which meets ecosystem and climatic pressures and addresses weaknesses in our current food system presents complex challenges for food producers. Adoption of ecological practices will reduce the dependence on imports into the farm and is one way to meet some of these policy ambitions. Understanding why farmers do or don't adopt these practices is key to enabling this transition. This study outlines a series of investigations into the key barriers, values and perceptions towards ecological practice adoption across European farming.

We find that personal, technical and institutional forces influence the adoption of more sustainable practices but these forces have varying levels of influence. The tensions between environmental, compared to purely production orientated motivations, may be a key barrier to ecological practice adoption. We also find a strong influence of commodity supply chains which may either encourage or limit adoption of these approaches. Promoting efforts for co-ordinated approaches between the public and private sectors may mitigate some of the dissonance in messaging towards these practices and alleviate these tensions. We also identify a great deal of heterogeneity within the European farming community and argue for a more targeted approach that would encourage adoption of ecological approaches and promote the scaling up of these practices.

Points de vue des agriculteurs européens et adoption de pratiques écologiques

 La mise en place d'une politique agricole qui réponde aux pressions écosystémiques et climatiques et remédie aux faiblesses de notre système alimentaire actuel présente des défis complexes pour les producteurs de denrées alimentaires. L'adoption de pratiques écologiques réduira la dépendance vis-à-vis des importations dans l'exploitation agricole et constitue un moyen de répondre à certaines des ambitions de la politique. Pour permettre cette transition, il est essentiel de comprendre pourquoi les agriculteurs adoptent ou non ces pratiques. Cette étude présente une série d'enquêtes sur les principaux obstacles, valeurs et perceptions liés à l'adoption de pratiques écologiques dans l'agriculture européenne. Nous constatons que les facteurs personnels, techniques et institutionnels influencent l'adoption de pratiques plus durables, mais leurs niveaux d'influence sont variables. Les tensions entre les motivations environnementales et celles purement axées sur la production peuvent constituer un obstacle majeur à l'adoption de pratiques écologiques. Nous constatons également une forte influence des chaînes d'approvisionnement en produits de base qui peuvent soit encourager, soit limiter l'adoption de ces approches. Promouvoir des efforts pour des approches coordonnées entre les secteurs public et privé peut atténuer une partie de la dissonance dans les messages à l'égard de ces pratiques et atténuer ces tensions. Nous identifions également une grande hétérogénéité au sein de la communauté agricole européenne et plaidons pour une approche plus ciblée qui encouragerait l'adoption d'approches écologiques et favoriserait le renforcement de ces pratiques.

Perspektiven der europäischen Landwirte und Landwirtinnen und die Anwendung ökologischer Wirtschaftsweisen

 Die Umsetzung einer Agrarpolitik, die den Anforderungen an Ökosysteme und das Klima gerecht wird und gleichzeitig die Schwächen unseres derzeitigen Lebensmittelsystems behebt, stellt die Erzeuger und Erzeugerinnen von Lebensmitteln vor große Herausforderungen. Die Anwendung ökologischer Wirtschaftsweisen wird die Importabhängigkeit landwirtschaftlicher Betriebe verringern und ist eine Möglichkeit, um einen Teil der politischen Ziele zu erreichen. Von großer Bedeutung für diesen Übergang ist das Verständnis darüber, warum Landwirte und Landwirtinnen die Wirtschaftsweise anwenden oder nicht. In der vorliegenden Studie wird eine Reihe von Untersuchungen zu den wesentlichen Hindernissen, Werten und Wahrnehmungen in Bezug auf die Einführung ökologischer Wirtschaftsweisen in der europäischen Landwirtschaft vorgestellt. Unsere Ergebnisse zeigen, dass persönliche, technische und institutionelle Faktoren die Einführung nachhaltigerer Wirtschaftsweisen beeinflussen. Allerdings sind diese Faktoren unterschiedlich stark ausgeprägt. Das Spannungsverhältnis zwischen umwelt- und ausschließlich produktionsorientierten Beweggründen kann ein wesentliches Hindernis für die Anwendung ökologischer Wirtschaftsweisen sein. Wir stellen auch einen starken Einfluss der Warenketten fest, da sie förderlich oder einschränkend wirken können. Bemühungen zur Förderung koordinierter Ansätze zwischen dem öffentlichen und dem privaten Sektor könnten einen Teil der Dissonanzen in der Kommunikation mildern und Spannungsverhältnisse abbauen. Wir identifizieren auch eine große Heterogenität innerhalb der europäischen Landwirtschaft und plädieren für einen gezielteren Ansatz, der die Anwendung ökologischer Wirtschaftsweisen und ihre Verbreitung fördern würde.

summary